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OPERATOR J. R.
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Billie H. Hix
BILLIE H. HIX
Chief, Technical Systems Branch
The Albert F. Simpson Historical
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NAFD

...NENTAL AIR DEFENSE COMMAND

AND

... AIR DEFENSE COMMAND

History

...uary - June 1955

Volume I
SUPPORTING DOCUMENTS
Docs. No. 1 - 65

3-3598-2

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 DOCUMENT NO. 1

K416.01-6

THIS DOCUMENT MAY BE FOUND

IN VOLUME 9 OF THE SUPPORTING

DOCUMENTS TO THIS HISTORY.

3-3538-2

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2

*ADCR 55-46

ADC REGULATION)
55-46)

HEADQUARTERS AIR DEFENSE COMMAND
Ent AFB, Colorado Springs, Colo.
4 June 1954

OPERATIONS

AC&W Operational Status Report

1. Purpose and Scope.

a. Purpose. This Regulation establishes procedure for preparation and submission of the AC&W Operational Status Reports as indicated below and fulfills the requirements of AFR 55-101. Compliance with this Regulation automatically insures compliance with AFR 55-101 and will be used in its place.

(1) These reports are a quarterly report entitled "AC&W Operational Status Report" and change report entitled "AC&W Status Change Report."

(2) The reports will reflect the latest status of all programmed and/or installed AC&W sites and point out areas limiting the operational status of AC&W sites.

b. Scope. For purposes of these reports, this Regulation is applicable to air defense forces having programmed and/or assigned radar sites (including sites used for tactical training) and control centers.

2. Responsibility. a. Air defense force commanders will insure accurate preparation and timely submission of the reports required herein.

b. Communications and electronics officers of sub-command and subordinate headquarters will establish such actions as will provide reporting activities with such technical assistance and/or administration necessary for accurate and timely reporting.

c. Statistical service activities at sub-command and subordinate headquarters will provide such headquarters with control, collection, audit, and submission services as are delegated by respective commanders.

3. Preparation. The AC&W Operational Status Report will be prepared as of 2400, local time, the 10th day of March, June, September, and December each year. AC&W Status Change Reports will be submitted immediately in the event of:

*This supersedes ADCR 55-46, 19 February 1954.

S

a. The establishment of a new site.

b. The discontinuance of a site.

c. Receipt of new equipment for a site.

d. Change in site designation (site number, site type, or unit operating the site).

e. Change in operational status. Temporary changes (10 days or less) will not be reported.

f. A change of 20 percent or more for any of the items listed in paragraph 4a(10) through (17) and (22).

NOTE: Sample formats are shown in Attachment 2.

4. Entries - RCS: AF-Z20.

a. ACEW Operational Status Report. Entries will be made for each site on a single numbered line. Sites will be grouped under the group or air division (defense) having operational control of the squadron assigned to the site. (See sample format.)

(1) Column (1) - If more than one site is operated by one squadron, enter the letter of the numerical designation of the detachment operating the site; otherwise leave blank.

(2) Column (2) - Enter the numerical designation of the squadron operating the site.

(3) Column (3) - Enter the designation of the installation or the nearest geographical landmark where the equipment is physically located. If the location of the site is classified "TOP SECRET" the word "CLASSIFIED" will be entered.

(4) Column (4) - Enter the function of the site, that is DC, CC, SS.

(5) Column (5) - Enter the type/model of primary search radar programmed.

(6) Column (6) - Enter the type/model of primary height finder programmed.

(7) Column (7) - Enter the type/model of standby search radar programmed.

0485

(8) Column (8) - Enter the type/model of standby height finder radar programmed.

(9) Column (9) - Enter the appropriate over-all code which consists of two parts: (1) a letter denoting the operational status of the site (see Attachment 1), and (2) a number denoting the major limiting factor. This numerical suffix will be determined in accordance with the following:

(a) Show "1" if construction is major reason for current status. A "1" will not be used in connection with any symbol other than symbol X.

(b) Show "2" if lack of personnel or insufficient training is major reason for current status. A "2" will not be used in connection with symbols F and CF.

(c) Show "3" if lack of equipment is major reason for current status. A "3" will not be used in connection with symbols F and CF.

(d) Subject to limitations shown above, "1," "2," and/or "3" may be used in any combination provided it is considered that the factors indicated are equally and materially responsible for the site's current status.

(10) Column (10) - Enter the percent of completion of construction program.

(11) Column (11) - Enter the percent of installation completed on primary search radar.

(12) Column (12) - Enter the percent of installation completed on primary height finder radar.

(13) Column (13) - Enter the percent of installation completed on standby search radar.

(14) Column (14) - Enter the percent of installation completed on standby height finder radar.

(NOTE: Telephone equipment normally included as a part of the radar will be included in computing percentages for Columns 11 through 14.)

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(15) Column (15) - Enter the percent of installation completed on all ground/air radio communication equipment. This percentage will be based on all ground/air radio equipment programmed. Interim equipment will be shown in the "Remarks" section.

(16) Column (16) - Enter the percent of installation completed on inside plant telephone facilities. This percentage to include inside plant telephone facilities normally a part of radar equipments.

(17) Column (17) - Enter the percent of installation completed on outside plant telephone facilities.

(18) Column (18) - Enter a forecast of the site's operational status as of 10th of each of the three months immediately following the "as of" date of the report. Use codes listed in (9) above and separate with slants.

(19) Column (19) - Enter the number of UHF air/ground channels programmed, and the number of UHF air/ground channels actually installed and operating. This column will consist of two entries, separated by a slant and preceded by the initials "UHF." Example: UHF 5/0. The first figure is to indicate the number of channels programmed by ADC; the second figure to indicate the number of channels actually installed and operating. (A "channel" is defined as the transmitting and receiving radio equipment necessary for two-way communication. Example: 1 AN/GRC-27 - 1 channel; or 1 AN/GRT-3 and 1 AN/GRR- combination - 1 channel. The end items cited include all ancillary equipment.)

(20) Column (20) - Enter the date of last calibration or evaluation if changed from last quarterly report.

(21) Column (21) - Enter the date station is complete, i.e., all programmed equipment is installed and operational, and all authorized personnel are assigned.

(22) Column (22) - Enter the percent of installation completed on all point-to-point radio communication equipment installed. This percentage will be based on all point-to-point radio communication equipment programmed by ADC. Interim equipment will be shown in the "Remarks" section.

(23) Column (23) - Enter the estimated or actual date of site survey. This entry to be carried until beneficial occupancy of a site, at which time it will no longer be required.

(24) When there is no entry to be made in a column, insert a dash (-).

b. Remarks. Add remarks to the end of the report and carry the same line number as the site to which they apply. Show remarks for the following:

(1) Changes in the geographical reference coordinates of a site and the use being made of a site ("O" if operational or "T" if training).

(2) Sites utilizing lash-up or interim equipment.

(3) The date of any formal equipment acceptance, by equipment type, on a one-time basis.

(4) The actual date of beneficial occupancy, on a one-time basis.

Remarks may also be used to explain data entered in columns (1) through (24) or to explain fully conditions affecting the status of a particular site.

c. AC&W Status Change Report. Entries will show, for units affected, all items required by paragraph 4a(1) through (24) above. (See sample change report.) Remarks may be added when necessary.

5. Reporting Data.

a. Due Date.

(1) AC&W Operational Status Reports will be due in Headquarters ADC not later than seven calendar days following the "as of" date of the reports.

(2) AC&W Status Change Reports will be due in Headquarters ADC as soon as possible after a change takes place.

b. Method of Transmission.

(1) AC&W Operational Status Reports for ZI installations, except the 4750th Training Wing, will be consolidated by air defense forces and will be

air mailed to Headquarters ADC.

(2) AC&W Operational Status Report for 4750th Training Wing (Defense) will be air mailed direct to Headquarters ADC.

(3) AC&W Operational Status Reports for units operating in Canada will be consolidated by the OIC, ADC Property Accounting Office, and air mailed direct to Headquarters ADC. Carbon copies will be transmitted to the interested air defense force.

(4) AC&W Status Change Reports will be submitted by air defense forces; OIC, ADC Property Accounting Office; and 4750th Training Wing (Defense), directly to Headquarters ADC by electrical transmission.

c. Security Classification. Reports will be classified in accordance with AFR 205-1 and ADCR 205-5.

d. Addressee. Reports will be addressed to this headquarters, ATTN: Director of Communications and Electronics.

e. Number of Copies. An original and two copies of the AC&W Operational Status Reports will be submitted to Headquarters ADC.

f. Records Disposition. Reports will be disposed of in accordance with paragraph 53c, AFM 181-5.
(ADOCE)

BY ORDER OF THE COMMANDER:

JARRED V. CRABB
Major General, USAF
Chief of Staff

OFFICIAL:

Joseph D. Hornsby
JOSEPH D. HORNSBY
Lt Colonel, USAF
Asst Comd Adj

3 Attachments:
1. Code for Column 9
2. Sample Reports
3. Percentage Fig for Compl of C&E Equip

DISTRIBUTION:
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(AF - ADC, Colorado Springs, Colo.)

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CODE FOR COLUMN 9, OPERATIONAL STATUS

Inoperative (Symbol X) - For any reason the site cannot be placed in operation in less than ten days.

Limited Operational (Symbol L) - The site is integrated into an air defense or tactical control system but due to shortages of personnel and/or equipment cannot be operated continuously. The site can operate for a minimum of twenty-four hours on an emergency basis.

Sustained Operational (Symbol S) - The site is integrated into an air defense tactical control system, minimum personnel and equipment are on hand to allow continuous operation, in accordance with the assigned mission, for a period of at least seventy-two hours. Complete coverage of the site need not be known (for radar sites only).

Fully Operational (Symbol F) - The site is integrated into an air defense or tactical control system; complete coverage of the site is known (for radar sites only) either by calibration, evaluation, or operational experience; sufficient equipment is on hand to allow continuous operation, in accordance with the assigned mission; adequate trained personnel are on hand to properly maintain the equipment; and adequate trained personnel are on hand to operate the site in accordance with the assigned mission and approved SOP's.

Capable of Limited Operations (Symbol CL) - No requirement exists for the site to operate in an air defense or tactical control system. The site could be integrated into an air defense or tactical control system within forty-eight hours and would be capable of limited operations in the system.

Capable of Sustained Operations (Symbol CS) - No requirement exists for the site to operate in an air defense or tactical control system. The site could be integrated into an air defense or tactical control system within forty-eight hours and would be capable of sustained operations.

Capable of Full Operations (Symbol CF) - No requirement exists for the site to operate in an air defense or tactical control system. The site could be integrated into an air defense or tactical control system within forty-eight hours and would be capable of full operations.

Attachment 1, ADCR 55-46, 4 June 1954.

SAMPLE REPORTS

(By Air Mail)

Subj: AC&W Operational Status Report, RCS: AF-Z20, as of ________________.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
21 ADiv																						
1	A	124 Durham, N.C.	DC	FPS-3	FPS-5	FPS-8	FPS-4	S	100	100	100	70	80	100	80	70	F/F/F	UHF-5/5	20 Jan 53	-	85	-
2	B	125 Louisville, Ky	DC	MPS-7	MPS-14	-	-	L-3	70	100	70	-	-	60	70	70	L/S/F	UHF-5/5	14 Feb 53	30 Nov 53	80	-
3		126 Macon AFS, Ga	DC	MPS-7	MPS-14	FPS-8	FPS-4	X	90	20	20	20	20	20	20	20	X/X/S	UHF-5/0	-	-	20	5Sep53

REMARKS:
1. Site will become fully operational with scheduled assignment of 5 additional controllers and 4 radar mechanics in July.
2. Status due to critical shortage of spare parts and test equipment.
3. Station operational on interim equipment at Dobbins AFB, Ga, with AN/TPS-1D

(By Electrical Transmission)

Subj: AC&W Status C Rpt, RCS: AF-Z20, as of ______________.

B/125/Louisville, Ky/DC/MPS-7/MPS-14/-/-/F/100/100/90/-/-/90/100/100/F/F/F/UHF-5/5/-/30Nov53/90/-/

Attachment 2, ADCR 55-46, 4 June 1954.

PERCENTAGE FIGURES FOR COMPLETION OF C&E EQUIPMENT

PERCENTAGES	MEANING
20	Plans approved by Air Materiel Command.
21 to 35	Tower and/or radio antenna systems erected.
36 to 50	Equipment installed on tower and in operations building (in case of radio equipment, cable facilities are available to remote Transmitter-Receiver sites).
51 to 65	Equipment is installed and is in clean-up and testing stages.
66 to 85	Equipment operating satisfactorily but not turned over to using agency.
86 to 90	Equipment operationally complete and ready to turn over to using agency.
91 to 95	AMA's Installation Acceptance Certificate (with list of exceptions, if any) accepted by using agency.
96 to 99	Facility Acceptance Report approved by major air command.
100	Exceptions to Facility Acceptance Report resolved.

Attachment 3, ADCR 55-46, 4 June 1954.

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ADCR 55-46A

ADC REGULATION)
55-46A)

HEADQUARTERS AIR DEFENSE COMMAND
Ent AFB, Colorado Springs, Colo.
9 July 1954

OPERATIONS

AC&W Operational Status Report

ADCR 55-46, 4 June 1954, is changed as follows:

* * *

4. Entries - RCS: AF-Z20.

* * *

a. AC&W Operational Status Report.

* * *

(1) Column (1) - Insert the AC&W site number, less letter prefix. When a squadron operates a detachment at another location, the detachment number only will be shown in this column--this will be a line item report following the basic squadron report. Likewise, when an operating location is used (such as Gap Filler Radar) the letter suffix only will be shown in this column.

* * *

6. Reports Control Symbol. AF-Z20.
(ADOCE)

BY ORDER OF THE COMMANDER:

JARRED V. CRABB
Major General, USAF
Chief of Staff

OFFICIAL:

Walter W. Robinson
WALTER W. ROBINSON
Colonel, USAF
Command Adjutant

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(AF - ADC, Colorado Springs, Colo.)

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3

HEADQUARTERS
ROME AIR FORCE DEPOT
Griffiss Air Force Base
Rome, New York

SUBJECT: GPA-27 Implementation Plan (U) 18 March 1955

TO: Commander
Air Defense Command
ATTN: Maj Gen F. H. Smith
Ent Air Force Base
Colorado Springs, Colorado

1. The Radar Improvement Conference, Hq ARDC, 2 Mar 55 and the 8 Mar 55 letter initiated by Maj Gen G. A. Blake, regarding the same subject, emphasized the need to expedite actions required to make newly developed radar techniques available to operating commands.

2. The matter, "How to accomplish the desired end", was jointly reviewed by Hq RAFD and Hq RADC. Review provided an approach which was presented in conference to USAF, ADC & AMC representatives, 17 March 1955, Hq RAFD.

3. The plan presented pertained to GPA-27 and establishes a method of providing Air Defense Command with an increased surveillance and weapon control capability in one-half the currently programmed time period. The magnitude of "capability increase" is not known, but can generally be expressed in equipment terms as follows:

a. The current specifications established by RADC calls for a dual channel GPA-27 system.

b. By separating dual channel components it is possible that two single channel systems can be installed at different site locations.

c. Two operational sites for each produced GPA-27 increases Defen capability and provides the increase at an earlier date.

4. Assuming that Air Defense Command programmed 20 GPA-27s, it follows that implementation can be accomplished by buying 10 GPA-27s, separating common elements of the system (See inclosure #1 with regard to component groups #1 & #2) and installing 20 single channel systems, Group #1, at sites programmed for GPA-27. Group #2 components to be installed at a later date, based upon production rate.

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HQ RAFD Subj: GPA-27 Implementation Plan [illegible]

5. In order to accomplish, the following procedure (reference inclosure) can be established upon determination of total GPA-27 requirements:

a. Buy a known quantity of category [illegible] components at the maximum production rate. (Rate to reflect [illegible] production time.)

b. Buy category "A" RF components and category [illegible] and miscellaneous components on a 2 for [illegible] until total requirement is fulfilled. This action provides total category "A" & "C" components in one-half the time required for total [illegible] known rate.

c. Separate category "B" components [illegible] & 2.

d. Marry separated category "B" components to category "A" and "C" components on a 1 for 1 basis. [illegible] identified as single channel GPA-27.)

e. Ship, install and operate on a [illegible] basis until remainder of category "B" components have been produced and phased into the system.

?

6. Logistically and technically the above [illegible] and it is apparent that a gain of one operational year [illegible] the total quantity of sites requiring GPA-27.

7. Since the GPA-27 specification has been [illegible] and since contractual negotiations will begin 1 Apr 55, it is necessary that the Air Defense Commander forward his recommendations to Commander, RAFD, by 31 Mar 55. An all out effort of the depot will be expended to insure the successful implementation of the Air Defense [illegible] operational requirements and will maintain a continuing review of similar matters regarding the potentialities and products of the Radar Improvement Program

1 Incl
GPA-27 Block Diagram(C)

ALFRED R. MAXWELL
Brig Gen, USAF
Commander

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FILE NUMBER 21 ... 4 ... vv

2 5 APR 1955

SUBJECT: (UNCLASSIFIED) AN/GPA-27 Implementation Plan

COMEBACK COPY

......Not requested, not furnished
CWE Furnished ..... 2 5 APR 1955 Dm
(Date) (Initials)

TO: Commander
Rome Air Force Depot
ATTN: Brig Gen A. R. Maxwell
Griffiss Air Force Base
Rome, New York

1. Reference: Your letter, subject: GPA-27 Implementation Plan, dated 10 March 1955.

2. This command concurs strongly with the objective of expediting the Radar Improvement Program as expressed in your letter. The GPA-27 Implementation Plan you have suggested for this purpose, however, would produce operational problems which we do not desire to accept.

3. It is recommended, therefore, that the plan to install one channel of the GPA-27 initially, with schedule of the second channel at a later date, not be placed into effect. The Air Defense operational requirements can best be met if both channels of the equipment are installed concurrently at each individual site.

4. The primary considerations upon which the above decision has been made are as follows:

a. The plan outlined in your letter could not be properly implemented unless a large number of radar sites within a given geographical area were "off-the-air" at one time. The Air Defense system can not withstand such a loss in operational capability in critical target areas.

b. The SAGE Implementation schedule will be delayed within Sector 1 if dual channel GPA-27's are not available at the programmed sites in this sector by mid 1956.

F-9839
F-9841
V-65334/01

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[illegible] OFFICE OF THE COMDR, Subject: (Unclas) AN/GPA-37 Implementation Plan

6. The initial operational date for many SS and [illegible] sites is after mid 1956. Installation of the GPA-37 must await completion of these sites, regardless of the Implementation Schedule.

7. It is suggested that study be given to the possibility of advancing first article delivery or increasing the build-up of production rate for the dual channel equipment. It is realized that the GPA-37 is a development production item, and that limitations to this method of approach do exist. From the operational standpoint, however, this method of expediting the program would produce the least amount of difficulties for the Air Defense Command.

GEORGE F. SMITH
Major General, [illegible]
Chief of Staff

Info copy:
AFOAC, USAF
Washington, D. C.
Comdr, ARDC
Baltimore, Md.

MEMO FOR RECORD: The C&E Directorate has completed a thorough study of the proposal submitted in the NAFD letter. The matter has been discussed with the various staff sections of this headquarters and it has been agreed that the Implementation Plan proposed by NAFD will present a large number of operational problems, as stated in this correspondence. It has been generally agreed by the various members of the staff that the NAFD proposal should not be accepted by this command. Comeback copy req'd for CO[illegible] file. Daily Diary item req'd.

FREDERICK R. NICHOLS LT COL USAF

NOTE: Info copy sent to Dir of Comm, USAF, Washington, D.C. and to Comdr. ARDC, Baltimore, Md.

no

Prepared by Lt/C. F. Nichols/1h

[illegible] Apr 55

This correspondence is classified ______ in accordance with

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a. EADF

b. CADF

c. WADF

Lt Col, USAF

Colonel, USAF

SECRET

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6

ABPRT-T-1

SUBJECT: Special Training AN/GPA-27 Radar Set

TO: Commander
Technical Training Air Force
Gulfport, Mississippi

1. Reference is made to classified message, VOTE 118B, your headquarters, subject same as above, dated 17 February 1955.

2. Available information indicates this command will complete installation of 44 AN/GPA-27 Radar Sets during the period May 1956 through February 1957.

3. Based upon the foregoing information, a requirement exists for training a total of 88 personnel during the period April 1956 through January 1957. Further, it is requested spaces not to exceed 9 per month be allocated for subject training.

4. It is the understanding of this headquarters that present planning calls for installation of all AN/GPA-27 Radar Sets to be accomplished by Bendix Radio. It is further understood that the amount of time involved to complete the modification will be approximately 3 weeks per installation. Of this amount the final week will be utilized for final peaking and debugging prior to the equipment being committed to active air defense. In this event it is recommended that your headquarters investigate the feasibility of procuring the services of one Contractor Instructor for each installation team for the purpose of conducting On Site Training during the period the installation team is present. Present installation schedule for subject equipment indicates a maximum of 4 AC&W sites will be inoperative at any one time for the purpose of installing the AN/GPA-27.

5. This headquarters realizes that "On Site Special Training" is a deviation from existing procedures; however, considering the tremendous saving in man hours and travel funds plus the fact that all personnel would receive the training rather than a selected few, the recommendation warrants consideration. In the event the training is conducted "On Site", the requirements outlined in paragraph 3 above will be negated.

FOR THE COMMANDER:

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7

21 January 1955

MEMORANDUM FOR RECORD:

SUBJECT: Radar Improvement Program

7 JVN

1. On 21 January, a meeting was held in the office of the C&E Director to establish guide lines for finalizing the Radar Improvement Program. Personnel present were:

Colonel O. T. Halley, Jr.
Colonel E. A. Herbes
Colonel H. E. Neal
Colonel J. H. Weiner
Colonel J. C. Meyer
Lt Col F. K. Nichols
Maj W. R. Goodrich, Jr.

2. Lt Col Nichols presented a recommended program for the deployment and installation of the AN/FPS-7 radar and the AN/GPA-27 improvement kit for the AN/FPS-3. The specific points covered were as follows:

a. A working group composed of Major Goodrich, C&E, Major Crispen, P&R; Major C. W. Taylor, O&T; and Major Lloyd, P&R, prepared a tentative deployment plan in early January 1955 for the radar improvement program. After this deployment plan was completed, considerable discussion was held concerning certain minor features of the plan, with particular reference to its implications regarding SAGE. As a result of these discussions, it was determined that a new deployment study should be undertaken.

b. A revised plan had been prepared by the C&E Directorate which was considered to meet the operational requirements presented by O&T and P&R. This revised plan was also considered to be compatible to the SAGE requirements. Significant features of this revised plan were as follows:

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(1) Thirty-two (32) 33(Sic) AN/FPS-7's were to be deployed as the first increment of this type radar. Twenty-nine (29) 30 (Sic) were to be sited in existing or programed stations in the U.S., and three (3) in Canada at "C" sites. The requirements for fourth phase sites in Canada were to be determined at an early date. (The possibility of placing one FPS-7 on TT-1 or P-10 at North Truro was discussed, with the general consensus of opinion being that P-10 was the more desirable site. The specific deployment is shown on Attachment 1.

(2) The priority of installation of individual sites would follow closely that of the SAGE system until mid-58. The best sites locates in SAGE Sector 1 would have first priority and would be completed by end-57. FPS-7 installations would then follow in early 58 in accordance with the schedule for SAGE sub-sectors. After mid-58, FPS-7 installations would be made solely on the basis of target priority as the radar program would then be ahead of the SAGE implementation schedule.

(3) With the deployment as presented, 10 AN/CPS-6B's would be replaced by FPS-7's. The programming goal of ADC will then be that 16 CPS-6B's will be replaced at an early date with AN/FPS-3's modified by the GPA-27's.

(4) With the deployment plan as presented, there would be five SAGE sub-sectors in which an FPS-7 would not be located: one along the northern perimeter, for which

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high-level coverage would be provided by a Canadian site--C-14; the two sub-sectors for which manual operations are planned; and two for which high-altitude coverage would be provided by FPS-7's located in adjacent sub-sectors.

c. Initial increment of GPA-27 improvement kits for the AN/FPS-3's will be between 50 and 60. It was agreed by all present that the ultimate goal would be to place the GPA-27 at all FPS-3 radars. This will require approximately 125 improvement kits.

3. The deployment plan presented, together with the suggested installation priorities, was accepted by all personnel present. It was agreed that finalization of PWP programing and other associated budgetary actions could be taken to implement the proposed plan.

F. K. NICHOLS
Lt Col, USAF

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[illegible]

[illegible] ________ . In regard to [illegible] of [illegible] search sets at sites where dual [illegible] AN/GPA-27 is programmed, the [illegible] policy will pertain.

[illegible] for the [illegible] set [illegible] actual [illegible] of the [illegible] has not commenced. Therefore, the [illegible] for [illegible] search sets at the [illegible] sites [illegible] -92, Tucson, Ariz; [illegible] -96, Almaden, Calif.; [illegible] -102, Harrington, [illegible]; [illegible] -132, Laudette, [illegible]; [illegible] -14[illegible], Valentine, [illegible]; [illegible] -1[illegible], Eagle Pass, [illegible]; [illegible] -191, Rockport, [illegible] -19[illegible], Tyndall [illegible], Fla; and [illegible] -200, Cross City, Fla. [illegible] changes [illegible] made by this [illegible] desire [illegible] plans be changed accordingly.

[illegible]: It has been decided that emergency search will not be required where dual channel AN/GPA-27 is programmed, since with [illegible] equipment sufficient backup for search will be provided.

RALPH J. STR[illegible]
Major, USAF

Maj Ralph J. Strosner/id

This correspondence is classified ________ in accordance with

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([illegible]) [illegible]

In some instances [illegible] presently plann[illegible] [illegible]/[illegible]-27 is [illegible] [illegible] of [illegible] / [illegible] -2[illegible], AVR [illegible] -27, [illegible] [illegible] [illegible] [illegible] -126, Yuma NAS, [illegible]; and [illegible]-162, [illegible].

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CONFIDENTIAL

COPY COPY 9

COMDR ADC

DEFERRED 18 Feb 55

COFS HQ USAF WASHINGTON DC

AFOAC 57492 CONFIDENTIAL

(CONFIDENTIAL) ADOCE-RQ______________. URMSG AFOAC 57492, 9 FEB 55, CONF

FOL is ANS to Item 1: When this HQ is assured that the GPA-27 and FPS-7, with their dual CHAN capability, are AVAL and proved to be capable of reliable OPR, the RQR for FPS-8 in a backup role will not exist. Item 2: Of the 4 sites listed in this item, only 1 is SKED for a GPA-27 within the first 50 sets of the MOD program. One other will receive the FPS-7 (DEC 58 The remaining 2 TM sites W/B retrofited with GPA-27 sometime after FEB 57. This HQ does not desire to DELT RQR for FPS-8 backup until GPA-27 and FPS-7 EQP is OPR proved.

Maj WRGoodrich/hb
2716
18 Feb 55

03910

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SECRET

FILE NUMBER 220

10

[illegible] 1955

SUBJECT: (Uncl) Operational Improvements in the Ground Environ- the Continental Air Defense System

TO: Director of Requirements
Headquarters, USAF
Washington 25, D. C.

INFO: Commander
Headquarters, ARDC
Baltimore, Maryland

OPR 8/1/55

1. Reference.

a. Letter this Hq, subject as above, dated 5 Septem- and letter Hq USAF, Headquarters USAF, subject as above, da-

b. Conference [illegible] of ADC and ARDC [illegible] between General Chidlaw, General Power and ARDC staffs, 8 July 1954.

c. Letter [illegible] of the Continental this Headquarters, subject: "Improvements [illegible] System of the Continental United States".

d. Letter [illegible] Defense Capabili[illegible] this Headquarters, signed by General Chid- [illegible] "Air Defense Capabilities", dated 17 Aug-

2. For several [illegible] of Staff, USAF. [illegible] on the So[illegible] constructing an [illegible] years, based on the best available intel- [illegible] aircraft carrying the Soviet offensive capability, the [illegible] would be the threat constructing an air defense system to [illegible] would be expected TU-4 type aircraft carrying atomic bombs. [illegible] indicated this would be the threat [illegible] today and [illegible] high performance jet bombers could be [illegible] aircraft are [illegible] in 1957. Quite recently, revised [illegible] at speeds greater [illegible] state that the jet aircraft expected [illegible] to pose a [illegible] today and will probably be around with [illegible] is expected to [illegible]. These aircraft are capable of flying [illegible] of 50,000 feet, at speeds greater than [illegible]

3. In addition [illegible] today in sufficient numbers to pose [illegible] the United States. The size of this [illegible] increase rapidly in the next few years.

Retyped w/ minor change
L-918 30/0619
F-6390 [illegible]

V-575-1

This correspondence is classified [illegible] in accordance with Par. 21 [illegible], AFR 205-1, [illegible] AFR 205-1, [illegible], or for the reason (s) stated.

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Ltr ADC ADOPR, Subject: (Uncl) Operational Improvements in the Ground Environment of the Continental Air Defense System

3. In addition to the startling realization that the system being built so laboriously is being outclassed in certain respects, both in the ground and the air environment, further intelligence information indicates the Soviets are expending great effort to perfect an intercontinental ballistic missile against which known defensive devices appear to be powerless. Furthermore, it is only reasonable to assume they are developing "cruise-type" missiles of the Snark, Navajo and air-to-surface types.

4. The seriousness of this situation cannot be over-emphasized. It demands that, both in development and procurement fields, immediate and overriding consideration be given certain items which will contribute toward re-establishing a reasonable degree of air defense capability against the air-breathing portion of this threat as soon as possible. The urgency associated with the intercontinental ballistic missile threat is well known at both your headquarters and the National Security Council. It suffices to say that the realization of the penalty we will pay for lagging in this field will in itself establish the degree of effort to be expended in overcoming this threat.

5. For your guidance, inclosure one (1) is a list of items considered as having vital importance in improving the ground environment of the system to cope with the manned bomber and cruise-type missile threat through 1960. A letter similar to this, but concerning the necessary improvements required in the weapons field, will be forwarded shortly. In both instances it is requested that the cardinal significance of these items be recognized and that the necessary planning, reprogramming and budgetary actions be taken to provide this command with the improved capability as soon as possible.

FOR THE COMMANDER:

1 Incl
Priority R&D Items

[illegible] H. SMITH JR.
[illegible] General, USAF
Vice Commander

SECRET

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AIR DEFENSE COMMAND

PRIORITY RESEARCH AND DEVELOPMENT ITEMS

DATA GATHERING

A. GROUND RADAR

1. Prime Radar

Prime radars must be designed with a detecting and tracking probability of 95-98 per cent on moving targets, with the equivalent of one (1) square meter of reflecting surface, at ranges up to 250 NM and at altitudes up to 65,000 feet. These radars must be available as soon as possible but no later than 31 December 1956. By 1959-60 the capability of prime radars must provide for the detection of "cruise" type missiles, with a reflecting area equivalent to one-quarter (¼) square meter, at altitudes up to 100,000 feet while maintaining a horizontal coverage of 250 NM and a probability of detection of 95-98 per cent. (Reference paragraph 3, page 4, of this document).

2. Raid Size Determination

The present methods and procedures for determining raid assessment by using expanded "A" and "J" scopes is entirely inadequate. Radars operating in the air defense system must be capable of producing raid assessment data simultaneous with initial detection. This assessment must be accurate to within plus or minus ten (10) per cent of the actual raid size. Raid assessment data is essential for rapid and accurate identification and for proper commitment of forces. This is an urgent requirement.

3. IFF

There is an immediate and urgent requirement for fail-proof identification for the air defense system. This requirement becomes more critical as the magnitude of the threat increases. The means for accomplishing this task is described in the Air Defense Requirements for 1954-60. The most desirable IFF equipment would provide positive identification simultaneously with the initial detection. A selective identification feature (SIF) requirement for all manned and unmanned interceptors is of equal importance. This capability is required as soon as possible. The requirement for air-to-air IFF will be outlined by this headquarters in separate correspondence.

4. Electronic Counter Measures (ECM)

Although all communications and electronic equipment intended for use within the air defense system is being designed for maximum security, the vulnerability of the ground-air communications link is of grave concern to this command. This vulnerability will become more critical with the advent of the data link. All ADC radars should be equipped with anti-jamming circuits, and all other means available, to minimize the effects of jamming. This urgent problem requires continuous investigation.

5. Height Finding Capability

Future ADC search radars should be designed to provide height data simultaneously with the initial detection. Height data, at all ranges, should be accurate to within plus or minus 1,000 feet of the actual height of the target. The equipment must be capable of providing height data on aircraft, with the equivalent of one (1) square meter reflecting surface, at ranges up to 150 NM and at altitudes up to 65,000 feet. This capability must be available to the Air Defense Command as soon as possible but no later than 31 December 1956. By 1959-60 the height finding capability must be improved to provide altitude coverage up to 100,000 feet on targets with the equivalent of one-quarter (¼) square meter reflecting surface and without a reduction in range or accuracy.

B. Airborne Radar

1. AMTI for AEW&C Aircraft

The development program for the airborne moving target indicator (AMTI) should be accelerated to the highest degree. Because of the non-availability of a suitable piece of equip-ment AEW&C aircraft are forced to fly at low altitudes. This method of operation results in poor radar coverage and creates severe communications problems. This is an urgent requirement and should be placed in priority category 1-A in accordance with Par. 4a, AFR 80-11, dated 23 March 1951.

2. AEW&C Radar

A requirement exists for airborne early warning and control (AEW&C) radar with the capability to detect and track airborne moving targets, with the equivalent of one (1) square meter of reflecting surface, at altitudes from the surface to 65,000 feet and at ranges up to 150 NM. This capability must include a 95-98 per cent probability of detection and be available as soon as possible. By 1959-60 this detection capability must be increased to include airborne moving targets, with the equivalent of one-quarter (¼) square meter of reflecting surface, at altitudes up to 100,000 feet and at ranges up to 150 NM while maintaining a probability of detection of 95-98 per cent.

3. Nuclear Powered AEW and AEW&C Aircraft

A new type of AEW&C and AEW aircraft must be designed to replace the present RC-121 in the 1960 time period. The range of the new type aircraft should be restricted only by the endurance of the flight crew and not by the fuel quantity. Nuclear power should be considered in developing such an aircraft.

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WEAPON CONTROL

A. Data Transmission Equipment

1. Ground-to-Air Data Link

The AN/GKA-1 must be improved to attain greater resistance to jamming and greater reliability at its expected maximum range. The development of a 10 KW, UHF power amplifier will contribute significantly toward overcoming these limitations. Initially, a 1 KW UHF amplifier will be acceptable and will be used to drive the 10 KW unit when it becomes available. This is an urgent requirement; it is imperative that the USAF command control data link be operational in the air defense system in early CY-56.

2. Improved Manual Air Defense System

The current threat demands that the capability of the manual air defense system be improved without delay. The AN/GPA-37 is now under production contract to the General Electric Company. Although this unit will increase the effectiveness of the air defense system, the early models will not include some desirable features which can be included in more refined models. Additional requirements have been forwarded to Headquarters USAF and Headquarters ARDC.

3. Weapon Recovery

This command must be capable of recovering its all-weather interceptors from a range of 200 miles by programming and directing an optimum "return-to-base" course for them and automatically scheduling their AGCA or ILAS. The "Volscan System", developed by AFCRC, may meet this requirement.

B. Ballistic Missile Threat

The present, or programmed, air defense system will not be capable of countering the intercontinental "ballistic-missile" threat. National intelligence information indicates that such a missile may be tactically available to the USSR in 1960; therefore, the seriousness of this situation cannot be over-emphasized. In view of this threat, overriding consideration must be given to study and development of a means of countering it.

C. Feasibility Study

The USSR currently has the capability of using decoys to distract and dissipate our air defense capability to a degree sufficient to permit atomic bomb-laden aircraft to approach their targets with relative ease. The appropriate agency should launch a vigorous investigation to determine the feasibility or possibility of developing a detection device, or method, which can discriminate between a bomber and a decoy.

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Changes to PC Document

DCAE-E

5 Oct 54

Plans &
Projects Div

Maj WRGoodrich/2716/mb

1. The attached recommended changes to the PC document for AN/FPS-6 height finders is a valid request based on the following:

a. The FPS-4 height finder is incapable of performing the air defense mission with the search equipment to which it assists. This height finder has ranges and accuracies not compatible with the search equipment.

b. AC&W stations located along the northernmost part of the Continental U. S. (called the Northern Perimeter of the Combat Zone) should have height-finding equipment capable of indicating height information more nearly in coincidence with search information than presently exists. This feature is of necessity if air defense is to be of optimum value. The same requirement exists along the complete perimeter of the Combat Zone and in and around the perimeter of the double perimeter areas.

c. During the coming era of 1956-1960, an extensive radar-improvement program will be undertaken to improve the search radar capability. Along with this program, the improvement of height-finding capability must be made compatible with that of the search capability in order that air defense may be accomplished in an effective and efficient manner.

2. In view of the above and the urgency with which the ADC requires accurate early-warning information, it is requested that the requirement for FPS-6 height finders be reviewed and approved.

7 Incls
Perms for
1. Cutbank, Mont.
2. Finley, N. D.
3. [illegible], N. D.
4. [illegible], Mont.
5. [illegible], N. D.
6. [illegible], Mont.
7. [illegible]

FREDERICK E. NICHOLS
Lt Col, USAF
Acting Chief, Elect Sys Div
Ext 2717

Secret

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1.5

CONFIDENTIAL

FILE 213.1
AU

COMDR ADC ROUTINE ROUTINE

COMDR RAFD GRIFFISS AFB ROME NY

X X

COMDR AMDC BALTIMORE MD
COMDR AMC WRIGHT-PATTERSON AFB OHIO
COMDR RADC GRIFFISS AFB ROME NY
COMDR AFCRC 224 ALBANY ST CAMBRIDGE MASS
DIR LINCOLN LAB MIT LEXINGTON 73 MASS

COMEBACK COPY
-----Not requested, not furnished
CK Furnished 21 JUN 1955
(Date) (Initials)

21 JUN 1955

(CONFIDENTIAL) ADOOR-RS 2359. FOL MSG in 5 Parts.

Part 1. This HQ understands that the FOL MOD are to be made to the OA-270/FPS-6: A. change the 90 - 200 MI range sweep to 0 - 200 MI range sweep. B. Change height capability from 60,000 FT. to 75,000 FT. Part 2. HQ ADC accepts both MOD as RQR. Part 3. INFO AVAL this HQ shows that: A. RADC and RAFD will see that ANY changes are incorporated in the existing OA-270/FPS-6 CONTR to incorporate MOD in these indicators to make them SAT for use within SAGE. B. Existing OA-270/FPS-6 indicators MFR prior to APRX AUG 1955 will be field MOD. Part 4. This HQ desires that no change be made which would impair OA-270 for use in the manual SYS. Part 5. REQ this HQ

1 2

V517.1

M/ JOHN ONILA

ADOOR-RS 2767

CONFIDENTIAL

HECTOR C. DACUS
Captain, USAF
Command Adj

This correspondence is classified ________ in accordance with AFR 205-1, 15 Dec 53, or for the reason (s) stated
Per ________

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9

CONFIDENTIAL

MEMO FOR RECORD: Subject modifications are mentioned in various minutes of meetings such as the AC&W Phasing Group, but no record exists in this HQ as to ADC's position on these modifications. A further purpose of this message is to ascertain the responsible agency for the modification and what action is required by this headquarters. Comeback copy req'd for COMM file. Info copies furnished to ARDC, AMC, RADC, AFCRC and Lincoln Lab. No daily diary item required.

JOHN ONILA MAJ USAF

Onila/ih
2717
June 1955

V517-2-x

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[illegible]

SUBJECT: ( ) [illegible] obile [illegible] adar for [illegible] ergency [illegible] ton

TO: Commander
[illegible] ir efense orce
amilton ir orce ase
alifornia

1. eferences:

a. [illegible] subject: [illegible]
[illegible] ober [illegible]

b. [illegible] ack-up
adar [illegible].

c. [illegible] letter, [illegible]
[illegible] thereto.

d. [illegible].

2. [illegible] special [illegible] group [illegible] for
a mobile back-up radar [illegible] air [illegible] ion. [illegible] of
this group, as [illegible] for such
use should [illegible] ed by [illegible].

3. The positive views of [illegible] have
been [illegible]. [illegible] Addi-
tional correspondence on this subject, [illegible] arters, is
not considered necessary. [illegible], [illegible]
desire further consideration of your views, a verbal presentation
of these views [illegible] of your headquarters is desired.

BY [illegible]

1 Incl
1. Summary ept: Study
Group for obile back-
up adars for ach ir
Division

V512-1X

This correspondence is classified ____________ in accordance with
Par ____________, AFR 205-1, 15 Dec 53, or for the reason (s) stated

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MEMO FOR RECORD: For Some time D/C&E and ADMEL have been asking RAFD to furnish us with the minimum separation criteria for high-powered radars. RADC has not as yet come up with the answers; however, our program for installing high-powered radars is moving along. If, at a later date, we have to relocate these radars because we do not meet the minimum separation criteria, it will be very costly--plus a set-back to our air defense capability while [illegible] tion is in progress.

HEADQUARTERS
AIR DEFENSE COMMAND
ENT AIR FORCE BASE
COLORADO SPRINGS, COLORADO

CONFIDENTIAL

ADMVC

13 Aug 1953

SUBJECT: Radiation Hazards Created by High-Powered Radars AN/FPS-6, AN/MPS-14 and AN/FPS-7

TO: Commander
Air Research and Development Command
P.O. Box 1395
Baltimore 3, Maryland

1. The introduction of high-powered radars into the air defense system poses problems formerly not experienced by us. We have heard and read various technical discussions regarding suspected radiation hazards to equipment and human beings. Generally speaking, the problem breaks down into three broad areas:

a. Radiation hazards to people.

b. Separation criteria to prevent crystal burn-out and/or blanking the scopes of other radars.

c. Separation criteria to prevent explosion of high-test gasoline, fuse caps, ammunition, [illegible], etc.

2. Realizing that these factors are major considerations when siting AC&W stations and determining the physical location of the radars themselves within the site, we have endeavored to get the answers from Rome Air Force Depot. They, in turn, have been querying Rome Air Development Center, but the answers are not forthcoming because the [illegible] have not as yet been completed.

3. Recently, staff officers of our headquarters visited Rome Air Development Center for the purpose of seeing how far along the project had progressed. They were told that a 1-A priority had been assigned to the project, but that most of Rome Air Development Center's projects were in the 1-A category. They were unable to give our people an estimate of the date when Rome Air Development Center will be able to furnish Air Defense Command with the answers.

4. This, of course, is unsatisfactory. Programming,
No planning, siting, land acquisition and installation of these radars must continue and cannot be delayed until answers are received. An illustration of the problem is that high-powered

Lt Col R.J. McCleary/jg/ADMEL-2, Ext 2861, 5 Aug 53

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COMEBACK CY FOR [illegible] ~~COMMANDER~~ ~~THRU~~ CHIEF OF STAFF

V-1

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radars are in various stages of installation at twenty-six (26) Air Force Base, Naval Air Stations, and Marine Corps Air Stations. If, at a later date, the minimum separation criteria is established at, for example, 500 feet between high-powered radars and humans; 500 feet between radars themselves; and 2,000 feet or more between high-powered radars and refueling or ammunition storage areas, it may mean that we shall have to relocate the high-powered radars. This would be very costly in manpower, materials and money. In addition, it will have a detrimental effect on the air defense system and will seriously hamper our operational capability.

5. It is therefore requested that a much higher priority be given to the projects for determining:

a. The development of protective clothing and for devices for reducing radiation hazards to humans.

b. The minimum safe separation criteria between high-powered radars and other radars.

c. The minimum safe separation criteria between high-powered radars and aircraft, refueling points, gasoline storage areas and ammunition storage areas.

FOR THE COMMANDER:

GEORGE F. SMITH
Major General, USAF
Chief of Staff

1 Incl
Air Bases on Which High-Powered Radars Will be Installed (Dup)

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15

CE-E

JECT: (Unclassified) Radar Interference

320.4

Director of Communications
Headquarters USAF
Washington 25, D. C.

1. References:

a. Headquarters, Army Antiaircraft Command, Ent AFB, orado Springs, Colorado, letter to the Adjutant General, artment of the Army, Washington 25, D. C., Attn: ACofS G3, ject: "Radar Interference," file ADOOA-C 471.94, dated Nov 54.

b. Headquarters USAF letter to Commander ADC, Ent , Colorado Springs, Colorado, Subject: "(Unclassified) ar Interference," file AFOAC-E/A, dated 25 Oct 54.

c. Second Indorsement from Headquarters ADC to mander ARDC, Baltimore, Md., file ADOCE-EG, dated 24 Jan to B/L, Subject: "Frequency Usage Conflicts," from dquarters 34th Air Division (Def), Kirtland AFB, N. M., e GCE, dated 28 Dec 54. Information copy provided Head-rters USAF (AFOAC).

2. The problem of radar interference has become the ject of concern among the three Services as well as ng major air commands and our operating commands.

3. Reference 1a above, copy attached as Inclosure 1, lines the concern and the actions recommended by Head-rters, Army Antiaircraft Command.

4. With reference to paragraph 2 of reference 1b above, is desired that this headquarters be apprised of the status this subject within the JCEC.

5. Reference 1c above, the problem is not confined to the Las Cruces, New Mexico, area; it can be expected to exist at virtually all ground control missile-firing installations since missiles fired in the conduct of the air defense mission will almost always be illuminated by at least one GCI radar.

Lt Col HKAnderson/hb Ext 2410
4 Feb 55

This correspondence is classified ______ in accordance with 23b(6) AFR 205-1, 24 Jul 53, or for the reason (s) stated

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6. It is desired to emphasize the importance that this headquarters feels the subject of radar interference holds in the establishment of an effective air defense system. Known interference of this nature is now serious, and it can be expected to become critical as the over-all ground/air environment for continental air defense is implemented.

7. Further, to references 1a and 1b above, it is recommended that an agency such as the Rand Corporation be given the task to study and recommend actions necessary to resolve the problems of radar interference within the Continental Air Defense System.

FOR THE COMMANDER IN CHIEF:

KENNETH P. BERGQUIST
Major General, USAF
DCS/Operations

1 Incl
Hq AAA Comd ltr
ADOAA-C 471.94,
29 Nov 54, subj:
Radar Interference

Incl not required for AG File
H. K. Anderson/ Lt Col/ USAF

MEMO FOR RECORD: An accumulation of correspondence from various agencies in the general area of radar interference, together with the importance of the subject to this command, promoted a letter of this nature. Reference is made to Comment N . 1 from DCS/O

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ELECTRONICS SYSTEMS ADCM 101-1

AIR DEFENSE COMMAND MANUAL

16

RADAR EVALUATION (ECM) PROCEDURES

OCTOBER 1954

AIR DEFENSE COMMAND

ENT AIR FORCE BASE (1,000)
DPS, Ogden, Utah

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October 1954

*ADCM 101-1

ADC MANUAL)
101-1)

HEADQUARTERS AIR DEFENSE COMMAND
Ent Air Force Base, Colorado Springs, Colorado
October 1954

FOREWORD

1. **Purpose.** This Manual generally is for helping radar evaluation (ECM) personnel to perform their mission, as outlined in ADCR 24-8. More specifically, its purpose is to:

a. Establish uniform procedures for evaluating certain aspects of AC&W performance.

b. Prescribe uniform methods of establishing performance standards.

c. Standardize radar evaluation reports.

d. Introduce some relatively new ideas and techniques for increasing the performance reliability of the ADC AC&W system.

2. **Policy.** Standardization of radar evaluation procedures has become a necessity. Of the many procedures now in use, those which are thought to be the best are combined in this Manual. These selected procedures are neither indisputable nor are the results always decisive; frequent revisions and additions to this manual are expected as improved procedures are developed. The active cooperation of evaluation personnel, and of the users of evaluation information, is required for these improvements. Experimenting with new approaches, testing techniques, and recommending changes are encouraged.

3. **Contents.** The first chapter provides some background and outlines the general features of radar evaluation. Each of the remaining chapters deals with a special phase of radar evaluation and, it is hoped, contains information sufficiently detailed so that relatively untrained personnel can carry out the required procedures.

BY ORDER OF THE COMMANDER:

GEORGE F. SMITH
Major General, USAF
Chief of Staff

OFFICIAL:

WALTER W. ROBINSON
Colonel, USAF
Command Adjutant

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Appendix "A", classified confidential - special distribution

Distribution:

HQ ADC	15	USAFE	10
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Air Divisions (Def)	2	TAC	10
Defense Wings	2	ATRC	10
Air Defense Groups	2	AU	5
Radar Eval (ECM) Flts	20	AMC	5
AC&W Sqs & Dets	2	ARDC	10
Hq USAF	2	APGC	5
AAC	10	Other Major Air Com'ds	2
FEAF	10	ADC RCAF	15

* This Manual supersedes ADCR 100-7, 7 June 1951.

CONTENTS

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INTRODUCTION

Chapter 1

1. **General.** "Radar evaluation" differs from "radar calibration" in several ways. Some important differences follow:

a. In the past, **calibration** consisted of peaking a station's equipment periodically, probing the radiation pattern to establish the station's **tracking** capability on a B-29 aircraft (with little regard for its **detection** capability), and then virtually forgetting about it until the next scheduled calibration. **Evaluation** provides for continuous measurement of a station's performance day and night, with corrective action being taken immediately after low performance is discovered.

b. Less reliance need be placed on flying calibration-type missions for routine performance checks, permitting a more concentrated flying effort in those abnormal cases where flying is specifically required.

c. The training function of radar evaluation (ECM) flights takes on added significance because AC&W squadrons and air divisions (def) will be performing some of the activities previously in the province of evaluation personnel only.

d. Aside from tactical evaluations, the radar evaluation (ECM) flight's services will be requested -- for a specific station -- only when that station's performance is known to be abnormal. Thus, the routine nature of radar calibration is largely replaced by expert investigative or trouble-shooting activities, sometimes involving techniques borrowed from recent scientific research. This not only permits, but requires, radar evaluation (ECM) flights to experiment with ideas, develop techniques, and recommend new procedures for improving this Manual.

e. Finally, radar performance is no longer considered a fixed quantity, but a perpetually fluctuating one. Some performance flexibility is recognized by taking into account atmospheric refraction variations and the resultant changes in the shapes of radiation patterns. To apply this information, a weather officer at air defense force level serves as advisor to, and part-time member of, the radar evaluation team.

NOTE: Throughout this Manual frequent reference is made to "Radar Evaluation Program Report," ADC, 1 May 1953, SECRET. For brevity it is referred to simply as "REPR."

2. **Definitions of Pertinent Terms.** Though these terms are not new, inconsistent usage calls for specific definitions for the purposes of this Manual.

a. **Evaluation:** A general term applied to measuring the detection and tracking performance of radar stations and comparing the measured values with known references; or recommending new references where necessary. It includes performance during mass raids and during ECM tactics. (Any electronics warfare activities are herein called ECM tactics.)

b. **Calibration:** Taking measurements on various parts of electronic equipment -- including radar, IFF and communications -- to determine each equipment's performance level, and whether it is up to T/O specifications. When possible, causes for abnormal performance will be recorded. Calibration will be included in "initial visits" and "special evaluations" (paragraphs 4 and 7).

c. **Radar station:** Any ADC installation incorporating radar for search and/or controlled interception, including fixed, mobile, surface-based, airborne AEW and AEW&C, attended, and unattached installations.

(1) AC&W station: Confined to fixed and mobile, attended installations.

(2) Gap-filler: Confined to fixed, unattended installations.

d. **Performance:** Whenever possible, a quantitative measure in specific units -- miles, minutes, decibles, scans, volts, watts, etc. -- describing how well a radar system, station, or part of a station was operating or otherwise accomplished its purpose at the time of measurement.

For example, the statement, "detection (or the station, or the operator) was **95% effective**," is not a measure of performance unless "effective" is defined precisely. On the other hand, "95% of the targets were detected" or, better still, "88% of the targets were detected within quality control limits, 7% below limits, and 5% were not detected," are good statements of a station's detection performance.

e. **Abnormal Performance:** Whenever a sampled performance level deviates markedly and persistently from the standard (or reference) performance level. An unusually high performance level is considered to be just as abnormal as an unusually low one and will be investigated for the cause.

At present, "deviates markedly," applied to a station's detection performance, is a deviation exceeding 15% of the reference detection range. The reference range is determined

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by the "lobe computer" (to be issued soon). For example, if the reference were 100 miles, detections at ranges exceeding 115 miles, or falling short of 85 miles, would be "marked deviations" and would require a statement of their cause; detections between 85 and 115 miles would be "normal" and would require no further action.

f. **Effectiveness:** As used in this Manual, pertains primarily to tactical evaluation. It is an **estimate** of the degree a station's or series of stations' performance is degraded in the face of ECM, deception, and tactics designed to confuse. This estimate is based on normal performance.

g. **Antenna Tilt Error:** The quantity which must be **added** to the tilt dial indication to obtain the true (electrical) tilt of the antenna -- e.g., if the dial reads $+1°$ when the beam is at $+2°$, the tilt error is $+1°$.

h. **Line-of-Sight Considerations:**

(1) Radar horizon: The most distant point (from the radar antenna along a given azimuth) on the earth's surface illuminated by the radar on purely geometric conditions; the conditions are that the illumination occurs along a straight line path where the path is taken over an effective earth's radius of 4/3 its true radius and where the radar's illuminating power is considered unlimited.

(2) Screening angle: The angle bounded by a straight line from the radar antenna to the horizon, and the horizontal at the antenna (assuming a 4/3 earth as described above).

(3) Radar line-of-sight (RLS): An extension of the screening angle line; it originates at the horizon and extends without limit away from the radar.

(4) Radar line-of-sight (or RLS) coverage: The distance (from the antenna) to the most distant intersection of the radar line-of-sight with a given altitude on a specific azimuth (without regard to power of the radar).

(5) Intermediate horizon: A screening object (hill, mountain, ridge, building) similar to the radar horizon described in (1) but not the most distant. For example, a distant mountain range might comprise the "radar horizon" on a given azimuth while a closer, lower ridge might screen a valley between it and the mountain range; the ridge would be an "intermediate horizon."

3. **Evaluation Policy.** The main functions of evaluation fall into four types:

a. Initial visit (to newly installed radar stations).

b. Continuous evaluation.

c. Tactical evaluation.

d. Special evaluation.

4. **Initial Visit.** The over-all purpose of the initial visit is to combine a large amount of technical information about the site into one volume and to train station personnel for certain evaluation activities. The initial visit, consisting of one or more physical visits to an AC&W station or gap-filler, is made by evaluation personnel as soon as practicable after the station has been accepted -- preferably while still in limited operation. Except in cases of an emergency nature, operational control of the radar and ancillary equipment will be relinquished to the radar evaluation officer during the initial visit. Evaluation aircraft are not normally required during this visit. The specific functions of the initial visit include:

a. Calibrating the equipment (see paragraph 2b and appropriate equipment T/O's).

b. Obtaining precise screening angle data (see chapter 2).

c. Measuring the error in antenna tilt indicators and recommending operating tilts (see chapter 3). The recommended tilt(s) should be based on the prescribed mission(s) of the particular station.

d. Mapping clutter intensity vs. range and azimuth. This consists of one or more map-like presentations showing areas in which aircraft of a certain type (at present, B-29) are very likely to fade because of clutter intensity (see REPR, pages 438 to 450, for details).

e. Initiating a continuous evaluation procedure at the AC&W station (see paragraph 5).

f. Pointing out installation or any other discrepancies which would affect the station's detection and tracking performance. This includes making observations and measurements -- which might not occur to acceptance teams and other personnel not engaged in radar evaluation **per se** -- and making recommendations therefrom.

g. Obtaining sufficient information for preparing coverage diagrams as outlined in chapter 4.

h. Compiling the measurements, observations, presentations, and resulting recomendations into an Initial Visit Report, RCS: 1-ADC-H10 (see chapter 5).

5. **Continuous Evaluation.** Broadly, the the purpose of continuous evaluation is to provide a perpetual record of how the station's equipment has been performing; how "early" the station has been detecting aircraft; what causes are usually asociated with individual cases of abnormal performance; and the over-all performance trend as station personnel gradually find and correct (or recommend correction of) assigned causes. Continuous evaluation shows the daily (or even hourly) detection performance of each AC&W station. It

is started during the initial visit by evaluation personnel, performed thereafter by station personnel, and monitored by higher echelons of command for over-all evaluations and indicated actions. The data, filed at the station, are available to air defense force, air division (def), and/or radar evaluation (ECM) flight commanders on request.

a. Continuous evaluation consists of two main activities — (1) monitoring certain aspects of equipment performance, and (2) sampling the station's detection performance on normal air traffic (using the lobe computer, see below). Whenever continous evaluation shows consistently abnormal performance — and the cause cannot be established by station personnel — evaluation personnel may be called upon to review the data and conduct special evaluations (paragraph 7) to ascertain the cause.

b. With regard to continuous evaluation, at every AC&W station (whether newly installed or not), evaluation personnel are specifically rèquired to:

(1) Furnish precise screening angle data (see chapter 2).

(2) Measure the tilt indicator error and recommend the electrical antenna tilt to be used by that station, consistent with the station's mission.

(3) Fabricate the component parts and compile the data for an adequate number of lobe computers. (Detailed instructions will be forwarded from this headquarters when available.)

(4) Train appropriate station personnel in the meaning, use, and purpose of the lobe computer and continuous evaluation in general.

(5) Recommend changes in evaluation procedures, lobe computer parameters and station SOP,s (tilt, PRF, etc.) whenever such changes are indicated.

6. **Tactical Evaluation.** Tactical evaluation is the evaluation of a radar station or series of stations operating under simulated combat conditions. To accomplish this, penetration missions will be flown against portions of the air defense system. Evaluation personnel will be present at stategic locations to collect necessary data. Collected data will be analyzed and compiled into a Tactical Evaluation Report, RCS: 2-ADC-H10 (see chapter 6). Maximum emphasis will be placed on realism, including ECM tactics, in planning these missions. Units involved in a tactical evaluation effort will provide — to the radar evaluation (ECM) flight — sufficient data to permit an accurate evaluation of the effort.

a. Tactical evaluation missions may be requested by the air division (def) commander or directed by the air defense force or this headquarters.

b. Missions involving the RCAF will be conducted in accordance with ADCR 101-3.

c. Missions will be unannounced except to necessary supervisory personnel in order that effective control may be maintained. Notification will be at least 24 hours prior to the scheduled mission.

d. Missions of opportunity may be conducted at the discretion of the radar evaluation (ECM) flight commander as long as necessary supervisory personnel are notified at least 24 hours in advance.

e. Tactical evaluation missions should not be confused with normal ECM training missions. Emphasis will continue to be placed on providing a maximum amount of ECM training missions in order to meet unit ECM training requirements. A tactical evaluation mission is in effect an evaluation of the effectiveness of ECM training missions.

7. **Special Evaluation.** Special evaluation may be required any time after a radar station has been installed; it is a trouble-shooting or investigative activity which may or may not involve evaluation aircraft, depending on the symptoms. It is not a periodic activity. Only after a station's performance is known to be consistantly abnormal, and the causes otherwise undetermined, will a special evaluation be conducted. Except in cases of an emergency nature, operational control of the radar and ancillary equipment will be relinquished to the radar evaluation officer during a special evaluation. Because of its trouble-shooting nature, specific procedures cannot be set down for a special evaluation, but the following will usually be included or at least considered.

a. Sampled detection data (on file at the station) should be examined for over-all performance levels, trends, or cycles. Abnormal data should be correlated with any suspected cause, such as: equipment performance, a particular crew, weather variations, or particular azmimuth sectors (where skyline data may be in error). The tilt dial error and/or screening angles may need re-measuring. The lobe computer should be re-examined to make certain that its parameters apply to that station.

b. If the data indicate that a particular crew is the cause of abnormal performance, it should be established whether maintenance or operations is the major contributor.

(1) If maintenance is suspected, equipment maintenance logs should be examined—including power output, receiver MDS figures,

sub-clutter visibility figures, rate of replacing critical components, etc. Again any trends or cycles should be noted; they provide additional clues toward locating the cause.

(2) If operations seems more likely, the station's SOP's should be reviewed — make certain that geoprophical areas of interest are not the cause of abnormal detection ranges. It may be well to investigate the detection performance of various radar operators while they are on duty, using a traget simulator. (A chapter on operator performance measurements will be forwarded from this headquarters when available.)

c. If these investigations reveal no causes internal to the station, and abnormal performance persists, weather should be investigated further. This requires participation of a weather officer (available through air defense force headquarters), and usually evaluation aircraft. Severe cases may demand the use of refractometer-equipped and/or field-intensity equipped aircraft, involving a major meteorological study.* Obviously every effort should be made to eliminate all possible causes internal to the station before launching such an all-out investigation.

d. When the cause of abnormal performance is found, corrective action generally takes the form of (1) testing and recommending parameter changes (tilt, voltages, scope adjustments, screening angles, etc.) or (2) testing and recommending changes in SOP's. In either case, corrective action includes training appropriate personnel in new techniques and/or the reasons behind the changes.

e. All findings and recommendations will be compiled into a Special Evaluation Report, RCS: 3-ADC-H10 (see chapter 7).

8. **Records Disposition.**

a. **Initial Visit, Tactical Evaluation, and Special Evaluation Reports.** Copies of these reports retained by radar evaluation (ECM) flights are permanent records and will be retired to the Kansas City Records Center upon de-activation of the ground radar station concerned. Copies in the custody of AC&W squadrons and intermediate headquarters will be destroyed one year after de-activation of the site concerned.

b. **Photographic Negatives.** Photographic negatives accumulated as a result of this Manual will be disposed of under AFM 181-5.

*This headquarters should be notified whenever special, scientific equipment is needed.

0576

Chapter 2

SKYLINE GRAPH

1. **General.** The skyline graph consists of both the screening angle chart and panoramic photographs, where the two have the same azmuth scale. A separate page is used for each azimuth quadrant and some overlap is provided from page to page; (see Fig. 2-1). Following are the procedures to be used in its preparation.

2. **Measuring Screening Angles.** With some exceptions, evaluation personnel have been measuring and recording transit data correctly. The exceptions will be evident upon reading the following procedures:

a. The radar tower's location (latitude and longitude) was established very accurately during an earlier ground survey by the Corps of Engineers. Their findings are in the station's site survey report; record this information on the transit data sheet (Fig. 2-2). After leveling the transit (usually on the catwalk of the radar tower), adjust the azimuth scale to read either true bearings, or bearings relative to some easily identifiable object, the true bearing of which is known. Do not rely on the transit's compass; large metal structures can introduce azimuth errors of 0 to 180°. For celestial observation procedures, a surveying handbook should be consulted; true north can thus be determined very precisely.

b. Fill in the top of the transit data sheet (Fig. 2-2), including (1) location of transit with respect to the center of the radar antenna, (2) transit orientation method, and (3) estimated limit of visibility.

c. Approximate the skyline (profile of the distant horizon) by recording the azimuth, elevation angle, and estimated horizon distance of each significant change in the skyline —significant changes include both changes in vertical angle and changes in horizon distance. Procedures such as taking readings every 10° (or 5°) should not be used; the skyline characteristics should determine where the readings are taken, and their number. (For example, nearby rough, jagged skylines call for readings as close together as a degree or so while smooth skylines may permit dozens of degrees between readings.) Elevation angles should be recorded to the nearest minute of arc; azimuth angles should be recorded to the nearest tenth of a degree (estimated); see Fig 2-2.

3. **Drawing the screening angle chart.**

a. Plot the transit data, corected for True North, on the screening angle chart lightly in pencil (Fig. 2-1). The most important points are those representing screening objects less than about 30 miles distant because, for more distant points, the elevation angles can be determined more accurately from a map.

b. The optical skyline data with the transit are now supplemented with skyline data resulting from a careful map-study* of the terrain about the site.

(1) In general, for screening objects less than about 30 miles from the site, the transit reading should be used as the true value of screening — particularly if the transit reading shows a higher (more positive) elevation angle than does map-study on that azimuth.

(2) For screening objects more than 30 miles distant, careful map-study almost invariably yields more accurate screening angle data. This is for two reasons:

(a) The true, distant horizon is obscured by haze or clouds. If so, the transit operator sees another (intermediate) horizon which is **always** at a **lower** elevation angle than the true horizon. These low screening angles result in a diagram showing line-of-sight coverage beyond the correct limits.

(b) If the true, distant horizon is visible, optical refraction inserts an error in the elevation inserts an error in the elevation angle. (Extreme cases are called mirages.) The amount of error depends on horizon distance and atmospheric pressure, temperature and humidity over the optical path. This error — difficult to calculate — usually causes the measured elevation angle to be **higher** than the true value, and the resulting diagram shows less than the correct amount of line-of-sight coverage.

(3) The figure "30 miles" is predicated on using a map whose scale is 1:1,000,000 with 1000-foot contours (WAC). When more detailed maps are used, the 30-mile figure can be reduced appreciably.

c. After the map-study is complete, ink in the final fully corrected screening angle chart — based on True North, and supplemented with the map-study information. Extend the skyline beyond both cardinal directions to the edge of the graph (Fig. 2-1), affording some useful overlap from page to page.

d. Label the following, directly on the skyline graph:

(1) The distance to the horizon all along the skyline, and further identify particular sectors such as "Rocky Mountains, 60 miles average," and "local hills, 3 to 8 miles."

(2) The exact azimuths (nearest tenth

*For map-study procedures, see chapter 4.

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of a degree) to all adjacent radar stations.

(3) The exact azimuths to any other interesting points.

4. **Photographs.** Where the panoramic is taken from a radar tower with radome, four tripod set-ups should be used; i. e., set up the camera at 045°, 135°, 225°, and 315° true. In other cases take the pan from the position occupied by the transit.

a. Though not specifically required, every effort should be made to use infrared film for the pan. The photographer should then be especially careful of two things: (1) exposure, because photographic light meters are not dependable for measuring infrared radiation; and (2) focus, because the lens should be "racked out" slightly from the sharp-focus (or infinity) position on the ground glass. Consult appropriate literature for specific information.

b. To prepare the pan so that both the horizon and the foreground match on adjacent prints, two things are esential: a tripod, and a camera mount which allows the **lens** instead of the camera body to be the center of rotation. Drawings for a camera mount which will fit on the transit tripod are given in Fig. 2-3.

5. **Mounting the panoramic prints.**

a. Prepare two **contact** prints from each of the 4" x 5" negatives (usually twelve) comprising the pan. The extra set of prints is required to supply the overlap at both ends of each azimuth quadrant (Fig. 2-1).

b. Match two azimuthally adjacent prints by laying one atop the other and flipping the top one quickly so the eye sees the top print, then the bottom one alternately. Repeatedly change the position of the top print until objects no longer appear to jump during the flipping operation. Mark the matching point.

c. Tape the two prints together temporarily and repeat paragraph b above with the next adjacent print.

d. Repeat paragraph c above for one complete set of prints. The full pan will be very close to 42" in length if the original 4" x 5" negatives, from which the contact prints were made, were exposed through a 6 3/8" lens (standard lens on AF-type C-3 camera).

e. Using the screening angle data, locate the true azimuths of several prominent features on the horizon and mark them temporarily on the asembled pan. To determine the average number of azimuthal degrees per inch along the pan, divide 360° by pan-length; a 42" pan has an average of 8.57 degrees per inch. (The actual number of degrees per inch varies within each print.) Degrees-per-inch is used for checking questionable azimuths and for locating unknown points. Mark the cardinal directions permanently, N,E,S, and W.

f. With the pan marked with cardinal directions and print-matching points, cut the pan vertically at each matching point except those near the cardinal directions. For the latter, try to cut the pan so that each azimuth strip is 11 3/4 inches long; notice that each strip is 100 degrees long instead of exactly 90 degrees. Prints from the spare set will be needed to provide the overlap.

g. Cement each print of the pan in place on the Skyline Graph blank form (Fig. 2-1), shifting the pan horizontally to put equal error at both ends of each quadrant if the pan is not exactly 42". (Either rubber cement or Kodak Mounting Tissue is superior to ordinary glue because neither material "wets" the print, eliminating bothersome shrinkage and wrinkling.) If it appears that the horizon may be "lost" (not reproduced) when rephotographed, darken it in with a fine line.

h. When the screening angle chart and panoramic are thus combined, have them photographed and printed to standard 8" x 10" with binding on the left — i. e., binding above the pan on Fig. 2-1.

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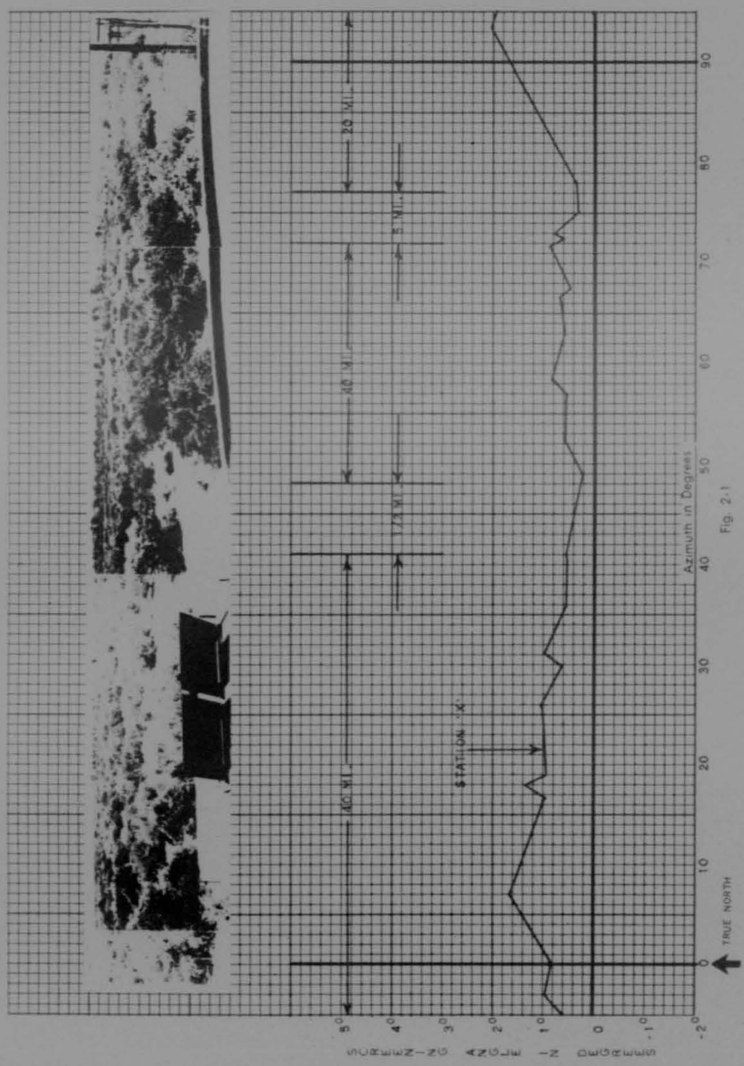

Fig. 2-1

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Transit Data Sheet

Date ________________________

a. Station name and number; grid coordinates; antenna elevation MSL; etc.

b. Transit located..............feet away and..............feet lower than, on azimuth..................°T from, center of antenna.

c. Transit orientation method. (Describe how True North was established.)

d. Visibility limited to about ....miles to the (Northwest)..............................
....................miles to the ....
....................miles to the ....
....................miles to the ....

Azimuth	Elevation Angle	Horizon	
		Distance (Estimated)	Description
017.5	+0° 43'	30 mi	Base of Mt. Black
019.6	+1° 02'	"	Peak " " "
024.0	0° 00'	40 mi	Edge of Cherry River Valley
025.7	—0° 14'	"	Bottom " " "
030.4	—0° 14'	"	" " "
036.0	+0° 18'	20 mi	Ridge (tree covered)
044.4	+0° 18'	25 mi	" " "

....
Transit operator (s)

....
Recorder

Fig. 2-2

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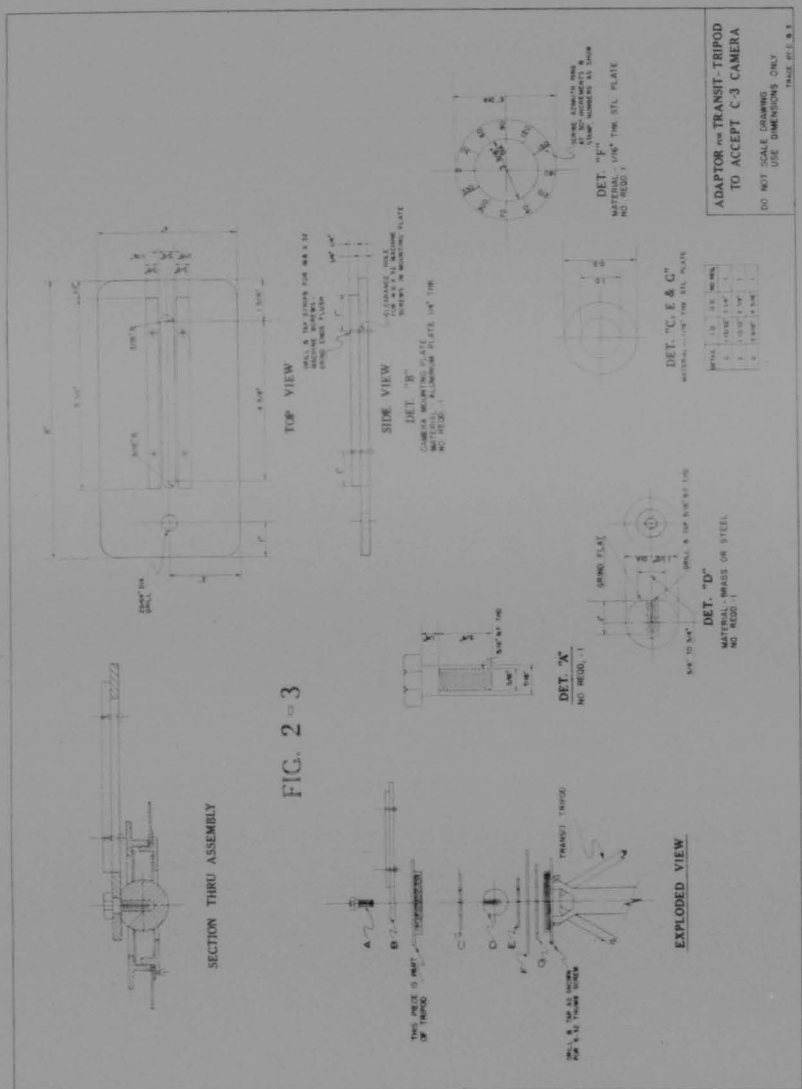

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Chapter 3

ANTENNA TILT DIAL CALIBRATION

1. **Definitions.** Tilt dial error (herein called "tilt error") will be measured as described below. Tilt error is the difference between the mechanical tilt reading and the electrical tilt of the beam; it is the quantity which must be **added** to the mechanical tilt reading to give the electrical tilt of the beam.

a. "Electrical tilt" is the angle of the lower beam's center-line in space, where the beam's center-line passes through the nose or maximum-range point. Single-beam radars are considered to have only a lower beam whose "center-line" passes through the nose. NOTE: The OA-347/CPS-6B search kit is considered to be an additional lower beam.

b. "Mechanical tilt" refers to the reading on the most-used tilt indicator — i. e., usually a remote tilt dial in the operations building. It does not necessarily mean the reading on the mechanical, sleeve-type indicator located on the antenna pedestal.

2. **General.** At present two tilt measurement methods have been accepted as "standard methods." Only the preferred one (Method I, Signal Generator) is given below. The second method is still in preparation, and others are being investigated. In the meantime, Method I will be used wherever possible; any others may be included for comparison. Even when Method I data are obviously poor, they should be included in evaluation (or initial visit) reports. In every case, the tilt measurement data will be accompanied by, or will refer to, a description of the measurement method used. (For example, an evaluation report might say, "Tilt error was measured using Searchlighting, described in REPR page 462, and using Method 1.") Any tilt method must be preceded by antenna alignment, described in paragraph 3 below, or the data will not be valid. All pertinent measurement data will always accompany the results; this, includes the original observations such as those indicated in Method I procedures. Until further notice, antenna tilt indicators will not be re-set to read electrical tilt; they will remain in error with a posted card showing tilt error. NOTE: Though not required, it would be useful to measure the electrical tilt of the next higher beam occasionally as well as that of the lowest (e.g., VC on the CPS-6B). The two beams should of course be measured close together in time to insure directly comparable results.

3. **Aligning Antenna.** The antenna pedestal must be leveled; a contour and horn alignment check must be made on the antenna reflector; and the relation between the tilt dial and mechanical tilt indication on the antenna must be established.

a. Level the antenna pedestal precisely in accordance with appropriate T/O's. State on the data sheet whether or not any leveling adjustments were made. Also state whether the antenna has a radome (it is possible that radomes have an effect on tilt error.

b. Check the antenna reflector contour and feed horn alignment as outlined in appropriate T/O's. State on the data sheet whether or not any adjustments were made.

c. Calibrate the remote tilt dial readings against the mechanical indicator readings on the antenna assembly throughout the entire tilt range. On a sheet of graph paper, plot dial readings vs. mechanical indicator readings; connect the points with a smooth curve (Fig. 3-1). Do not reset the tilt dial, even if it does not correspond with the mechanical indicator.

4. **Method I, Signal Generator.** This method does not require an aircraft and has been carried out successfully by radar station personnel after a verbal description. It involves simple concepts familiar to maintenance personnel, a signal generator and dipole, and an engineer's transit.

a. **Measuring Mechanical Angle of Signal Source.** An RF dipole, connected to a signal generator, is set at a remote point and its elevation angle is measured with the radar antenna. This angle, read off the tilt dial, is called the "mechanical angle" of the dipole, and is compared later with the "optical angle."

(1) Mount a horn radiator or dipole at some distance greater than 100 yards (one to ten miles is desirable) from the radar antenna. If possible, mount the dipole at an elevation of 0° or higher, the higher the better. The dipole should be mounted horizontally if the radar is horizontally polarized, and vertically for vertically polarized radars. The transmission path between the dipole and the radar should be relatively free from ground reflections; smooth, even terrain is not desirable; rough, tree-covered ground, or a valley, between the radar antenna and the signal generator is preferred. (Include a sketch showing the profile view of the measurement setup, depicting the approximate nature of intervening terrain.)

(2) Connect the dipole to an RF signal generator. If a co-axial cable is necessary, it should be short to insure adequate signal strength for the radar. Sometimes it is pre-

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ferable to plug the dipole directly into the signal generator RF output jack and hoist the entire signal generator up to the measuring position.

(3) Set the signal generator on CW and maximum power output, and tune it to the radar transmitter frequency. The radar transmitter may then be turned off, provided the receiver is not de-activated by doing so. (If the transmitter is left on, the dipole should be beyond one "pulse packet" length, i.e., at least 500 ft. per microsecond of radar pulse length.) A bright line (CW jamming) will be seen on the PPI at the dipole azimuth when the radar antenna is rotated. The signal generator should be turned off and on to make certain the correct signal is being observed.

(4) Train the radar antenna manually to the dipole azimuth by observing maximum signal return.

(5) At the second detector of the radar receiver, measure the current output (with a 0-1 ma meter). Adjust the antenna reflector in both azimuth and tilt for maximum signal return (maximum dector current). Readjust the stalo frequency for maximum signal. Lock the antenna in azimuth.

(6) Set the signal generator output attenuator to a convenient reading, giving a fairly strong signal at the radar. Adjust the IF gain to a second detector current reading of 0.5 to 0.7 ma; try to prevent receiver limiting.

(7) Sweep the antenna through the entire range of the tilt mechanism, recording detector curent vs. tilt dial reading. Readings near the beam's nose (and near any side lobes) should be taken at 0.25° intervals or less. All should be read as accurately as possible. Record as in Fig. 3-2. Record also magnetron frequency.

(8) Repeat steps (4) and (7) so that at least two sets of data are available for comparison. NOTE: It is important to repeat step (4) because of the difficulty of horizontally pointing the beam's exact nose at the dipole.

b. **Calibrating Second Detector.** Amplitude response of the radar receiver is measured to check for lobing.

(9) Re-adjust the tilt for maximum signal and record the detector current. (Fig 3-3).

(10) Reduce the signal generator output by exactly 1 db and record the detector current.

(11) Repeat step (10) until the signal has been reduced 6 to 12 db; then increase the signal generator output in 1- or 2-db steps until the signal has been increased to at least 3 db stronger than it was in step (9).

c. **Plotting the Data.** The mechanical angle of the dipole is established. Also beam width and beam shape are observed to see if lobing (ground reflection) has invalidated the data.

(12) Plot the data step (7) and connect the plotted points with a smooth curve. Likewise (using different symbols) plot step (8) data. The two plots should essentially form one smooth curve; label this "curve A" as in Fig. 3-4. Note the maximum current point and the corresponding tilt dial reading; this is close to the mechanical angle of the dipole.

(13) From the data obtained in steps (9) through (11), plot "curve B" (showing db vs. detector current) on the same graph. See Fig. 3-4.

(14) From the peak of curve A, draw a horizontal line intersecting curve B. Then drop down 3 db along curve B and mark this point. Draw a horizontal line through that point so it intersects curve A on both sides of the peak. Observe the angular distance betwen the two intersections (½-power points); it should be very close to the beam-width of the antenna. If it is not, and if the beam shape looks peculiar, ground reflections were undoubtedly present to distort the readings — a new dipole location (on a new azimuth) should be selected and the measurements repeated. If the beam shape and beam width appear normal, locate the midpoint of the horizontal ("3 db down") line and draw a vertical line through the mid-point; this line, the mechanical angle of the dipole, should pass through the very peak of curve A. The mechanical angle will later be compared with the optical angle.

d. **Measuring Optical Angle of Signal Source.** The purpose of the optical measurement is to see what the mechanical angle should have been if there were no tilt error. This angle is measured with an engineer's transit. The difference between the mechanical and optical angles is the tilt dial error sought.

(15) Set up an engineer's transit (reading to within one minute of arc) as close to the radar antenna as possible — usually on the catwalk of radome-equipped radars. Place the transit tripod so it is the same distance from the dipole as is the radar antenna (Fig. 3-5). This eliminates an otherwise necessary distance correction.

(16) Measure the vertical distance between the center of the radar antenna and the transit. Attach to the dipole an easily visible target so that it hangs below the dipole this same distance (Fig. 3-6). An otherwise necessary correction for vertical displacement between the radar antenna and the transit is thus eliminated.

(17) Level the transit precisely. Extreme care is necessary because even walking a-

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round the catwalk will throw the transit off level.

(18) Sight the optical target (hanging below the dipole) and read the elevation angle to the nearest minute.

(19) Practice steps (17) and (18) until the readings become fairly consistent. Then repeat steps (17) and (18) at least four more times and record the elevation angle each time, as in Fig. 3-3. Be sure to re-level the instrument for each measurement because errors here arise more from non-level transits than from erroneous readings.

(20) Since the distance from the radar antenna to the dipole will always be under ten miles, no correction need be made for the difference between optical and radar refractive indices. The distance can therefore simply be estimated and recorded as Fig. in 3-3.

e. **Determining Tilt Dial Error.**

(21) Take the arithmetic average of the four (or more) observations from step (19) by merely adding all the values and dividing by the number of observations.

(22) Draw a vertical line at this average optical elevation angle directly on the graph (Fig. 3-4). This optical angle is taken to be the true electrical tilt of the antenna.

(23) Subtract the mechanical angle from the optical angle. This is the tilt dial error sought; post it near the tilt indicator. When it is added algebraically to any tilt dial reading, it gives the electrical tilt of the antenna.

f. All data sheets and graphs will be included in evaluation (or initial visit) reports.

Antenna Alignment

Date

1. Antenna has radome..................(yes,no).
2. Antenna pedestal needed leveling............(yes, no). Was it leveled?............(yes, no)
3. Horn alignment needed adjustment ....(yes, no). Was it corrected? ....(yes, no)

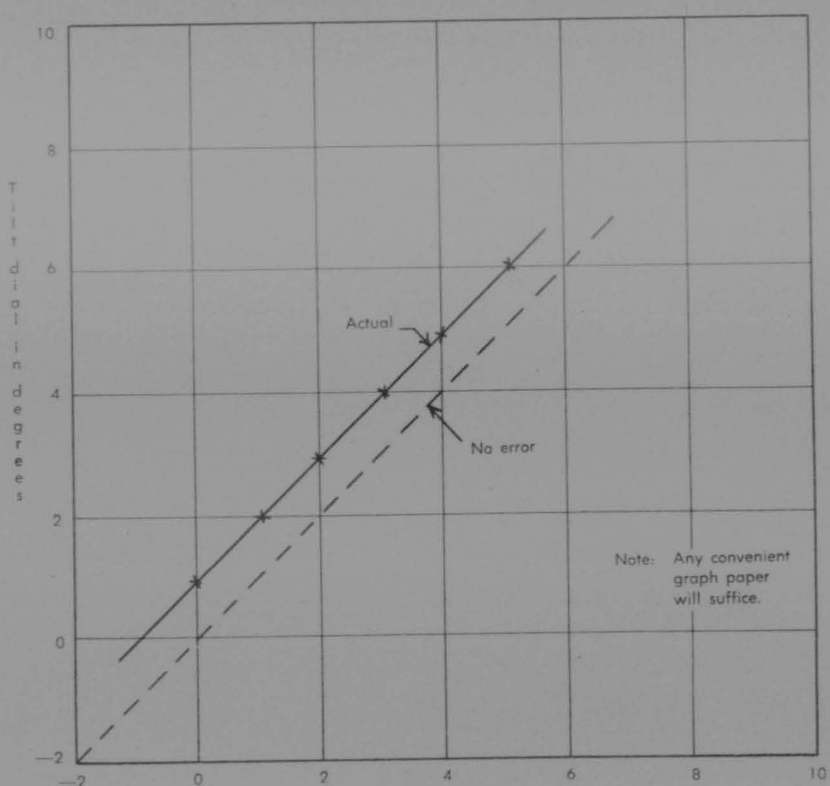

Fig. 3-1

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Detector Current Data Sheet

Date ____________________

Trial #1 (Signal generator output ____ db)		Trial #2 (Signal generator output ____ db)	
Tilt dial reading (degrees)	Detector current (state units)	Tilt dial reading (degrees)	Detector current (state units)

(To be extended as required)
Fig 3-2

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Data Sheet

Date ____________

Distance from center of radar antenna to dipole ____________

Optical angle of dipole from center of radar antenna:
(4 measurements) _____ , _____ , _____ , _____ ; average _____ .

Azimuth of dipole from radar antenna _____ ° True.

Magnetron frequency _____ megacycles per second.

Receiver Response Curve
(Stationary Antenna)

Sig Gen Output (db)	Detector Current (state units)

Fig 3-3

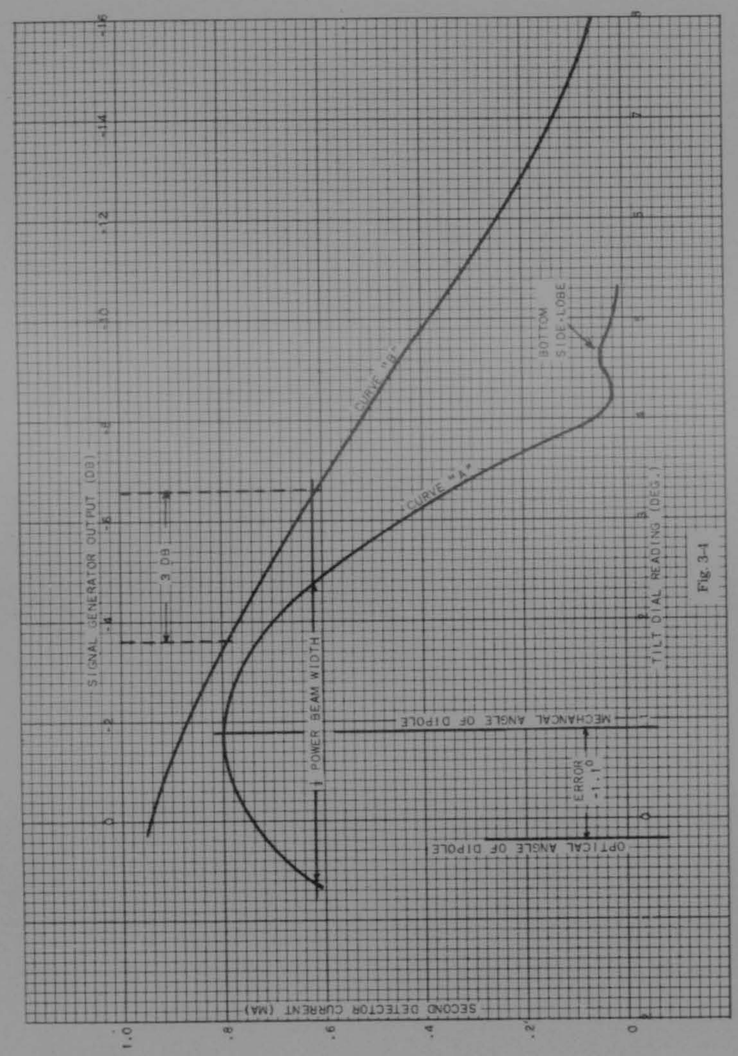
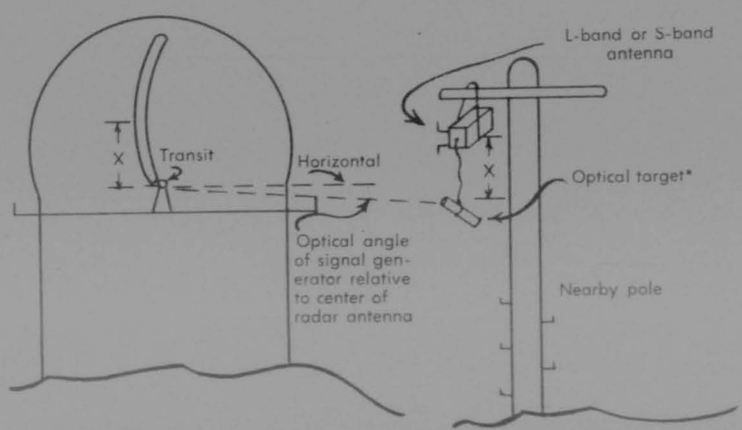

SIGNAL GENERATOR OUTPUT (DB)
TILT DIAL READING (DEG.)
SECOND DETECTOR CURRENT (MA)
CURVE "A"
CURVE "B"
BOTTOM SIDE-LOBE
3 DB
POWER BEAM WIDTH
MECHANICAL ANGLE OF DIPOLE
OPTICAL ANGLE OF DIPOLE
ERROR +1.1°

Fig. 3-1

Measurement Setup

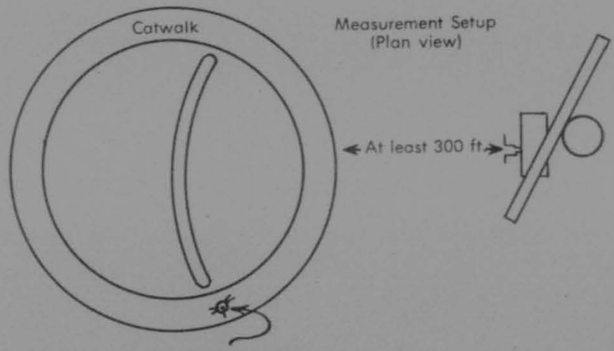
(Profile view)



*Optical target should be same distance "X" below dipole as transit is below center of radar antenna.

Fig 3-5

Measurement Setup
(Plan view)



(Same distance from dipole as is radar antenna; eliminates distance correction.)

Fig 3-6

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Chapter 4

COVERAGE DIAGRAMS

1. **General.** Three basic coverage diagrams will be prepared for each radar station; any other useful presentations may be included. Coverage diagrams will be inclosed in the evaluation report so that they can be removed easily for tracing; where size permits, removable transparent overlays are preferred. They will be classified SECRET. NOTE: The term "theoretical coverage" will not appear on these diagrams; the term is confusing in that "theoretical" could mean "line-of-sight only," "line-of-sight plus theoretical equipment limitations," "equipment capability without operator degradation," etc. Rather, "radar line-of-sight coverage" (or "RLS coverage") will be used or, when appropriate, other specific titles. The three diagrams are:

a. A low-altitude, single-station diagram, scale 1:1,000,000, showing boundaries for 500, 1000, and 2000 feet over terrain.

b. A medium-altitude, single-station diagram, scale 1:3,000,000, showing boundaries for 5000, 10,000, 20,000 and 30,000 feet MSL.

c. A low-altitude, system-coverage diagram, scale 1:3,000,000, showing system coverage contours for 500, 1000, and 2000 feet over terrain. Sheet size will be 16" x 20". Coverage contours for all stations falling on the sheet will be included.

2. **Over-Terrain Contours.** RLS boundaries for the low-altitude diagrams — 500, 1000, 2000 feet over terrain — are determined as follows. (For additional background see "Siting Directive for the Low-Altitude, Unattended Gap-Filler Radar Program," Hq ADC, Inclosure 1, 26 May 1954, CONFIDENTIAL.)

a. Locate the site on a detailed contour map. Start at a convenient azimuth — e. g., True North — and study terrain elevations and distances (the earth's profile) along that azimuth. With the aid of the skyline graph and 4/3 earth chart (or CADS Tables), locate the radar horizon. A complete record — something like the transit data sheet (Fig. 2-2), but extended to the right for "coverage height" columns — should be made and filed because it is often necessary to check portions of the work long after a diagram is complete. NOTE: PPI photographs of lower-beam ground clutter, taken during "normal" atmospheric conditions, might help; they show the coverage at "zero feet over terrain," and the most distant clutter (or PE) on any given azimuth is the radar horizon. The line-of-sight cutoff will of course be at a greater range.

b. After locating the horizon, record its distance (for use later in drawing a "horizon distance line" about the site). Then continue outward from the horizon (increasing range) along the terrain profile until the terrain falls off 500 feet below line of sight. Mark this point (see Fig. 4-1). If the terrain again comes up to within 500 feet of the line of sight, mark those points also.

c. Going back along the profile toward the site, mark **all points** at which the terrain is more than 500 feet below new radar lines of sight. These new lines of sight must be obtained from the map because their elevation angles will always be **lower** (more negative) than the elevation angle to the radar horizon; see Fig. 4-1. Draw lines (on the map, or, preferably, on a plastic overlay) connecting the coverage limits on that azimuth. Draw the lines over the parts which have coverage, leaving the no-coverage areas blank.

d. Repeat paragraphs 2b and c, above, for the other heights of interest, viz., 1000 and 2000 feet above terrain, omitting the lines over coverage areas since they are for 500 feet only.

e. Shift to a slightly different azimuth; the amount of shift should be dictated by the terrain — shifts of only one or two degrees must sometimes be made, while shifts of dozens of degrees are possible over flat terrain or water. Repeat paragraph 2b, c, and d, drawing radial lines to show where there is coverage at 500-over-terrain.

f. Repeat paragraph 2e for the full 360 degrees about the site. The radial lines over the coverage areas will have the appearance of cross-hatching, showing where RLS coverage is expected at 500-over-terrain (Fig. 4-2).

g. Plot the horizon distance (step b) for each azimuth studied on the coverage diagram. Draw a dotted line (Fig. 4-2) showing horizon distance around the site. This line shows how far ground clutter can be expected on any given azimuth.

3. **MSL Contours.** The procedures are the same as in paragraph 2 except that the RLS cutoff will occur at a given constant altitude — e.g., 5000 feet mean sea level (MSL) — rather than at a given height above terrain. Careful map-study, supplemented with the skyline graph, is important here too.

4. **Additional Diagrams.** At present, the three basic diagrams described above will contain RLS boundaries only. Additional diagrams which show equipment capability contours may be included if desired, but they will not be required until continuous evaluation has been in progress for some time.

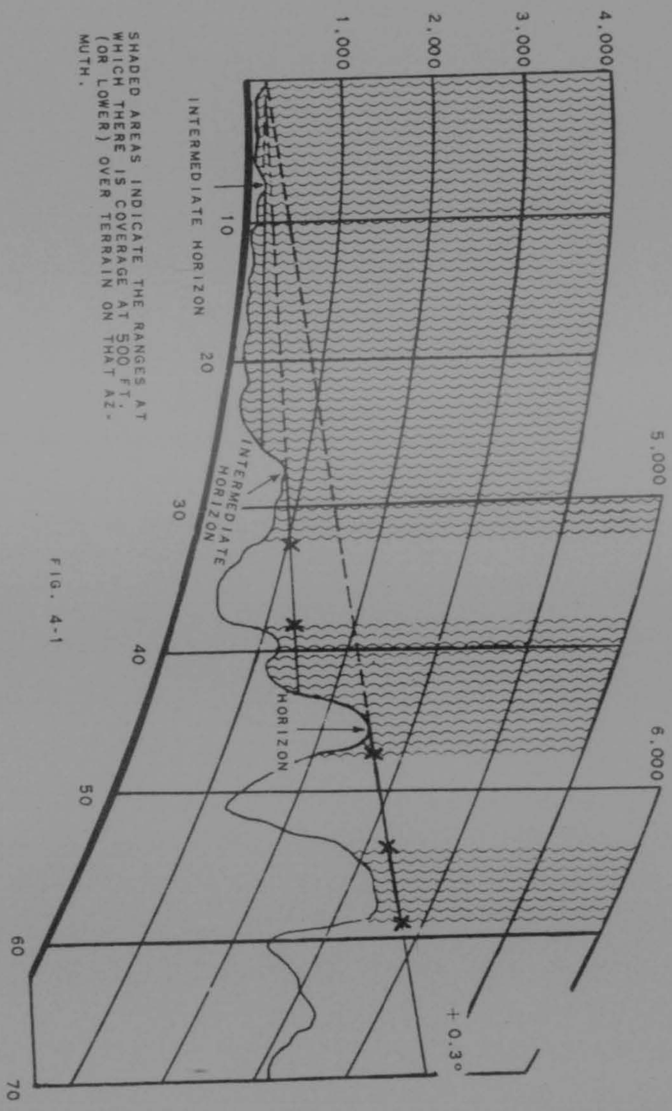

FIG. 4-1

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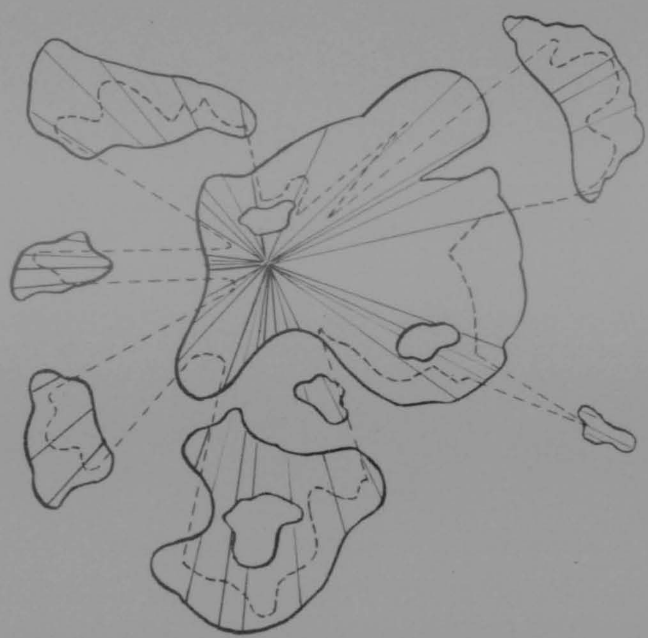
Coverage from One Station at 500-Over-Terrain- (Plan View)



Dashed line is "horizon distance line."

Fig. 4-2

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Chapter 5

INITIAL VISIT REPORT

1. **General.** An initial visit report is intended to be a small "library" of detailed technical information on the station involved. Evaluation personnel are expected to expend considerable effort on this report because there will be only one such report per station. Any information deemed valuable, even though not in the format below, should be included.

2. **Distribution.** Distribution of the report will be as follows:

a. 1 copy to each AC&W squadron concerned.

b. 2 copies to interested air division (def) headquarters.

c. 2 copies to air defense force headquarters, Attn: DC&E.

d. 1 copy to Air Defense Command Headquarters, Attn: DC&E.

e. Any additional distribution directed by air defense force commander or this headquarters.

f. At least one reproducible file copy well be retained by the radar evaluation (ECM) flight.

3. **Preparation.** The report will be prepared on 8" x 10½" paper (except for certain diagrams, maps, etc.), inclosed in a binder, and classified according to its content. Inclosures will be classified according to individual content, without regard to classification of the report. Reports will be submitted as soon as practical after each mission.

4. **Format.** Reports Control Symbol 1-ADC-H10 will apply for this report. The following format will be used as a guide.

Cover

Title, date, site number and name, evaluation flight number, RCS 1- ADC-H10

I. Cover Page

1. Site No. ________ Name ______________________________ Sq ________________

P. O. Address ____

Grid Co-ordinates ____________ N ____________ W (See site survey)

Air Defense Force ______________________ Air Division (Def) ________________

Defense Wing ____

Station Commander ____

2. Mission of Station (brief summary):

3. Remarks: (Provide a convenient reference for staff personnel.)

A general description of the site, including station facilities, security, access (Transportation links), etc. (Some of this information can be obtained from siting and installation reports.)

II. Table of Contents

Include index to inclosures.

III. Electronic Equipment

1. **Radar**

a. Prime search type ____________ Serial ____________

Tower height ______ ft. Elevation of antenna focal point ____ ft. MSL

Recommended operating antenna tilt: mechanical ____________ degrees; electrical __________ degrees. Tilt error ________ °

b. List of Performance Data Date ______ Time __________ (Z)

	Beams (1)	(2)	(3)	(4)	...
MDS (each receiver), dbm	____	____	____	____	
Power (each transmitter), dbm	____	____	____	____	
Performance figure, dbm	____	____	____	____	
Signal crystal current	____	____	____	____	
AFC crystal current	____	____	____	____	
Stalo frequency	____	____	____	____	
Stalo cathode current	____	____	____	____	
Magnetron type	____	____	____	____	
Magnetron frequency	____	____	____	____	
Magnetron current	____	____	____	____	

Magnetron spectrum (show graphs)

Measured PRF ______________ cps* ________________ n. mi.**

Pulse width

High voltage

Mod. clipper current

Mod. (thyratron) capsule voltages

Other; Include installation or supply discrepancies.

* State how measured.
**Miles in a pulse period.

c. **Height finder**: Data should follow same format as for search gear but include the following when practical:

(1) Indicated altitude of known aircraft ____________________________

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(State whether relative to station, or MSL.)

(2) Actual altitude of the aircraft ______________________________ ft.

(3) Height error ________ ft. at ______ alt. and ________ n. mi.
(Include height vs. range curves when possible.)

Remarks:

Any condition such as supply, defective spares, etc., that degrade effectiveness of height-finder operation.

d. **Backup equipment:**

Follow same format as for prime equipment.

e. **MTI**:

Specific data as reflects MTI performance, including sub-clutter visibility figure and clutter intensity diagrams.

2. **Training Aids**:

Report in narrative form how equipment such as 15-J-1C are used, any unusual SOP's, etc.

IV. **Measuring Equipment**

1. Signal generator type ______________________ serial ______________________

Date last calibrated ____________ by __________(Shop or organization)

2. Pad ____________ db attenuation. Cable __________ db attenuation.

3. Power meter type ______________________ serial ______________________

Date last calibrated ____________ by __________(Shop or organization)

4. Other:

5. Remarks:

General statment of physical and electrical condition of test equipment, adequacy of same. Mention any other type of test gear that is important for maintaining station effectiveness and condition of same.

V. **Communications Equipment**

1. **HF radio**

Follow format similiar to that for radar; include:

Coverage — indicate differences from radar coverage.

Type equipment ______________________ serial ______________________

Type emmission ____

Power output ____ (Watts)

2. **UHF** (Same format as HF radio)

3. Describe over-all picture of tele-communications — data link and data transmission methods, etc. Explain by what means flight plans are passed and plotting data relayed — e. g., teletype, HF voice, etc.

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4. Communications test equipment data (Same format as Section IV)

VI. Summary

Note unusual features, when found, of maintenance and operations procedures used by station personnel. Comment on cooperation of site personnel in general. Specific comment is invited where outstanding techniques or personnel are encountered.

VII. Personnel

1. Evaluation personnel:

   Name ____________ Grade ______ AFSC and job title ____________________

2. Main station personnel contacted:

   Name ____________ Grade ______ AFSC and job title ____________________

VIII. Additional Information

1. Skyline graph (see Chapter 2).
2. Coverage diagrams (see Chapter 4)
3. Maps, charts, etc.
4. Tilt measurement data (see Chapter 3).
5. Clutter intensity diagrams.
6. Other.

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Chapter 6

TACTICAL EVALUATION REPORT

1. **Content**. A complete and detailed analysis of each tactical evaluation mission will be prepared by radar evaluation (ECM) personnel as soon as practicable after completion of the mission.

2. **Distribution**. Distribution of the report will be as follows:

a. 1 copy to each AC&W, fighter, AEW-&C and AAA unit participating in the evaluation.

b. 2 copies to the interested air division (def) headquarters.

c. 2 copies to air defense force headquarters, Attn: DC&E.

d. 2 copies to Air Defense Command Headquarters, Attn: DC&E.

e. At least one reproducible file copy will be retained by the radar evaluation (ECM) flight.

3. **Preparation**. Reports will be prepared on 8" x 10½" paper, inclosed in a binder, classified SECRET, and will be in accord with the following format:

a. Section I — **Mission Objective** will contain a short description of the basic objectives of the mission, particular areas of the air defense system that are to be evaluated, and agency requesting the evaluation, if applicable.

b. Section II — **Mission Plan** will contain a description of the means employed to attain the objective. Overlays depicting bomber and fighter aircraft tracks will be appended. Bomber tracks will be displayed on one overlay and fighter tracks displayed on another, capable of being superimposed over a pertinent, inclosed map section; type map will be the Jet Navagation Series (JN-29, 30, 44 or 45) scale 1: 2,000,000. Overlays will be suitably annotated.

c. Section III — **Mission Results** will contain a summary of the effect of each strike force comprising the mission; the degree of success attained by each strike force, together with hindering and aiding factors.

d. Section IV — **Mission Analysis** will contain a relatively detailed analysis of all factors having a bearing on the success or failure of the mission. Analysis will treat all pertinent areas of the defense system — e.g., equipment capabilities and limitations, utilization of available equipment and procedures. Recommendations will be made when appropriate.

e. Section V — **Conclusions** will contain a brief summary of the success of the mission in attaining the stated objective, pertinent comment on areas of special interest and recommendations for types of future evaluation missions, if appropriate.

4. **Reports Control Symbol**-2-ADC-H10 will apply for this report.

Chapter 7

SPECIAL EVALUATION REPORT

1. **Content**. The actual content of Special Evaluation Reports will vary because they convey trouble-shooting information, and different symptoms will be pursued at different radar stations.

a. The main portion of the report will be narrative in style, preferably in chronological order. The remainder will contain detailed tabulations (or other presentations) of all pertinent measurements and other observatios; they too will be identified chronologically since the times (i. e., sequence) of observations are sometimes as important as the observations themselves.

b. Information which was omitted from the Initial Visit Report for that station will be included in the Special Evaluation Report; pertinent changes in previous information will be noted.

2. **Distribution**. Distribution of the report will be as follows:

a. 1 copy to each AC&W squadron concerned.

b. 2 copies to interested air division (def) headquarters.

c. 2 copies to air defense force headquarters, Attn: DC&E.

d. 1 copy to Air Defense Command Headquarters, Attn: DC&E.

e. Any additional distribution by air defense force commander or this headquarters.

f. At least one reproducible file copy will be retained by the radar evaluation (ECM) flight.

3. **Preparation**. The report will be prepared on 8" x 10½" paper (except for certain diagrams, maps, etc.), inclosed in a binder, and classified according to its content. Inclosures will be classified according to individual content, without regard to classification of the report. The report will be prepared as soon as practical after the mission.

4. **Format**. The following general format will be used as a guide:

a. **Cover**: Title and date of the report; the radar station's name and number; and the designation of the radar evaluation (ECM) flight, and RCS 3-ADC-H10.

b. **Cover page**: Type radar, station designation, station coordinates, antenna elevation MSL (measured to focal point), operational tilt (mechanical), tilt error, tilt(s) used during evaluation, dates of evaluation, station commander, evaluation officer, and team members and their job titles; (if applicable) type evaluation aircraft used, hours flown, type support aircraft used, hours flown.

c. General table of contents and list of inclosures.

NOTE: Careful indexing is important since this report may assume rather large proportions.

d. **Summary**: Brief summation (usually one or two short paragraphs) covering outstanding points of the evaluation mission.

e. **Reason for evaluation**: Outline the symptoms reported in the request for evaluation and by whom reported. A copy of the evaluation request may be inclosed if appropriate.

f. **Symptoms noted upon arrival at station**: Narrative, accompanied by specific data and comments or complaints made by station personnel.

g. **Specific investigations**: List all appropriate investigations and their results. Include investigations which reveal no trouble, as well as those with abnormal indications.

h. **Reasons found for abnormal performance**: Include supporting evidence. Detailed discussions — as indicated in paragraph k below — are invited.

i. **Recommended solution(s)**: When useful, include one or more alternate solutions. Also include any tentative results if the recommended changes were tested.

j. **Recommended areas for further study**: An investigation of this type sometimes brings to light other problems, the pursuit of which is not warranted in that specific operational situation. Discuss these problems, why they should be studied, and how. If few or no specific reasons were outlined in paragraph h, indicate here the most fruitful lines of further investigation. Also recommend any additional, or changes in, evaluation procedures which became evident during the evaluation mission.

k. **Additional information**: This section contains the inclosures and any lengthy explanations, theoretical treatments or large quantities of data which would be cumbersome in the report text — e. g., MDS and power histories, blip scan data, weather data, detailed measurement procedures (such as antenna tilt), operator performance data, suggested equipment modifications, etc.

5. **Reports Control Symbol**: 3-ADC-H10 will apply for this report.

0548

12

17

AC&W QUALITY CONTROL PROGRAM

12 AUGUST 1955

4713th RADAR EVALUATION ECM FLIGHT
GRIFFISS AIR FORCE BASE
ROME, NEW YORK.

0549

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14

Squadrons report that they have encountered four major problems in the operation of QC. These are; 1) the additional workload, 2) turnover in personnel, 3) inability to use fighters, and 4) lack of aircraft suitable for QC. Each of these will be considered.

First, that there is an additional workload is undeniable. However, the workload is considerably overestimated by personnel unfamiliar with actual QC procedures. The entire process, once mastered, becomes virtually mechanical and non-time consuming to any major degree.

Second, turnover in personnel is a major problem and can only be solved by proper training and continual indoctrination. Continuity of skill must be passed along to new personnel. One of the best methods of maintaining continuity is the wide dissemination of knowledge and techniques. This is a major lack of the present QC program. It has been noted, for example, that a squadron will have a good QC system on one investigation and practically no program at all, three or four months later, as a result of personnel turnover. To provide the necessary competent training of new personnel it is felt that the responsibility for training should rest with the civilian site engineer. This will provide the desirable features noted below. He is the most permanent individual onthe site and can therefore provide the necessary continuity of skill and interest. Both maintenance and operations can be most advantageously drawn into the program. No other individual is so favorably placed to accomplish adequate training. The use of the site engineer will provide an "on site" monitor of the training and skill level obtained by the personnel. The engineer will be able to aid materially in the extension of the QC program and the accumulation of basic additional data.

Third, the squadrons state it is difficult to use fighter aircraft for QC. Two reasons are given: 1) fighter aircraft are not suitable and 2) fighters have too many other commitments. As for the first reason, this is due to a lack of understanding. Fighters are excellent material. The second reason is a matter of operational policy. Even so, fighters could be used considerably more frequently than is now the case without change in operational commitments.

Finally, a major difficulty claimed by the squadrons is the lack of sufficient traffic suitable for QC. One site, with a monthly average of 120 checks, has a total of 17,000 logged tracks per month. In view of this, the claim of no traffic is slightly out of order. This same squadron did manage to secure approximately 380 monthly QC tracks, over three times their usual number, during the two months ADC-wide test. Of course some sites may have a real problem, however, the establishment of a Movements and Identification Section at these stations would help alleviate this situation. It is clear that the majority ofstations could obtain more checks than they do.

Aspect of an aircraft should not be considered a limiting factor in determining if a target is satisfactory for QC purposes. Present pro-

0350

cedures involve the use of head and tail aspect only. Thus an aircraft must either be going or coming directly to or from a station to be useful as a QC subject. In practice, a 20% swing to either side has been considered as head or tail. True head or tail on targets are almost nonexistent due to the placement of radar stations in relation to the airlines and general traffic. This 20% variation has worked very well in the field. It appears that aspect might profitably be eliminated entirely and thus provide a greater number of suitable targets and simplify procedures for station personnel at the same time. The practical limits of aspect should not normally vary the QC percentage in a sufficient amount to exceed the limits of control. (85-100%).

All technical papers on the subject of aspect point out that the variable is extremely complex and no two really agree on a measurable factor. Present studies are strictly of a laboratory type and are inapplicable to aircraft in normal flight. Aircraft in flight are constantly varying their aspect in relation to the radar beam as the result of normal flying conditions (i.e. yawing, pitching, rolling, correction for wind drift, minor course changes, and height corrections). A statistical analysis of this complex factor should average out to a usable mean. A controlled flight (i.e. one in which aircraft aspect, altitude, etc. are definitely known or controlled), remains the most accurate method of determining radar performance with a single or specific QC check.

Db ratings are not available for many types of aircraft. Certain stations have large numbers of navy or commercial aircraft available, but have no assigned db ratings, and hence, do not use them for QC. This can be corrected by supplying the field with additional data, when available, or by the use of an established procedure.

A recommended method is contained in the February 1955 issue of the ADC Communications and Electronics Digest under the title "Planes Rated by Relative Echoing Area vs. Empty Weight".

Following are other specific discrepancies that have been noted. They are indicative of the quality of the present program at some stations.

No attempt is made to explain low QC percentages.

Flights of aircraft are treated as one aircraft.

In some cases QC is being taken on a beacon signal rather than the radar.

Computors are improperly used.

It has been observed that where squadrons extract operator efficiency records from QC, they are apt to have good programs. This

12

follows, because to extract the operator factor involves the two main elements of QC, specifically, a sufficient number of checks and a thorough understanding of the methods involved.

This understanding may be passed on usefully to Division which will establish a station average, of raw data, and note competitive performance between stations. They may also note the effect that anomalous propagation has in certain months on coastal stations, weather in winter on northerly stations, and operator effectiveness due to experience levels. Certain months of the year may stand out as areas of low detection effectiveness in a particular sector, and an increased effort of surveillance may be directed toward that weak spot.

CONCLUSIONS

There are four specific characteristics that are considered essential for an effective quality control program. They are 1) standardization of methods, 2) enforcement of regulations at all levels, 3) proper inspection and monitoring and 4) prompt aid from higher headquarters when low and unaccountable QC figures are obtained.

First, standardization must be uniform throughout the command. Everyone must be using the same procedures, reporting a figure that has the same meaning, etc. The major fault of the present program is the wide diversity encountered between sites. Variation is so great at the present time that QC for comparative purposes is practically useless. Standardization must point toward raw data that gives a straight forward analysis useful for comparison. As indicated, the present program does not approach this goal.

Second, a standardized system once agreed upon and distributed to the field must be enforced by constant monitoring and inspection, and supported by a display of interest at command levels. Greater interest and understanding of the program by personnel at higher headquarters will go far toward ironing out present difficulties.

Third, periodic inspection of the program is of paramount importance. Reliable QC figures can simply not be obtained from a casually run program, as is the case at present.

Fourth, it must be recognized at Division and Air Defense Force Headquarters that a station running low in QC is a situation for investigation and possibly outside help rather than necessarily a situation for blame. This would become one of the missions of the evaluation flight. In any event, squadrons should be able to look for help instead of having to view the program as a way of receiving arbitrary criticism because of a low QC report.

0552

A properly conducted program of QC will have research capabilities in so far as studying the effect of abnormal propagation, seasonal effects on radar performance, maintenance program effectiveness, aircraft aspect analysis, etc. The future possiblities of QC are exceptionally bright and should be of considerable interest and value to the Air Force.

RECOMMENDATIONS

Complete standardization of the Quality Control Program should be evolved at the highest command level.

A program of inspection by a higher headquarters be initiated.

The civilian site engineer be given the responsibility of training pertinent station personnel in quality control procedures and objectives.

A system of quality control be instituted that contains the basic requirements as outlined in attachment ~~two~~. 1

Aspect of aircraft should be disregarded entirely as opposed to the present system of considering only aircraft with a head or tail bearing.

That quality control, as pertains to AC&W radar station performance, be included in the curriculum of the AC&W Controllers and Electronic courses of the Air Training Command.

0553

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15

INTRODUCTION

Quality control (QC) establishes a means which enables a radar station to maintain a given level of efficiency. The system is analagous to that used in industry, in that a constant sampling is made of the radar station's product - detection and tracking of aircraft - and compared to a standard.

The quality control program (QC) as it is presently employed is considered inadequate. After two years of use in the field it has established a foothold within the AC&W system. However, the time has arrived to stop and review QC as it is now applied. An attempt has been made to evaluate the program and to formulate changes in the hope that an improved quality control system will be evolved. It is not intended to infer that the present program has been a failure. It has not. Many benefits have been derived, foremost of these being:

Better understanding of the capabilities and limitations of radar equipment.

Greater cooperation between the maintenance and operations sections, of an AC&W station.

The instilling of desire in AC&W personnel to operate their facilities at an optimum level (once they are aware of their capabilities).

The immediate detection of sub-par performance of the radar equipment.

A means of evaluating radar operator efficiency (the lag between the time when a target is first detected electrically by the radar and the time when it appears on the plotting board).

The reduction of "off the air" time by utilizing QC as the "necessity" criteria for radar maintenance periods.

The quality control program has generally been wholeheartedly received by AC&W personnel. However, certain deficiencies have been noted that need corrective action inorder that maximum benefit to the Air Defense Mission can be realized. It is with these deficiencies and suggested corrective action that this paper is concerned.

DISCUSSION

Evaluation officers of the 4713th REVFT have periodically inspected AC&W quality control records since inception of the program. Noted below is an analysis of the major difficulties encountered during recent evaluation of nine AC&W sites within EADF.

0554

56

At stations with a satisfactory program, both operations and maintenance sections were vitally concerned with quality control. In addition, in those squadrons with good programs there is a wide distribution of knowledge of QC techniques among the different sections. However, this is not the case in all squadrons. For example, at only 55% of the sites were operations people checked out in QC. At some of these sites only the controllers understood its' use. Maintenance personnel were familiar with QC at 77% of the sites. Again this may mean that only the maintenance officer follows the program. These figures are significant in that they indicate that QC is not being most advantageously employed. Both sections are important in making the program work. However, final responsibility should rest with operations. This is because they are the people most favorably placed to perform QC.

QC is common ground on which operations and maintenance can meet, and thereby improve the teamwork of the two sections. At some sites investigated, this teamwork between operations and maintenance was not apparent. Quite the contrary, one section generally has exclusive use of QC with the other uninterested.

Most sites are taking two few checks to properly monitor the operation of their equipment. The figures vary widely from squadron to squadron. Twenty-five QCs per week or approximately four per day is a reasonably representative figure. This means four checks for a twenty-four hour period, not a sufficient number to catch a decrease in optimum station performance. These checks are usually taken during periods of high traffic density, and more than twelve hours may elapse between checks. Four per day are also too few to obtain enough information to properly evaluate the radar operators. EADF Regulation 55-9 requires a minimum of one an hour. Few of the sites come anywhere near this figure.

Of the total QC checks obtained, 50 to 100% are limited by screening. These checks are therefore not true measures, as targets limited by screening do not give a sensitive indication of set performance. Considerable degredation of the radar may occur and not be reflected. However, such checks are useful for determining operator efficiency ratings. In most squadrons altitude data for QC is obtained from flight plans, or is estimated. This is primarily due to lack of height finder equipment that will supply height information at the range where QC checks are made. New equipment programmed in should correct this difficulty. More efficient use of cross tell information will also be of value, both in obtaining height information, and in increasing the number of checks.

Extraction of a usable and accurate measure of efficiency of a site's radar operators is a real contribution to their development. This valuable tool is being completely overlooked by two-thirds of the squadrons. The sites using QC procedures for extracting operator effectiveness have had excellent success. This success is reflected by an increase in efficiency, better morale, better competition between crews, improved overall station performance, and increased understanding of the capabilities of the radar.

16

C

RECOMMENDED STANDARD QUALITY CONTROL SYSTEM

Information relative to a flight or target is received, either via flight plan, cross tell, control of local aircraft, mission aircraft or internal identification. The target's track is established within the range of the radar with azimuth, range, height and type aircraft known.

The individual responsible for quality control checks will seat himself at a PPI scope to observe the target and note the range when it first appears on the radar. This range versus the theoretical range is a "Radar Quality Control" figure, (RQC). The plot as it appears on the plotting board will then be noted and this range versus the theoretical range is the "Station Quality Control" figure (SQC). The difference between the two, subtracted from 100, is then the operators effectiveness in percentage.

As raw data is recorded under "Station Quality Control" (SQC) it is to be expected that the figures will fluctuate. With two successive low SQC's there is a "snap vector" in the direction of the trouble. An immediate check should be made, under the advisement of the Director, of the radar and operator effectiveness. One or the other figure should be indicative of trouble. If not, the cause may be weather or inaccurate height data.

If then the succeeding SQC checks continue the lower trend and it appears that radar performance is the cause, a controlled RQC check with fighters will be made. If a low RQC is obtained, maintenance is in order. The crew can be ready and trouble shooting to a certain extent before emergency time is necessary. It may be noted that any low controlled RQC check is indicative of reduced set performance and corrective action should be taken at once.

The limits of SQC will be 100% and 85% with the understanding that a figure of 100% or higher is as abnormal as a figure of 85% or lower. A station will arrive at a statistical average and wide variances about this average will be important. It is at this point that the stations who are exceptions to the standard system will stand out and with proper understanding may be compensated for.

All targets regardless of "aspect" will be used for SQC.

A limitation of 10,000 feet and 70 miles should be imposed for all checks in order to insure the exclusion of low altitude, short range aircraft, which are valueless in evaluating radar set performance.

The Division, as well as Squadron operations and C&E personnel, must monitor the program jointly. A proposed log of QC figures is indicated by a typical sample in figure one. Such a log will be of considerable value for the inspecting officer, commander of the squadron, etc.

ATTACHMENT I

1

The log is perfectly straight forward and compiled "on the spot" by the squadrons involved. It will be of particular use to officers inspecting the program, as it permits a rapid analysis of the program.

A brief analysis might go somewhat as follows:

First, a glance at the time column reveals that the minimum number of checks are being taken: i.e. one per hour.

Secondly, the track column is indicative of the utilization of tracks assigned for QC purposes versus the number of tracks available.

Third, tracks 11, 12, 13 are low. Track 13 is obviously a controlled flight. Crew A is following the proper procedure,

Fourth, SQC is the figure that is averaged and reported at the specified time to division. The station average is 86% the RQC is 96% indicating that this station has an operator degredation factor of 10%. If crew comparison figures are available, as they should be, Crew A will be found to average 92% efficient, Crew B 89% efficient. Question, what action is being taken on training crew B?

Next, note should be taken of the type aircraft column. Are fighters being utilized? Are commercial aircraft being used, etc.?

Finally, the inspecting officer should note weather phenomena to determine if it is being properly noted (Tracks 6, 8, 9, 39, 50).

All of this is only the immediate value of the log. It will serve in this capacity for inspections, monitoring, and squadron use. A major portion of the program is the information that may be extracted for research purposes and statistical studies.

0357

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_______ ACWRON QUALITY CONTROL RECORD SHEET DATE

TIME	TRACK NO.	AZIM.	HEAD	A/C TYPE	HEIGHT	WEA.	SQC	RQC	OP	IND. CREW	REMARKS (ON REVERSE SIDE)
0015	1	270°	70°	F-86	10 K	N	96	98	98	JC A	
0100	3	185°	10°	B-47	25 K	N	85	98	87	RW A	
0130	4	0°	95°	B-29	15 K	N	86	98	88	JC A	
0200	5	310°	120°	CONST.	12 K	N	87	97	90	JC A	
0230	6	90°	285°	CONST.	12 K	RAIN 30 MI.	85	90	90	JC A	30 MI. OF RAIN THIS AZIMUTH
0300	8	50°	50°	F-86	20 K	RAIN 15 MI.	87	93	94	RW A	15 MI. OF RAIN THIS AZIMUTH
0310	9	70°	150°	F-86	23 K	RAIN 23 MI.	86	95	91	JC C	23 MI. RAIN
0410	11	310°	135°	CONST.	15 K	N	88	96	92	JC A	
0440	12	40°	285°	B-25	18 K	N	70	76	94	RW A	
0455	13	90°	250°	B-29	18 K	N	75	80	95	RW A	CONTROLLED FLIGHT
0510	15	75°	255°	F-86	20 K	N	80	84	96	JC A	SET OFF TO CHECK AFC-INOPERAT PEAKED MANUALLY
0600	16	92°	285°	CONST.	12 K	N	90	93	97	JC A	
0615	17	92°	240°	B-29	20 K	N	86	96	90	MM B	SET OFF AIR AFC REPLACED SET NORMAL
0715	24	90°	280°	CONST.	12 K	N	85	97	89	MM B	
0805	39	120°	290°	B-25	6 K	DUCT.	95	116	79	NR B	DUCTING – PE'S 121 MI AT 270° OPER CAUTIONED
0905	50	90°	285°	CONST.	12 K	DUCT.	85	89	96	NR B	DUCTING PE 75 MI. AT 270°
1000	68	90°	270°	F-86	25 K	N	90	98	92	MM B	
1035	95	310°	120°	CONST.	12 K	N	87	97	90	MM B	
1100	140	270°	270°	F-86	20 K	N	91	103	98	NR B	

Fig 1

0558

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DOCUMENT NO. 18

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0559

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DOCUMENT NO. 19

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0560

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18

207.2

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0561

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19

CONFIDENTIAL

Hq ADC, ADOCH-A, Subj: (Uncl) Operational Dates for Approved ACAW Program

c. Approval of sites in Canada has been delayed to a point where their completion prior to the end of FY56 is very doubtful.

d. Non-availability of equipment required for installation of communications-electronics facilities has resulted in slippage in estimated operational dates.

(1) Arctic towers for the AN/MPS-11 and AN/FPS-8 equipment will not be available until approximately June 1955. The operational date of at least two sites (M-93, Winslow, Arizona, and M-110, Bucks Harbor, Maine) will be slipped into FY56 because of this delay.

(2) Delay in availability and/or installation of telephone facilities has resulted in the slippage of the estimated operational dates of several sites.

e. In some cases Air Material Area installation teams have not been ready to start work when sites have been made available to them. This headquarters has no information as to the reason for these delays.

4. Since this headquarters does not have control of most of the factors that are presently delaying the mobile program, it is suggested that your headquarters call a meeting of all concerned agencies and attempt to solve these problems.

5. In the future, change requests will be submitted in all cases where the estimated operational date will not meet the programmed operational date.

6. Reference paragraph 5 of above-referenced letter, this headquarters does not consider the Bi-Weekly Status Report to be a programming document. The dates contained in this report indicate current status and estimated accomplishment of various phases of the implementation of the ACAW program. As such, they are used by agencies concerned with implementing and supporting these programs in forecasting dates on which they may take actions required of them. Therefore, this headquarters plans to continue to publish estimated dates for the accomplishment of beneficial occupancy and operational status of stations in the ACAW program.

FOR THE COMMANDER:

W. J. BIRMELE
LT COL., USAF
Asst Comd...

2-50121
C777

Prepared by Lt Col WALafrenz/id
Telephone 2411
Date 25 Mar 55

MEMO FOR RECORD: (OVER)

2

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V718-1

0562

PROPOSED, REVISED 4TH PHASE RADAR PROGRAM (CANADA)

I. This study was made by a group composed of representatives of the RCAF-ADC and USAF-ADC to evaluate a revised radar program for providing improved detection and tracking capability to the north of the Continental U. S. The program developed by the study group will provide contiguous radar coverage northward from the presently programmed combat zone to approximately 200 NM north of the Mid-Canada line. The target date for the completion of this program is CY-1958.

II. In an effort to minimize confusion in the present radar programs, this study refers to the "4th Phase Radar Program (Canada)" with the priority for installation referred to as "Increments."

III. The initial action by the study group was to determine the number of radars required, by type, to provide coverage at the "higher" altitudes, using 35,000' as the minimum "high" altitude. Charts were prepared to determine the theoretical coverage at 25,000' and 35,000' with the deployment shown on Attachments 1 and 2. This deployment will provide contiguous coverage from the present combat zone at all altitudes above 20,000' to approximately 230 NM north of the Mid-Canada line. Similar charts were prepared to determine the theoretical coverage at 5000' and 15,000' as shown on Attachments 3 and 4. It was noted that serious lateral gaps existed on the Mid-Canada line at altitudes below approximately 18,000'; however, one of the principal aims of the study was to extend the high altitude contiguous coverage against a jet type bomber force. A detection capability will be provided at altitudes below 15,000' by the planned DOPPLER fence on the Mid-Canada line, and tracking capability by the AN/FPS-3 and AN/FPS-14 type radars proposed in the third and fourth increments of this study.

IV. 1st Increment; Required Operational Date, 1957

Three (3) Direction Centers to be operational by end CY-1957 at the locations listed for the 1st Increment on Attachment 6. Radars programmed for this increment should be the AN/FPS-3 type. The three (3) radars in this increment are deployed to fill the gaps in the radar coverage which now exists between the NEAC chain and the line Moisie, St. Margarets, and Sydney. These sites are necessary to provide adequate tracking and identification capability within this area. This is of particular importance because of the heavy concentration of critical targets southeast of this area and because of the difficulties involved in identification generated by the high volume of local and trans-oceanic air traffic.

V. 2nd Increment; Required Operational Date, 1957

Six (6) of the heavy radars in the 2nd Increment are located on the Mid-Canada line and two (2) on the westward extension to this line. These locations, as shown on Attachment 6, include the three (3) stations—Knob Lake, Flin Flon, and [illegible]—which were part of the original plan for the Mid-Canada line. Radars programmed for these eight (8) locations should be of the AN/FPS-7 type. It is considered that, with the communications and transportation facilities being provided for the Mid-Canada line, these stations can be built relatively quickly in comparison with some of the more isolated locations in the 3rd Increment. The coverage from these radars will link up with the present Pinetree chain at altitudes above 20,000', and at 35,000' will provide contiguous coverage to approximately 230 NM north of the Mid-Canada line (see Attachment 1).

VI. 3rd and 4th Increments; Required Operational Date, 1958

1. Ten (10) Direction Centers are included in the 3rd Increment, and five (5) Direction Centers in the 4th Increment at the locations listed on Attachment 6. These increments include the stations required to fill in the radar coverage at lower altitudes between the Mid-Canada and Pinetree lines. The initial study indicates that most of the radars in these increments can be of the improved AN/FPS-3 (GPA-27) type. To increase the high-altitude coverage capability throughout the combat zone, AN/FPS-7 or equivalent type radars should be installed at certain existing and 3rd and 4th Increment locations. The following locations, in addition to the presently approved "ADC Radar Improvement Program," were selected for installation of AN/FPS-7 type radars.

a. Puntzi Mt., B. C.

b. [illegible], Alta.

c. N. Caribou Lake, Ont.

d. Mistassini Post, Que.

e. Moisie, Que.

f. Sydney, N. S.

2. To enhance the radar capability in this area, it is recommended that the Northeast Air Command program AN/FPS-7 type radars at Gander and Cartwright.

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[illegible]

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f. Adequate height-finding capability to be provided throughout the area of coverage of the prime radars.

11. [illegible] headquarters will provide the technical assistance normally required of this command as necessary to accomplish the systems engineering; however, it is desired that participation in this function be through periods of TDY, as required, and that a "systems engineering group," as such, not be formed.

6 Attachments (2 cys ea)
1. 35,000' coverage chart
2. 25,000' coverage chart
3. 15,000' coverage chart
4. 5,000' coverage chart
5. AN/[illegible] coverage chart
6. Proposed Loc for Revised 4th Phase Radar Program

0566

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24

[illegible]
for
[illegible] PROGRAM (CANADA)

1st Increment

Resolution Island	[illegible]	[illegible]
Walton Bay	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

2nd Increment

Knob Lake, P. Q.	5459N	6690W
Great Whale River, P. Q.	5518N	7745W
Wabuk Pt., Ont.	5518N	8510W
Amery, Manitoba	5634N	9398W
Flin Flon, Manitoba	5446N	10152W
Waterways, Alta.	5643N	11120W
Fort Nelson, B. C.	5848N	12232W
Masset GCI's, B. C.	5400N	13219W

3rd Increment

Lake Pardu, P. Q.	5021N	7000W
Mistassini Post, P. Q.	5021N	7350W
Lake Evans, P. Q.	5047N	7705W
Moosonee, Ont.	5116N	8057W
Pekanho River, Ont.	5228N	8530W
Ekwan River, Ont.	5300N	8639W
No. Caribou Lake, Ont.	5254N	9100W
Cairns Lake, Ont.	5148N	9446W
Gypsumville, Man.	5147N	9862W
Carberry, Man.	4956N	9926W

4th Increment

Saltcoats, Sask.	5103N	10210W
Davidson, Sask.	5113N	10600W
Mantario, Sask.	5119N	10979W
Acme, Alta.	5130N	11318W
Chip Lake, Alta.	5340N	11537W

0567

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April 53

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0568

23

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COMDR ADC

PRIORITY

COMDR CADF GRANDVIEW AFB MO X

COMDR WADF HAMILTON AFB CALIF X

COMDR EADF STEWART AFB NEWBURGH NY

(UNCLASSIFIED) ADCCR-00______. REF page 5, PARA 15, siting directive for 1st [illegible] gap filler radar program, dated 26 MAY 55. Deadline date for 1st 125 site surveys changed to 31 MAR 56. This change also applies to page 5, PARA 27 and INCL 3 to [illegible] gap filler radar siting directive. Above change does not negate urgency for compl. 125 surveys by 31 MAR 56. Present status, this HQ, indicates each ADF should submit 21 surveys apiece to bring total to 125. Add 21 surveys from each ADF can be obtained from [illegible] program.

MEMO FOR RECORD: Gap filler program deadline date of 1 Mar 56 has been changed to 31 Mar 56 by [illegible] Hq USAF.

UNCLASSIFIED

[illegible]

0569

Jan 18 1955 63

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SPI. 1 Jan 55

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BT

/S E C R E T/FROM AFOOP-OP-D 56356. THIS MSG IN 2 PARTS. PART 1. REF YOUR 21 JUN 54 AND THREE 6 OCT 54 LTRS CONCERNING THE SMALL AUTO RADAR PROGRAMS. PD-57-I WILL CMTN THE PROPOSED LOC FOR 421 GAP FILLER RADARS CMM IN THE ORDER OF PRIORITIES LISTED IN LTRS CITED ABOVE. DESIRE 2 ADD LOC BE FWD ASAP TO CONFORM WITH THE TOTAL NR OF SITES PROGRAMMED IN PG-57-I. PART 2. TO INSURE THAT THE U.S. POSIT IS NOT JEOPARDIZED BY FWD PIECEMEAL RQR TO EITHER THE MIL COOPERATION COMTE OR THE PERM JT BD ON DEF CMM CANADA-U.S. CMM DESIRE THAT AN AGREED POSIT ON RADAR RQR IN CANADA BE REACHED WITH THE RCAF-ADC SOONEST. ATTAINMENT OF THIS WILL ALLOW THE USAF TO SUBMIT ONE REQ FOR SITE

F-01647-A

FILE NUMBER 211
DV

PAGE TWO JEPHQ 82
SURVEY RIGHTS AND SUBSEQUENTLY ONE GOVERNMENTAL AGREEMENT. TO ASSIST THIS HQ IT IS FURTHER DESIRED THAT THE RESULTS OF ANY DISCUSSIONS WITH RCAF-ADC REGARDING THE EQUIPPING CMM MANNING CMM CONST OR OPERATION OF EITHER THE PRIME OR GAP FILLER RADARS BE FWD.
BT
13/1409Z JAN JEPHQ

Destroy
J[illegible]

V587-1X

ADC Hq-O-AG-Form 23
9 April 53

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0570

25

AOCOP-AL

SUBJECT: (Unclassified) Automatic Gap-filler Program

TO: Director of Operations
Headquarters USAF
Washington 25, D. C.

1. This will confirm verbal information given recently to representatives of AFOOP-OP-R concerning deletion of 61 automatic gap-filler radar sites from USAF Program Directive, PD-57-1. These sites are shown in Inclosure 1. The sites shown in the PD are approximate locations only and will be replaced with actual locations as the site surveys are approved by this headquarters. The 61 corrected locations which will replace those deleted are given in Inclosure 2. In addition to this 61, six sites are included for which site surveys have been approved with no change in location.

2. Since the above action, 29 additional site surveys have been approved by this headquarters. These site locations are given in Inclosure 3. The sites which they replace in the PD are given in Inclosure 4.

FOR THE COMMANDER:

[illegible]

4 Incls
1. 61 Sites Deleted
2. 67 Sites Approved
3. 29 Sites Added
4. 29 Sites Deleted

[illegible] FOR RECORD: An arrangement has been made whereby tentative gap-filler site locations in the PD will be replaced with actual sites as this Hq approves the site surveys. This is the first such list for PD changes.

[illegible] Patterson/[illegible]
[illegible] Apr [illegible]

0571

61 Gap-Filler Sites to be Deleted from PD-57-2

	Location	Coordinates
1.	Carpenterville, Ore.	42°12' N - 124°20' W
2.	Eureka, Calif.	40°45' N - 124°06' W
3.	Westport, Calif.	39°34' N - 123°48' W
4.	San Nicolas Island	33°15' N - 119°30' W
5.	Huntington Beach, Calif.	33°33' N - 117°46' W
6.	San Diego (Tijuana)	32°03' N - 117°07' W
7.	El Centro, Calif.	32°46' N - 115°33' W
8.	No Town, Ariz.	32°15' N - 113°49' W
9.	San Miguel, Ariz.	31°15' N - 111°50' W
10.	Duquesne, Ariz.	31°25' N - 110°35' W
11.	Bulliss Gap, Tex.	29°48' N - 102°35' W
12.	Pumpville, Tex.	29°52' N - 101°40' W
13.	Del Rio, Tex.	29°25' N - 100°50' W
14.	La Mesa Ranch, Tex.	27°51' N - 99°50' W
15.	Grulla, Tex.	26°17' N - 98°38' W
16.	San Perlita, Tex.	26°50' N - 97°40' W
17.	Brownsville, Tex.	25°59' N - 97°36' W
18.	Chapman Ranch, Tex.	27°28' N - 97°26' W
19.	Matagora, Tex.	28°44' N - 95°47' W
20.	Sabine, Tex.	29°41' N - 94°02' W
21.	Weeks, La.	29°48' N - 91°50' W
22.	Shell Beach, La.	29°51' N - 89°40' W
23.	Ft Walton, Fla.	30°25' N - 86°35' W
24.	Scanton, Fla.	30°08' N - 83°85' W
25.	Olustree, Fla.	30°12' N - 82°26' W
26.	Darien, Fla.	31°24' N - 81°25' W
27.	Ft Royal, S. C.	32°25' N - 80°40' W
28.	McClellanville, S. C.	33°05' N - 79°27' W
29.	Murrells Inlet, S. C.	33°33' N - 79°03' W
30.	Crescent Beach, S. C.	33°45' N - 78° 45' W
31.	Marshallberg, N. C.	34°40' N - 76°31' W
32.	Elizabeth, N. C.	36°16' N - 75°54' W
33.	Tasley, Va.	37°42' N - 75°39' W
34.	Rehoboth Beach, Del.	38°44' N - 75°05' W
35.	Surf City, N. J.	39°40' N - 74°09' W
36.	Foxboro, Mass.	42°05' N - 71°15' W
37.	Gloucester, Mass.	42°37' N - 70°32' W
38.	Camden, Me.	44°30' N - 69°53' W
39.	Moosehead Lake, Me.	69°56' N - 45°52' W
40.	Conway, N. D.	46°11' N - 97°44' W
41.	Starkweather, N. D.	46°28' N - 99°00' W
42.	Orrin, N. D.	46°05' N - 100°06' W
43.	Columbus, N. D.	46°52' N - 102°41' W
44.	Cherry Ridge, Mont.	46°59' N - 109°05' W
45.	Whitlash, Mont.	48°59' N - 111°57' W
46.	Quarter Circle, Mont.	48°52' N - 114°22' W

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Location	Coordinates
47. Rexford, Mont.	48°45' N - 115° 05' W
48. Copeland, Idaho	48°54' N - 116°31' W
49. Laurier, Wash.	48°43' N - 120°40' W
50. Pembina, N. D.	49°00' N - 97°15' W
51. Cameron, La.	29°47' N - 93°30' W
52. Freeport, Tex.	28°57' N - 95°25' W
53. Gage, Tex.	28°15' N - 100°12' W
54. Ajo, Ariz.	32°07' N - 113°20' W
55. Sasabe, Ariz.	31°30' N - 111°30' W
56. Plaster City, Calif.	32°50' N - 115°50' W
57. Plentywood, Mont.	48°59' N - 104°35' W
58. Cocolalla, Idaho	48°06' N - 116°35' W
59. Conrad, Mont.	48°10' N - 112°00' W
60. Big Sandy, Mont.	48°10' N - 110°20' W
61. Phillips, Mont.	48°05' N - 108°10' W

1121-3

0573

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67 Gap-Filler Sites Approved for Addition to [illegible]

	Location	Coordinates North	Coordinates West	[illegible]
1.	P-9A, Gibbsboro, N. J.	39°49'27"	[illegible]	[illegible]
2.	P-10A, Westboro, Mass.	[illegible]	[illegible]	[illegible]
3.	P-11A, Porthill, Idaho	[illegible]	[illegible]	[illegible]
4.	P-11B, Eureka, Mont.	[illegible]	[illegible]	[illegible]
5.	P-11C, Moyie Springs, Ida.	[illegible]	[illegible]	[illegible]
6.	P-12A, Port Orford, Ore.	[illegible]	[illegible]	[illegible]
7.	P-13A, Sedgwick, Me.	[illegible]	[illegible]	[illegible]
8.	P-21A, Browning, Mont.	[illegible]	[illegible]	[illegible]
9.	P-21B, Sweetgrass, Mont.	[illegible]	[illegible]	[illegible]
10.	P-21C, Galata, Mont.	[illegible]	[illegible]	[illegible]
11.	P-[illegible], Hogeland, Mont.	[illegible]	[illegible]	[illegible]
12.	P-[illegible], Whitewater, Mont.	[illegible]	[illegible]	[illegible]
13.	P-27A, Whitetail, Mont.	[illegible]	[illegible]	[illegible]
14.	P-28A, Niobe, N. D.	[illegible]	[illegible]	[illegible]
15.	P-29A, Sheyenne, N. D.	[illegible]	[illegible]	[illegible]
16.	P-29B, Grafton, N. D.	[illegible]	[illegible]	[illegible]
17.	P-33A, Capetown, Calif.	[illegible]	[illegible]	[illegible]
18.	P-37A, Rockport, Calif.	[illegible]	[illegible]	[illegible]
19.	P-[illegible], [illegible]nerville, [illegible]	[illegible]	[illegible]	[illegible]
20.	P-[illegible], Chilmark, Mass.	[illegible]	[illegible]	[illegible]
21.	P-[illegible], New Preston, Conn.	[illegible]	[illegible]	[illegible]
22.	P-[illegible], Bethany Beach, Del.	[illegible]	[illegible]	[illegible]
23.	P-55A, Chestertown, Md.	[illegible]	[illegible]	[illegible]
24.	P-55B, Hermanville, Md.	[illegible]	[illegible]	[illegible]
25.	P-59C, Hallsboro, Va.	[illegible]	[illegible]	[illegible]
26.	P-60A, Ione, Wash.	[illegible]	[illegible]	[illegible]
27.	P-76A, Tecate, Calif.	[illegible]	[illegible]	[illegible]
28.	P-76B, San Ysidro, Calif.	[illegible]	[illegible]	[illegible]
29.	P-76C, [illegible]pass, Calif.	[illegible]	[illegible]	[illegible]
30.	P-76D, Coyote Wells, Calif.	32°41'29"	[illegible]	[illegible]
31.	P-79A, Farnett, Texas	[illegible]	[illegible]	[illegible]
32.	P-79B, Van Vleck, Texas	[illegible]	[illegible]	[illegible]
33.	M-90A, Orla, Texas	[illegible]	[illegible]	[illegible]
34.	M-90B, Sierra Blanca, Tex.	[illegible]	[illegible]	[illegible]
35.	M-92A, Sells, Ariz.	32°00'00"	[illegible]	[illegible]
36.	M-92B, Covered Wells, Ariz.	[illegible]	[illegible]	[illegible]
37.	M-92C, Benson, Ariz.	31°59'20"	[illegible]	[illegible]
38.	M-95A, El Paso, Tex.	31°49'21"	[illegible]	[illegible]
39.	M-95B, Columbus, N. M.	[illegible]	[illegible]	[illegible]
40.	M-112A, Parris Island MS, S. C.	[illegible]	[illegible]	[illegible]
41.	M-112B, St Simon Island, Ga.	31°11'30"	[illegible]	[illegible]
42.	M-113A, Myrtle Beach, S.C.	[illegible]	[illegible]	[illegible]
43.	M-113B, Georgetown, S. C.	[illegible]	[illegible]	[illegible]
44.	M-116A, Elizabeth City, N.C.	[illegible]	[illegible]	[illegible]
45.	M-116B, Engelhard, N. C.	[illegible]	[illegible]	[illegible]
46.	M-116C, Hollyridge, N. C.	[illegible]	[illegible]	[illegible]
47.	M-126A, New Orleans, La.	30°01'37"	[illegible]	[illegible]
48.	SM-162A, Tacna, Ariz.	32°41'01"	[illegible]	[illegible]

1021-4

0574

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Location	Coordinates North	Coordinates West	Bmrd Oprl Date
49. SM-162B, Horn, Ariz.	32°57'08"	113°29'44"	Feb 56
50. TM-179A, Columbia Falls, Mont.	48°43'40"	114°18'45"	Jul 56
51. TM-187A, McCamey, Tex.	30°54'24"	102°04'48"	Jun 56
52. TM-187B, Comstock, Tex.	29°51'29"	101°09'41"	Jun 56
53. TM-188A, Carriso Springs, Tex.	28°30'17"	99°50'00"	Aug 56
54. TM-189A, Delmita, Tex.	26°38'41"	98°27'38"	Aug 56
55. TM-189B, Laredo, Tex.	27°43'49"	99°29'28"	Aug 56
56. TM-191A, Riviera, Tex.	27°19'46"	97°44'40"	Aug 56
57. TM-191B, Palacios, Tex.	28°42'00"	96°16'00"	Aug 56
58. TM-194A, Weeks Island, La.	29°49'00"	91°49'00"	Aug 56
59. TM-196A, Eglin AFB, Fla.	30°33'12"	86°45'39"	Aug 57
60. TM-196B, Gulfport, Miss.	30°25'00"	89°04'00"	Aug 57
61. TM-198A, Carrabelle, Fla.	29°51'26"	84°37'53"	Oct 56
62. TM-200A, Perry, Fla.	30°04'30"	83°35'00"	Jun 56
63. TM-200B, Lake City, Fla.	30°11'00"	82°34'45"	Jun 56
64. P-30A, Duttonville, N. J.	41°19'22"	74°40'18"	Jan 56
65. P-30B, Topton, Pa.	40°28'37"	75°40'58"	Jan 56
66. P-21A, Brockport, N. Y.	43°11'28"	77°56'02"	Apr 56
67. P-56A, Temperanceville, Va.	37°51'37"	75°33'29"	Nov 55

1021-5

0575

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29 Gap-filler Sites Approved for Addition to PD-57-1

	Location	Coordinates North	Coordinates West	Rqrd Oprl Date
1.	P-20A, Burnside, Mich.	43°10'52"	83°03'10"	Mar 56
2.	P-30C, East Meredith, N.Y.	42°24'12"	74°54'18"	Jan 56
3.	P-34A, Petoskey, Mich.	45°19'35"	84°53'08"	Mar 56
4.	P-34B, Grayling, Mich.	44°34'37"	84°47'55"	Mar 56
5.	P-45C, Middletown, Conn.	41°30'19"	72°36'55"	Jan 56
6.	P-50B, Saugerties, N. Y.	42°06'45"	73°58'50"	Jan 56
7.	P-50D, Stoddard, N. H.	43°05'38"	72°08'08"	Jan 56
8.	P-50E, New Salem, Mass.	42°33'07"	72°21'15"	Jan 56
9.	P-55D, Hanover, Pa.	39°51'14"	76°58'58"	Mar 56
10.	P-58A, Modesto, Calif.	37°37'25"	120°57'50"	Mar 56
11.	P-58B, Oroville, Calif.	39°29'00"	121°37'21"	Apr 56
12.	P-59A, Shafter, Calif.	35°30'05"	119°12'05"	Feb 56
13.	P-63A, Ft Loudon, Pa.	39°56'56"	77°56'15"	Mar 56
14.	P-67A, Midland, Mich.	43°38'00"	84°25'37"	Mar 56
15.	P-74A, Lemoore, Calif.	36°14'08"	119°56'02"	May 56
16.	M-118A, Burns Junction, Ore.	42°41'00"	117°52'30"	May 56
17.	M-127A, Quinn River Crossing, Nev.	41°27'00"	118°17'00"	Apr 56
18.	M-127B, Unionville, Nev.	40°33'48"	118°03'12"	Apr 56
19.	M-128B, Searchlight, Nev.	35°29'27"	114°54'29"	Apr 56
20.	M-128C, Topock, Ariz.	34°43'16"	114°14'48"	Apr 56
21.	M-128D, Poston, Ariz.	33°59'26"	114°24'13"	Apr 56
22.	SM-156C, Lovelock, Nev.	40°15'24"	118°24'00"	Apr 56
23.	SM-162C, Stone Cabin, Ariz.	33°14'21"	114°15'25"	Apr 56
24.	SM-162D, Palo Verde, Calif.	33°17'48"	114°44'24"	Apr 56
25.	SM-163A, Boulder City, Nev.	35°59'45"	114°51'54"	Jun 56
26.	SM-164B, Coaldale, Nev.	37°56'05"	117°53'15"	May 56
27.	TM-182A, Elfrida, Ariz.	31°36'44"	109°40'23"	Jan 57
28.	TM-183A, Animas, N. M.	31°57'24"	108°46'55"	Jan 57
29.	TM-183B, Apache, Ariz.	31°36'45"	109°40'23"	Jan 57

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29 Gap-Filler Sites to be Deleted from PD-57-1

	Location	Coordinates North	Coordinates West
1.	Cape Blanco, Ore.	42°49'	124°33'
2.	Genner, Calif.	38°52'	123°06'
3.	Pigeon Point, Calif.	37°30'	122°25'
4.	Lucia, Calif.	36°02'	121°33'
5.	Guadalupe, Calif.	34°56'	120°38'
6.	Concepcion, Calif.	34°27'	120°27'
7.	Bisbee, Ariz.	31°25'	109°57'
8.	Douglas, Ariz.	31°20'	109°20'
9.	Antelope Wells, N. M.	31°20'	108°30'
10.	Fabens, N. M.	31°32'	106°08'
11.	Sierra Blanca, Tex.	31°00'	105°31'
12.	Adobes, Tex.	29°51'	104°34'
13.	Patchogue, N. Y.	40°45'	72°57'
14.	Squibnocket, Mass.	41°20'	70°49'
15.	Kennebunckport, Me.	43°18'	70°32'
16.	Sea Cove, Me.	44°37'	66°53'
17.	Haynesville, Me.	67°58'	45°50'
18.	Donnybrook, N. D.	48°30'	102°56'
19.	Orient, Wash.	48°50'	118°05'
20.	Metaline Falls, Wash.	48°52'	117°22'
21.	Oroville, Wash.	48°57'	119°26'
22.	Destruction Island, Wash.	47°40'	124°20'
23.	Hoquiam, Wash.	47°05'	124°10'
24.	Chelan, Wash.	47°47'	119°58'
25.	Castle Rock, Wash.	46°16'	122°55'
26.	Paine AFB, Wash.	47°55'	122°16'
27.	Lyle, Wash.	45°42'	121°15'
28.	Pendelton, Wash.	45°50'	119°00'
29.	Lacrosse, Wash.	46°48'	117°52'

Incl #4

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ROUTINE

COMDR ADC

COMDR WADF HAMILTON AFB CALIF

1

MDOCS-E 5C-1380 CONFID

(CONFIDENTIAL) ADOCS-AL 1192, UNASG MDOCS-E 5C-1380. The criteria for selection of parent STA for gap filler radar sites are as FOL: 1. PRIM consideration W/B parent STA coverage and approach routes. 2. Compatibility with SAGE subsector boundaries. The parent site should be within the same subsector as the gap filler radar site. 3. Parent STA should have MAINT responsibility for the gap filler site. 4. When change in parent STA is made ADDL cost of COMMS is taken into consideration.

BMD

MEMO FOR RECORD: WADF requested we furnish criteria for selection of parent stations for gap-filler radars. Daily Diary item not required.

R. J. STREAMER
Major, USAF

1 1

2643
21 Apr 55

Maj R. J. Streamer/ld

ADOCE-AL

This correspondence is classified ____________ in accordance with
Par ________, AF[illegible], 15 Dec 53, or for the reason (s) stated.

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28 Feb 1955

FILE NUMBER

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[illegible]

W. J. BIRMELE
LT COL., USAF
Asst Comd Adj

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COMDR ADC

ROUTINE

COMDR ARDC BALTIMORE MD

1200167 13-7-12 X

SSS

RDTRR-2-49-E

(SECRET) ADOCE-EG ______. [illegible] RDTRR-2-49-E, 18 FEB, and conversation COL Friedlander and LTCOL Nichols this HQ 4 MAR. ADC must make IMMED decision on TWR heights for gap fillers. STD 70' TWR at all LOC is desired. Site surveys have been made on basis that this TWR height would be technically adequate, and consequently MIN acceptable TWR heights have not been DETM. If 70' TWR cannot be used, we must change our siting criteria and rework surveys already completed. Rework will REQ at least 6 WK by our field units and will have serious impact on our DIR DUDAT for completing gap-filler surveys. We must have IMMED and positive answer to QUES: Will the AN/FPS-14 OPR SAT with antenna MTD on 70-foot TWR? Our criteria for SAT OPR are: (1) 75% blip scan ratio on B-47 target at ALT between 500 and 5000 feet up to SDV cutoff range of 43 miles; (2) proper signal strength for acceptable remote presentation when used with AN/FSA-8 and AN/FSA-10 SYS; (3) acceptable performance for 7 days' unattended OPN. REQ reply at earliest possible date.

MEMO FOR RECORD: On back.

Comeback cy req'd for DOC file.

1 1

F K Nichols

F. K. NICHOLS, Lt Col USAF

Will be Confirmed in Std Publication Form Under par 3e, ADCSM
S-3 No

F K Nichols

Prepared by L/C FKNichols/hb
2716
8 Mar 55
LT COL F. K. NICHOLS

ADC NO ADOCE-EG

This correspondence 2716 classified ______ in accordance with

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COMDR ADC

DEFERRED

COMDR WADF HAMILTON AFB CALIF X

COMDR EADF STEWART AFB NEWBURGH NY X

COMDR CADF GRANDVIEW AFB MO X

211.1

(CONFIDENTIAL) ADOCE-EG 1778. REF Gap-Filler Radar Program. To further enhance the SCTY of the gap-filler site, it has become NEC to ESTB a fire break area. This area encompasses a rectangular zone 20 FT wide, from the perimeter fence to the outer BDRY of the fire break area. Fire break areas W/B APPL to those gap-filler STA that would be endangered by grass and tree fires. Acreage RQR for fire breaks to be INCL in site surveys under real estate required.

B-10-24 2423537

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MAJ W. R. GOODRICH, JR.

ADOCE-EG 2716

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A SPECIAL REPORT TO

Major General E. A. Parker

30 September 1955

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A SPECIAL REPORT TO

Major General H. A. Parker

30 September 1955

0584

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PROGRESS REPORT
30 August 1954 - 1 September 1955
Directorate of Civil Air Defense
Deputy Chief of Staff/Operations

I. INTRODUCTION

Progress in coordinating and promotional effort is difficult to measure. However, I believe that it is important to highlight certain milestones. This will bring you up to date as to the current status of the Ground Observer Corps. This report, then, is not an account of the activities of one individual, or one activity; rather it is an attempt to outline the overall achievement of the combined efforts of many different individuals and organizations working together toward a common goal - the improvement of the air defense system.

II. SURVEILLANCE CAPABILITY

The two basic criteria for measuring progress in the GOC are:

1. Number of active posts.

2. Number of volunteers.

In the early part of last year it was discovered that a uniform method of reporting the number of volunteers was not being followed throughout the system. For example, in some instances, volunteers were being carried on the rolls for more than two years after they had last been active, while other detachments were dropping individuals after a six-month lapse. A new regulation was published which remedied this situation, but which apparently resulted in an apparent loss of volunteers as reported to this office. Careful supervision has been exercised to insure the continuance of accurate reporting. The apparent decrease in numbers of volunteers shown below at the beginning of the second half of the year, then, is due to this corrected reporting procedure. The figures for the latter part of the year are reliable and accurate. The steady increase in the number of active and 24-hour posts is most gratifying.

Summary of Comparative Strength

	31 Aug 54	28 Feb 55	31 Aug 55
Posts required	16,421	19,134	29,615
Posts organized	13,657	12,028	13,779
Active posts	5,452	7,062	9,230
24-hour posts	1,427	1,399	1,598
Volunteers enrolled	370,728	320,188	354,677

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III. INSPIRATION AND LEADERSHIP

In creating and maintaining the drive necessary to keep the volunteer Ground Observer Corps program moving ahead much depends upon the enthusiasm of the people "selling" the program. I have attempted to give direct and aggressive personal leadership to the Air Force people assigned to the Ground Observer Corps. Toward this end the second annual Community Leadership Seminar was conducted at Headquarters ADC, in June for the State GOC Coordinators. This six day seminar, which was described as highly successful both by the student and faculty participants, continues to pay off because of the sounder community support that our military personnel are developing throughout the country. Other significant activities in this area include:

Three ADC-GOC conferences of Defense Force Civil Air Defense directors.

Participation by this office in twelve regional conferences of GOC military personnel.

Scores of personal letters to state coordinators and filter center commanders.

In order to broaden the base of community support for our filter centers, I have developed an "Advisory Council Plan",(see Tab "A"). This plan is receiving excellent acceptance. As it becomes more or less generally accepted, the volunteer element of the air defense effort will be much more stable and permanent.

IV. NATIONAL PROMOTION

The Aircraft Flash, our monthly magazine for civilian volunteers, has been increasingly valuable in building Volunteer morale. Because of the demonstrated effectiveness of this publication, Headquarters USAF, last May, approved an increase in the size of the magazine from eight to twelve pages and an increase in the number of copies run from 200,000 to 300,000 per month.

A considerable part of the improvement noted in operational capability stems from successful efforts to get civilian community organizations to share that responsibility for the Ground Observer Corps. This has been done through a series of support programs. Such programs are launched with conferences between representatives of this office and national officers of such civilian organizations at which general programs of support and procedural steps are agreed upon. These are followed by meetings at state or regional level attended by coordinators and corresponding leaders of the civilian group, and finally meetings between local groups and filter center representatives.

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31

These programs do more than open up great reservoirs of potential volunteers; they promote more effective utilization of volunteers. People who participate in the GOC program as individuals have little motivation except patriotism. Too often they get little recognition and too often they get lost in the shuffle and fail to show up for duty. But when a local group accepts responsibility for a shift or a day at a post or filter center, the community usually knows about it and any failure quickly comes to public attention. The individuals who serve are given full recognition by their own groups and the community. The whole system works much better when an organized local group publicly accepts co-responsibility with the Air Force for this part of the air defense system.

The list of national organizations with which cooperative programs were consummated during the past year include the following:

The U.S. Junior Chamber of Commerce
The Veterans of Foreign Wars
The American Legion
The Boy Scouts of America
The General Federation of Womens Clubs
Kiwanis International

The third anniversary of Skywatch, celebrated on 14 July 1955, was almost as spectacularly successful. Much of the credit is due to the aggressive program planned by Col. Oldfield and executed by the OIS organization. Articles on the Ground Observer Corps appeared in such national magazines as Newsweek, Look, Saturday Evening Post, Air Force Times, Army, Navy, Air Force Journal, and in many regional magazines such as the Colorado Rancher and The Oklahoma Farmer-Stockman.

A total of 23 Air Defense Command general officers made speeches on the Ground Observer Corps at key cities during the Skywatch celebration period.

V. COORDINATION

In coordination with The Advertising Council, the third annual advertising campaign was planned and implemented. Results of this campaign are reflected in a greatly increased public acceptance of the Ground Observer Corps which our coordinators report.

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32

Last October six area GOC planning conferences were conducted at key points throughout the states to bring military and civilian personnel up to date on The Advertising Council platform and the GOC program for the coming year.

The important function of integrating ADC staff actions on all GOC matters has been much more than simple coordination. In some cases it has entailed much background research and even prodding. Generally the ADC staff support has been splendid. The combined efforts have resulted in the following list of accomplishments:

503 new Plymouth station wagons have been procured and assigned for use by the 73 filter centers.

5,500 acoustic detectors (Sound Ranging Set, AN/UNS-1) for use by Observation Posts have been ordered and are now being manufactured.

3 filter centers have been relocated because of inadequate space and facilities in previous locations.

A new style vertical plotting board has been designed, manufactured and installed in the 24 new filter centers and in three other filter centers in the old area.

The personnel representatives of this headquarters and USAF have been most helpful. The plan to permit officers to volunteer for GOC duty upon completion of overseas tours is beginning to pay off. In August, Headquarters USAF announced a provision for airmen worldwide to volunteer for duty with the GOC.

The requirement for manning 24 new detachments has lowered the experience level of our military detachments considerably. I am quite concerned about the manning level of the detachments in the Central Air Defense Force area. The manning figures, as of 31 August 1955, for GOC detachment military personnel in the three Defense Forces are as follows:

	OFFICERS		AIRMEN	
	Auth.	Asgd	Auth	Asgnd
Eastern Air Defense Force	181	137	641	712
Central Air Defense Force	174	82	649	522
Western Air Defense Force	64	48	242	238

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33

VI. TRAINING - OPERATIONS

The most significant item, operations wise, during the past year has been the three-fold expansion of the Corps. Organization has now been completed in all 48 states; much of the previous standby organization has been, or is being prepared for upgrading to 24-hour Skywatch, and initial steps have been completed to give filter centers responsibility for certain aspects of aircraft identification, (flight plan correlation).

The number of Ground Observer Corps Squadrons has been increased from 9 to 12 and the number of filter center detachments from 49 to 73. The status of completion of facilities in the new filter center areas is as follows:

Operational	1
In training	13
Under construction	10
TOTAL	24

Identification by flight plan correlation mentioned above is being accomplished in a number of filter centers now, and will be made standard procedure as soon as the necessary training and facilities can be completed.

The detection and tracking capability of GOC volunteers has been shown to be considerably better than was previously estimated. This has been proved by the results of the command-wide alerted test of GOC capability, Skyscan 1954, and the unalerted test, Skyscan 1955, held in May of this year.

This office assisted in the study of procedures that has resulted in the publication of a new standardization manual CONAD Manual 55-1. It is believed that this manual will provide for better utilization of GOC information by radars and commanders.

Emphasis has been placed upon providing additional volunteer training to increase the accuracy of volunteer reporting and filtering. In this area a new regulation has been prepared and implemented which specifies optimum training standards for civilian volunteers in filter centers and observation posts. Also, an administrative supervisor's handbook has been prepared and distributed to each volunteer administrative supervisor.

0569

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34

There is a continuing need for motion picture films as recruiting and training aids. This office has coordinated plans for the production of the following films which have been completed during the past year:

Guardians All	(Lockheed)
The Dangerous Mile	
Friend or Foe	(North American Aviation)

Work is presently proceeding on the production of a new film "Scramble" which will depict the mission of the Continental Air Defense Command.

VII. LIAISON

Close and continuous liaison has been maintained with the RCAF (Ground Observer Corps). This has resulted in the joint publication of Air Force Manuals "Aircraft Recognition for the Ground Observer" and "Filter Center Operation" which are being used by both Corps. In some instances Observation Posts along the international border report from one country to another - for example, communications in some instances dictate that American Observation Posts report to Canadian filter centers and vice versa.

The 4602d AISS has cooperated closely with this office in all contacts with Civil Defense officials of states and localities. In turn the Ground Observer Corps submits information on all unknown flying objects for forwarding to the 4602d.

In cooperation with the 3rd Weather Group, this headquarters, plans have been completed for the Ground Observer Corps organization to submit and process severe weather reports (GOREPS). This plan has the approval of the U.S. Weather Bureau.

As a result of my visit early in the year to the headquarters of the Federal Civil Defense Administration at Battle Creek, Michigan, and two subsequent conferences with Governor Val Peterson, FCDA Administrator, much better and closer cooperation and liaison has been effected between this headquarters and the FCDA insofar as the Ground Observer Corps is concerned. One tangible result, for example, has been an invitation from FCDA to present a GOC - CONAD briefing to the fall conference of the Women's Advisory Committee of the FCDA. Another result was the opportunity provided by FCDA for 49 filter center volunteer supervisors to attend the Open Shot Nuclear Test at Las Vegas last April. The opportunity for our volunteers to participate in the program there added much prestige to their positions and as a result, to the Ground Observer Corps.

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Continuous liaison has been maintained throughout the year with the officers and various individual members of the Association of Territorial and State Civil Defense Directors. As a result an opportunity was provided for the DCS/O this headquarters to appear before the assembled State Directors last April at Las Vegas and present the plans for the expansion of the Ground Observer Corps for their approval. Two members of the Association's current GOC committee met at this headquarters recently to complete plans for a GOC briefing by DCS/O to be given at the fall meeting of the Association in Washington, D.C. 3 and 4 November 1955.

VIII. HOUSEKEEPING - DIRECTORATE FUNCTIONING

With only five officers (one civilian of officer rank) assigned this directorate it has been necessary for all of us to do much travelling in order to maintain the desired close supervision of state coordinator and detachment activities. During the year 47 staff visits were made to filter centers plus a considerable number of observation posts. Many of these visits involved formal or informal speeches. In addition the list of promotional projects indicates the number of Boards of Directors, Executive Committees, Managing Directors and the like with whom conferences were held. It is perhaps interesting to note that in no case did any of our staff receive a negative answer to a request for an assistance program. We got the promises and agreements we went after.

The entire staff travelled; mileages were as follows:

	Miles	Days TDY
Col B.H. Mayall	53,734	89
Lt Col W.T. Schuster (Transferred Jan 1955)	8,050	21
Lt Col C.R.Stapp (asgnd Mar 55)	9,084	12
Lt Col A.A.Walters (transf Sep 55)	23,717	43
Maj J.C. Keller, Jr	20,269	28
1st Lt S.M. Van De Mark (separated June 55)	15,771	35
1st Lt J.W. Rush (asgnd June 55)	5,706	8
Mr. W. L. Wilson	22,505	63
	158,836	299

This travel was performed within the cost estimates.

0591

36

In addition to official duties, officers of this directorate recognize their responsibilities as members of the Colorado Springs community. The following tabulation shows some of the personal activities undertaken:

Col. Mayall	-	Chairman, 1955 Citizenship Committee, Colorado Springs Lions Club; Member, Executive Board Pikes Peak Council, Boy Scouts of America Member, Official Board, First Christian Church, Colorado Springs Chairman, Civil Defense Committee, Ivywild PTA Volunteer of GOC Filter Center.
Lt Col Walters	-	Member, Two Boy Scout Troop Committees; Member PTA Committee; New NRA Junior Rifle Club, Organizer and Instructor
Lt. Col C.R. Stapp	-	Volunteer of GOC Filter Center
Maj J.C. Keller, Jr	-	Member, Colorado Springs Tennis Club. participant in Colorado State Tournament; on Southern Colorado championship doubles team, Southern Colorado Tournament Volunteer of GOC Filter Center
1st Lt J.W. Rush	-	Member, Junior Chamber of Commerce

IX. PLANS

The major emphasis for the next twelve months will be upon increasing the operational effectiveness of the GOC by improving the detection, tracking, and identification capability. In this connection a field study of current usage practices is planned. In an effort to obtain the desired surveillance capability throughout the 48 states a campaign will be waged to recruit one million additional volunteers. To stimulate interest in this campaign a USAF trip to Europe for 25 volunteer administrative supervisors is under consideration. These supervisors will be selected upon the basis of a contest to be carried on in all filter center areas.

To date 16 agreements have been consummated in as many states between USAF - ADC representatives and the states regarding the responsibilities of the states in the administration of the Ground Observer Corps. Every effort will be made during the coming year to obtain similar agreements in the remaining states.

The question of whether or not to move filter centers from target areas must be resolved. Upon receipt of the guidance which has been requested from Headquarters USAF the required action will be taken. Seventeen centers are involved. There are still 45 filter centers to be converted to the use of the vertical plotting board during the coming year.

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ADC ADOCE-[illegible] Subject: ([illegible]) Programmed Passive Detection Equipment

ADOCE-[illegible] (18 Mar 1965) 2d Ind

[illegible] AIR DEFENSE COMMAND, Ent AFB, Colorado Springs, Colorado

TO: Director of Communications, Headquarters [illegible], Washington 25, D.C.

1. The following information gleaned from the operation of a passive detection system within this command is forwarded in accordance with your request:

a. Equipment. The equipment utilized consisted of:

[illegible]

(1) [illegible] decrease in sensitivity after [illegible] use [illegible] to overheating. [illegible]

(2) The [illegible]

(3) [illegible] and is known to exhibit [illegible]. [illegible] resolution and range capability, however, [illegible] capability of [illegible] [illegible].

M-[illegible]

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36

(4) The system of using revolving D/F antennas is not satisfactory due to low signal intercept probability. An initial pick-up antenna should be employed for initial detection and the D/F antennas used only for D/Fing. Such an antenna should have a beam width on the order of 120° to 180° and sufficient gain to pick up signals at line of sight ranges. Such an antenna, however, would greatly increase the interference problem from indigenous signals.

b. Concept of Employment and Operation. When employed in air defense operation, passive detection is expected to perform two functions:

(1) Provide early warning, in advance of radar detection, on aircraft operating airborne radar equipment.

(2) Provide track information when the prime radar is rendered useless through jamming.

To be operationally significant, in areas where indigenous signals are present, early warning information must consist of range and azimuth data. In order to provide these data two stations, or more, must be deployed in a D/F system.

c. Capabilities and Limitations. A passive detection station employing the equipment outlined above, can track an aircraft operating an airborne radar to approximately line of sight ranges. This range is considerably reduced under normal operations when the station has to search in both azimuth and frequency, averaging approximately 140 NM. The range of D/F fixes is further reduced by the time necessary to correlate the signal between two stations, averaging on the order of 80 to 100 NM. Operational experience indicates approximately 8 - 10% of the fixes result in Class A or B fixes. Approximately 50% of the signal intercepts made by a station can be correlated with a radar track. There is no way of determining the percentage of signal intercepts made against the actual signals present.

231

ADC ADOCE-EW Subject: (C) Programmed Passive Detection Equipment

ADOCE-EW (18 Mar 1955) 2d Ind (contd)

Three major problems severely limit the capabilities of the passive detection system:

(1) Probability of signal detection.

(2) Probability of signal correlation between two stations.

(3) The inability to discriminate between the great number of indigenous signals present at most locations in the U.S. and the desired signals of penetrating aircraft.

It can generally be said that the passive detection system employed by this command does not provide early warning in advance of the radar system; cannot track aircraft signals through the high signal density areas in which they operate; and cannot identify signals in the high signal density areas in which it operates, to the degree desired for operational effectiveness. Operation of the system to provide track data when the prime radar was jammed proved completely useless. Tests made against the AN/APT-16 jammer tuned to a frequency other than that of the prime radar, indicated a detection range of approximately 50 miles. When the jammer was tuned to the frequency of the prime radar it could not be detected due to the signal level of the prime radar.

[illegible]. Conclusions and Recommendations. The operation of a passive detection system made up of currently available equipment would not significantly add to the capability of this command to perform its mission. It is considered that a passive detection system could be of some operational value if it were sited in a low signal density area and in advance of the radar perimeter. The capability of a Tornado type Clutter system should be examined in this conjunction. A system so sited would not be in a position to furnish track data when the prime radars are jammed; however, it is doubtful if a system could provide this information when sited adjacent to the prime radars due to the high power output of the radar.

0335

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HQ ADC ADOCE-EW Subject: (C) Programmed Passive Detection Equipment

ADOCE-EW (18 Mar 1955) 2d Ind (contd)

2. In view of the material presented in Paragraph 1, the request contained in Paragraph 2 of the basic letter is reiterated.

FOR THE COMMANDER:

2 Incls
n/c

This correspondence is classified ____________ in accordance with

0536

MAINTENANCE ADCM 66-6

AIR DEFENSE COMMAND MANUAL

32

GROUND RADAR-COMMUNICATIONS MAINTENANCE ORGANIZATIONS AND PROCEDURES

MAY 1955

AIR DEFENSE COMMAND

ENT AIR FORCE BASE (2,000)

0597

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ADC MANUAL)
66-6)

HEADQUARTERS AIR DEFENSE COMMAND
Ent AFB, Colorado Springs, Colo.
1 April 1955

FOREWORD

1. **Purpose.** This Manual establishes a standard maintenance organization for ACW, communications squadrons, and air division communications maintenance sections.

2. **Scope.** This Manual applies to all of the above Air Defense Command functions.

3. **Responsibilities.** Commanders of the above units are responsible for implementing and enforcing the organization and functions prescribed by this Manual. Approval for deviation from the prescribed organization will be obtained from Headquarters Air Defense Command prior to initiation of organizational change.

4. **Changes to Manual.** Proposed changes to the Manual will be submitted through command channels to the Deputy Chief of Staff for Materiel, Headquarters, Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado.

BY ORDER OF THE COMMANDER:

George F. Smith
Major General, USAF
Chief of Staff

OFFICIAL:

Walter W. Robinson
Colonel, USAF
Command Adjutant

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0598

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TABLE OF CONTENTS

0539

CHAPTER I
INTRODUCTION

GENERAL:

Sound management requires that all personnel know the scope of their responsibilities and the specific functions which have been assigned to their activity. This Manual has been written for the purpose of outlining the functions and responsibilities of ground radar-communications field activities throughout the Air Defense Command. The ultimate purpose of this Manual is to improve the maintenance management and efficiency of these organizations, thereby increasing the effectiveness of the ACW system.

We know that sound management at all echelons of command is essential to proper support of the operation organization. While not all management problems start at, or can be corrected by the squadron, experience indicates that the solution of problems of organization, planning and supervision, training and utilization of personnel which arise at squadron level can contribute substantially to the improvement and maintenance of the entire command's capability. Also the more problems that can be solved at squadron level, the less there will be for supervisory personnel at staff levels. Problems in supply, facility, maintenance, and other support areas which are beyond the scope of squadron managemnt must be identified and reported to higher headquarters.

In the maintenance organization established by this Manual, the supervision of over-all maintenance at most ACW squadrons has been centralized in a section termed "Electronics Maintenance." Implementation of this organization will free the commander from having to act as coordinator between supply, operations and several maintenance sections. As a commander, he should only be required to coordinate and supervise a minimum of functions.

This organization will improve the commander's control and management of the maintenance support required by his mission; however, it in itself provides only a more satisfactory arrangement of the functions that must be performed to provide the required support. Leadership, proper administration, and management must be exercised. Supervisors at every level within the squadron maintenance organization must efficiently manage and carry out responsibilities in order to meet operational demands for quality, quantity, and timely maintenance - only then will its success be assured.

DEFINITIONS: The terminology used in this Manual is defined as follows:

a. **ACW System:** The aggregate of radar, radio, teletype, wire-communications, test equipment at one ACW site is defined as an "ACW System."

b. **Direction Center:** A radar installation capable of performing those functions pertaining to air surveillance, identification, air interception, control, and direction of air defense forces that are allocated to a subsector. The maintenance organization for this type site is shown on chart 1. Note that this is the only type site having an electronics maintenance section, and a civilian augmentation maintenance engineer assigned.

c. **Surveillance Station:** A radar installation capable of extending or completing the air surveillance functions assigned to a Direction Center. This type of site is shown on chart 2. The maintenance requirements of both radar and communications at this type site is much less than for any other type.

d. **Air Division Communications Maintenance Sections and Communications Squadrons:** These organizations are shown on chart 3.

0300

CHAPTER 2

MAINTENANCE FUNCTIONAL CHARTS

SECTION I

Radar-Communications Organizations

1. **Functional Charts.** The functional charts shown in this chapter have been developed to fit all ground radar-communications installations in Air Defense Command. As indicated in chapter 1 under definitions, the type of site is determined by the mission and the equipment installed. This in turn determines the applicable maintenance organization which will be used at any particular installation.

2. **Supply Function.** The supply function is shown for reference purposes only since technical supply for these installations is covered by ADC Manual 67-1.

CHART 1

Direction Center
Maintenance Organization

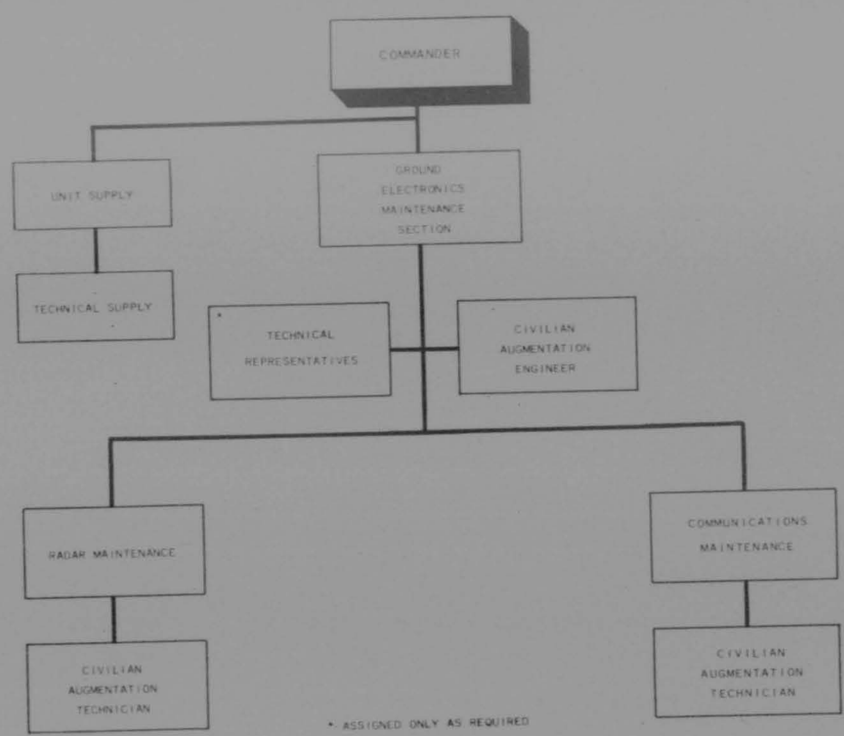
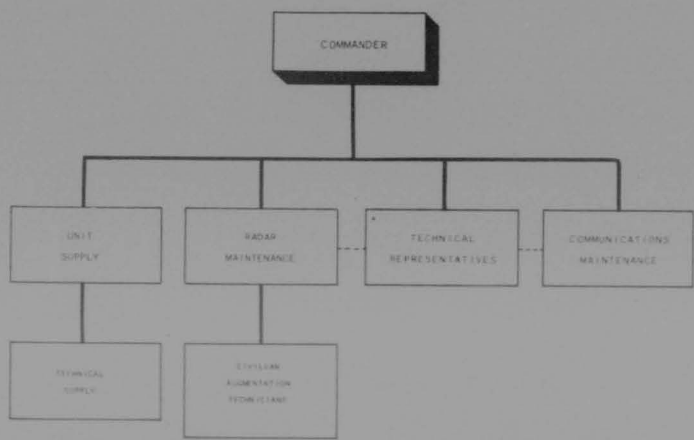


CHART 2

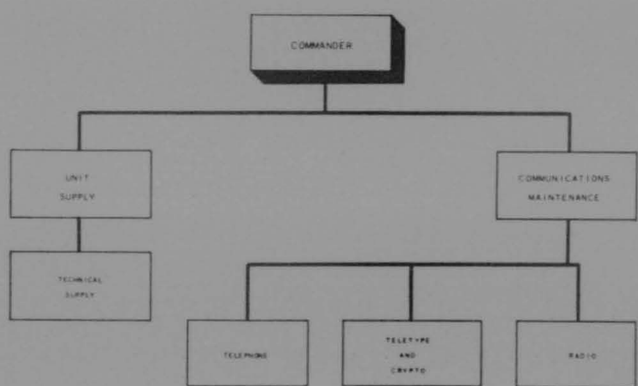
Surveillance Station Maintenance Organization



*ASSIGNED ONLY AS REQUIRED

CHART 3

Communications Maintenance Organizations



FOR THE FOLLOWING INSTALLATIONS:

A. COMMUNICATIONS SQUADRONS.
B. AIR DIVISION COMMUNICATIONS MAINTENANCE SECTIONS.

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CHAPTER 3

FUNCTION AND RESPONSIBILITIES

Section I

Electronics Maintenance Section

1. **Function.** The squadron electronics maintenance section plans, directs, coordinates, and supervises the functions of radar and communications maintenance.

2. **Responsibilities.** The electronics maintenance officer is responsible to the squadron commander for:

a. Supervision and organization of the radar-communications maintenance program within the squadron to insure compliance with maintenance policies.

b. Providing technical advice to the commander regarding the maintenance of squadron radar-communications equipment.

c. Submitting requests for maintenance support on items requiring repair that are beyond the capability of the organization.

d. Preparation of required reports.

e. Maintenance of current limited technical order files and technical data pertaining to the squadron equipment and establishing a program to insure reading and familiarization of such data.

f. Coordinating with the training officer in establishing and monitoring the OJT program in accordance with applicable directives designed to progressively increase the efficiency of each individual assigned to the radar-communications maintenance organization.

g. Maintaining liaison with appropriate contractor support agencies, and the applicable AMA, to insure that required additional technical assistance and supply support is rendered.

h. Coordinating with unit supply on all matters affecting maintenance of the squadron electronics equipment.

i. Establishing and supervising the unsatisfactory report clearing and control office functions.

3. **Narrative.** a. The electronics maintenance section was established at ACW direction center sites to supervise all of the radar-communications maintenance activities. The functions of the electronics maintenance officer will be assigned to the ranking radar or communications officer. The activities of the civilian augmentation engineer are directly under the supervision of the electronics maintenance officer.

b. The electronics maintenance officer makes decisions on questions or differences which arise between the various maintenance sections. He must attempt to solve these problems to the satisfaction of all concerned, giving prime consideration to the squadron mission. The radar and communications maintenance officers will keep him advised of their sections capabilities so that he in turn may inform and advise the squadron commander and the operations officer.

c. The electronics maintenance officer will coordinate the needs of the maintenance organization with the responsible depot overhaul and repair activity. He must, with the aid of the commander, obtain the required support in consonance with the depot maintenance requirements of the squadron. In this connection he will also establish an SOP so that all maintenance personnel will be familiar with procedures to obtain emergency overhaul or repair of items beyond the capability of the organization at any time.

d. The electronics maintenance officer makes certain that the technical representatives and civilian augmentation maintenance personnel are fully and properly utilized in accordance with directives in this Manual. Technical representatives are hired for the prime purpose of providing technical indoctrination and orientation of military personnel on new equipments. They should not be utilized to perform routine or preventive maintenance except in case of an absolute emergency. Civilian augmentation personnel will perform OJT, classroom training, and organizational and field maintenance in accordance with terms of their contract.

e. The electronics maintenance administrative section prepares, processes, distributes, and files correspondence; maintains the maintenance personnel file, central library of SOPs, regulations, and other technical publications. Technical orders pertaining to specific equipments such as transmitters, receivers, etc., will be maintained at the shop with that equipment.

CHAPTER 3

Section II

Radar Maintenance Section

1. **Function.** The radar maintenance section performs radar maintenance at all ACW squadrons.

2. **Responsibilities.** The radar maintenance officer is responsible to the electronics maintenance officer or to the commander at installations where no electronics maintenance section is assigned for:

a. Maintenance, repair, and adjustment of all radar and associated apparatus.

b. Assignment of personnel by duty or primary AFSC, as required, to obtain maximum use of supervisory skills.

c. Exercising the best possible management of resources under his control in support of the primary mission.

d. Close coordination with technical supply in all matters affecting maintenance support of the radar equipment.

e. Scheduling working hours of maintenance personnel and assignment to routine and preventive duties.

f. Establishment of ground safety procedures to insure conformance with AFM 32-3.

g. Assuming that portion of the electronics maintenance officer's responsibilities pertaining to his section in the event no electronics maintenance officer is assigned.

h. Maintenance of equipment used in class room training of radar maintenance personnel.

i. Cooperate to the fullest extent with the training officer and/or the electronics maintenance officer regarding OJT, classroom training, and utilization of technical representatives and civilian augmentation technicians to perform this training.

3. **Narrative.** The function of radar maintenance is one of the most important ones in the squadron. The prime purpose of the ACW site is the detection and control of aircraft, and without adequate radar maintenance it is impossible for the squadron to perform its assigned mission. Proper operation of the radar goes beyond just performing routine and preventive maintenance as required by existing directives. Because of his experience and training, the radar officer is responsible for and must insure peak operation of the radar at all times. This can be done only by close personal supervision of the maintenance.

Section III

Communications Maintenance Section

1. **Function.** The communications maintenance section performs all maintenance associated with communications equipment.

2. **Responsibilities.** The communications maintenance officer is responsible to the electronics maintenance officer, or the commander at installations where no electronics maintenance officer is assigned for:

a. Maintenance, repair and adjustment of all radio, teletype, cryptographic, recording and telephone equipment, and associated training aids.

b. Supervision of emergency power maintenance at the receiver and transmitter buildings at installations where such equipment is installed.

c. Close cooperation with the technical supply on matters which affect maintenance of communications equipment.

d. Assignment of personnel by duty or primary AFSC to obtain maximum utilization of technical or supervisory skills.

e. Exercising the best possible management of resources under his control in support of his primary mission.

f. Scheduling working hours of maintenance personnel and assignment to routine and preventive maintenance duties.

g. Establishing ground safety procedures to insure conformance with AFM 32-3.

h. Assuming that portion of the electronics maintenance officer's responsibilities pertaining to his section in the event no electronics maintenance officer is assigned.

i. Maintenance of equipment used in classroom training of communications personnel.

j. Cooperation with the training officer and/or the electronics maintenance officer regarding OJT, classroom training, and utilization of technical representatives and civilian augmentation technicians assigned his section to perform this training.

3. **Narrative.** a. The communications maintenance officer has the respon-

sibility of insuring that circuit and channel outage is kept to a minimum. Since the equipment which is his responsibility is installed in many different locations, more than the average amount of supervision is required to insure this. Adequate work space, tools, and common items of test equipment should be provided at each installation to facilitate the required maintenance.

b. The communications maintenance officer should be especially alert to insure that all phases of the maintenance is properly performed. Such items as wire circuits antenna's, and transmission systems should be given special attention. This is especially true of the UHF antenna system since small, not so obvious defects in this system drastically impair it's usefulness.

Section IV

Technical Representatives

1. **Function.** Technical representatives will provide technical indoctrination and orientation of maintenance and operations personnel on new equipments introduced into the Air Defense System.

2. **Responsibilities.** Technical representatives are responsible to supervisory personnel of the section to which they are assigned for:

a. Advice, assistance, matters of use, support, maintenance and the solution of technical difficulties pertaining to the equipment manufactured by the company he represents.

b. Conducting OJT and classroom training, in cooperation with the training officer, on the equipment manufactured by his company, or other equipment covered by applicable directives.

3. **Narrative.** a. Technical representatives in these instances are hired primarily to conduct training on new radar-communications equipment. Technical representatives should not normally be utilized to perform routine or preventive maintenance except in case of emergency.

b. Technical representatives, upon assignment, are subject to call 24 hours a day. However, they will normally perform their assigned duties on the same daily and hourly basis as the organization to which they are assigned.

Section V

Contractor Augmentation Electronics Engineer

1. **Function.** The contractor augmentation electronics engineer performs, or assists in performing, organizational and field level maintenance, inspection, repair, modification, adjustment, calibration, siting, installation, and training of personnel on all radar-communications and power equipment at ACW squadrons.

2. **Responsibilities.** The contractor augmentation electronics engineer is responsible to the electronics maintenance officer for:

a. Providing engineering-level technical advice and assistance on all phases of radar-communications equipment maintenance.

b. Establishing efficient and technically correct procedures for the rapid diagnosis and repair of defective equipment.

c. Establishing correct techniques for the use of complex electronics test equipment in order to insure proper operation of the radar-communications equipment.

d. Conducting, in cooperation with the training officer, effective training on radar-communications equipment.

e. Supervising the contractor augmentation technician personnel.

3. **Narrative.** a. The prime purpose of the engineer is to act as technical adviser to the electronics maintenance officer. He is responsible for providing engineering-level assistance and advice on the solution of maintenance problems on all radar, radio, wire-communications, related control and test equipment, antenna systems, motors, diesel-electric power generators, indicating and remoting systems, power distribution systems, etc., which are integral components of the over-all electronics system at ACW sites.

b. He will coordinate with technical supply and other Air Force personnel the following: Determining test equipment, tools, spare parts and technical requirements in order that established maintenance policies and procedures can be accomplished.

Section VI

Contractor Augmentation Radar Technician

1. **Function.** The contracor augmentation radar technician performs organizational and field maintenance on all radar and associated equipment at ACW sites.

2. **Responsibilities.** The contractor augmentation radar technician is responsible to the radar maintenance officer for:

a. Performing or assisting in performing detailed electrical and mechanical maintenance on the radar and associated electronic control and test equipment used at the ACW site.

b. Conducting OJT and classroom training in cooperation with the training officer, as required for military and other personnel in the understanding and performance of electronics equipment.

3. **Narrative.** Under the direction of the radar maintenance officer, the contractor augmentation technician adjusts, repairs, calibrates, aligns, and tunes all types of radar and related accessories used at an ACW site. At a typical site, tests, measures, and adjusts any of the individual circuits and mechanics with respect to frequency, radar range, stability, power, bandwidth, scope presentation, clarity, definition, resolution, etc., in order to obtain the greatest over-all station efficiency consistent with continuous and dependable service under all operating conditions.

Section VII

Contractor Augmentation Communications Technician

1. **Function.** The contractor augmentation communication technician performs organizational and field maintenance on all communications and related equipment at ACW sites.

2. **Responsibilities.** The contractor augmentation communications technician is responsible to the communications maintenance officer for:

a. Performing or assisting in performing maintenance on all communications and related equipment.

b. Conducting OJT and classroom training, in cooperation with the training officer, for military and other personnel in the understanding and performance of communications equipment.

3. **Narrative.** Under the direction of the communications maintenance officer, the communications augmentation technician will inspect, test, repair, overhaul, adjust and align all types of communications equipment and associated test equipment in use. At a typical ACW site, this will involve knowledge of various types of HF, VHF, and UHF antenna systems and their radiation characteristics; auto-tune remote channeling systems; radio interference characteristics from other radio sets, radar installations, and/or extraneous sources; telephone central office equipment, including switchboards, distribution panels, power supply units, operators keying boxes, and disabling circuits, etc.

0306

CHAPTER 4

CIVILIAN MAINTENANCE AUGMENTATION PERSONNEL

Section I

Duties of Contract Technicians

1. **Responsibilities.** Contract technicians are employed to assist in accomplishing organizational and field level maintenance on all radar, radio, teletypewriter, wire-communications equipment, and test equipment assigned to the ACW site, not otherwise maintained with a different contract. More specific responsibilities of contract personnel are outlined in Chapter II of this Manual.

2. **Maintenance.** Contract technicians will also be required to do organizational and field level maintenance on radar-communications equipments of subordinate radar sites, (i.e., gap fillers, etc.).

Section II

Status of Contract Maintenance Augmentation Personnel

1. **Assignment, Re-Assignment, Leave, Etc.** a. The assignment and reassignment of contractor personnel is the responsibility of the contractor. This is to be accomplished in accordance with requirements processed through each air defense force headquarters.

b. In the event the services of the contractor personnel are not performed in accordance with the terms of the contract, Headquarters Air Defense Command will be notified, stating fully and factually the reasons their services are unsatisfactory.

c. Leaves will be processed by the contractor. Only one contract individual from a site will be on leave during the same period of time.

2. **Facilities.** a. All equipment necessary for accomplishing field and organizational maintenance, such as tools, test equipment and spare parts, will be government furnished equipment (GFE).

b. **Government Housing and Quarters.** Government quarters will be made available to contract personnel at remote sites. At sites located on established military bases, local policy will prevail. Engineers will be afforded quarters in the Bachelor Officer's Quarters. Technicians will be housed in the Bachelor Airmen's Quarters. Rental charges will be determined in accordance with AFR 93-2. Government quarters will not be made available to dependents.

c. **Government Meals.** Meals will be made available to contract personnel in accordance with AFR 146-6 and ADCR 146-5. Requirement rates for meals sold in dining halls will be in accordance with AFR 146-5.

d. **Exchange, Theater, and Commissary Privileges.** Not authorized except where extreme hardship is demonstrated. Exceptions will be governed by AFR 147-8, and 147-9, and AFR 145-15.

e. **Medical.** Emergency medical facilities will be furnished in accordance with AFR 160-73.

f. **Clothing.** Contract personnel are authorized special clothing in overseas theaters **only** -- see paragraph 8f, AFR 66-18.

3. **Transportation and Travel.** a. In the event on-site contractor personnel are required to travel in the performance of their duties, government air or surface transportation will be used. Government Transportation Requests (T/R's) will be issued in accordance with AFM 40-10 and AFM 30-3 when deemed more advantageous to the government. Government vehicles will not be utilized for TDY when commercial facilities are available. TPA will only be authorized when definitely advantageous to the government.

b. **Special Assignment of Vehicles.** Government vehicles will not be assigned to contract personnel for the accomplishment of routine daily duties, but will be made available on an "as needed" basis.

CHAPTER 5

STANDARD MAINTENANCE DIRECTIVE

Section I

1. **Maintenance of Equipment.** a. Maintenance of radar equipment will be performed in accordance with TO 31P-1-10 and ADC 66-12.

b. Maintenance of communications equipment will be performed in accordance with TO 31-1-10.

c. Maintenance of AC&W telephone plant system records will be in accordance with ADC Regulation 66-18.

d. Depot overhaul and/or repair beyond the capability of the organization on contractor supported equipment will be performed by the contractor in accordance with TO 31P6-2CPS-6-13, TO 31P6-2FPS-3 and TO 31P-1-14.

e. Depot overhaul and/or repair beyond the capabilities of the organization on noncontractor supported electronic equipment will be performed by the applicable AMA under the provisions of TO 0-25-107 and TO 0-25-123. It will be the responsibility of Headquarters Air Defense Command to establish the schedules for depot overhaul of this equipment with the responsible AMA. Maintenance supervisory personnel will be responsible for procedures for requesting technical assistance from the respective AMA on items of emergency or routine repair beyond the capabilities of organizational personnel.

Section II

Calibration and Repair of Test Equipment

2. **Test Equipment.** a. **Calibration and minor repair** of communications and electronics test equipment will be accomplished under the provisions of TO 12R-1-505. In addition, the following procedures are made possible as a result of agreements between Headquarters ADC and Gentile Air Force Depot. This authority should not be construed to mean that depot echelon repair (rebuild, etc.) will be accomplished by the AMA. **Depot echelon repair** will be accomplished through supply channels to the bi-zonal depot. In this latter case, the test equipment is not usually returned to the using command but is replaced by a like item. With the existing critical shortage of test equipment, replacement items are not available in many cases. Using the procedures outlined below, test equipment will be hand-carried to the applicable AMA and thereby the using unit retains control of the equipment. Following procedures apply:

(1) Air divisions or defense wings and commanders of communications and training squadrons are responsible for scheduling minor repair and/or calibration of test equipment with the responsible AMA.

(2) Providing transportation and a representative to accompany the equipment to and from the depot.

(3) Insuring that accountability does not change and that hand receipts are accomplished.

Section III

Ground Radar Operations During "Storm Alerts"

3. **"Storm Alerts."** a. Following pertains to and prescribes procedures to be followed in the event of a "Storm Warning Alert" and to define the operating limitations for radar antenna during inclement weather. Squadron commanders will insure that a "Standard Maintenance Procedure" is published implementing the procedure outlined below:

(1) When squadrons receive "Storm Warning Alerts" which forecast winds in excess of forty knots, the following action will be taken: (This action will be taken three hours in advance of the forecasted high winds).

(a) The technical buss load will be switched from commercial to diesel power.

(b) Immediately thereafter, the essential base electrical load will be switched to diesel power.

(2) Both the essential base load and technical load will remain on diesel power until the wind velocity subsides and is anticipated to remain below forty knots.

(3) Listed below are the operating limits of radar antennas not installed in radomes.

Equipment	Maximum Winds in which Antennas May Be Rotated
AN/FPS-3	52 Knots
AN/MPS-7	52 Knots
AN/FPS-4	52 Knots
AN/FPS-6	52 Knots
AN/FPS-8	52 Knots
AN/TPS-1C-1D	39 Knots

(a) Antennas will not be rotated when the Ice Load exceeds two inches in thickness.

(b) In the event it is anticipated that winds will exceed a speed of seventy-five knots, action will be taken to guy radar antennas not installed in radomes.

(4) Radomes will be kept free of ice as is practical by use of infra red ray banks. Maximum ice load is two inches measured radially to the radome surface.

(5) Antenna installed in radomes will be stopped when wind speeds exceed one hundred and nine knots.

Section IV

Unsatisfactory and Electronic Failure Reports

4. **Reports.** a. Unsatisfactory reports will be initiated and processed in accordance with TO 00-35D-54. These reports provide valuable information to Air Force Research Centers in the evaluation of equipment performance and in the modificaton of existing equipment to insure more reliable operation. Unsatisfactory reports are also a valuable aid to the design engineer in making recommendations for new or improved equipment. They will be initiated by any individual assigned or attached to the United States Air Force operating equipment or materiel, or using related technical directives, upon the first and subsequent observation of and unsatisfactory condition as outlined in paragraph 1, section 1, TO 00-35D-54. Paragraph 2, section 1, outlines conditions that will not be reported by an unsatisfactory report.

b. As indicated in chapter 3, section I, paragraph i, an unsatisfactory report clearing and control office will be established in the electronics maintenance section at all direction centers. At surveillance sites, that function will be the responsibility of the radar maintenance section. An exception is made to the above type sites if located on an airbase. When located on an airbase, the base UR clearing and control office will be used. At air divisions and communications squadrons, the base UR clearing and control office will be used. The reason for placing this UR clearing and control at the ACW site instead of the air division is to have that function physically located near the maintenance activity. It is essential that the UR clearing and control office have access to information on all factors which may have contributed to the unsatisfactory condition. In view of the new system of initiating UR's and the electronic failure report (DD Form 787-1) which is designed to replace the routine UR, the additional work load of that function should not pose any undue difficulty.

c. Distribution of UR's will be made in accordance with paragraph 5, section II, part II, of TO 00-35D-54.

d. The AMC Electronic Failure Reporting System Form DD 787-1 will be initiated and processed in accordance with paragraph 1, section I, part III, of TO 00-35D-54. Equipment reported on is listed in appendix 1, part III.

e. The ADC Electronic Failure Reporting System, using ADC Form 151, will continue to be used until further notice.

Section V

Allocation of Maintenance Time for Ground Radar Equipment

5. **Scheduling of Time.** a. Scheduling of radar maintenance time will be the responsibility of the air defense forces as per ADCR 55-43. The electronics and/or radar maintenance officer of each site will determine if maintenance time will be taken each day. Following procedures will be adhered to:

(1) ACW senior director will deny his station routine maintenance when:

(a) An unknown is in the station's area of responsibility.

(b) Adjacent station is inoperative.

(2) Preventive maintenance and daily equipment checks will be performed on all radar equipment by the most quali-

0309

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fied personnel of the using organization. Methods and techniques of performance will be in accordance with applicable technical orders and supplementary maintenance directives.

(3) Time Allocations.

(a) Separate time allocations will be made for search and height radars. The FPS-3/MPS-7, FPS-8/MPS-11, and TPS-1D will be allowed one hour routine and preventive maintenance time daily on six days of each one-week period. On the seventh day of each one-week period, two hours will be allowed for preventive maintenance. The CPS-6B/FPS-10 will be allocated two hours daily on six days of each one-week period, with four hour period on the seventh day of each one-week period.

(b) Height finder radars will be allocated one hour routine and preventive maintenance time daily on six days of each one-week period. On the seventh day of each one-week period, two hours will be allocated for preventive maintenance on height finders.

(c) When back-up equipment is available, it will be fully operational prior to shut-down of primary equipment for routine maintenance. Preventive maintenance for back-up equipment, will be accomplished at the discretion of the maintenance officer and only when primary equipment is operating.

(d) For installations not operating twenty-four hours per day, preventive maintenance periods will be confined to those hours of "non-operational status" which are currently authorized.

(e) Squadrons equipped with individual search and height finder radar sets will be required to operate and fully man search equipment during shut-down period allocated for height finders.

(4) Training.

(a) One two hour period will be scheduled per week for maintenance training. This time may be used for either search or height finding equipment at the discretion of the electronics maintenance officer.

(b) The maintenance and training period will be conducted in such a manner that the equipment may be returned to full operation within fifteen minutes after receipt of notification from the air division.

(5) To insure that "off the air" time is kept at a minimum, the supervisory personnel will issue necessary instructions to have tools and test equipment laid out prior to any shut-down of equipment. A complete briefing of "work to be accomplished" will be held prior to the preventive maintenance period.

(6) As soon as maintenance is completed, the radar will be returned to the net immediately.

Section VI

Protection of Equipment From Lightning Damage

6. **Protection of Equipment.** a. Good engineering practices call for the installation of grounding systems to minimize lightning damage on fixed electronic equipment. Damage may be caused by direct lightning hits, or power surges transmitted considerable distances over power and communication lines. The protection of costly and/or irreplaceable equipment by use of a relatively inexpensive grounding system is of prime importance. ACW squadron commanders will be responsible for the installation of adequate grounding systems. The technical procedures described in TO 31W-1-16, 4 April 1952, are to be followed wherever practicable. However, physical conditions at some sites may warrant variations in the procedure. The cost of installation of a grounding system relative to the amount of protection afforded could and should be considered in choosing its design. The metallic water system should be used as a common ground for all equipment wherever practicable. At sites where the water system is not continuously metallic, an alternate method of grounding such as a multiple driven ground rod net will be used.

b. **Procedure.** Once a month, the respective maintenance sections will perform the following:

(1) Inspect all ground connectors to insure they are mechanically tight, corrosion free, and in good condition.

(2) Inspect all conductors between the various equipments and the common ground systems to insure that they are continuous and in good condition.

c. After each lightning storm, but at no longer than monthly intervals, the sections will inspect all dischargers and spark gaps for foreign material and carbon matter and particles. All protective carbon blocks located on the telephone central

0510

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main frame, radio or radar equipment, or terminal strips will be checked during this inspection. All carbon blocks will be wiped with a clean, lint-free cloth or cleaned with a brush designed for this purpose before replacing in the mounting.

d. All radar, radio, telephone equipment, and power neutrals will be connected to the station common ground. This will include all power switchboards, power generating units, metal antenna support structures, and pole mounted switch gear. At sites where ground mats have been installed, the mats will be connected to the common ground system. Communications antenna and transmission line systems will be grounded in accordance with established engineering procedures using principles outlined in TO 31W-1-16.

Section VII

Assisting Depot Overhaul

7. **Depot Haul.** a. Organizational personnel will assist depot overhaul teams when depot overhaul is being performed on squadron equipment. Not only will this facilitate returning the equipment to operating status in a minimum of time, but valuable training can thus be obtained.

b. Particular attention by organizational personnel should be given to procedures for returning each component to specifications during the overhaul. In this way organizational personnel can more readily determine components contributing to poor operation of the radar or communications systems during normal operation.

0511

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CHAPTER 6

GROUND ELECTRONICS EQUIPMENT DATA

Section I

ELECTRONIC EQUIPMENT	PRIMARY SEARCH RADAR	STANDBY SEARCH RADAR	PRIMARY H/F RADAR	STANDBY H/F RADAR	RADAR IDENTIFICATION EQUIPMENT	TOWERS	
						ARCTIC	TEMPERATE
1. AN/CPS-5		X					AB-52
2. AN/CPS-6B	X					AB-451	
3. AN/FPS-3	X					AB-199 AB-199A	AB-178 AB-196
4. AN/FPS-4			X	X		AB-343	AB-302
5. AN/FPS-5			X	X			AB-204
6. AN/FPS-6			X			AB-259 AB-373	AB-258
7. AN/FPS-8	X	X				AB-313	AB-396 AB-397
8. AN/FPS-10	X					AB-451	
9. AN/FPS-14	X						
10. AN/MPS-7	X					AB-199	AB-196
11. AN/MPS-8			X	X		AB-343	AB-302
12. AN/MPS-11	X	X				AB-313	AB-396 AB-356
13. AN/MPS-14			X			AB-259	AB-258
14. AN/TPS-10		X					AB-107
15. AN/TPS-100			X	X			AB-302
16. AN/GPX-6					X		
17. AN/GPX-7					X		
18. AN/GPX-13					X		
19. AN/GPX-18					X		
20. AN/GPX-20					X		

0312

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Section III

TEST EQUIPMENT

TEST EQUIPMENT	AN/CPS-5	AN/CPS-6B	AN/FPS-3	AN/FPS-4	AN/FPS-5	AN/FPS-6	AN/FPS-8	AN/FPS-10	AN/FPS-14	AN/MPS-7	AN/MPS-8	AN/MPS-11	AN/MPS-14	AN/TPS-1D	AN/TPS-10D	AN/GPX-6	AN/GPX-7	AN/GPX-13	AN/GPX-18	AN/GPX-20				
1. ME-29/U	x	x			x			x		x														
2. CN-110/U	x									x														
3. AN/UPM-23	x	x	x			x		x		x			x	x										
4. TS-545/U	x		x				x			x		x												
5. CU-225/U	x																							
6. AN/URM-59	x									x														
7. DA-56/U	x																							
8. TS-158/AP	x	x	x	x				x		x	x													
9. AN/UPM-15	x		x		x		x			x		x												
10. TS-452B/U	x	x		x	x	x		x		x	x		x		x									
11. TS-419/U	x		x				x			x		x		x										
12. TS-130A/UP	x																							
13. TS-297/U	x	x		x	x	x		x		x	x		x		x									
14. TS-505/U	x	x		x	x	x	x	x		x	x	x	x	x	x									
15. AN/PSM-6	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x				
16. AN/USM-24	x	x	x	x	x	x	x	x		x	x	x	x	x	x				x					
17. TS-268D/U	x	x	x	x	x	x	x	x		x	x	x	x	x	x									
18. TV-7/U	x	x		x	x	x	x	x			x	x	x	x	x	x	x	x	x	x				
19. TV-2/U			x				x			x														
20. AN/UPM-18	x			x						x	x				x									
21. AN/UPM-41	x	x	x					x		x														
22. ME-30/U	x	x					x	x		x		x												
23. MX-1028/U	x		x							x														

0513

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TEST EQUIPMENT	AN/CPS-5	AN/CPS-6B	AN/FPS-3	AN/FPS-4	AN/FPS-5	AN/FPS-6	AN/FPS-8	AN/FPS-10	AN/FPS-14	AN/MPS-7	AN/MPS-8	AN/MPS-11	AN/MPS-14	AN/TPS-1D	AN/TPS-10D	AN/GPX-6	AN/GPX-7	AN/GPX-13	AN/GPX-18	AN/GPX-20			
24. CN-45/UP		x						x															
25. CN-42/UP		x				x		x					x										
26. CN-29/UP		x				x		x					x										
27. TS-270B/UP		x				x		x					x										
28. 1448A-1A		x						x															
29. CV-52/U		x						x															
30. CAWY-14ACN		x						x		x													
31. DA-18/U		x						x															
32. TS-382D/U		x		x	x	x	x	x		x		x	x		x								
33. AN/URM-61		x				x		x					x										
34. TS-12/AP		x		x	x			x		x					x								
35. OS-8( )/U		x			x	x	x	x		x		x	x		x								
36. SM-34/CPS-6B		x						x															
37. AN/PSM-2		x	x					x		x													
38. TS-117/GP		x				x		x					x										
39. MX-915/U		x						x															
40. MX-925/U		x						x															
41. TS-497B/URR			x				x			x		x											
42. TS-148A/UP				x							x				x								
43. TS-573/UP				x							x												
44. TS-488/UP				x							x				x								
45. DA-21/U				x							x				x								
46. TS-366B/TPS10				x							x												

TEST EQUIPMENT	AN/CPS-5	AN/CPS-6B	AN/FPS-3	AN/FPS-4	AN/FPS-5	AN/FPS-6	AN/FPS-8	AN/FPS-10	AN/FPS-14	AN/MPS-7	AN/MPS-8	AN/MPS-11	AN/MPS-14	AN/TPS-10	AN/TPS-10D	AN/GPX-6	AN/GPX-7	AN/GPX-13	AN/GPX-18	AN/GPX-20		
47. AN/USM-14				x							x				x							
48. TS-34A/UP				x							x			x	x							
49. AN/UPM-25				x							x											
50. TS-353A/UP				x							x											
51. TS-446/U											x			x	x							
52. TS-501/UP					x																	
53. AN/URM-24					x																	
54. DA-64/UP					x										x							
55. DA-20/U					x																	
56. TS-621/U					x																	
57. AN/USM-6					x																	
58. FIXED ATT'TOR						x							x									
59. AN/TRM-3							x					x										
60. MX-1258/U														x								
61. TS-328/U														x								
62. OS-41 1/AP																x	x	x		x		
63. AN/UPM-6B																x	x	x	x	x		

NOTE: THE ABOVE LISTED TEST EQUIPMENTS ARE INDICATED FOR FIELD AND ORGANIZATIONAL MAINTENANCE. TO DETERMINE THE EXACT QUANTITIES OF TEST EQUIPMENT FOR EACH SET, REFERENCE IS MADE TO THE SPECIAL INFORMATION SECTION ON PAGES 1, 2, AND 3 OF E.C.L. 20-30-10.

0515

ALL CLASS 17-C

EXCEPT WHERE NOTED

TEST EQUIPMENT	A. F. STOCK NO.
1. ME-29/U AMMETER	7CAC-028975
2. CN-110/U FIXED ATTENUATOR	7CAC-075606-17
3. AN/URM23 SUMMATION BRIDGE	7CAC-138790
4. TS-545/U TUNED CAVITY	7CAC-177651
5. CU-225/U DIRECTIONAL COUPLER	7CAC-225590
6. AN/URM-59 DUMMY LOAD	7CAC-274352-75
7. DA-56/U DUMMY LOAD, ELECTRICAL	7CAC-274381
8. TS-15B/AP FLUXMETER	7CAC-312130
9. AN/UPM-15 PULSE GENERATOR	7CAC-363817-5
10. TS-452B/U SIGNAL GENERATOR	7CAC-363895
11. TS-419/U SIGNAL GENERATER	7CAC-363969
12. TS-130A/UP STANDING WAVE INDICATOR	7CAC-439745
13. TS-297/U MULTIMETER	7CAC-587845
14. TS-505/U MULTIMETER, ELECTRONIC	7CAC-587943
15. AN/PSM-6 MULTIMETER	7CAC-589073-3
16. AN/USM24 OSCILLOSCOPE	7CAC-611119
17. TS-268D/U CRYSTAL TEST SET	7CAC-801318-5478
18. TV-7/U TUBE CHECKER	7CAC-801318-5725
19. TV-2/U TUBE CHECKER	7CAC-801319-124
20. AN/UPM-18 RADAR TEST SET	7CAC-801319-2187
21. AN/UPM-41 RADAR TEST SET	7CAC-801319-2232
22. ME-30/U VOLTMETER	7CAC-936155
23. MX-1028/U TEST SET	7CBM-MX-1028U
24. CN-45/UP ATTENUATOR	7CAC-075604-3
25. CN-42/UP ATTENUATOR	7CAC-075605
26. CN-29/UP ATTENUATOR	7CAC-075608
27. TS-270B/UP TUNED CAVITY	7CAC-177659
28. 14ABA-1A TUNED CAVITY	7CAC-177673
29. CV-52/U CRYSTAL CONVERTER	7CAC-224425
30. CAWY-14ACN DUMMY LOAD, ELECTRICAL	7CAC-274437
31. DA-18/U DUMMY LOAD	7CAC-274443
32. TS-382D/U SIGNAL GENERATOR	7CAC-363916-5
33. AN/URM-61 SIGNAL GENERATOR	7CAC-363974-6
34. TS-12/AP STANDING WAVE INDICATOR	7CAC-439744-5
35. OS-8( )/U OSCILLOSCOPE	7CAC-604337-5
36. SM-34/CPS-6B ANTENNA POSITION SIMULATOR	7CAC-725325
37. AN/PSM-2 INSULATION TEST SET	7CAC-801319-128
38. TS-117/GP WAVEMETER	7CAC-979578
39. MX-915/U TEST SET	7CBM-MX915U
40. MX-925/U RF PROBE	7CGE-M1-7403540
41. TS-497B/URR SIGNAL GENERATOR	7CAC-363892-3
42. TS-148A/UP SPECTRUM ANALYZER	7CAC-041086
43. TS-573/UP RANGE CALIBRATOR	7CAC-170276-35
44. TS-488/UP ECHO BOX	7CAC-177680
45. DA-21/U DUMMY LOAD	7CAC-274383
46. TS-366B/TPS10 DUMMY LOAD	7CAC-274421
47. AN/USM-14 STANDING WAVE INDICATOR	7CAC-439730
48. TS-34A/UP OSCILLOSCOPE	7CAC-611112
49. AN/UPM-25 RADAR TEST SET	7CAC-801319-215785
50. TS-353A/UP WAVE GUIDE PROBE	7CZR-SG5227
51. TS-446/U RF INDICATOR	7CAC-439725
52. TS-501/UP TUNED CAVITY "CLASS 16-C"	1800-330092030
53. AN/URM-24 SUMMATION BRIDGE	7CAC-138775
54. DA-64/UP DUMMY LOAD	7CAC-274352-7
55. DA-20/U DUMMY LOAD	7CAC-274372
56. TS-621/U SIGNAL GENERATOR	7CAC-364375

TEST EQUIPMENT (Cont'd) **A. F. STOCK NO.**

57.	AN/USM-6 STANDING WAVE INDICATOR	7CAC-439728
58.	FIXED ATTENUATOR	7CAC-075607-7
59.	AN/TRM-3 RADIO TEST SET	7CAC-801319-21539
60.	MX-1258/U TEST SOCKET KIT	7CAC-461886
61.	TS-328/U FREQUENCY METER, ELECTRICAL	7CAC-526125
62.	OS-4( )/AP OSCILLOSCOPE	7CAC-611136
63.	AN/UPM-6B RADAR TEST SET	7CAC-801319-21582

NOTE: ALL CABLE ASSEMBLIES AND LEADS FOR THE TEST EQUIPMENT HAVE BEEN OMITTED FROM THIS LIST. THEY MAY BE FOUND IN E. C. L. 20-30-10.

Section IV

TECH ORDER REFERENCE FOR ELECTRONIC EQUIPMENT

1. AN/CPS-5

Old		New
TO NO. 16-30CPS-5		TO NO. 31P6-2CPS5
-2	OPERATING INSTRUCTIONS	-1
-3	MAINTENANCE INSTRUCTIONS	-12
-11	SERVICE INSTRUCTIONS	-22
-21	EMERGENCY STARTING PRO.	-21
-31	SERVICE INSTR, CPS-5D	-11
-42	INSTALLATION OF TUN MAGNT AN/CPS-5	-501
-43	INSTALLATION OF TUN MAGNT AN/CPS-5D	-505

2. AN/CPS-6B

TO NO. 16-30CPS6		TO NO. 31P6-2CPS6
-6	OPERATING INSTRUCTIONS	-11
-7	MAINTENANCE INSTR T/R SYSTEM	-22
-8	PARTS CATALOG T/R SYSTEM	-24
-11	MAINTENANCE INSTR ANTENNA SYS	-32
-12	PARTS CATALOG ANTENNA SYSTEM	-34
-15	MAINTENANCE INSTR VIDEO SYSTEM	-42
-16	PARTS CATALOG VIDEO SYSTEM	-44
-19	MAINTENANCE INSTR TELEPH COMM SYS	-52
-20	PARTS CATALOG TELEPH COMM SYSTEM	-54
-23	MAINTENANCE INSTR AN/CPS-6B, AN/FPS-10	-12
-24	PARTS CATALOG PRIM POWER & MAINT UTIL	-14
TO NO. 16-2CBA		
-2	INSTALLATION PLANNING	-15

3. AN/FPS-3

Old		New
TO NO. 16-30FPS3		TO NO. 31P6-2FPS3
-11	OPERATING AND SERVICE INSTRUCTIONS	-1
-14	PARTS CATALOG	-4
-21	OPERATION AND SERVICE TELE CENTRAL GP AN/GTA-3	-11
-23	MAINTENANCE INSTRUCTIONS TELEPH. CENT. GP. AN/GTA-3	-12
-31	OPERATIONS AND SERVICE INSTRUCTIONS, ARCTIC EQUIP.	-21
-33	MAINTENANCE INSTRUCTIONS, ARCTIC EQUIP.	-22
-34	PARTS CATALOG, ARCTIC EQUIP.	-24
-41	OPERATION AND SERVICE, TOWER AB-178/FPS-3	-31
-44	PARTS CATALOG, TOWER AB-178/FPS-3	-34
-51	OPERATION AND SERVICE, TOWER AB-196/FPS-3	-41
-54	PARTS CATALOG, TOWER AB-196/FPS-3	-44

AN/FPS-3 (Cont'd)

-63	MAINTENANCE INSTRUCTIONS, FPS-3, MPS-7, RECV. EQUIP.	-62
-73	MAINTENANCE INSTRUCTIONS, FPS-3, MPS-7, TRANSMITTING EQUIP.	-72
-93	MAINTENANCE INSTRUCTIONS, INDICATOR GROUPS OA-175 & 175A	-112
-94	PARTS CATALOG, INDICATOR GROUPS OA-175 & OA-175A	-114
-103	MAINT. INST. INDICATOR OA-188 & BLANKER-INDICATOR OA-319	-122
-104	PARTS CATALOG, OA-188, OA319, & RADAR SET GROUP OA-355/MPS-7	-124
-113	MAINT. INST. OSCILLOSCOPE OS-17, POWER SUPPLY PP-659, CASE CY-910	
-114	PARTS CATALOG, OS-17, PP-659, AND CY-910	
-123	MAINT. INST. FPS-3 ANTENNA EQUIPMENT	-92
-124	PARTS CATALOG, FPS-3 AND MPS-7 ANTENNA EQUIPMENT	-54

Old		New
TO NO. 16-30FPS3		TO NO. 31P6-2FPS3
-133	MAINT. INST. CONTROL & POWER DISTRIBUTION EQUIP.	-142
-144	PARTS CATALOG, RADAR TEST SET AN/UPM-13	
-153	MAINT. INST. FPS-3, FPS-3A, MPS-7 VOLTAGE REGUL. EQUIP.	-152
-154	PARTS CATALOG, VOLTAGE REGULATOR CN-116/FPS-3	-154
-164	PARTS CATALOG, AN/FPS-3 PLOTTING EQUIPMENT	-174
-174	PARTS CATALOG, TRANSMITTER GP., OA-214, OA-398, OA-398A	-74
-184	PARTS CATALOG, RECEIVER GROUP, OA-176 AND OA-318	-64
-194	PARTS CATALOG, FPS-3 CONTROL & POWER DIST. EQUIP.	-144
-204	PARTS CATALOG, FPS-3 & MPS-7 MODULATION EQUIPMENT	-84
-214	PARTS CATALOG, GENERATOR GROUP OA-174	-104
-301	MODIFICATION OF AN/FPS-3	-501
-319	MODIFICATIONS TO IMPROVE OPERATION OF AN/FPS-3	-507
TO NO. 16-2CBA		
-1	INSTALLATION PLANNING	-5

4. AN/FPS-4

REFER TO AN/TPS-10D

5. AN/FPS-5

TO NO. 16-30MPS4		TO NO. 31P3-2FPS5
-5	INSTRUCTION BOOK	-2
TO NO. 16-2CBA		
-3	INSTALLATION PLANNING	-5

6. AN/FPS-6

TO NO. 16-30FPS6		TO NO. 31P3-2FPS6
-1	OPERATING INSTRUCTIONS	-1
-3	MAINTENANCE INSTRUCTIONS	-2
-13	MAINT. INST. FOR ANTENNA SYSTEM	-12
-14	PARTS CATALOG FOR ANTENNA SYSTEM	-14

Old		New
16-30FPS6		TO NO. 31P3-2FPS6
-23	MAINTENANCE INSTRUCTIONS FOR T/R SYSTEM	-22
-24	PARTS CATALOG FOR T/R SYSTEM	-24
-33	MAINT. INST. FOR PRESSURIZER AND DEHYDRATOR	-32
-34	PARTS CATALOG FOR PRESSURIZER AND DEHYDRATOR	-34
-43	MAINT. INST. FOR HEAT EXCHANGER	-42
-44	PARTS CATALOG FOR HEAT EXCHANGER	-44
-53	MAINT. INST. FOR RHI	-52

TECH ORDER REFERENCE FOR ELECTRONIC EQUIPMENT

AN/FPS-6 (Cont'd)

-54	PARTS CATALOG FOR RHI	-54
-63	MAINT. INST. FOR CONTROL GROUP ASSEMBLY	-62
-64	PARTS CATALOG FOR CONTROL GROUP ASSEMBLY	-64
-73	MAINT. INST. FOR AZIMUTH SWITCH BOX, TIME SHARING MASTER CONTROL, AND JUNCTION BOX.	-72
-74	PARTS CATALOG FOR AZIMUTH SWITCH BOX, TIME SHARING MASTER CONTROL, AND JUNCTION BOX.	-74
-83	MAINT. INST., AZIMUTH CONTROL OVERPLAY AND REMOTE HEIGHT DISPLAY.	-82
-84	PARTS CATALOG, AZIMUTH CONTROL OVERPLAY AND REMOTE HEIGHT DISPLAY.	-84
TO NO. 16-2CBA		
-5	INSTALLATION PLANNING	-94

7. AN/FPS-8 TO NO. 31P6-2FPS8

AN16-30FPS8		
-1	OPERATING INSTRUCTIONS	-1
-2	SERVICE INSTRUCTIONS	-2
-3	OVERHAUL INSTRUCTIONS	-3
Old		New
AN 16-30FPS8		TO NO. 31P6-2FPS8
-4	PARTS CATALOG	-4
-14	PARTS CATALOG, INDICATOR GROUP	-14
16-350A405		
-4	PARTS CATALOG, ANTENNA GROUP OA-405	-24
16-350A413		
-4	PARTS CATALOG, TRANSMITTER GROUP OA-413	-34
16-350A416		
-4	PARTS CATALOG, VIDEO DISTRIBUTION GROUP OA-416	-44
16-350A417		
-4	PARTS CATALOG, RECEIVER GROUP OA-417	-54
16-35PT182		
-1	OPERATION & SERVICE INST. RADAR DISPLAY BD. PT-182	-61
-4	ILLUSTRATED PARTS BREAKDOWN, RADAR DISPLAY BD. PT-182	-64
16-35PT183		
-1	OPERATION & SERVICE INST. RADAR DISPLAY BD., PT-183	-71
16-35PT183		
-4	ILLUSTRATED PARTS BREAKDOWN, RADAR DISPLAY BD. PT-183	-74
Old		New

8. AN/FPS-10

REFER TO AN/CPS-6B

9. AN/FPS-14

NO INFORMATION LISTED

10. AN/MPS-7 TO NO. 31P6-2MPS7

AN 16-30MPS7		
-1	OPERATING INSTRUCTIONS	-1
-2	SERVICE INSTRUCTIONS	-2
-4	ILLUSTRATED PARTS BREAKDOWN	-4
-14	BUILDING S-80, SHELTERS S-81 AND S-82	-14

11. AN/MPS-8

REFER TO AN/TPS-10D

0519

TECH ORDER REFERENCE FOR ELECTRONIC EQUIPMENT

12. AN/MPS-11

AN 16-30MPS11 TO NO. 31P6-2MPS11
-4 MOBILE RADAR SYSTEM (REFERENCE AN/FPS-8) -4

13. AN/MPS-14

AN 16-30MPS14 TO NO. 31P3-2MPS14
-3 MAINT. INST. TRAILERS, SHELTER & ACCESSORIES -3
-4 PARTS CATALOG MOBILE UNIT -4
(REFERENCE AN/FPS-6)

14. AN/TPS-1D

TO NO. 16-2CBA TO NO. 31P6-2TPS1
-6 INSTALLATION PLANNING -37
TO NO. 16-30TPS1
-25 INSTRUCTION BOOK -51
TO NO. 16-35PT171
-5 PLOTTING BOARD, PT-171 ( )/TPS-1D -41

Old New

TO NO. 16-35PT176 -14
-5 RADAR DATA PLOTTING BOARD PT-176/TPS-1D
TO NO. 16-350A175
-102 ADAPTING INDICATOR OA-175/FPS-3 WITH TPS-1D -45
PRELIMINARY INSTALLATION PLANNING DATA -35

15. AN/TPS-10D

TO NO. 16-30TPS10 TO NO. 31P3-2FPS-4
-10 OPERATION AND SERVICE INSTRUCTION, TPS-10D, FPS-4, -1
MPS-8
-11 MAINT. INST. TPS-10D, FPS-4, MPS-8 -2
-12 ILLUSTRATED PARTS BREAKDOWN, TPS-10D, FPS-4, MPS-8 -4
TO NO. 16-2CBA-
-4 INSTALLATION PLANNING -5
TO NO. 16-35AB204
-2 INSTALLATION & MAINTENANCE, AB-302 TOWER -15
TO NO. 16-35AB204
-4 PARTS CATALOG, AB-302 TOWER -14
TO NO. 16-35AB226 TO NO. 31P3-2TPS10
-101 PEDESTAL AB-226/TPS-10D -505
TO NO. 16-35CU262
-101 DUPLEXER CU-262/TPS-10D -511
TO NO. 16-35IM65-
-101 STANDING WAVE INDICATOR IM-65/TPS-10D -512

Old New

16. AN/GPX-6 TO NO. 31P4-2GPX6

TO NO. 16-30GPX6
-1 OPERATING AND SERVICE INSTRUCTIONS -1
-3 MAINTENANCE INSTRUCTIONS -2
-4 ILLUSTRATED PARTS BREAKDOWN -4
-5 PRELIMINARY INSTALLATION DATA -5
- SPARE PARTS LIST -14

17. AN/GPX-7 TO NO. 31P4-2GPX7

CO 16-30GPX7
-1 OPERATION AND SERVICE INSTRUCTIONS -1
-3 MAINTENANCE INSTRUCTIONS -2
-4 ILLUSTRATED PARTS BREAKDOWN -4
-5 PRELIMINARY INSTALLATION DATA -5

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18. AN/GPX-13

TO NO. 16-30GPX13		TO NO. 31P4-2GPX13
-1	OPERATION AND SERVICE INSTRUCTIONS	-1
-3	MAINTENANCE INSTRUCTIONS	-2
-4	ILLUSTRATED PARTS BREAKDOWN	-4
-5	PRELIMINARY INSTALLATION DATA	-5

19. AN/GPX-18

NO INFORMATION LISTED

20. AN/GPX-20

NO INFORMATION LISTED

Section V

GENERAL DESCRIPTION OF ELECTRONICS EQUIPMENT

1. AN/CPS-5

This is a medium range, SW radar set operating in the L band. The information is displayed on one A and two PPI scopes. An associated H/F is necessary for CCI operation.

2. AN/CPS-6B

A tower mounted integral high power search and height-finding radar set operating in the S band. This set has MTI operation. The indicators used in this system are as follows, ten PPI's, four HRI's, and five expanded B indicators. Radar set AN/CPS-6B and AN/FPS-10 differ with respect to the intercabling between systems components, the number of indicators, the telephone equipment, and the quantity of plotting equipment supplied. Differences in quantities and types of system components are listed in TO 16-30CPS6-6. Both radar sets include the auxiliary search modification kit, radar set group OA-347/CPS-6B.

3. AN/FPS-3

A high power, long range radar search set for detection of aircraft operating in the L band. This equipment uses MTI operation. An associated height-finder is required for GCI operation.

4. AN/FPS-4

This is the tower mounted version of the AN/TPS-10D. (Refer to AN/TPS-10D)

5. AN/FPS-5

This set is a medium power and range height finder operating in the xb, band. It is used in conjunction with search radars to determine the height of targets at selected bearings and ranges. The equipment has five range scales, 0-80, 0-20, 20-40, 40-60, 60-80 nautical miles. The height capability is from minus 5000 to plus 40,000 feet. One feature is the incorporation of a range indicator to provide accurate range verification when necessary.

6. AN/FPS-6

This is a high power fixed station height-finder operating in the S band. It is capable of making height determinations for aircraft targets flying within the elevation-angle limits of minus 2 and plus 32 degrees. This set has a maximum slant-range capability of 200 nautical miles and a maximum height capability of 60,000 feet. This equipment uses two RHI's with the following range scales: 0 to 110 nautical miles, 90 to 200 nautical miles, or an adjustable 50 mile bracket which may be delayed to start at any range up to 150 miles.

7. AN/FPS-8

This is a tower mounted, high power, search radar set operating in the L band. MTI is incorporated in this system. Provisions are made for the use of six PPI's and a video mapping unit. Electronic cursors are used on the PPI's for azimuth and range. When the video mapping unit is not used a seventh PPI may be added in its place.

8. AN/FPS-10

Refer to AN/CPS-6B

9. AN/FPS-14

This is a tower mounted automatic search radar, rated at 500 KW to be increased at a later date to 2.5 MW by using klystrons, Operating in the S band. Its primary design was based on CAA airport surveillance radars. The video information from this set can be processed to SDV for telephone line transmission. Other features of this equipment is its low altitude coverage and the availability of circular polarization.

10. AN/MPS-7

This is the mobile version of the AN/FPS-3 (Refer to AN/FPS-3).

11. AN/MPS-8

This is the mobile version of the AN/TPS-10D (Refer to AN/TPS-10D).

12. AN/MPS-11

This is the mobile version of the AN/FPS-8 (Refer to AN/FPS-8).

13. AN/MPS-14

This is the mobile version of the AN/FPS-6 (Refer to AN/FPS-6).

14. AN/TPS-1D

This is a ground and air transportable, lightweight, medium range search radar set operating in the L band. The system uses MTI operation. Normally this set will not include a primary power unit, test equipment, or maintenance parts. The nomenclature AN/TPS-15 has been assigned to the set with these items included.

15. AN/TPS-100

This is a portable, medium range height operating in the x band. It can be operated in conjunction with an associated search radar set to indicate the altitude of selected aircraft. This system can be operated as an emergency search set providing slant range, azimuth, and altitude. It is capable of making height determinations for aircraft targets flying within the elevation-angle limits of minus 2 and plus 23 degrees. The equipment has a maximum slant range capability of 120 nautical miles, and a maximum height capability of 60,000 feet.

16. AN/CPX-6

Identification set.

17. AN/GPX-7

Identification set.

18. AN/GPX-13

Identification set.

19. AN/FPX-18

Identification set.

20. AN/GPX-20

Identification set.

SECTION VI

GENERAL DESCRIPTION OF TEST EQUIPMENT

1. ME-29/U

This is a portable DC milliameter of 92 ohms internal resistance. It has a polarity reversing switch.

2. CN-110/U

This is a fixed attenuator. It is a transmission line, resistive type, with metalized glass tubing. The input and output impedence is 50 ohms, with one watt rating, operating in the 1000-4000 megacycle frequency range. The nominal attenuation is 10 DB, plus or minus 0.1 DB. The termination at the input ENO is with the female coupling UG-46/U and at the output end with male coupling UG-45/U.

3. AN/URM-23

This is a summation bridge which measures R. F. power in the range of 5 watts within the frequency range of 1000 to 4000 megacycles. The scale is from zero to 50 milliwatts in increments of one milliwatt. The accuracy of this bridge is plus or minus 15% of the measured power. This set operates from single phase, 115 volts AC, 50 to 1000 cycles.

4. TS-545/U

This is a tuned cavity operating in the frequency range of 1150 to 1350 megacycles. It is manually tuned by a rotating knob. This equipment is part of radar test set AN/CPM-5.

5. CU-225/U

This is a directional coupler operating in the 1130 to 1150 megacycle frequency range. It has a wavequide flange for the main line and a coaxial socket for the secondary line.

6. AN/URM-59

This is an electrical dummy load which provides replacement for an antenna of a radio or radar set for purposes of testing or adjusting the radio or radar set. It operates in the frequency range from 1150 to 1750 megacycles using rectangular waveguide. This set has an average power dissipation of 1000 watts, and a peak power dissipation of 10 megawatts at 0.10 microseconds pulse width. The power requirements for this set is single phase, 60 cycle, 110 volts A. C. The AN/URM-59 is comprised of electrical dummy load, DA-54/U and case, CY-1311/URM-59.

7. DA-65/U

This is an electrical dummy load operating in the frequecy range from 1150 to 1400 MC. The peak power is 10 KW and the minimum power is 1200 W. It has a 50 ohm resistive input impedance.

8. TS-15B/AP

This is a portable, field type, direct reading fluxmeter for measuring the flux density between the pole faces of magnets: (a) pole face diameter 3/4 inch, gap 0.6 inch; (b) pole face diameter 1 5/8 inch, gap 1.3 to 1.5 inch; (c) pole face diameter 2 inch, gap 2 inch. This unit is powered from self-contained batteries and has a range from 1000 to 10,000 gauss.

9. AN/UPM-15

This is a pulse generator set capable of generating 50 to 10,000 pulses per second. They may be either single or double pulses of variable PRF, width, and amplitude. The set may be internally or externally sychronized. The power requirements are 115 volts AC, 50 to 1600 cycles at 300 watts. The AN/UPM-15 consits of pulse generator TS-392/UPM-15, CASE CY-672/U, plus cords and adapters.

10. TS-452/U

This is a frequency modulated, RF signal generator. The frequency varies at a fixed rate across each of six bands between 5 and 100 megacycles. The accuracy is 3/10 percent of the frequency measured. This set has a traveling detector, calibrated step attenuator, calibrated wavemeter, and a built-in cathode ray indicator for observing band pass characteristics of equipment under test. The power requirements for this equipment is 115 volts AC, 50 to 1600 cycles.

11. TS-419/U

This equipment is an R. F. signal generator. It is capable of producing CW, internal pulse, and external pulse types of modulation. The frequency range is from 900 to 2100 megacycles, covered in one band. There is a direct-indication of frequency whose amplitude accuracy is within plus or minus 1 percent. The internal pulse modulation has a variable PRF of 40 to 40,000 cycles and a variable width of 1/2 to 10 microseconds. The external modulation is by single pulses, 40 to 70 volts peak amplitude. The internal and external pulses have 100 percent modulation and are not adjustable. The signal amplitude output is directly indicated in DBM and microvolts across 50 ohms, where the amplitude is variable from minus 3 to minus 120 DBM. The power requirements for this set is 105 to 125 volts AC, single phase, 50 to 1600 cycles.

12. TS-130A/UP

This is a standing wave indicator with an unbalanced coaxial transmission line used with a 50 ohm impedance line. It operates within the frequency range of 400 to 3000 megacycles. The frequency meter scale is graduated from 0 to 54 centimeters.

13. TS-297/U

This is a portable type battery operated, simpson multimeter used in measuring 0-1500 volts AC/DC, 0 to 150 milliampers DC, and 0 to 100,000 ohms resistance. The scale ranges are 0/3/15/30-/150/300/1500 volts AC/DC; 0/1.5/15/30/150 milliameters DC; 0/1000/10,000/1000,000 ohms.

14. TS-505/U

This is an electronic multimeter which is capable of measuring 0 to 1000 volts DC volts DC in 9 steps; 0 to 500 volts DC, using center scale zero, in 9 steps; 0 to 200 volts AC in 7 steps; 0 to 100 megohms in 7 steps. The input impedence is 50 megohms on the 0 to 1000 volts DC range and 20 megohms on all other DC volt ranges. The accuracy of this meter is plus or minus 2 percent. The power requirements are 115 volts AC from 50 to 1600 cycles.

GENERAL DESCRIPTION OF TEST EQUIPMENT

15. AN/PSM-6

This is a portable type, battery operated multimeter. The ranges for this meter are as follows: DC voltages, 0.5/2.5 /10/50/250/ 500 at 20,000 ohms/volt and 1000 volts at 100 ohms/volt and 1000 volts at 1000 ohms/volt; AC voltages, 2.5/10/ 50/250/500/1000 at 1000 ohms/volt; current,1 MA/0.5/2.5/10 amperes; resistance, 1000/10,000/100,000 / 1,000,000 /10,000,-000 ohms. Output measurements are available on all AC ranges. There is a plus or minus 3% accuracy on all ranges. This equipment consists of multimeter ME-70-/PSM-6, multirange shunt MX-1409/PSM-6, and test prod MX-1410/U.

16. AN/USM-24

This is an oscilloscope using a 3-inch screen. It has a recurrent sweep from 8 CPS to 600 KC, and a triggered sweep from 1.25 to 125,000 microseconds duration. The vertical input data is as follows: sensitivity 0.035 volts RMS/inch, response 4 CPS to 10 Mc, input resistance 300,000 ohms. The horizontal input data is as follows: sensitivity 4.0 volts RMS/inch, response 0.5 CPS to 700 KC, input resistance 300,000 ohms. The beam modulation response is 50 CPS to 10 MC and its resistance is 56,000 ohms. Some of the special features on this equipment is a marker generator providing calibration markers synchronized with the sweep, a trigger generator providing trigger voltages at 5 rates. A calibration voltage for directly measuring amplitude of observed waveform, a delayed sweep with 10.1 time expansion, input terminals at rear of case for direct connection to the deflection plates. The power requirements for this set is single phase, 105, 115, 125 volts AC, 50 to 1000 cycles at 125 watts.

17. TS-268D/U

This is a crystal test set for testing the front and back resistance of crystals, types 1n21, 1n21a, 1n21b, 1n23a, 1n23b and 1n-25. This test set includes one selector switch with 5 rotating contacts and crystal holder with a clamp.

18. TV-7/U

Information to be supplied at a later date.

19. TV2/U

This is an electron tube tester used to test conventional receiving tubes and low power transmission tubes. It is the mutual conductance type tube tester. The power requirements for this set is 115 or 230 volts AC at 50 to 1000 cycles.

20. AN/UPM-18

This is a voltage divider which divides pulses up to 35,000 volts peak. It has two ratios, 50 to 1 and 200 to 1. The dividing ratio is accurate to within 5 percent. The divider is listed as TS-359B/U.

21. AN/UPM-41

This is a radar test set used to determine the sub-clutter visibility, stalo stability, and pulse jitter of a moving target radar system. The operating data for this system is as follows: signal generator, 27 to 33 MC frequency range, 22.4 microvolts to 224 millivolts calibrated output, 50 to 6,000 cycles PRF; pulse jitter tester, 258 KC sine wave sweep frequency from 27 to 33 MC, with jitter reading accurate to plus or minus 10 percent but not less than 0.01 microseconds. The output is displayed on an oscilloscope where full deflection is produced by 2 milivolts or more. Major components of this equipment are the test set indicator TS-677/UP, power supply PP-910/UPM and delay lines MX-1418/UP, MX-1449/UP, MX-1450/ MX-1451/UP, MX-1452/UP. The power requirements for this system is 115 volts plus or minus 10 percent, 50 to 1000 cycles, single phase.

22. ME-30/U

This is a vacuum tube voltmeter capable of measuring 0 to 300 volts in 12 ranges. The input impedence, at low frequencies, is 10 megohms. The DB scale is calibrated from minus 12 to plus 2 DB. The accuracy of this meter is within 3 percent at frequencies below 100 KC and within 5 percent at frequencies from 100 KC to 2 megacycles. The power requirements for this meter is 115 volts AC, single phase, 50 to 60 cycles at 50 watts.

23. MX-1028/U

This is an adapter that is used with but one part of fluxmeter TS-15B/AP. Its purpose is to center and secure fluxmeter TS-15B/AB to a magnetron magnet whose pole gap is 3.64 inches and pole face diameter is 4 inches.

24. CN-45/U

This is an attenuator which is used to decrease the voltage pulse applied to a high powered S band magnetrons so as to permit seasoning of the magnetron. The unit consits of 2 connectors and 4 ten ohm resistors connected in series-parallel to give a total resistance of ten ohms.

25. CN-42/UP

This is a fixed attenuator in L pad form of 50 ohm impedance. It has a peak power rating of 500 watts and an average power rating of 1 watt.

26. CP-29/UP

This is an attenuator in the form of a metal tube with a meallized glass insert 5 inches long. It is matched to a characteristic impedance of 49 ohms at both ends.

27. TS-27OB/UP

This is a tuned cavity designed to operate in the frequency range from 2630 to 2970 MC. It is manually tuned by rotating dial. The frequency scale is calibrated every 10 MC.

28. 14ABA-1A

This is a tuned cavity operating in the frequency range from 2800 to 3000 MC. It is tuned manually by rotating dials.

29. CV-52/U

This is a crystal converter with an input from 2600 to 4000 MC. The resultant output is 30 MC. It has a 50 ohm imdedence for both input and output.

30. CAWY-14ACN

This is an electrical dummy load with a 600 ohm resistive impedance. It operates at a nominal 1800 watts and a peak 3000 watts.

31.DA-18/U

This is an electrical dummy load with a resistive impedance. It has a waveguide incorporated with a frequency range from 2600 to 3950 MC. It operates at a nominal 1900 watts and a peak 2 megawatts.

32. TS-382D/U

This is a signal generator capable of generating frequencies from 20 cycles to 200 kilocycles at plus or minus 3 percent accuracy. The calibrated output is from 0 to 10 volts with a maximum variation of plus or minus 2 DB. The output impedance is 1000 ohms. The power requirements is 100 to 120 volts AC at 50 to 1600 cycles.

33. AN/URM-61

This is a signal generator capable of generating frequencies from 1800 to 4000 MC, at plus or minus 1 percent accuracy. The calibrated output is from minus 10 to minus 120 DB below 1 milliwatt at a maximum variation of 1 DB throughout the frequency range, EM and pulse modulation is available from 40 to 4000 cycles PRF. The output impedance of this set is 50 ohms. The power requirements are 115 volts, single phase, 50 to 1600 cycles.

34. TS-12/AP

Information to be supplied at a later date.

35. OS-8( ) /U

This is a small, lightweight ocsillo scope. The vertical amplifiers operate over a frequency range from 5 cycles to 2 MC, with a sensitivity of 0.1 volts RMS per inch. The accuracy is plus or minus 3 DB. The horizontal amplifiers operate over a frequency range from 25 to 100,000 cycles with a sensitivity of 0.1 volts RMS per inch. The accuracy is plus or minus 2 DB. There is a direct access to the horizontal and vertical deflection plates. The power requirements for this set is 115 volts AC, plus or minus 10 percent, at 50 to 1600 cycles.

36. SM-34/CPS-6B

This is an antenna position simulator. Its function is to place a voltage on a control transformer. This gives a simulated antenna position signal which is applied to the servo system to permit allignment of the servo amplifier.

37. AN/PSM-2

This is an insulation test set with a resistance range from 0 to 1000 megohms. It is powered by a self contained hand generator.

38. TS-117/GP

This is a wavemeter designed to operate in the frequency range from 2400 to 3400 MC. This set is accurate to plus or minus 0.75 percent.

39. MX-915/U

This is a test set adapter in the form of an AN type of magnet. It can be used in conjunction with the TS- 15B/AP.

40. MX-925/U

This is an RF probe used as a traveling detector. Its maximum rating is 50 volts at 20 milliameters. It operates from 10 to 50 MC.

41. TS-497B/URR

This is a signal generator which supplies an AM modulated RF signal for alignment purposes. The frequency range is from 2 to 400 MC in 6 bands with an accuracy of plus or minus 0.5 percent. The signal output is calibrated from 0.1 to 100,000 microvolts with an accuracy of plus or minus 10 percent from 2 to 200 MC and plus or minus 15 percent from 200 to 400 MC. The internal modulation is at 400 to 1000 cycles and is variable from 0 to 30 percent. The power requirements is 117 volts AC, single phase, 50 to 60 cycles.

42. TS-148A/UP

This is a spectrum used to observe RF pulse characteristics in the X band. This test set consists of an X band super- heterodyne receiver which sweeps 50 MC of the band at one time and presents the spectra received on a type A scope. The tuning range is limited by the local oscillator which varies with different 2K25 Klystron oscillator. The frequency meter is calibrated directly from 8470 to 9630 MC.

43. TS-573/UP

This is a range calibrator used for measurement of radar timing circuits and for generation of trigger pulses for general radar use. The trigger pulse can be either positive or negative having repetition rates of 160, 480, 800, 1200, and 2400 pulses per second. The power requirements for this set is 115 volts AC, single phase, 50 to 1600 cycles.

44. TS-188/UP

This is an echo box consisting of an X band tunable cavity and a crystal detector with a microammeter circuit to indicate when the cavity is tuned to resonance. This set can be used for measuring ring time, AFC locking, and TR tube performance.

45. DA-21/U

This is an electrical dummy load with a resistive impedance operating in the frequency range from 7050 to 10,000 MC. It operates at a peak power of 0.80 megawatts and a nominal power of 280 watts.

46. TS-366B/TPS10

This is an electrical dummy load with a resistive impedance of 50 ohms. It operates at a peak power of 200 KW and a nominal power of 160 watts.

47. AN/USM-14

This is a standing wave indicator used to determine voltage and power standing wave ratios and impedance of waveguide systems and components. This set operates in the frequency range from 8200 to 12400 MC.

48. TS-34A/UP

This is an oscilloscope using a 2-inch screen with a magnifying glass. The sweep circuit is from 30 cycles to 1 MC. The start stop duration is from 4.50 to 8 microseconds, 20 to 50 microseconds, and 120 to 280 microseconds. The sensitivity of the vertical plates is 196 volts DC per inch. The input impedance on the Y axis is 62 or 430,000 ohms. The power requirements for this set is 120 to 125 volts AC, single phase, 50 to 1200 cycles at 90 watts.

49. AN/UPM-25

This is a radar test set which operates over the frequency range of 8500 to 9500 MC. The main item in this set is the TS-541/TPS. It is used to measure radar transmitter power output, frequency, spectrum, radar receiver sensitivity and bandwidth, and system recovery time. It is also employed to check magnetron pulling, AFC tracking, and discriminator alignment. These measurements are accurate within plus or minus 1 DB. The power requirements for this set is 105 to 125 volts AC, 50 to 1200 cycles at 70 watts.

50. TS-353A/UP

This is a waveguide probe designed to operate in the frequency range from 8500 to 9600 MC.

51. TS-446/U

This is a RF indicator in the form of a lucite pencil with a probe and neon bulb mounted at each end.

52. TS-501/UP

This is a tuned cavity designed to operate in the frequency range from 6250 to 6900 MC. It consists of a hand tuned echo box in a circuit with a crystal rectifier and a microammeter.

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53. AN/URM-24

This is a summation bridge used to measure RF power from 5 milliwatts to 5 watts. It operates in the frequency range from 4000 to 10,000 MC. The power ranges are from 5 to 50 milliwatts, 50 to 500 milliwatts, and 0.5 to 5 watts. The power requirements for this set is 115 volts AC, single phase, 50 to 1600 cycles.

54. DA-64/UP

This is an electrical dummy load with a resistive impedance of 47.5 to 52.5 ohms. Its power dissipation is 1400 watts maximum and 1200 watts nominal. It has a 75 to 1 ratio voltage divider for observing pulse forms.

55. DA-20/U

This is an electrical dummy load operating in the frequency range from 5850 to 8200 MC. Its power dissipation is 1.20 megawatts peak and 420 watts nominal.

56. TS-621/U

Information to be supplied at a later date.

57. AN/USM-6

This is a standing wave indicator operating in the frequency range from 5850 to 8200 MC. This set comprised of slotted line IM-45/U and RF Probe MX-1019/U.

58. FIXED ATTENUATOR

This is a fixed attenuator of the circular waveguide type. It has plug UG-21-B/U at one end and Jack UG-23B/U at the other end. The waveguide has a maximum standing ratio of 1.25. The frequency response is from 2000 to 10,000 MC. The attenuation is 6 DB plus or minus 0.8 DB. The power rating of this attenuator is 1 KW peak and 1 watt average.

59. AN/TRM-3

Information to be supplied at a later date.

60. MX-1258/U

This is a kit which provides adapters for vacuum tubes for the purpose of extending pin connections on the tubes.

61. TS-328/U

Information to be supplied at a later date.

62. OS-4( ) /AP

Information to be supplied at a later date.

63. AN/UPM-6B

Information to be supplied at a later date.

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FILE NUMBER 208

Operational Plan 33
for
SEAWARD EXTENSION OF THE AIR DEFENSE COMBAT ZONE

33 55a

Continental Air Defense Command
Ent AFB Colorado

20 JUNE 1955 SECRET

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27

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This document contains information affecting the National Defense of the United States within the meaning of the Espionage Laws, Title 18, U. S. C., Sections 793 and 794. Its transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law.

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24

FOREWORD

This plan represents the Continental Air Defense Command concept of operation for the extension to seaward of the surveillance and control capability of the Air Defense Combat Zone for the defense of the Continental United States. Appropriate logistics and personnel requirements to support the CONAD operational elements will be contained in detailed operational plans for each element.

The purpose of this plan is to provide for the integration and effective utilization of Texas Towers, Picket Ships and Airborne Early Warning and Control Aircraft, to extend the detection, tracking and weapons control capability of the Air Defense Combat Zone. Future developments, such as Armstrong Platforms, will be considered when available. Elements in the seaward extension program will operate in conjunction with designated coastal Air Defense Direction Centers.

This program is time phased to provide an optimum Air Defense capability in the contiguous seaward extension of the Air Defense Combat Zone, consistent with forces now programmed. The effectiveness of the Air Defense capability of the seaward extension program during the

25

SECRET

1956-1959 time period will depend on the availability of radar platforms (AEW&C Aircraft and Picket Ships) and a reliable communications system.

The employment of Picket Ships and AEW&C Aircraft to provide contiguous seaward extension of the Air Defense Combat Zone will be in addition to Airborne Early Warning and Picket Ship barrier extension of the Distant Early Warning line. The barrier extension of the DEW line will be operated and forces provided by the United States Navy, but will be responsive to the need of the Continental Air Defense Command.

S. R. Mickelsen

S. R. MICKELSEN
Lieutenant General, USA
Commander in Chief

SECRET

26

SECRET

DISTRIBUTION

HQ USAF	20
COMNAVFORCONAD	10
COMNAVFOREASTCONAD	5
COMNAVFORWESTCONAD	5
CG ARAACOMCONAD	5
HQ ARDC	5
HQ JEADF	12
HQ JWADF	12
HQ JCADF	2
HQ WADC	5
HQ RADC	5
MAAMA	5
AFCRC	5
USAFIR, New England Region	3
WSEG	6
HQ ADC	
8th Air Div	10
Comd Adj	40
DCS/M	4
DCS/I	2
DCS/O	2
D/C&E	4
D/M&O	2

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73

SECRET

D/O&T	5
D/P&R	4
OOA	2
ADVHP	1
ADC Liaison Office P. O. Box 73 Lexington 73, Mass.	6
TOTAL:	187

SECRET

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27

SECRET

TABLE OF CONTENTS

SECRET

SECRET

SECTION I

PLANNING FACTORS

1. The foremost planning factors considered in developing this plan were:

a. The Continental Air Defense Command is responsible for the operation and direction of assigned forces in the Seaward Extension of the Air Defense Combat Zone.

b. The Seaward Extension Program is to be completely operational by 1959.

c. This plan pertains to the Seaward Extension Program on the East and West Coasts. The plan for Gulf Coast stations will be formulated at a later date.

d. The system tactic of scrambling AEW&C Aircraft will depend on CINCONAD deriving warning from the Distant Early Warning system or strategic sources.

e. Elements were deployed in accordance with the following equipment characteristics:

(1) Picket Ship radar range for this period - 200 NM, at 65,000 feet on a one (1) square meter target. *

(2) AEW&C radar range for this period - 150 NM on a one (1) square meter target at lower

SECRET

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27

altitudes. **

(3) AEW&C Aircraft will fly initially at altitudes between 5 and 15 thousand feet.

(4) Texas Towers will initially have the same capability as shore-based radars. (200 NM at 65,000 feet on a one (1) square meter target) ***

f. A ratio of 7.5 AEW&C Aircraft is required to man each AEW&C station continuously.

g. Certain AEW&C stations will not be manned continuously.

h. AEW&C Aircraft require 30-45 minutes to be airborne from time of scramble order.

* The following is the Air Defense Command priority for research and development for shore-based prime radars:

Prime radars must be designed with a detecting and tracking probability of 95-98 per cent on moving targets, with the equivalent of one (1) square meter of reflecting surface, at ranges up to 250 NM and at altitudes up to 65,000 feet. These radars must be available as soon as possible but no later than 31 December 1956. By 1959-60 the capability of prime radars must provide for the detection of "cruise" type missiles,

0336

71

with a reflecting area equivalent to one-quarter (¼) square meter, at altitudes up to 100,000 feet while maintaining a horizontal coverage of 250 NM and a probability of detection of 95-98 per cent.

The operational requirement above constitutes the planning requirements for the Continental Air Defense System. It is recognized that the "State of the Art" in Air Defense equipment development may not permit full realization of all requirements in the time-period 1957-60. The most practical equipment that is available must be used on the Seaward Extension elements during this time period. It is assumed that by 1960 Picket Ship radars will provide altitude coverage to 65,000 feet at ranges of 200 NM against a one (1) square meter target. The improvement of this performance, as practicable, to parallel the expected improvement of the land base system is considered a matter of urgent necessity.

** The requirement for an improved AEW&C support system is as outlined in USAF, "General Operational Requirement for an AEW&C Support System," AD-3c, 1957-63.

*** The planning for installation of improved type radar on Texas Towers beyond presently programmed equipments has not been completed.

29

SECRET

SECTION II

DEFINITIONS

1. Air Defense Combat Zone: That area extending outward from the target areas which has contiguous radar coverage and within which the four functions of air defense can be performed.

2. Control Coverage: That area extending outward from the target areas which has all of the elements necessary for performance of close control of air defense weapons.

3. Texas Tower: A fixed offshore radar installation built on coastal shoals and capable of performing the functions of air surveillance and control.

4. Picket Ship: An ocean going vessel equipped to function as a direction center.

5. AEW&C Aircraft: An aircraft equipped to function as a direction center.

6. Manual Direction Center: A radar installation having the capability of performing air surveillance and air control and direction of air defense weapons. This installation may or may not have an identification responsibility.

7. SAGE Direction Center: The AN/FSQ-7 equipped

installation for control of air defense activities in a subsector. (AN/FSQ-7 is the SAGE System Computer and associated Direction Center equipment.)

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30

SECRET

SECTION III

CONCEPT OF OPERATION

1. Elements of the seaward extension program will be deployed to extend seaward the contiguous radar and weapon directing capability of the Air Defense Combat Zone. The exact deployment of these elements will be made by the appropriate Joint Air Defense Force Commander in coordination with CINCONAD. This deployment will be based on the capabilities of the assigned elements under their command to provide an air defense capability to counter the expected threat.

2. These radar platforms function as direction centers, but are in reality an extension of the parent shore-based radar. The principle difference in operation being, they do not have an identification responsibility, nor interceptor scramble prerogative. Future developments and procedures may permit track identification by the seaward extension elements.

3. On the East Coast the seaward extension program will initially consist of Texas Towers, Picket Ships and AEW&C Aircraft operating on station continuously. Texas Towers and Picket Ships will be deployed to provide the high altitude detection capability;

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AEW&C Aircraft will be deployed to provide the low altitude detection capability. With the exception of Texas Towers, deployment of forces on the West Coast will be similar to the concept visualized for initial operation on the East Coast.

4. As additional AEW&C Aircraft become available and the Distant Early Warning System becomes operational, the employment of contiguous elements of the seaward extension program will be modified.

a. East Coast: An additional row of AEW&C Stations will be deployed on the outer perimeter of Picket Ship Stations. The outer row of AEW&C Aircraft will extend the low altitude detection capability and complete the all-altitude contiguous system when all elements are on station. The outer Picket Ship and AEW&C Aircraft elements will operate continuously. Aircraft for the inner row of AEW&C Stations will be maintained on an alert status. The northernmost stations of the inner AEW&C row may have to be continuously manned due to their proximity to the DEW Line. Continuous manning of these stations will be effected with the receipt of warning derived from information from the Distant Early Warning Line or strategic sources.

b. West Coast: Continuous manning of all AEW&C Stations in this area is not required after the Distant

31

Early Warning Line is in operation. Due to the proximity of the Distant Early Warning Line it will be necessary to continuously man the two most northerly AEW&C Stations only. The remaining AEW&C Stations will be manned from a scramble status on warning derived from the Distant Early Warning Line or other strategic information. This procedure will permit all AEW&C Stations to be manned during critical periods. These stations are adjacent to the shore-based radars rather than a second row of AEW&C Stations as indicated for the East Coast.

The concept of scrambling AEW&C Aircraft to man the inner row of stations on the East and West Coast is required in this plan because there are insufficient programmed aircraft to man the inner rows on a continuous basis. This concept is also based upon the assumption that when the DEW Line is installed it will provide reliable warning. CONAD will ask for additional forces in the CONAD 55-65 requirements plan to man all stations continuously. Experience may dictate that the system tactic of scrambling AEW&C Aircraft upon penetration of the DEW Line is not feasible, in this event the additional AEW&C Aircraft must be furnished or the off shore coverage reduced to an unacceptable degree.

68

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SECTION IV

MISSION

To extend seaward the Air Defense Combat Zone of the Continental Air Defense System.

SECTION V

METHOD OF OPERATION

1. In the manual, improved manual and SAGE emergency air defense operation, the Seaward Extension of the Combat Zone will act as a continuation of the Continental Air Defense System. Phases are used to denote quantity and technique of force deployment. Phase I is based on quantity of forces available by 1958. Phase II is based on availability of forces by 1960 and scramble technique when the DEW Line is operationally reliable. The SAGE System was not considered to be a major factor in determining the deployment of seaward extension forces in either operational phase.

a. Phase I.

(1) East Coast. During this phase of operation the Seaward Extension will be composed of 5 Texas Towers, 6 AEW&C Stations and 5 Picket Ship Stations with all elements operating 24 hours a day.

(a) Picket Ships. Each Picket Ship must be capable of telling 8 to 12 tracks to a shore direction center at any one time. They must also be capable of cross-telling information to adjacent Picket Ships. The air defense "Command

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32

and Liaison" functions necessary between adjacent Picket Ships can be conducted on the cross-telling circuits. The Picket Ships must also be capable of accepting control and direction of air defense interceptors, and when practicable, perform identification functions. There will be a need for command control of the Picket Ships and the appropriate communications channels should be planned for this purpose.

(b) AEW&C Aircraft. The AEW&C Aircraft must have the capability of telling, when within or beyond line-of-sight, to the appropriate Picket Ship or land-based direction center when required. A mimimum of two simplex circuits are necessary for this operation, plus a circuit for command and control. The AEW&C Aircraft must have the capability of cross-telling between four and six tracks, via UHF, to adjacent AEW&C Aircraft during any one minute period. The AEW&C Aircraft must be capable of accepting control and direction of air defense interceptors.

(c) Texas Towers. The Texas Towers will be more an integral part of the shore installation and have programmed sufficient communications to perform their basic function of telling information to the shore-based direction centers, accepting control and direction

67

of air defense interceptors and relaying information from AEW&C Aircraft to the shore-based direction centers.

(2) West Coast -- The Picket Ships and AEW&C Aircraft will function identically with those on the East Coast. The procedures involved and the communications necessary will be identical.

b. Phase II.

(1) East Coast.

(a) Manual. During this phase on the East Coast there will be five Texas Towers, five Picket Ships and twelve AEW&C Aircraft stations. The Texas Towers and Picket Ships will remain in relatively the same geographical location and perform the same functions with the same basic equipment and communications as in Phase I. The AEW&C Aircraft stations will be deployed into two rows. The inner row will function as in Phase I. The principle difference will be that the five most southerly stations on the inner row will not be on station 24 hours a day as in Phase I, but will be maintained on alert status and scrambled to their stations when warning is derived from the DEW Line or strategic sources. The outer row of five AEW&C Aircraft will remain on station 24 hours a day. These aircraft must have the capability of reporting eight to twelve tracks to the shore direction center or to the appropriate Picket Ship.

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They must also have a direct command and control circuit to the shore direction center. The cross telling capability of these aircraft must be as stated in Phase I.

(b) SAGE. During the SAGE time period Texas Towers and the inner row of AEW&C Aircraft will act as surveillance stations and feed radar information automatically to the SAGE Direction Center. Deployment of AEW&C Aircraft in some areas on the East Coast may require or permit automatic relay of video information through an appropriate Texas Tower. The non-line-of-sight circuitry for manually transmitting radar information must be retained for the inner row of AEW&C Aircraft stations for periods when automatic video transmission is not possible. Control of interceptors, through the nearest shore radar or Texas Tower and the inner row of AEW&C Aircraft, will be accomplished from the SAGE Direction Center. Picket Ships and the outer row of AEW&C Aircraft will act as direction centers; however, they will manually report radar information direct to the SAGE Direction Center.

(2) West Coast.

(a) Manual. During this phase of operation there will be seven Picket Ships and eight AEW&C stations on the West Coast. Their functions will not change from the first phase other than possibly having new reporting points. The communications and operational equipment will remain the same.

(b) SAGE. During the SAGE period the AEW&C Aircraft will employ the same method of operation as the inner row on the East Coast.

2. To insure the degree of reliability necessary for Air Defense Operation alternate communications routing must be provided for AEW&C Aircraft and Picket Ships.

SECTION VI

DEPLOYMENT

The deployment of elements in the Seaward Extension Program to extend the Air Defense Combat Zone is based upon the theoretical radar characteristics and the operational availability of units within each specific element. This plan presents two phases, each marking the end of a specific time period equipmentwise.

Figure 1 shows the initial Phase I deployment of Texas Towers, Picket Ship Stations and AEW&C Aircraft Stations on the East Coast, and deployment of Picket Ship Stations and AEW&C Aircraft Stations on the West Coast.

Figure 2 shows the deployment with an outer row of AEW&C Aircraft Stations added on the East Coast and additional AEW&C Aircraft and Picket Ship Stations on the West Coast.

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Appendix 1 to this section shows the geographical grid location of the stations as shown on Figures 1 and 2.

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65

EAST COAST

RECOMMENDED INITIAL DEPLOYMENT OF TEXAS TOWERS,

PICKET SHIPS, AND AEW&C STATIONS

PHASE I

Picket Ships -- 41"40'N-61"25'W

39"30'N-64"26'W

38"15'N-67"40'W

36"32'N-70"40'W

33"22'N-72"30'W

Texas Towers -- Nantucket Shoal, 40"45'N-69"19'W, June 56

George's Shoal, 41"44'N-67"45'W, June 56

Cashe's Ledge, 42"54'N-68"57'W, June 56

Brown's Bank, 42"47'N-65"37'W, June 57

Unnamed Shoal, 39"48'N-72"40'W, June 57

AEW&C Aircraft -- 33"20'N-74"45'W

36"25'N-72"45'W

38"43'N-70"50'W

40"00'N-66"45'W

42"18'N-67"10'W

42"10'N-63"32'W

PHASE II

Texas Towers -- Same as Phase I.

Picket Ships -- Same as Phase I.

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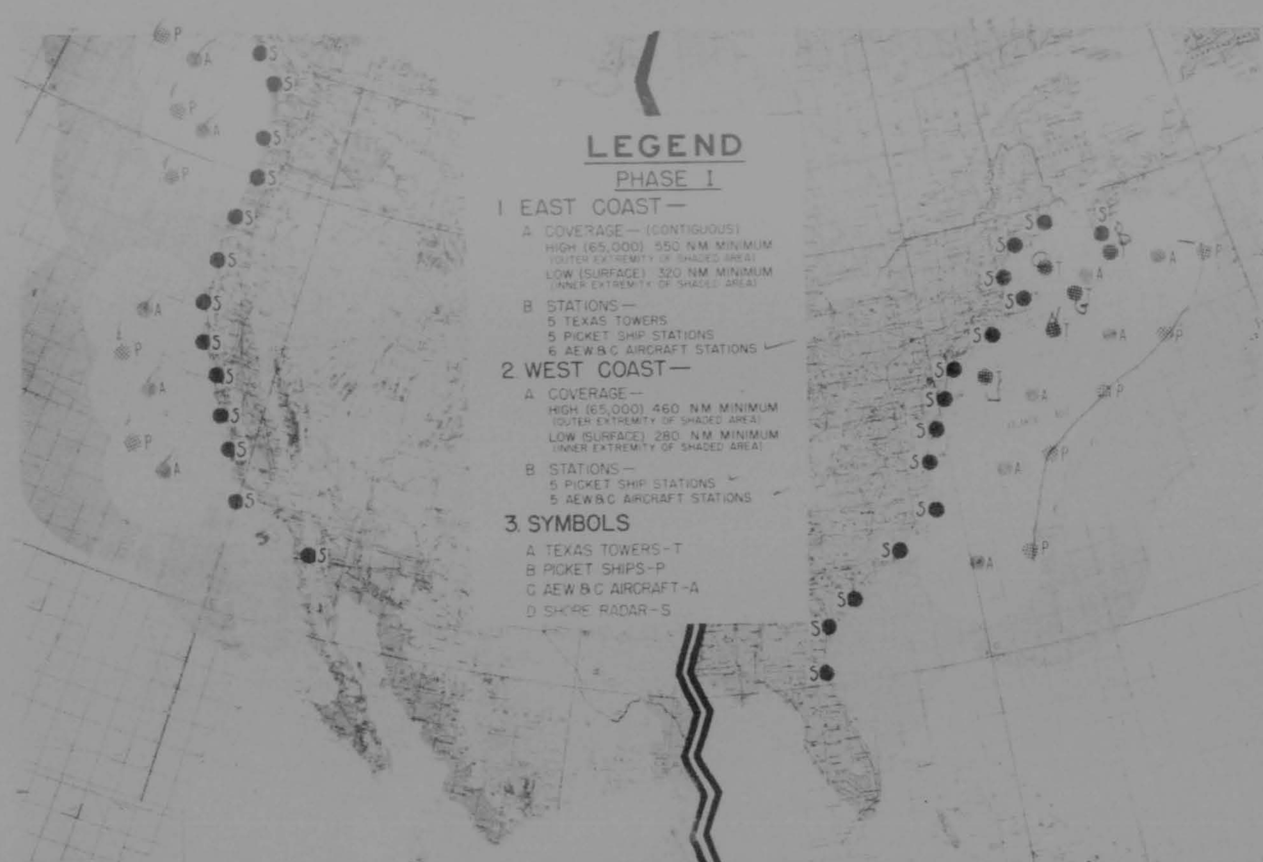

FIG. 1

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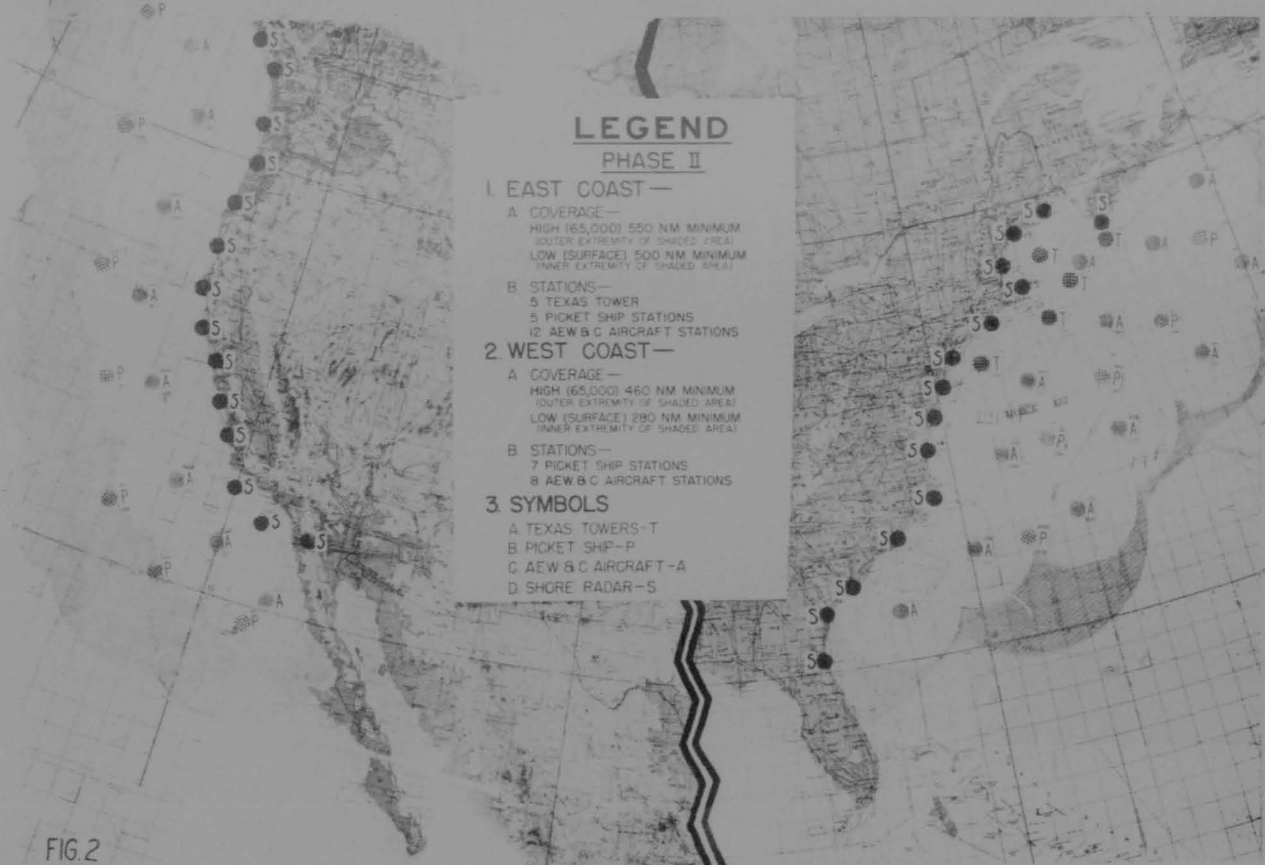

FIG. 2

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EAST COAST

PHASE II

AEW&C Aircraft -- Inner Row, same as Phase I.

Outer Row, 31"38'N-78"12'W

33"58'N-70"12'W

36"15'N-67"40'W

37"57'N-63"10'W

40"26'N-59"58'W

43"40'N-60"35'W

64

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WEST COAST

RECOMMENDED INITIAL DEPLOYMENT OF TEXAS TOWERS,

PICKET SHIPS, AND AEW&C STATIONS

PHASE I

Picket Ships -- 48"30'N-130"30'W
46"10'N-128"20'W
44"55'N-127"20'W
37"35'N-126"45'W
34"40'N-125"00'W

AEW&C Aircraft -- 48"00'N-128"25'W
45"50'N-127"00'W
39"20'N-126"30'W
36"40'N-125"05'W
34"10'N-123"20'W

PHASE II

Picket Ships -- 48"40'N-131"20'W
44"40'N-130"05'W
39"50'N-128"40'W
36"15'N-126"40'W
32"10'N-124"45'W
30"20'N-122"00'W
29"30'N-118"10'W

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38

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WEST COAST

PHASE II

AEW&C Aircraft -- 48"05'N-128"40'W

45"50'N-127"00'W

42"30'N-127"00'W

39"20'N-126"30'W

36"30'N-124"45'W

33"30'N-122"20'W

31"45'N-120"00'W

30"20'N-117"25'W

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SECTION VII

COMMUNICATIONS

1. The communications circuitry contained in this section was designed to accommodate the preceding concept and method of operation and is consistent with the planning factors used in the development of this document. * The minimum number of channels were provided each element in the seaward extension program to be consistent with the operational requirements for sound communication practices and the weight and space limitations of AEW&C Aircraft and Picket Ships. The communication channels necessary for manual operation will be retained to function in the manual back-up for the SAGE System.

2. Manual Operation.

a. Elements operating in the seaward extension program will require the following channels:

Channel No. 1. Two HF voice telling channels between each Picket Ship and associated land-based Air Defense communications relay center, or Direction Center.

Channel No. 2. One HF voice command and control between each Picket Ship and the associated land-based Air Defense communications relay center, or Direction Center.

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39

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* Figures 3, 4 and 5 at the end of this section graphically outline the circuitry described herein.

Channel No. 3. One HF CW parallel telling channel between each Picket Ship and the appropriate Navy shore-based relay point for retransmittal to the appropriate Direction Center.

Channel No. 4. One HF CW Navy ship-to-shore common channel. This channel is presently in operation using frequencies provided by the USN - no additional frequencies required.

Channel No. 5. One HF CW Navy Task Force Picket Group Common Channel. This channel is presently in operation using frequencies provided by USN - no additional frequencies required.

Channel No. 6. One HF voice cross telling channel between adjacent Picket Ships (six channels per seven Picket Ships).

Channel No. 7. One HF voice control channel between adjacent Picket Ships (six channels per seven Picket Ships).

Channel No. 8. One UHF voice cross telling channel between each Picket Ship and the appropriate AEW&C Aircraft or between AEW&C Aircraft and appropriate Texas Tower.

Channel No. 9. One UHF voice control channel between each Picket Ship and the appropriate AEW&C Aircraft and appropriate Texas Tower.

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Channel No. 10. Two UHF voice telling channels between each AEW&C Aircraft and associated Air Defense communications relay center or Direction Center. (Operational experience to date indicates that although UHF should constitute this prime means of communications on these channels, a like number of alternate HF channels should be available for this use.)

Channel No. 11. One UHF voice command and control channel between each AEW&C Aircraft and associated Air Defense communications relay center or Direction Center. See note under Channel No. 10 above.

Channel No. 12. One UHF voice telling channel between adjacent AEW&C Aircraft. (Seven channels per eight AEW&C Stations.)

Channel No. 13. One UHF voice control channel between adjacent AEW&C Aircraft. (Except AEW&C Aircraft operating in the outer row.) (Seven channels per eight AEW&C Stations.)

Channel No. 14. One HF voice/CW AEW&C wing common channel.

Channel No.15. Four (4) UHF voice air-ground-air interceptor direction channels from AEW&C Aircraft and Picket Ships (one emergency, one tactical common, two tactical control channels). Frequencies necessary to support these channels are presently available to ADC and are currently being used in the Air Defense

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System. This requirement does not pertain to AEW&C Aircraft operating in the outer row off the East Coast.

b. Off the West Coast, Picket Ships will report all Air Defense data to the appropriate Air Force land-based communications relay center (McChord, Hamilton, or Norton Air Force Base) for retransmission to the proper manual Direction Center. Normally, all Air Defense data transmitted by a Picket Ship will be developed on that particular ship. However, as indicated by the channel requirements described in Par. 2a above, each Picket Ship will be capable of retransmitting to the communications relay center a summary of the Air Defense data cross told to it by adjacent Picket Ships or AEW&C Aircraft.

c. On the East Coast, Picket Ships will transmit Air Defense data directly to the direction center with which they operate. Since Picket Ships operating off of the East Coast will have the same communications capability as those operating off of the West Coast, they will also be provided the same degree of operational flexibility and quantity of back-up facilities. This method of operation can be used in manual as well as in the emergency back-up for SAGE.

3. SAGE Operation.

a. All Air Defense data derived from Picket Ships operating off of the West Coast will be transmitted

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to a land-based communications center and automatically retransmitted to the computer direction center. Picket Ships operating off of the East Coast will transmit all Air Defense data directly to the computer direction center. Picket Ships operating off of both coasts during this era are expected to be using radio teletype and long range communications techniques. Operational flexibility and alternate routing will be provided by the communications facilities of adjacent elements.

b. AEW&C Aircraft operating off of the West Coast will be operating within line of sight of adjacent Picket Ships, AEW&C Aircraft and land-based Direction Centers. It also appears desirable to have each AEW&C Aircraft report directly to the appropriate Direction Center using line-of-sight communications. However, in the event of a communications failure, and to provide a desirable degree of operational flexibility, provisions must be available to transmit data by line-of-sight or non-line-of-sight communications to either a Picket Ship or land-based communications relay center for retransmission to the appropriate SAGE Direction Center.

c. AEW&C Aircraft operating off of the East Coast will report directly to the appropriate SAGE Direction Center. The aircraft manning the inner row of AEW&C stations will normally be within communications line-of-sight of the SAGE Direction Center with which they will operate. This

41

permits the use of video transmission equipment; however, these aircraft should have the capability of using non-line-of-sight communications when necessary. If the equipment necessary to provide the video transmission capability is not available or operating, AEW&C Aircraft operating in the inner row will report (by RTTY) direct to the SAGE Direction Center. Aircraft manning the outer row of AEW&C stations will use non-line-of-sight communications and report manual inputs directly to the SAGE Direction Center with which they operate. All AEW&C Aircraft will be capable of transmitting Air Defense data to an adjacent Picket Ship for retransmission to the appropriate SAGE Direction Center. AEW&C Aircraft operating in the vicinity of the Texas Towers may relay data to the Tower for automatic retransmission to the proper SAGE Direction Center.

d. The above method of operation will be followed during all SAGE operations except during periods of alternate communication routings for back-up and during periods when the inner row of AEW&C Aircraft must fly at altitudes precluding line-of-sight operation.

e. Off of the West Coast, AEW&C Aircraft will report to a land-based prime radar station where data will be automatically relayed to the proper SAGE Direction Center. When necessary, AEW&C Aircraft will use long range communications and report information to the communications relay center.

f. Interceptor instructions will be generated at the SAGE Direction Center and relayed to the interceptor through either the Texas Towers, AEW&C Aircraft, or the Picket Ships or any combination thereof.

4. Texas Towers.

a. Each of the five Texas Towers operating off the East Coast will require the following communications channels in the manual Air Defense system:

(1) One voice channel-controller to controller.

(2) Two voice telling channels.

(3) Three voice command, control and administration.

(4) One teletype command, control and administration.

(5) One voice toll station.

(6) Two air-ground-air AEW&C to shore automatic relay (voice channel).

(7) Six voice channel spares.

(8) One voice channel cross control to each adjacent.

(9) One voice channel telling to each Texas Tower.

42

b. Each Texas Tower operating in the SAGE system will require the following communications channels:

(1) Two data channels - telling.

(2) Two voice toll station channels.

(3) One data channel for height servo.

(4) One teletype operations channel.

(5) One voice operations channel.

(6) One voice toll terminal channel.

(7) One voice telling liaison channel.

(8) One voice air surveillance channel.

(9) Two data channels - data link.

(10) One data link voice channel.

(11) Twenty-two ground/air voice channels.

(12) Twenty-two ground/air radio keying channels.

(13) Two data channels - AEW&C.

(14) Eight voice Navy channels.

(15) One voice cross telling channel to each adjacent Texas Tower or ADDC.

(16) One voice control channel to each adjacent Texas Tower or ADDC.

(17) One UHF relay from Texas Towers to shore.

59

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SECTION VIII

PLANNING PROGRAM

1. The following programmed elements and forces were used in developing this plan.

a. Texas Towers

(1)	Cashes Ledge	TT-1	Sept 56
(2)	Georges Shoal	TT-2	Sept 55
(3)	Nantucket Shoal	TT-3	Sept 56
(4)	Unnamed Shoal	TT-4	Sept 56
(5)	Brown's Bank	TT-5	Sept 56

b. Picket Ships

(1)	East Coast	5 Stations	July 55
(2)	West Coast	5 Stations	July 56
		7 Stations	July 57

c. AEW&C Aircraft

(1)	McClellan	27 Aircraft by July 56
(2)	Otis	33 Aircraft by July 56
(3)	Norton	10 Aircraft by July 56
(4)	Mc Chord	15 Aircraft by July 56
(5)	Seymour-	11 Aircraft by July 56
	Johnson	26 Aircraft by July 57
		31 Aircraft by July 58

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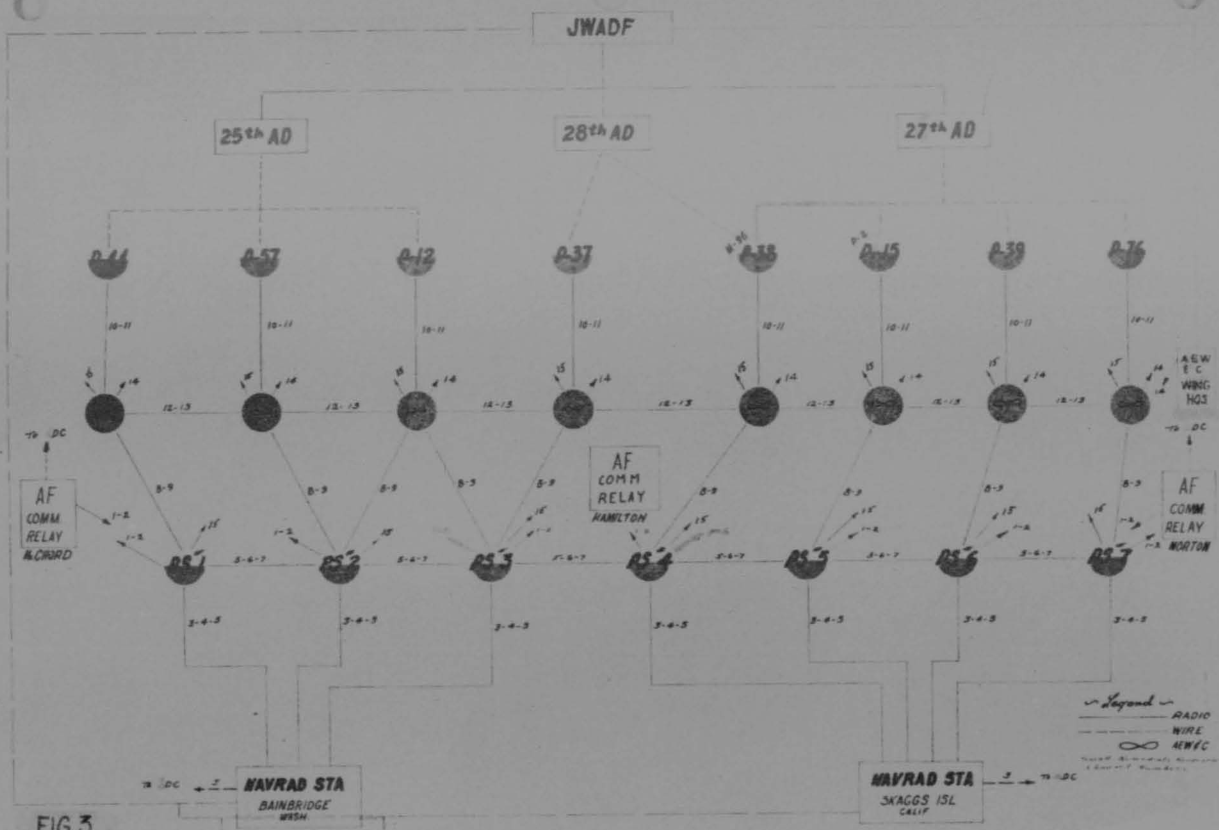

FIG. 3

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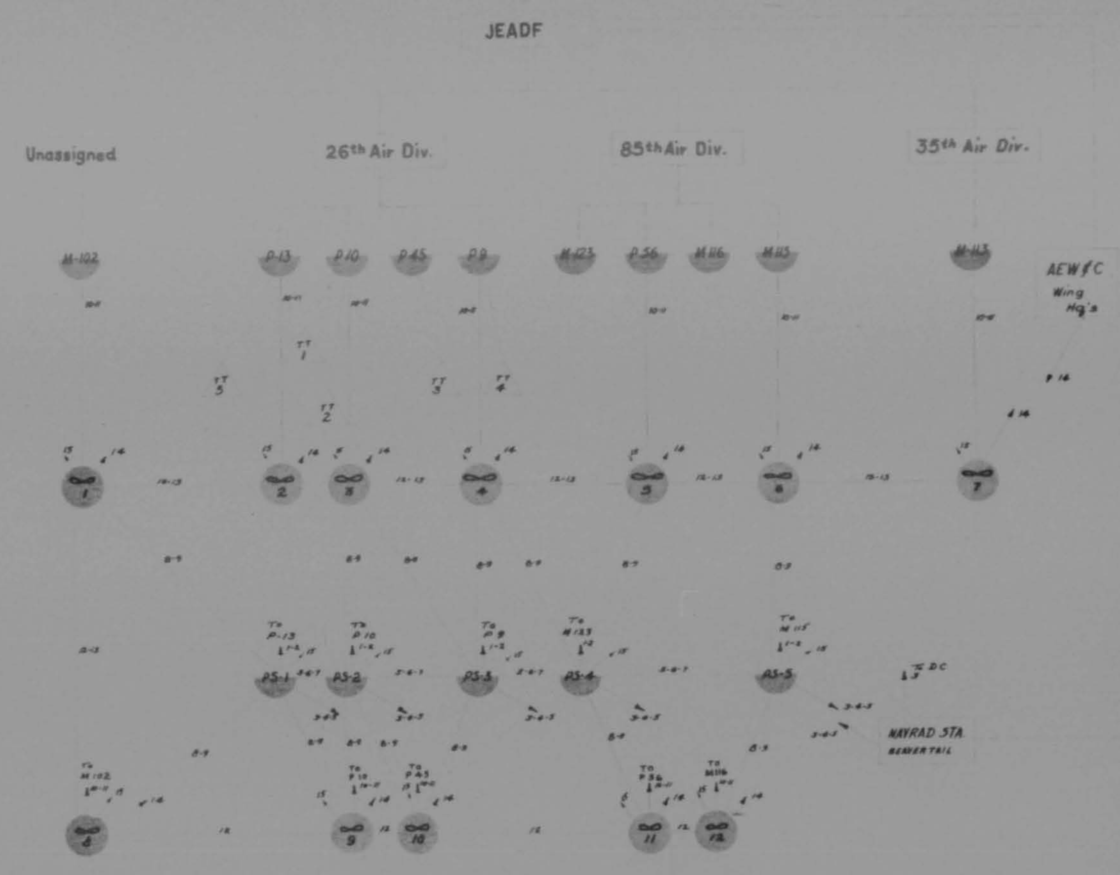

FIG. 4

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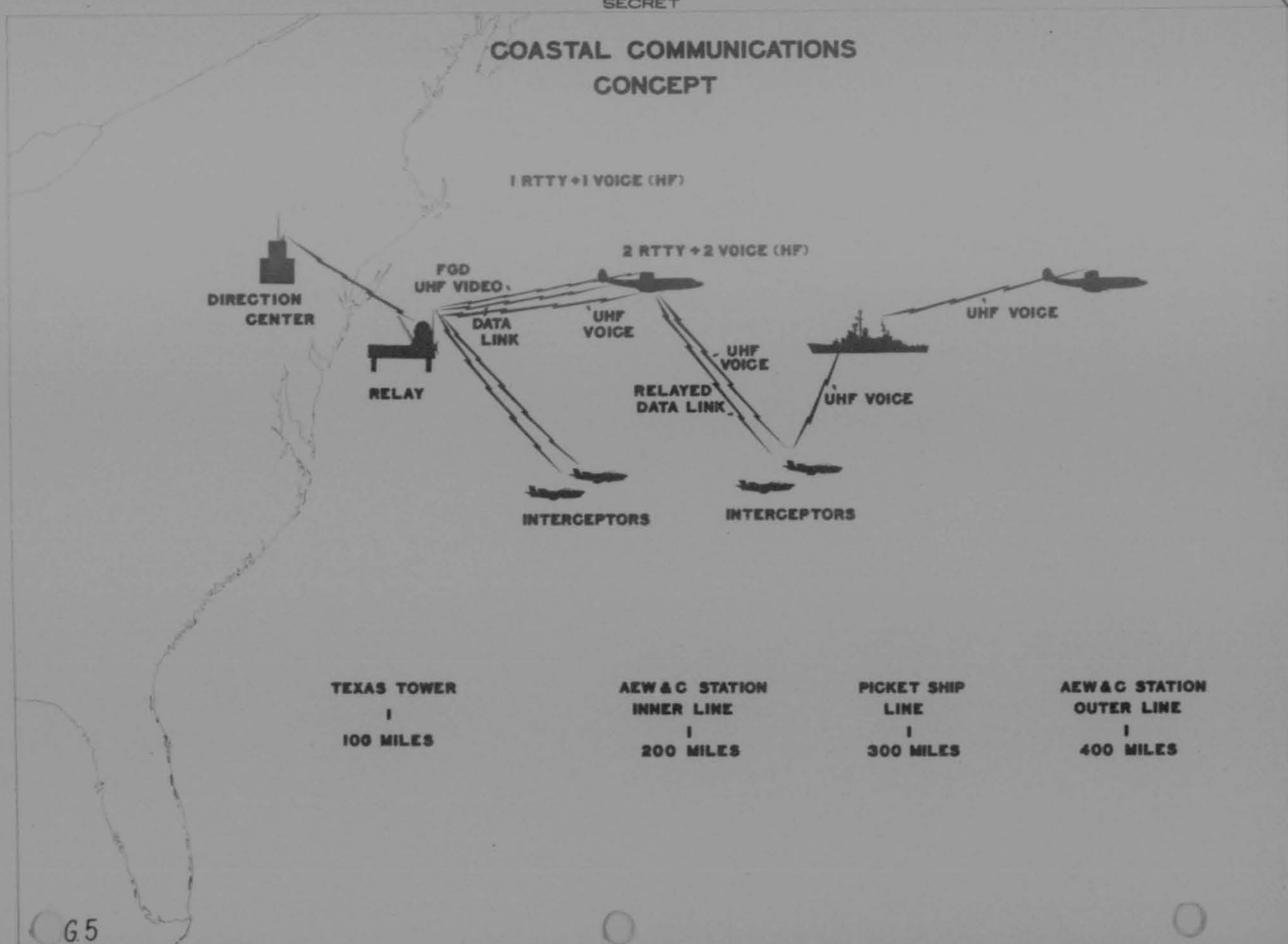

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MANUAL COMMUNICATIONS

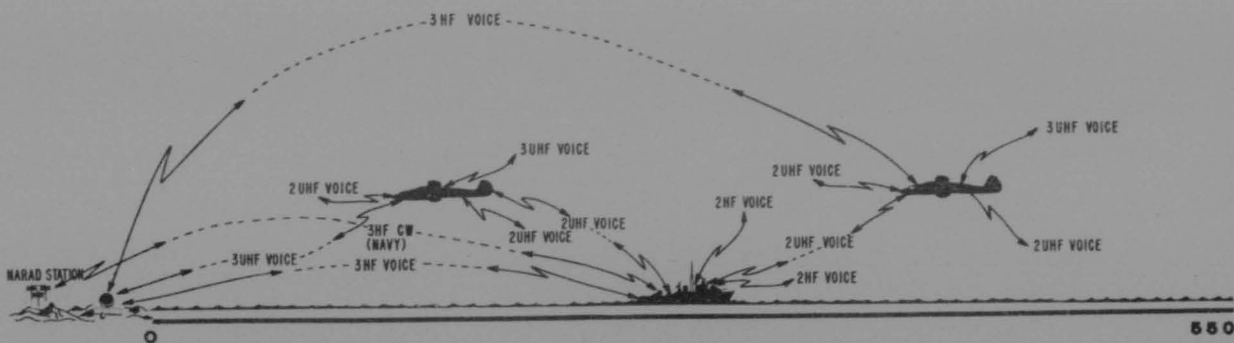

FIG. 6

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13 May 1955

From: Hq USAF, Washington, D. C.

To: CinCONAD, Ent AFB, Colo.

(SECRET) From AFOOP-OP-D 53564. This message in VI parts. Part I. References: (A) Our message AFOAC-S/O 52279, 11 Oct 54. (b) CNO letter dated 17 Jan 55, subject: "Navy Communication Plans to Support the Contiguous Radar Coverage - Early Warning System, Continental Air Defense." (C) Our message AFOAC-S/O 58100, 24 Feb 55. (D) Your message ADOCE-AL 0803, 1 Mar 55. (E) Conference this headquarters 26/27 April 1955. Part II. References A and B, above, requested that Headquarters, Air Defense Command submit an operational plan for the seaward extension of contiguous radar system. To date, this headquarters has received three separate plans covering Texas Towers, Picket Vessels, and Airborne Early Warning and Control. Part III. Considerable difficulty has been experienced in reviewing and commenting upon references B, above in view of the fact that the overall plan for contiguous radar system had not been submitted. This difficulty was again encountered when the frequency assignment problem was discussed during the conference reference E, above. Part IV. Your message reference D, above concurred in CNO plan with the exception of teletype circuits to force level. Recent memorandum from this hqs to CNO agreed in general to this plan with the following exceptions: (1) Parallel telling Circuit No. 6 was considered a duplication of direct circuits from PV's to DC's ; (2) Prop sed concept of operation for Circuit No. 11 by-passes the ADCC's. It was recommended that the Navy communications planning be changed to conform to established Air Force SOP's for processing the flow of air surveillance information. Further, that the Air Force saw no requirement for duplicating aerial plotting facilities

0568

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90

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AFOOP-OP-D 53564. (Contd) at Naval installations which was indicative of the plan at Jamestown, Rhode Island and Skaggs Island, California. Part V. With the impetus given to the assignment on frequencies to support the contiguous radar facilities, a high-level JCEC. AD-HOC Group has been established to consider frequency requirements. This group is unable to validate the quantitative frequency requirement without a complete operational plan and V Associated Communications Annex. Part VI. The next meeting of the JCEC AD-HOC Group is 1000 hours, 24 May55. An agenda of the Operational and Communication Plan for the Seaward Extension of contiguous radar cover. Therefore, it is desired that your headquarters prepare necessary plan for this presentation. Due cognizance will be taken of this headquarters comments to the Navy plan as outlined in Part IV. This headquarters desires a preliminary Air Force briefing at 1330 hours, 23 May 55, Room BD927.

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36

23 June 1955

SUBJECT: (Unclassified) CONAD Operational Plan for Seaward Extension of the Air Defense Combat Zone

TO: Chief of Staff
as Executive Agent for JCS
Headquarters USAF
Washington 25, D. C.

1. In response to your message (SECRET) AFOOP-OP-D 53564, dated 13 May 55, 25 copies of the "CONAD Operational Plan for Seaward Extension of the Air Defense Combat Zone" (Inclosure 1), are forwarded for your review and comment. This plan was developed for the purpose of integrating the Picket Ships, Texas Towers and AEW&C Aircraft into the Air Defense Combat Zone and, particularly, to determine the communications necessary for this purpose. This plan is not in sufficient detail to permit its use as a detailed guide for personnel planning, logistic planning, funding, etc.

2. Inclosure 2 to this correspondence lists the CONAD recommendations concerning the frequencies necessary to support the channel requirements as described in Section VII of the attached Operational Plan.

3. The 1958-1960 redeployment of one programmed picket ship station from the East Coast to the West Coast results in seven stations off the West Coast and five off the East Coast. Although this is the same number of stations as programmed by the United States Navy, the redeployment may result in an increase of one Picket Ship for proper support of the programmed stations.

/s/t/ S. R. MICKELSEN
Lt General, USA
Commander-In-Chief

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From: Comdr ADC 25 Jan 1955

To: CofS, Hq USAF, Wash. D.C.

Info: Comdr EADF, Stewart AFB, Newburgh, N.Y.
Comdr RAFD, Griffiss AFB, Rome N.Y.
Comdr MAAMA, Olmsted AFB, Middletown, Pa.
Comdr, 8th Air Div, McClellan AFB, Calif.

(SECRET) ADOCE-CR 0087. Ref AEW&C and PV RAD COMM STAS EADF area. (1) Due lowered wire circuitry cost and better OPR EFFCY, decision reached to install above COMM STAS at LOC SAGE DC's in sub-sectors 1,2,3, and 4. SS #2, 3, and 4 will handle one AEW&C and one PV. SS #1 will handle one AEW&C and 2 PV's. 2 AN/FRT-15's and compatible REC EQP W/B programmed by this hq for COMM to each PV or AEW&C. One ADD set of EQP W/B programmed each STA as backup. (2) In period before SAGE, 400-600W HF XMTRS and compatible RCVRS W/B LOC AC&W sites for COMM with PV and AEW&C. P-10, P-13, P-54 and P-56 will COMM with one PV and one AEW&C. P-45 will COMM with one PV. As interim measure, HF EQP instld at above STAS for use ADC EMERG RAD CKTS W/B used for PV and AEW&C COMM. ADD HF EQP W/B programmed by this hq for permanent pre-SAGE use. After SAGE SYS implemented, above AC&W sites will retain HF EQP for manual OPR at AC&W sites. (3) CRT RQR to PV's reduced from 3 to 2. Therefore circuitry to both AEW&C and PV now 2 per STA. (4) ADD details pertaining this change W/B explained by personnel this hq at Hq USAF SAGE COMM RQR CONF being held 27 Jan 55.

MEMO FOR RECORD: It was decided last Friday to change physical location of AEW&C and PV Comm. Stations because of reasons noted in msg above. This will require numerous PC changes. PC changes will be submitted after completion of Hq USAF SAGE Communications Requirements Conference, 27 Jan 55. We have sufficient equipment at the AC&W sites noted in msg to provide interim communications as required.

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38

From: Comdr ADC 18 Mar 1955

To: Comdr EADF, Stewart AFB, Newburgh, N.Y.

(SECRET) ADOCE-CR 0047 URMSG EAOCE-CR-C-343. This hq programing fol nr 99A's compatible RCVRS and antennas for AEW&C/PV COMM. Total NR RQR below INDC NR RQR in ADD to 2 units being retained each STA for EMERG P/P COMM: P-13, 4; P-10, 4; P-45, 2; P-54, 3; P-56, 4. Contrary to previous INFO released by this HQ, 3 CKTS W/B programed to PV's. 99A's for en route purposes P-10 and P-56 not favorably considered.

MEMO FOR RECORD: This number equipments required EADF for PV/AEW&C communications East Coast for interim stations and ultimate SAGE backup - Sufficient equipment now installed for communications with PV/AEW&C until equipment noted in message installed.

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39

HEADQUARTERS
AIR DEFENSE COMMAND
Ent Air Force Base
Colorado Springs, Colorado

ADOMO 22 Mar 1955

SUBJECT: Manpower for Maintenance Function of Ground Radio Stations AEW&Con and Picket Vessels Program

TO: Director of Manpower and Organization
Headquarters United States Air Force
Washington 25, D. C.

1. Reference is made to:

a. Operation Plan for Picket Vessels (SECRET), dated 15 June 1954.

b. Operation Plan Extensions to Seaward of Contiguous Radar Coverage (AEW&Con) (SECRET), dated 10 March 1954.

2. The ADC Operational Plan referred to in 1a and 1b above, requires the utilization of high frequency radio communications between AEW&Con aircraft, Picket Vessels and ground stations. Voice communications are planned in the interest of speed when atmospheric conditions permit. Under some conditions, however, it will be necessary that radio-telegraph (CW) be employed for reliability because required low altitude operation of aircraft precludes the use of UHF communications equipment. This letter pertains to the maintenance and operations personnel spaces required to maintain and operate the (50 AN/FRT-15 Transmitters, 138 Receivers) HF communications equipment.

3. Originally four (4) ground HF radio stations were programmed, two (2) on each coast, with one in each defense sector to fulfill the voice communications requirements between AEW&Con aircraft, picket vessels and ground stations. Subsequently, three (3) ground HF radio stations were programmed for the West Coast and two (2) for the East Coast. The manpower and base utilization portion of the ADC Program, dated July 1954, reflected the latter concept; however, plans approved recently call for five (5) ground HF radio stations to be utilized on the East Coast, and three (3) on the West Coast. The locations of these ground stations are as follows:

EAST COAST	WEST COAST
Brunswick NAS, Maine	Norton AFB, California
North Truro, AFS, Mass.	Hamilton AFB, California
Montauk AFS, N.Y.	McChord AFB, Washington
Palermo AFS, N.J.	
Cape Charles AFS, Va.	

ADOMO, subj: Manpower for Maintenance Function of Ground Radio Stations AEW&Con and Picket Vessels Program

4. The aircraft delivery schedule of AEW&Con aircraft indicates that by October 1955, Eastern Air Defense Force will have received their full complement of aircraft and by April of 1955 will have "on station" five (5) picket vessels. As the 24-hour "on station" operation of both aircraft and picket vessels becomes a reality, the entire HF net must be manned, equipped and capable of a 24-hour day operation, therefore, additional radio maintenance and operations personnel will be required on the East Coast not later than October 1955.

5. Picket vessels for the West Coast will be available and "on station" by July of 1955 and a full complement of AEW&Con aircraft will be available to provide a 24-hour day "on station" operation by December 1955. Therefore, the entire HF net for the West Coast should be manned, equipped, and capable of a 24-hour day operation not later than November 1955. (however, partial operation (80%) will be required prior to November).

6. For the two coastal defense forces, the 50 AN/FRT-15 transmitters and 138 Receivers (single, dual, and triple diversity) will be utilized to provide the communications circuits to the AEW&Con aircraft and picket vessels from the Air Defense Direction/Control Center. However, current ADC operations directives require the use of available radio communications equipment, regardless of status of FRT-15 equipment.

7. A break-down of the anticipated equipment by appropriate defense force is as follows:

	EADF			WADF	
LOCATION	TRANSMITTERS	RECEIVERS	LOCATION	TRANSMITTERS	RECEIVERS
Brunswick	5	14	Norton	8	23
Montauk	5	13	Hamilton	9	23
North Truro	5	14	McChord	8	23
Cape Charles	5	14			
Palermo	5	14			
TOTALS	25	69		25	69

8. As can be noted, paragraph 6, the workload equivalent for each coast is 94 pieces of radio communications equipment. Some of the details of the maintenance functions required are as follows:

a. Required to perform daily and weekly performance checks, consisting of cleaning, tube checking, testing and alignment to insure proper operation.

0574

b. Monthly or less often preventive maintenance. Consisting of mechanical maintenance such as cleaning of filters, lubrication and detailed adjustments which insure that equipment does not fail during a tactical period.

c. In addition to above, it is pointed out that in all probability the receivers and transmitters will be located in different buildings which will add to the workload.

9. Due to lack of operating experience and firm commitments of dates of operational availability of radio equipment this request constitutes an interim solution only. Readjustments and/or increases may be required at a later date.

10. Based on the above data and in order to provide a 24-hour per day, 7 day per week radio maintenance capability, the troop spaces indicated below are considered the minimum required. Request that the PAV for ADC be increased by 63 airman troop spaces. Details are as follows:

For October 1955 reporting for the 5 EADF Ground Stations

EASTERN AIR DEFENSE FORCE

LOCATION	TRANSMITTER	RECEIVER	AIRMAN SPACES	TITLE	AFSC	GRADE
Brunswick	5	14	2	Apr Gnd Radio Rpm	30430	A/2C
			2	Gnd Radio Rpm	30450	S Sgt
			2	Gnd Radio Rpm	30450	A/1C
			1	Gnd Radio Maint Tech	30470	T Sgt
Montauk	5	13	1	Apr Gnd Radio Rpm	30430	A/2C
			1	Gnd Radio Rpm	30450	A/1C
			1	Gnd Radio Rpm	30450	S Sgt
			1	Gnd Radio Maint Tech	30470m	T Sgt
North Truro	5	14	2	Apr Gnd Radio Rpm	30430	A/2C
			3	Gnd Radio Rpm	30450	A/1C
			2	Gnd Radio Rpm	30450	S Sgt
			1	Gnd Radio Maint Tech	30470	T Sgt
Cape Charles	5	14	2	Apr Gnd Radio Rpm	30430	A/2C
			3	Gnd Radio Rpm	30450	A/1C
			2	Gnd Radio Rpm	30450	S Sgt
			1	Gnd Radio Maint Tech	30470	T Sgt

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ADOMO, subj: Manpower for Maintenance Function of Ground Radio Stations AEW&Con and Picket Vessels Program

LOCATION	TRANSMITTER	RECEIVER	AIRMAN SPACES	TITLE	AFSC	GRADE
Palermo	5	14	2	Apr Gnd Radio Rpm	30430	A/2C
			2	Gnd Radio Rpm	30450	A/1C
			1	Gnd Radio Rpm	30450	S Sgt
			1	Gnd Radio Maint Tech	30470	T Sgt
TOTALS	25	69	33			

For November 1955 reporting for the three (3) WADF Ground Stations:

WESTERN AIR DEFENSE FORCE

LOCATION	TRANSMITTER	RECEIVER	SPACES	TITLE	AFSC	GRADE
Norton	8	23	2	Gnd Radio Maint Tech	30470	T Sgt
			4	Gnd Radio Rpm	30450	S Sgt
			4	Gnd Radio Rpm	30450	A/1C
Hamilton	9	23	2	Gnd Radio Maint Tech	30470	T Sgt
			4	Gnd Radio Rpm	30450	S Sgt
			4	Gnd Radio Rpm	30450	A/1C
McChord	8	23	2	Gnd Radio Maint Tech	30470	T Sgt
			4	Gnd Radio Rpm	30450	S Sgt
TOTALS	25	69	30			

NOTE: Western Air Defense Force will not require radio operator type (29 Career Field) troop spaces asthis phase of communications will be provided from WADF manpower resources.

SUMMARY OF GRADES:

T Sgt	11
S Sgt	20
A/1C	23
A/2C	9
TOTAL	63 Airmen

FOR THE COMMANDER:

/s/t/ W. J. BIRMELE
Lt Col, USAF
Asst Comd Adj

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Bs Ltr fr Air Defense Command, Ent AFB, Colorado Springs, Colo., dtd 22 Mar 55
Subj: Manpower for Maintenance Function of Ground Radio Stations AEW&Con and Picket Vessels Program

AFOMO-O-3 1st Ind 4 May 1955

Department of the Air Force, Hq USAF, Washington 25, D. C.

TO: Commander, Air Defense Command, Ent AFB, Colorado Springs, Colorado

1. The requirement for manpower to maintain additional shore-based radio equipment associated with AEW&Con and Picket Vessels Programs is recognized. However, there are several points requiring clarification:

a. Reference paragraph 4 of basic - information is required as to the point in time that the AEW&Con Aircraft commences training operations at sea. It is this phase of AEW&Con operation which generates manpower requirements for radio personnel at the shore-based radio stations, not the delivery date of aircraft.

b. Paragraph 2 of basic discusses radio operators, and the note to paragraph 10 implies that EADF will require radio operators. However, paragraph 10 lists AFSC 304--(maintenance) career field only. Clarification is required.

c. It is noted in paragraph 10 that there are variations in the number of troop spaces requested for different locations having exactly the same amount of radio equipment. An explanation of these variations is required.

2. To enable Hq USAF to perperly evaluate your request, it is desired that an explanation of the questions raised in paragraph 1 above, be furnished, and that this requirement, as well as other future requirements, be submitted on AF Form 1282 (MARC) - reference, AFR 26-3, 2 February 1955.

BY ORDER OF THE CHIEF OF STAFF:

/s/t/ ALBERT H. BETHUNE
Colonel, USAF
Deputy Chief, Organization Div.
D/Manpower & Organization, DCS/O

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10 Aug 1955

ADOCE-CR

SUBJECT: (Uncl) AEW&C Aircraft Communicati ns

TO: Director of Requirements
Headquarters USAF
Washington 25, D. C.

1. References:

a. CONAD Operational Plan for Seaward Extension of the Air Defense Combat Zone, dated 20 June 1955. Twenty (20) copies of this plan were forwarded to your headquarters.

b. Headquarters USAF Letter, GOR No. 97(AD-3f), subject: "(Uncl) General Operational Requirement for Continental Airborne Early Warning and Control Support System," dated 10 June 1955.

c. GOR No. 9 CE-2a-62, subject: "GOR Communications Support System," dated 10 February 1955.

2. In addition to the requirements outlined in paragraph IVS2 of reference 1b above, a requirement during the SAGE era will exist for:

a. A reliable radio teletype system with adequate range capability from AEW&C aircraft to SAGE direction centers.

b. An airborne automatic simplex UHF relay in the AEW&C aircraft for voice communications between shore stations and interceptor aircraft.

3. It is necessary that this headquarters initiate appropriate communications programming action on the above equipments. It is requested that we be provided with information on existing equipment that will meet the above requirements so that this action can be taken.

4. If development is required, it is requested that development and procurement action be taken so that equipment can be installed and operational by August 1957.

FOR THE COMMANDER:

MEMO FOR RECORD: This action required so that the comm requirements for SAGE will be met.

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41

From: Comdr ADC 11 July 1955

To: CofS, Hq USAF, Washington, D.C.

(CONFIDENTIAL) ADOCE-CR 3474. For DIR COMM. REQ permission to use FOL FREQs ASG this COMD, 1.1F1 point/point backup EADF area for 6A3 COMM to picket vessels off shore EADF: Two four seven eight, two five on eight, two seven seven eight, two seven nine eight, two nine four zero, three three one one, four four one seven PT five, four five three five, four six four eight PT five, four seven seven two PT five, four eight five five, and four nine eight seven PT five KCS. Further REQ permission to use all 6A3 FREQ ASG in block form 26th and 32nd AD's for COMM to PV and AEW&C units offshore EADF. Power REQ all FREQs 500 watts. All FREQs will be used on NIB to other SVCs.

MEMO FOR RECORD: USAF has informally given us clearance to use about half of the 1.1F1 frequencies for PV communications. They have requested we come in with this message on the subject and attempts will be made to obtain permission to use all of 1.1F1 frequencies for 6A3 comm's. USAF has informally indicated they will allow us to use the 6A3 frequencies assigned in block form to the 26th and 32nd AD's for comm's for PV and AEW&C units. This message will officially request the above authorization.

ROBERT E. PALMER
Major, USAF
Asst Comd Adj

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42

COMMANDER NAVAL FORCES
CONTINENTAL AIR DEFENSE COMMAND
Ent Air Force Base
Colorado Springs, Colorado

Jan 13, 1955

From: Commander Naval Forces, Continental Air Defense Command
Commander in Chief, Continental Air Defense Command

Subj: CW back-up circuit for contiguous picket to direction center telling circuit.

Ref: (a) CINCONAD Operation Plan for Picket Vessels, date not yet specified

(b) ADOCE-C ltr to Commander Eastern Air Defense Force, subj: Operations Plan for Picket Vessel and AEW&C Communications

1. Reference (a) states that "in order to utilize the radar intelligence received by the Picket Vessel's radar, radio communications circuits must be provided which will be highly reliable". It further states that high frequency voice circuits is the only means available at this time to meet the communications requirement. Reference (b) states that a "CW capability will be required for alternate or emergency use in the event of unsatisfactory voice communications".

2. Experience gained thus far in picket to shore communications indicates that high frequency voice circuits have not yet been developed to the point where they are completely reliable. A CW back-up is considered necessary to provide vital information during periods when atmospheric and other interference prevents reliable voice communications. Naval plans include provision for these back-up, or paralleling circuits, through a Naval shore radio radio station with direct teletype communications to the Direction Centers and other Air Defense Command installations.

3. While such communications are inherently slower than direct voice radio, delays can be reduced to the point where information thus transmitted will be of value.

4. Experience in contiguous picket operations thus far has not confirmed the requirement for 3 HF voice telling and control circuits. It is believed that two circuits will satisfy the requirements of the system. In view of the importance of CW parallel circuits, it is requested that frequency allocation plans make provision for one circuit for each picket station in lieu of one of the three voice circuits now planned.

A. K. MOREHOUSE

/t/s/ D. J. SULLIVAN
By direction

0530

CONAD Naval Forces FF5-20:N5 Ser 04-55 Subj: CW Back-up Circuit for Contiguous Picket to Direction Center Telling Circuit

CONADOCE-CR (13 Jan 55) 1st Ind 18 Feb 1955

HQ CONTINENTAL AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colorado

TO: Commander Naval Forces, Continental Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado

1. The requirement for three HF voice circuits to each Picket Vessel is firm and is considered the minimum number of voice circuits required to support the Air Defense mission.

2. Reference paragraph 2. This headquarters concurs in the requirement for CW parallel telling circuits as outlined in inclosure No. 2 to CNO letter Ser 002127P30, dated 24 January 1955: Action will be taken to request frequencies for operation of subject circuits.

FOR THE COMMANDER IN CHIEF:

/s/t/ C. F. HUMPHREYS
Captain, USAF
Asst Command Adj

MEMO FOR RECORD: Because there has never been a full scale exercise employing large numbers of aircraft against picket vessels, it is not believed that a firm requirement of only 2 HF voice circuits can be established. Use of the one circuits for CW from the PV to Beavertail (Navy Station) will insure communications in the event of unsatisfactory voice operation.

37

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43

From: COMNAVFORCONAD

To: CINCONAD (courier)

23 Jun 55

(CONFIDENTIAL) NAV 0083. Following received from COMNAVEASTCONAD. "COMEASTSEAFRON Informs that Picket Ships will be available to man five stations commencing about 5 July. Past experience indicates that extreme communication difficulties and unacceptable lowered standard of performance may be experienced unless frequencies mentioned my oplan 1-55 Appendix one to Annex A circuits two, three, four, six, and 10 are made available by USAF. In view of the above recommended manning three stations using best available frequencies and two stations on a modified or training basis with continued manning of five stations if difficulties are not encountered or until such time as frequencies are made available. COMEASTSEAFRON and COMDESLANT are requested to comment." Manning of five stations required by NBDP 1-55. Request action be taken to obtain necessary frequencies. COMNAVEASTCONAD being so advised.

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38

From: CINCONAD

To: COMNAVFORCONAD (Courier)

(UNCLASSIFIED) ADOCE-CR_______________. Reference your message NAV 0083 dated 23 June 55; action taken to obtain necessary frequencies is contained in our message ADOCE-CR 50197, dated 30 June 55, to Commander, JEADF with info to your headquarters.

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5 Jul 55 44

From: Comdr ADC, Ent AFB, Colo. Springs, Colo.

To: JWADF, Hamilton AFB, Calif

SECRET/ADOPR 3437 . Reference teleconference on 14 Jun btwn Col Claassen, Comdr Ustick and Maj Mc Kay, your Hq, and Lt Col C. S. Glenn this Hq. Your item one (1) proposing equal amt of contiguous radar coverage on the East and West Coasts is not in consonance with ADC plcy. The preponderance of targets on and near the East Coast rqr that a greater nr of weapons be deployed there to defend the most critical Northeast heartland against the expected greater percentage of the enemy's atk. This in turn rqr a greater depth of radar coverage in order to eff use the deployed weapons The priority of the Northeastern tgt complex is such that this area must first be well defended within the capability of programmed forces aval. It would be desirable to have add coverage off the West Coast, but this add coverage is not feasible during the near future because of the non-availability of forces. Your item two (2) that pertains to positioning of Picket Ships and AEW&C Acft. The Air Def activities envisioned for the combat zone over the seaward approaches necessitates all-alt radar coverage. We are not proposing gaps as your teleconference indc. The radar capabilities on proposed eqp for the seaward extension of the combat zone indc at this time that proper deployment of the elm is for Picket Ships to provide the high-alt radar coverage

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and AEW&C Acft to provide the low-alt coverage. Our posit is simply stated as an all-alt radar coverage to meet the all-alt threat. This does not mean that elm of the seaward extension to the land-based sys may not be redeployed to provide max flex under varying cond. This is a matter to be determined btwn Commander in Chief CONAD and the Joint Defense Force Commander as appn. A CONAD operational plan incorporating the above concepts for employment has been appr by Commander CONAD and is being fwd to Hq USAF. Copies of the compl plan will be fwd your Hq. Reference your item three (3) pertaining to scramble of AEW&C Acft. The concept of scrambling AEW&C Acft to man some sta off the West Coast is mandatory at this time for planning purposes because there are insufficient programmed acft to man all stations on a continuous basis. This concept is also partially based upon the assumption that when the DEW Line is instl, it will provide reliable wng. However, experience only will dictate whether we must mod this concept, and add forces will be considered in CONAD 55-65 rqr plan to man all sta cont. Sgd F. Smith,

Comdr ADC

MEMO FOR RECORD: Subsequent to CONAD conference on 1 and 2 Jun 55, called for the purpose of developing a CONAD operational plan for the seaward extension of the combat zone, JWADF representatives briefed General Todd on the results of the conference. As indicated in the proposed message and in the attached record of the teleconference, General Todd was not satisfied with some CONAD basic fundamentals and concepts inherent in the seaward extension program. On 17 Jun 55, the operational plan was presented to, and approved by, the CONAD Command Council.

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WADF/Telecon 4/55. Started at 14 Jun 55
Classification: SECRET
Subject: Seaward Extension Concept

WADF Item Number One (SECRET)

In briefing General Todd regarding the Operational Plan for the Seaward Extension of the Air Defense Combat Zone, he raised certain exceptions. In order to completely evaluate the proposed concept, it is essential that certain questions be resolved. 1. Why is the contiguous coverage of the Combat Zone of the West Coast less than the East Coast? ADR 54-60 was consulted for the answer, however, the factors listed that were used in establishing the zones seemed to apply equally to substantiate the same coverage requirement for both coasts.

WADF Item Number Two (SECRET)

Commander, WADF feels that AEW&Con aircraft should be positioned outboard of Picket Vessel Line for the following reasons: A. HF communication from AEW&C aircraft to shore is required regardless of positioning of AEW&C aircraft inboard or outboard of Picket Vessel Line. B. Air battle will be initiated in the approximate area of the inboard line and Picket Vessel can provide a more stable intercept and control platform. C. Reversal of Lines will not produce additional low altitude gaps over that proposed by CONAD.

WADF item Number Three (SECRET)

The scramble of AEW&C aircraft appears to be premature at this time, and to provide the required radar coverage outlined, it is essential to have AEW&C aircraft on station 24 hours per day. Using the alloted

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number of AEW&C aircraft it seems desirable to man six stations, 24 hours per day and two stations under emergency. Request comments.

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45

HEADQUARTERS
8TH AIR DIVISION (AEW&C)
McClellan Air Force Base
McClellan, California

8DOPR 11 May 1955

SUBJECT: Proposal to Activate the 966th AEW&C Squadron
at McClellan Air Force Base

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. Reference is made to your message, ADHVC 2010, dated 23 April 1955 requesting submission of justification to activate subject squadron at McClellan AFB.

2. Inclosure 1 to this letter contains the requested justification data. The program at Otis AFB is now behind schedule. The mission objective of that Wing for March 1956 is already in jeopardy and if that organization is taxed with the activation, training, support and facility requirements which will arise by activation of another squadron, it cannot be expected that the Wing will be able to carry out its mission between now and March.

3. It is recommended that action be taken to activate the 966th Airborne Early Warning and Control Squadron at McClellan AFB and that it remain at that location until such time as the Seymour-Johnson facility possesses an in being capability to support the squadron's operations.

1 Incl
Justification Data (SECRET)

/s/t/ KENNETH H. GIBSON
Brigadier General, USAF
Commander

SECRET

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SECRET

551ST AEW&C WING

OBJECTIVE -- STATUS -- CAPABILITIES

OBJECTIVE

Operational Readiness -- March 1956.

Includes:

1. Personnel at 100% of authorizations
2. Seventy-five trained aircrews.
3. Aircraft maintenance capability to generate 5000 hours per month.
4. Electronics maintenance capability to provide effective radar performance for Airborne Operations Centers at 4100 hours per month.

STATUS

1. Total flying hour capability for May - 650 hours
2. Total radar capability for May - 130 hours
3. Trained aircrews - 10
4. Support factors -
   a. Nose docks - None at present - First dock will be in place 15 June 1955.
   b. Runway - Resurfacing not complete until 1 September 1955.
   c. Transportation - Acknowledged by ADC but not forthcoming in near future because they are not available by type or quantity to the ADC/AF inventory.
   d. Supplies, aircraft - adequate.
   e. Electronics spares - unknown - Some relief expected by August 1955.
   f. Personnel Manning to T/O:

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3[illegible]% manned in officers.

31% manned in airmen.

g. Family Housing - In emergency status.

CAPABILITIES

1. Marginal for mission accomplishment.

2. Effect of 966th Activation at Otis

Places Training, maintenance and facility, requirement in excess of Wing and Base capabilities; specifically, in two areas:

a. Aircraft and Electronics Maintenance: Activation of the 966th AEW&C Squadron at Otis with no aircraft and electronics maintenance capability places the burden of support on the facilities of the 551st Wing. This occurs at a time when the maintenance resources of the Wing, involved in a large familiarization traning program, are taxed to the limit to maintain the weapon and the platform for 4-station, 24-hour operation. This condition would not be resolved by the early input of the TDA augmentation programmed for the 966th upon the move to Seymour-Johnson. This would impose a training load for OJT on the facilities of the 551st Wing which would exceed the maintenance capability.

b. Aircrew Training: Training of the twenty-five crews will place a workload on the operational capabilities of the 551st Wing. Instructor personnel will have to be withdrawn from the Wing to meet this training requirement. This will reduce the aircrew resource of the Wing at a time when the full effort of the Wing is required for the performance of the mission and still carry out a primary training operation.

Flying Hour Objectives by Month Required to Meet Readiness Objectives:

MONTH	TOTAL FLYING HOURS	RADAR HOURS
June	1375	1000
July	1820	1460
August	[illegible]	1550
September	2520	2000
October	2900	2350
November	3500	2925
December	4195	3250
January	4800	3550
February	4950	3950
March	5100	4100

Commander's Estimate of Situation:

Further delay in construction of facilities and in the absence of almost immediate relief to eliminate base support deficiencies, will make it impossible to meet operational readiness objectives. This estimate assumes there will be no further quantitative or qualitative slippages of personnel input to the command and that airframe and electronic supply support will be made available to meet mission requirements.

The November 1955 - March 1956 period is one of severe weather. During that time, the mission progress of the command must be devoted to its internal training operation. The weather pattern for the Otis

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area for this period is historically unfavorable. It cannot be expected that the command will conduct more than a minimum of transition type operations during this time. If the 56th training requirements are added, they will exceed the training capability of this organization.

Any diversion from primary mission effort must be accomplished by relief from March 1956 objectives.

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From: Comdr, ADC
To: CofS, USAF, Washington, D. C.
Info: Comdr, 8th Air Div (AEW&C)
Comdr, WADF, Hamilton AFB
Comdr, EADF, Stewart AFB

(CONFIDENTIAL) ADOOT-B1 3335 Urmsg AFOOP-OC-C 54802 8 Jun 55. This hq does not concur in the proposal to delay actv of 966th AEW&C Sq at Seymour-Johnson in Jun 56. Continuance of acft dlvr rqr supp and our pers; consequently, delay in actv would result in loss of auth for such pers. It is recm that 966th be actv at McClellan rather than Otis on 8 Nov 55. Adequate on-base housing will be avail for airmen at McClellan and adequate reasonably priced family housing is aval in Sacramento area. It is further recm that 966th remain at McClellan until such time that adequate fac are compl at Seymour-Johnson. It now appears that beneficial occupancy of Seymour-Johnson in Jun of 56 is questionable, and that family housing situation at Goldsboro will be even more critical than at Otis. If above proposal is appr by your hq, req nec changes be made to reflect same in the CPU and other appropriate programming docu,

M/R: The above ADC proposal is based on recommendations of 8th Air Div and ADC staff sections. Transfer of 966 from McClellan to Otis and thence to Seymour-Johnson is not considered acceptable due to dislocation allowances, critical housing situation at Otis, etc. Transfer date of 966 from McClellan to Seymour-Johnson should be established on or about Dec 55 and based on realistic estimate of fac compl at Seymour-Johnson.

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CONFIDENTIAL

From: Hq USAF, Washington, D. C.
To: Comdr, ADC, Ent AFB, Colo.

/C O N F I D E N T I A L/ From AFOCP-OC-C 54802. Lack of suf depn housing at Otis AFB is of concern to AF especially when this defiency will adversely affect welfare of AF pers and their depn. Desire ASAP comments and/or concurrence on proposal to act 966th AEW&C Sq at Seymour-Johnson AFB in June 56, lieu of 8 Nov 55 at Otis AFB and moving to Seymour-Johnson Jun 56. Full acft eqp for this unit not anticipated until 1/57. Following advantages would accrue (A) Eliminates moving unit PCS Otis to Seymour-Johnson; (B) Improved morale innot activating and moving a unit within 7 month period.

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46

Subject: 8th Air Division (AEW&Con) Proposal
To: DCS/M
DCS/P
(In Turn)
From: DCS/O
Date: 23 May 55
Comment No. 1

1. Inclosed for your information is a proposal received from 8th Air Division (AEW&Con) relative to activation of the 966th AEW&Con Squadron at McClellan rather than at Otis.

2. The inclosure to the letter contains justification data as prepared by the 8th Air Division (AEW&Con). From an operational and training viewpoint, the severe weather conditions encountered in the New England area during the fall and winter months will seriously hamper the effectiveness of training programs; consequently, I believe the activation at McClellan is an acceptable and desirable program change.

3. If your office has no objection to activation of the 966th at McClellan, please indicate your concurrence at the earliest practicable date. I will then recommend to the VC the required program change with acceptance by our respective offices.

/s/t/ KENNETH P. BERGQUIST
Major General, USAF
DCS/Operations

1 Incl
Ltr Hq 8th ADiv (AEW&Con), 8DCPR, Subj: Proposal to Act the 966th AEW&C Sq at McClellan AFB, 11 May 55, w/1 Incl

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Subject: (U) 8th Air Division (AEW&C) Proposal
To: ADMSV From: ADMIS Date: 3 Jun 55 Comment No. 2

1. This directorate seriously doubts the capability of McClellan Air Force Base to support this additional squadron at McClellan, facility-wise. Construction progress reports indicate that scheduled completion dates of major requirements will be provided at Otis Air Force Base by December of calendar year 1955, whereas no military construction programmed items will be complete at McClellan until February to May of calendar year 1955. If additional interim facilities at McClellan will be required to support this additional squadron, or relocation of nose docks or other facilities programmed for Otis Air Force Base is required, this directorate does not concur in the proposal.

2. Unless this additional squadron can be accommodated at McClellan by facilities presently existing or being made available by presently scheduled programmed construction, it is recommended that the proposal be disapproved.

/s/t/ C. E. NICHOLS
Major, USAF
Chief, Operations Division

/s/t/ JAMES S. CAPLES
Colonel, USAF
Deputy Director of
Installations

To: ADMAC From: ADMSV Date: 7 June 1955 Comment #3

Concur provided Air Materiel Command (McClellan Air Force Base) has facilities and equipment to support this unit. McClellan Air Force Base provides all "services" support. Their ability to absorb this increased workload is the only factor involved.

/s/t/ B. KRUPINSKI
Lt Col, USAF
Act Dir of Gen Sup & Svc

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Subject: (Uncl) 8th Air Division (AEW&C) Proposal
To: DCS/M From: ADMAC Date: 7 Jun 55 Comment No. 4

1. This office agrees that the proposed activation of the 966th squadron at McClellan Air Force Base should be subject to the proviso contained in Comment 3 above.

2. It may be anticipated that by April 1956 all permanent facilities for the 551st Wing at Otis AFB will be completed. (In comment #2 ADMIS is estimating completion by December 1955; however, this is still after activation date of the 966th squadron.) Therefore by April 1956, at least the 551st Wing will have vacated the temporary area it now occupies.

3. This office concurs with activation of the 966th at McClellan AFB on scheduled activation date in November 1955 but recommends that the squadron be moved to Otis AFB as soon as practical to occupy the temporary area vacated by the 551st Wing. This squadron should remain at Otis until such time as facilities are completed at Seymour-Johnson AFB. This recommendation serves two purposes:

a. It allows the 966th to activate at a base where the best facilities and training are available but will allow this additional workload on the McClellan activities to be relieved as soon as the squadron is considered fit to be transferred, and

b. It provides a base other than Seymour-Johnson for the 966th where it may be located until facilities are completed at Seymour-Johnson. This guarantees that the 966th will not face the problems at Seymour-Johnson that the 551st Wing has had to face at Otis.

/s/t/ JACK D. BECKELMAN
Lt Col USAF
Ch. Acft Maint Div
Exts 2043-2142

/s/t/ DONALD M. HAMILTON
Colonel, USAF
Dir of Acft, S&M
Exts 2406-2407

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Subject: (Uncl) 8th Air Division (AEW&C) Proposal
To: DCS/O . From: DCS/P Date: 9 June 55 Comment No. 5

1. Concur in Comment 1 provided facilities are available for adequate housing, messing, and administrative support of personnel.

2. This office does not concur with proposal for several moves suggested in paragraph 3 of Comment 4. Present limitations on PCS imposed because of requirements to pay dislocation allowance makes it necessary to obtain Secretary of Air Force approval for more than one PCS in any one fiscal year. It is doubtful if such approval would be forthcoming on the basis of justification contained in Comment 4.

/s/t/ G. B. [illegible]
Colonel, USAF
Director, [illegible]
Ext 2582/2730

/s/t/ JOHN C. [illegible]
Colonel, USAF
DCS/Personnel
Ext [illegible]

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47

15 June 1955

From: Comdr, 8 Air Div
To: Comdr ADC
Info: Comdr, 551 AEW&C Wg, Otis AFB
Comdr, SMAMA

/CONFIDENTIAL/ Cite 8 DOPR 8 AD -T-214. Urmsg ADOOT-BRAVO 13277 dtd 11 Jun Curr. Hq USAF proposal to delay activation of 966 AEW&C Sq to Jun 56 not concurred in by this hq. Proposal does not affect acft dlvrs. Opns and spt pers programmed for the 966 will be required to operate delivered msn acft regardless of activation location. Delay in activation date would result in loss of authorizations for such pers. In this regard, ref is made to recent ltrs this hq relative to activation of the 966 at McClellan; your acft deficiencies and the overall proposals contained in ltr this hq, "Proposed AEW&C Programmed Actions", dtd 10 May curr. Programmed 966 resources with activation date of Nov curr are essential to success of six sq program without regard to ultimate deployment to Seymour Johnson at future date. Activation delay will interrupt continuity of pers input flows. This input estab at considerable effort over past year and the internal tng program of this comd is geared to continued pers flow. ATRC Keesler activity and contract schools are also geared for continued pers input. Six months gap would require stoppage of these tng activities and require new start when input is resumed. This considered uneconomical. Info avail to this hq gives every indication that the family housing situation at Seymour Johnson will be even more critical than Otis. ADC and TAC units programmed for that installation thru 1958 will saturate the Goldsboro community and the proposed six months

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/CONFIDENTIAL/ Cite 8 DCPR 9 AD-T-214 (Continued). program slippage will not resolve this problem. Also, it is the opinion of this comd, as in the case of Otis AFB last Sep 54, that AEW&C construction is not certain for beneficial occupancy in June 56 and that there is a strong probability that the move of AEW&C units to Seymour Johnson will of necessity be further delayed beyond June 56. Activation at McClellan as proposed in ltr this hq "Proposal to Activate the 966 AEW&C Sq at McClellan AFB" dtd 11 May curr considered desirable solution. In regard to PCS of pers, it is intent of this hq to hold manning of 966 opns and support pers to a minimum and at the time of move to Seymour Johnson provide pers for the 966 from pers now on hand at McClellan. It is not intended to make a dual PCS of pers now programmed for the 966. This negates concern of Air Force as quoted in that msg. Activation at McClellan has additional advantage in that Sacremento community at McClellan has plentiful and reasonably priced family housing. The new ADC barracks programmed for AEW&C organizations will provide ample on base housing for amn.

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48

10 Aug 1955

From: Comdr, ADC
To: Comdr, 8th Air Div (AEW&C)
McClellan AFB
McClellan, Calif.

(SECRET) ADOOT-B1 3677 . URCLASLTR 8DOPR, Subj: Proposal to Actv the 966th AEW&C Sq at McClellan AFB, 11 May 55. Fol msg from Hq USAF quoted for your info "Act 966th AEW&C Sq at McClellan AFB, 8 Nov 55, appr. Date of mov to Seymour-Johnson depn upon aval of new fac being cons, now expected 1/57. DAF ltr 702J, 27 Jun 55 will be amnd. CFU 56-2 and P-58 series USAF Program Docu will reflect this change." DAF act ltr will be fwd upon rec this hq.

M/R: This msg completes action to incorporate this change in program documents. M&O will fwd DAF ltr upon rec.

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HEADQUARTERS
AIR DEFENSE COMMAND
ENT AIR FORCE BASE
COLORADO SPRINGS, COLORADO

49

GENERAL ORDERS)
NUMBER 16)

4 May 1955

CONSTITUTION AND ACTIVATION OF TABLE OF ORGANIZATION UNITS...I
ASSIGNMENT OF UNITS.......................................II

I. CONSTITUTION AND ACTIVATION OF TABLE OF ORGANIZATION UNITS.
1. The following units having been constituted, assigned to this command, are further assigned to the 8th Air Division (Airborne Early Warning and Control) and are activated effective 8 July 1955 as indicated.

Headquarters, 552nd Airborne Early Warning and Control Wing
Table of Organization Composition 1-2121, 1 June 1955, 1 x part II
Authorized Strength - Officers 27 - Warrant Officers 1 - Airmen 123
Station of Activation - McClellan Air Force Base, Sacramento, California

962nd Airborne Early Warning and Control Squadron
Table of Organization Composition 1-2122, 1 June 1955, 1 x part II
Authorized Strength - Officers 158 - Airmen 268
Station of Activation - Otis Air Force Base, Falmouth, Massachusetts

2. Personnel will be furnished from sources under control of the Commander, 8th Air Division (Airborne Early Warning and Control). Military personnel requirements which cannot be filled from within your resources will be requisitioned in accordance with normal cycle. A flow of personnel cannot be made available until six months subsequent to authorizations being reflected on the 5-AF-P2 report. Personnel manning will be phased in accordance with the units' capability to utilize the personnel effectively.

3. The above are category D units and are authorized Unit Essential equipment as listed in the master equipment authorization list. The unit mission equipment column of the unit allowance list will be prepared to indicate authorizations based on column 3a of the master equipment authorization list and above table of organization composition. These units are authorized additional equipment in the unit support equipment column of the unit allowance list in conformance with Air Force Regulations 67-83 and 150-8.

4. Action directed herein will be reported in accordance with Air Force Regulation 20-49 and Air Defense Command Regulation 20-1.

5. The 962nd Airborne Early Warning and Control Squadron will be furnished administrative and logistic support from sources under the control of the Commander, Eastern Air Defense Force.

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6. Authority: Department of the Air Force letter AFOMO 610j, subject "Constitution and Activation of the Headquarters, 552nd Airborne Early Warning and Control Wing and 962nd Airborne Early Warning and Control Squadron" 30 March 1955.

II. ASSIGNMENT OF UNITS.--1. Effective 8 July 1955 the following units are further assigned as indicated.

UNIT	ASSIGNMENT
552nd Electronics Maintenance Squadron	552nd Airborne Early Warning and Control Wing
552nd Periodic Maintenance Squadron	552nd Airborne Early Warning and Control Wing
963rd Airborne Early Warning and Control Squadron	552nd Airborne Early Warning and Control Wing
964th Airborne Early Warning and Control Squadron	552nd Airborne Early Warning and Control Wing
962nd Airborne Early Warning and Control Squadron	551st Airborne Early Warning and Control Wing

2. Authority: Department of the Air Force letter AFOMO 610j, subject "Constitution and Activation of the Headquarters, 552nd Airborne Early Warning and Control Wing and 962nd Airborne Early Warning and Control Squadron" 30 March 1955.

BY ORDER OF THE COMMANDER:

GEORGE F SMITH
Major General, USAF
Chief of Staff

OFFICIAL:

W J Birmele
W J BIRMELE
LT COL, USAF
Asst Comd Adj

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39

HEADQUARTERS
AIR DEFENSE COMMAND
ENT AIR FORCE BASE
COLORADO SPRINGS, COLORADO

50

GENERAL ORDERS)
NUMBER 19)

24 May 1955

DISCONTINUANCE OF A PROVISIONAL UNIT.--1. The Airborne Early Warning and Control Wing, Provisional is discontinued at McClellan Air Force Base, California, effective 8 July 1955.

2. Action directed herein will be reported in accordance with Air Force Regulation 20-49.

3. Authority: Air Force Regulation 20-27.

BY ORDER OF THE COMMANDER:

OFFICIAL:

GEORGE F SMITH
Major General, USAF
Chief of Staff

Walter W. Robinson
WALTER W ROBINSON
Colonel, USAF
Command Adjutant

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40

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HEADQUARTERS
AIR DEFENSE COMMAND
Ent Air Force Base
Colorado Springs, Colorado

ADC PROGRAM DIRECTIVE NO. 55-2

24 February 1955

SUBJECT: 962nd AEW&C Squadron

1. Objective:

a. To insure timely and coordinated staff action required for:

(1) Activation of the 962nd AEW&C Squadron at Otis Air Force Base on or about 8 July 1955.

(2) Equipping of the 962nd AEW&C Squadron with initial RC-121 aircraft and all associated equipment by September 1955, and the remaining aircraft beginning in November 1955.

2. Preliminary Staff Consideration:

a. Representatives from DCS/O, DCS/M, DCS/P, DCS/C and the Office of the Assistant for Programming met on 21 February 1955 to discuss the activation and equipping of the 962nd AEW&C Squadron and to determine actions for inclusion in this program directive. Conferees are listed in Attachment #1.

3. Analysis of the Problem:

a. On 1 October 1954 the ADC Command Council approved the activation of the 962nd AEW&C Squadron at Otis Air Force Base in 1st Quarter FY 1956 and equipping of the squadron with RC-121 aircraft in 2nd Quarter FY 1956.

b. Headquarters USAF approval of this program will be indicated in PD 57-1.

c. Based on known aircraft production schedules and USAF aircraft allocations, sufficient RC-121D aircraft will be available to equip the 962nd AEW&C Squadron with one UE aircraft in September 1955 and the remainder of UE aircraft beginning in November 1955. Early delivery of the first aircraft is for ground crew familiarization and training.

d. Activation of the 962nd AEW&C Squadron in July 1955 was confirmed to Headquarters USAF on the AF Form 532, dated 9 February 1955.

e. The 962nd AEW&C Squadron will be assigned to the 551st AEW&C

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Wing as one of three AEW&C squadrons at Otis Air Force Base. The FY 1955 M&O Program provided interim facilities for aircraft maintenance, troop housing, training, operation, pavement and necessary utilities for all AEW&C squadrons programmed for Otis Air Force Base in CY 1955. These projects are under construction and will provide interim facilities by 15 April 1955.

f. Permanent facilities in various Public Works Programs will become available during month of November 1955 through August 1956 at which time interim facilities will be available for activation of other units or for property disposal.

g. The requirement for RC-121D flight simulators and mobile training detachments was submitted in August 1953. The authorized basis of issue is one simulator per four squadrons.

h. More than 120 days are available, prior to receipt of aircraft, for logistic actions.

i. Non-T/O space authorizations for support of the 962nd AEW&C Squadron were requested 30 December 1954.

j. Headquarters USAF has verbally informed Personnel representatives of ADC that USAF does not have a source of sufficiently skilled four-engine pilots for the AEW&C Program. Headquarters USAF is contemplating the establishment of an RC-121 pilot training course to relieve this shortage. DCS/P in coordination with DCS/O will monitor this program.

k. Funds for the 962nd AEW&C Squadron have been included in the FY 1956 Financial Plan.

l. Current analysis reveals that although some facility and personnel problems exist, these problems will not preclude the activation of the 962nd AEW&C Squadron on or about 8 July 1955 and delivery of RC-121 aircraft beginning in November 1955.

4. Agreed Course of Action:

a. The 962nd AEW&C Squadron will be activated at Otis Air Force Base under T/O 1-2122 on or about 8 July 1955.

b. The unit will be equipped with RC-121 aircraft beginning in November 1955.

5. Implementation Required (Hq ADC Action):

a. The Assistant for Programming will:

41

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(1) Through publication of the ADC Program and changes thereto, supply EADF with program guidance concerning the 962nd AEW&C Squadron.

(2) Upon receipt of advance schedule of organizational changes from Headquarters USAF in March 1955, immediately distribute copies to DCS/M, DCS/P, DCS/O, and DCS/C.

b. The Deputy Chief of Staff/Comptroller will:

(1) Upon receipt of advance schedule of organizational changes in March 1955, include personnel requirements in the March 1955 AF 5P-2 Report to Headquarters USAF. (ADCST)

(2) Consolidate progress reports of participating staff agencies and submit an overall monthly report which summarizes significant progress toward and highlights deviations from this directive to the Assistant for Programming (ADHVP). Information copies of the summary report will be forwarded to each participating staff agency. (ADCMA)

(3) In April 1955, insure provision of funds for activation of the 962nd AEW&C Squadron in July 1955. (ADCBA)

(4) In July 1955, evaluate actual fund requirements for the 962nd AEW&C Squadron. (ADCBA)

c. The Deputy Chief of Staff/Operations will:

(1) Insure that appropriate troop strengths have been entered in the ADC program document. (ADOMO)

(2) Assure that the DAF activation letter is received in April 1955. Upon receipt of the DAF letter directing activation of the 962nd AEW&C Squadron, indorse the letter to EADF, directing issuance of general orders activating the unit. (ADOMO)

d. The Deputy Chief of Staff/Personnel will:

(1) As soon as personnel requirements are included in the AF 5P-2 Report, recompute manning levels of air defense forces, and allocate personnel accordingly.

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(2) Inform EADF as soon as possible the ADC crew resources by number available to that command in support of the activation.

(3) Request EADF submit not later than 1 April 1955:

(a) Required personnel for cadre who are not available to EADF.

(b) Suggest additional formal training required for personnel to support the activation.

(c) The number of personnel EADF can furnish to support the training in (b) above.

(d) Activation and manning plan for the activation of the 962nd AEW&C Squadron.

(4) Require EADF to submit periodic manning reports on the activating organization.

(5) Effect the personnel withdrawal and assignment from ADC sources to support the activation.

e. The Deputy Chief of Staff/Materiel will:

(1) Upon receipt of schedule of organizational changes in March 1955:

(a) Inform appropriate DCS/M staff sections of required actions and maintain follow-up to insure timely completion. (ADMLO)

(b) Direct EADF (info ADMLO) to initiate immediate action to requisition spares to support the 962nd AEW&C Squadron. (ADMAC)

(c) Direct EADF (info ADMLO) to initiate immediate action to prepare and provide Equipment Authorization Documents, submit required reports (copy this headquarters) in accordance with paragraph 3b, AFR 67-88. Requisitions may be submitted 120 days prior to activation. (ADMMC)

(d) Establish aircraft delivery dates and advise EADF of required actions and delivery dates, type air-

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42

craft, model, etc., such action will be accomplished to insure delivery of one UE aircraft by September 1955. (ADMAC)

(e) Initiate action to portray status and progress of programs to completion and maintain follow-up actions. Monitor equipment reports submitted by EADF in accordance with AFR 67-88. (ADMMC)

(2) Monitor construction of interim and permanent facilities for aircraft maintenance, troop housing, training, operations, pavements and necessary utilities at Otis Air Force Base. (ADMIS)

(3) Monitor final inspection of facilities and acceptance from construction agency. (ADMIS)

(4) Begin delivery during November 1955 of remaining UE aircraft. (ADMAC)

6. Reports:

a. Each Deputy Chief of Staff or comparable staff agency named in preceding paragraphs will submit a monthly report to DCS/C (info ADHVP): Attention Directorate of Management Analysis. This report will be prepared as of 2400 hours 28th of each month, covering the period from 29th of preceding month, and will be delivered to DCS/C not later than 2nd of each month following as of date. It will be prepared on Disposition Form (DD Form 96) as a brief narrative statement of all action taken during the period by the preparing agency toward accomplishment of this directive, and will show the current status with:

(1) Positive action toward accomplishment.

(2) Negative factors adversely affecting the program. The initial report is due 2 April 1955.

Frederic H. Smith Jr.
FREDERIC H. SMITH, JR.
Major General, USAF
Vice Commander

1 Attachment
List of Conferees

DISTRIBUTION:

Hq USAF, DCS/D	- 5 cys	ADC	
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ADC		DCS/C	- 4 cys
CofS	- 1 cy	ADHVP	- 17 cys
DCS/M	- 5 cys		

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43

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LIST OF CONFEREES

ADPRT. . . . . Major B. E. Davis, Jr.

ADMLO. . . . . Capt. O. Brewer, Jr.

ADCMA. . . . . CWO S. C. Slivinski
Mr. C. H. Franz

ADCBA. . . . . Mr. F. V. Cava
Mr. J. W. Chandler

ADOOT. . . . . none

ADOCE. . . . . none

ADOMO. . . . . none

Attachment #1

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52

20 April 1955

ADCMO

SUBJECT: Constitution and Activation of the Headquarters, 552nd Airborne Early Warning and Control Wing and 962nd Airborne Early Warning and Control Squadron

TO: Commander
Western Air Defense Force
Hamilton Air Force Base
Hamilton, California

1. Inclosed herewith for your information are copies of DAF letter AFOMO [illegible] dated 30 March 1955 which directs activation and assignment of certain Airborne Early Warning and Control Units.

2. General Orders will be published by this headquarters effecting this action and distribution will be made at an early date.

BY ORDER OF THE COMMANDER:

1 Incl
Cy DAF ltr AFOMO 610j
dtd 30 Mar 55

cc: Commander, EADF
Commander, 8th Air Division (AEW&Con)

MEMO FOR RECORD: Programmed activations. Upon activation of these two units and subassignment as directed in paragraph 2 basic the following AEW&Con units will be active with location and assignment as indicated.

UNIT	LOCATION	ASSIGNMENT
Hq 8th Air Div (AEW&Con)	McClellan AFB	ADC
Hq 552nd AEW&Con Wg	"	8th Air Div (AEW&Con)
552nd Elect Maint Sq	"	552d AEW&Con Wg
552nd Periodic Maint Sq	"	552d AEW&Con Wg
963d AEW&Con Sq	"	552d AEW&Con Wg
964th AEW&Con Sq	"	552d AEW&Con Wg
Hq 551st AEW&Con Sq	Otis AFB	8th Air Div (AEW&Con)
960th AEW&Con Sq	"	551st AEW&Con Wg
961st AEW&Con Sq	"	551st AEW&Con Wg
962d AEW&Con Sq	"	551st AEW&Con Wg
551st Elct Maint Sq	"	551st AEW&Con Wg
551st Periodic Maint Sq	"	551st AEW&Con Wg

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DEPARTMENT OF THE AIR FORCE
Washington 25, D. C.

AFOMO 610j | 30 March 1955

SUBJECT: Constitution and Activation of the Headquarters, 552d Airborne Early Warning and Control Wing and 962d Airborne Early Warning and Control Squadron

TO: Commander, Air Defense Command

1. The following units are constituted, assigned to Air Defense Command, and will be activated on or about [illegible] July 1955, as indicated:

UNIT	T/O COMPOSITION	Authd Str OFF	WO	AMN	Station of Activation
Hq, 552d AEW & Con Wg	1-2121, 1 Jun 55, 1 x part II	27	1	123	McClellan AFB, Sacramento, Calif
962d AEW & Con Sq	1-2122, 1 Jun 55, 1 x part II	153		269	Otis AFB, Falmouth, Mass

2. Concurrent with activation directed above, the following units are further assigned, as indicated:

UNIT	ASSIGNMENT
552d Elct Maint Sq	552d AEW & Con Wg
552d Periodic Maint Sq	"
963d AEW & Con Sq	"
964th AEW & Con Sq	"
962d AEW & Con Sq	551st AEW & Con Wg

3. Personnel will be furnished from sources under control of the Commander, Air Defense Command. Military personnel requirements which cannot be filled from within your resources will be requisitioned in accordance with normal cycle. A flow of personnel cannot be made available until six months subsequent to authorizations being reflected on the 5-AF-P2 report. Personnel manning will be phased in accordance with the units' capability to utilize the personnel effectively.

4. The above are category D units and are authorized Unit Essential equipment as listed in the MEAL. The UEE column of the UAL will be prepared to indicate authorizations based on column 3A of the MEAL and above T/O composition. These units are authorized additional equipment in the UEE column of the UAL in conformance with AFR's 67-33 and 150-8.

5. The precedence categories for the Headquarters 552d Airborne Early Warning and Control Wing and 962d Airborne Early Warning and Control Squadron are established as indicated in the current issue of the USAF Operating Program--Priorities of Programmed Units; any changes will be reflected in subsequent issues of this publication.

6. When the actions directed herein have been accomplished, report will be made to Headquarters USAF by means of the Air Force Organization Status Change Report (Reports Control Symbol AF-O1) in compliance with current instructions.

7. Thirty (30) copies of the order issued pursuant to this letter will be forwarded to the Air Adjutant General, Headquarters USAF, ATTENTION: Publishing Division, Washington 25, D. C.

BY ORDER OF THE SECRETARY OF THE AIR FORCE:

s/ E. E. TORO

t/ E. E. TORO
Colonel, USAF
Air Adjutant General

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53

HEADQUARTERS
8th AIR DIVISION (AEW&C)
McClellan Air Force Base
McClellan, California

8DOPR

14 Jan 1955

SUBJECT: 8th Air Division Assignment

TO: Commander
Western Air Defense Force
Hamilton Air Force Base
Hamilton, California

1. Reference is made to the progress summary letter of this command, dated 7 January 1955 (Inclosure 1).

2. On 13 January, that letter was reviewed in detail with the Vice Commander, Western Air Defense Force, and the Deputy Chief of Staff for Operations, Headquarters, Air Defense Command, relative to actions available to their respective headquarters to mitigate the effects of the program slippage cause factors outlined in the referenced letter.

3. It was determined that the existing personnel and material situations represent a "best" effort in light of other Air Defense and Air Force-wide requirements for people and material. It was concluded that maximum development of the AEW&C potential during the coming year will be achieved only through the medium of direct command supervision. Furthermore, the operational effectiveness and state of development of the AEW&C program will not be sufficiently advanced by July, 1955, to permit a division of development responsibilities. This last will result from the programmed deactivation of this Division and the assignment of the two AEW&C Wings to the Eastern and Western Air Defense Forces.

4. Material and personnel shortages require that the remaining resources be closely controlled and allocated to the eastern and western areas of defense responsibilities as required by the air defense system. The current assignment of this two-coast defense responsibility is now assigned to the Western Air Defense Force. This is inconsistent with the overall objectives of the program, and the fact that the Air Defense Command priority of effort to attain operational readiness of AEW&C, is directed to the eastern phase of the operation.

5. It is recommended that action be initiated to revise the airborne early warning and control program to remove this Division

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from its current command assignment under the Western Air Defense Force and that it be assigned with its present strength of fifteen (15) officers, seventeen (17) airmen, and two (2) civilians, directly to Headquarters, Air Defense Command, with station at McClellan Air Force Base.

1 Incl:
a/s

KENNETH H GIBSON
Brigadier General, USAF
Commander

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Hq 8th Air Division (AEW&C) 8DOPL, Subject: 8th Air Division Assignment

WDCDR (14 Jun 55) 1st Ind 19 Jun 1955

HQ WESTERN AIR DEFENSE FORCE, Hamilton Air Force Base, Hamilton, California

TO: Commander, Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado

1. I concur in the recommendation contained in paragraph 5 of basic letter.

2. The 8th Air Division (AEW&C) was activated 1 May 1954 and assigned to Western Air Defense Force in order to expedite the implementation of the AEW&C Program. It is considered that, for the time period and status of the program involved, this was a logical move. However, with the involvement of Eastern Air Defense Force actively in the program, it is believed that the liaison and command relationships are too complex under this assignment status, with only one AEW&C Division involved.

3. It is recommended that provision be made for the assignment at the earliest practicable date of an integral AEW&C unit (Division or Wing) directly to Eastern Air Defense Force and Western Air Defense Force. The integration of the AEW&C function with the Air Divisions (Defense) will then be more direct and responsive to the complete requirements of the Air Defense mission.

4. If this recommended assignment is approved, it is requested that Eastern and Western Air Defense Forces be included as information addressees for communications concerning the status and operational readiness of the AEW&C units.

FOR AND IN THE ABSENCE OF:

WALTER E. TODD
Major General, USAF
Commander

CLINTON D. VINCENT
Brigadier General, USAF
Vice Commander

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Hq 8th Air Div (AEW&C), ADOPR, Subj: 8th Air Division Assignment

ADOOT-B1 (14 Jan 55) 2nd Ind [illegible] Mar 1955

HQ AIR DEFENSE COMMAND, Ent AFB, Colorado Springs, Colo.

TO: Commander, Western Air Defense Force, Hamilton Air Force Base, Hamilton, California

Decision on the request contained in paragraph [illegible] of basic letter is being held in abeyance pending receipt of answer to correspondence submitted to Headquarters USAF. This correspondence requests retention of the 8th Air Division (AEW&C) beyond the currently programmed date for deactivation. You will be advised on this matter at the earliest possible date.

FREDERIC H. SMITH, JR.
Major General
Vice Commander

1 Incl
n/c

MEMO FOR RECORD: Action to assign 8th Air Div directly to this Hq is being held in abeyance pending approval by Hq USAF for retention of this organization beyond July 1955.

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HEADQUARTERS
8TH AIR DIVISION (AEW&C)
McCLELLAN AIR FORCE BASE
McCLELLAN CALIFORNIA

54

8DCDR

7 Jan 1955

SUBJECT: Progress Report

THRU: Commander
Western Air Defense Force
Hamilton Air Force Base
Hamilton, California

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. Pursuant to conversation between the Vice Commander, Air Defense Command, and the Commander, 8th Air Division, this letter is the seventh of monthly reports concerning the activities, progress and program achievements of this command. I have discussed these reports with the Vice Commander, WADF, in regard: (1) Timely arrival at your headquarters, and (2) Time required for WADF staff analysis and indorsing action. It was agreed that a copy of each report should be forwarded directly to your headquarters, simultaneously with dispatch of the signed original to WADF. Accordingly, this and subsequent reports will be forwarded in that manner.

2. The Division has been in existence for a period of seven months. Preceding reports submitted to your headquarters have been concerned primarily with the month-to-month details and the immediate problems of the operation. As with all new Air Force activities, this command is experiencing normal growth pains. In addition, the AEW&C program has the added element of being a new facet of air defense operations and I have prepared this month's report to summarize the overall command status from that standpoint after seven months of effort.

3. Personnel:

a. Quantitative requirements for personnel are not being met on schedule. Manning of Division units is now at only 46% of authorized officer and airmen strengths. Assigned officers number 1[illegible]4; airmen, 1147. A 120-day personnel slippage was announced in your headquarters' message ADPMP-A 41298, 21 December 1954. It is now certain that the AEW&C personnel requisitioned from USAF last month will not be made available to this command in any appreciable number until March 1955. This slippage will combine with major materiel deficiencies and T/O and T/D personnel authorization deficiencies of the type discussed later in this paragraph, to act as an overall program deterrent.

b. Outside training sources to train the aircrews and technicians required to operate and maintain unit aircraft and equipments

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are not yet in operation. Proposals made by this command in letter, "AEW&C Training Program", 2 November 1954, to meet training requirements of the build-up of units have been disapproved. As a result, in addition to the quantitative deficiency, the Division is also faced with a qualitative deficiency which is even more serious.

c. The maintenance contract made with the Lockheed Air Service at Idlewild, resulted in action to activate the Periodic and Electronics Squadrons at Otis AFB on a T/D rather than a T/O basis. Personnel reduction from T/O authorization represent a 40% across-the-board cut. Subsequent to that initial action, a further reduction was made to remove all remaining supply personnel from the T/D, except those engaged in unit supply activities. The requirement for supply personnel in the initial stages of activation and build-up at Otis will be at the highest. In the Maintenance Squadron, a 40% reduction was made in all areas including flight line maintenance personnel, even though the Lockheed contract does not provide flight line maintenance.

4. Operations:

a. Lockheed Aircraft Corporation aircraft deliveries are on schedule. Initial acceptance and procurement difficulties inherent in procurement of unit aircraft under Navy contract have been resolved. Aircraft build-up is going ahead as programmed but in light of the facts cited in the preceding paragraph, utilization of this materiel resource is forecast to be far below lowest acceptable figures. It is not possible at this time to predict the degree of this deficiency.

b. Training of aircrews consistent with aircraft deliveries is not keeping pace. Full details of this requirement were incorporated in the training study recently reviewed by your headquarters. That training requirement still exists, and I have directed that the effort of the 4712th AEW&C Squadron at McClellan AFB, be devoted primarily to the training of aircrews for West Coast operations. Similar action, must be taken for the Eastern operation. Crew production will be directly proportional to the rate at which crew members are made available to the command to receive this training.

c. A keystone to development is the status of AEW&C facilities at Otis. I am discounting any possibility that they will not be available to the operation by 8 March 1955, and have forwarded through WADF, an appropriate movement request to effect the programmed movement of the 4701st AEW&C Squadron to Otis AFB and its reorganization there as the 960th AEW&C Squadron. The 8 March date will see the new squadron activated and in place with ten aircraft. Personnel to be moved from McClellan number 67 officers and 373 airmen.

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d. The Division Operations Center is nearing completion. It will be in 24-hour operation this month. I fully expect this facility will provide the key to more effective supervision and development of command aircraft operations.

e. Airborne and ground communications equipment over the past six months has been a continuing problem area. The primary difficulty is the lack of UHF and HF frequencies in both ground radar stations and AEW&C aircraft which acts to reduce the effectiveness of our mission. Appropriate recommendations have been forwarded and I believe that action now under way will provide the needed relief.

f. Communications requirements have been submitted to our support base and action has been taken to reinforce telephone cables in two areas. We have also received technical and engineering assistance in relocating our radio ground station at a permanent location.

5. Materiel:

a. Aircraft Area: AOCP's are at a minimum. I anticipate this favorable situation will continue. It is the result of SMAMA being the prime depot for the aircraft and that 100% of all required aircraft spares have been shipped to the Sacramento area. All provisioning that is a direct responsibility of the McClellan Depot has been reviewed. A review of provisioning for support of the RC-121 aircraft for other depots having responsibilities in this area has been requested. When necessary, SMAMA procures spare parts for emergencies and at the same time reviews provisioning of these emergency items to insure future coverage. Arrangements are being made for the shipment of equipment tables to the East Coast to insure that the required Otis AFB support is in place. There is every indication that aircraft support will be available to meet our requirements for both coasts.

b. Requirements for C&E Equipment: Since May 1954, there has been a major lack of spares for electronics components. This shortage is not only for repair of individual "black boxes", but for the shortage of the black boxes themselves. As a result, mockups for bench maintenance and other required uses are difficult to construct in the absence of the required parts and components. This has been an item on the agenda of the Weapons System Phasing Group for over a year. Command action taken in August brought about some improvement. Even so, shortages in this area will continue to exist for at least six months. At the present time, the Gentile Depot is reviewing procurement of all spares for electronics components to ascertain specific areas in which deficiencies exist, and to take action to buy sufficient stocks to erase them as soon as possible. Due to procurement lead times required to manufacture and place the spares as on-hand stock in our supply system, the situation is forecast to remain unfavorable for at least twelve, possibly eighteen, months.

c. Maintenance Equipment Status: Electronics maintenance test equipment shortages have been gradually eased over the past six months. Electronic components for bench sets, however, are in extremely short supply. Initial procurement contracts provided for only thirty-five (35) sets of which ten (10) were for use as spares; the other twenty-five (25) to be installed equipment in production aircraft. The Air Training Command has levied a requirement on this limited resource for eight (8) complete sets; 80% of the available spare resource. Only two (2) bench sets will then remain for Division maintenance and electronic training activities on both coasts.

d. The need for the bench sets is most urgent and I am planning to proceed under AFR 57-4 to effect Class I modifications to remove from three unit aircraft, Group B electronic components. These components will provide the needed bench sets, and the aircraft from which they have been removed will be employed in the transition training program. Two of the three modified aircraft will be for use in the transition program at Otis AFB. The remaining aircraft will be for use in the McClellan transition program. I expect that this action will bring about a substantial improvement of the command electronics maintenance capability, and a corresponding increase in aircraft utilization rates.

e. McClellan Facilities: The delay in the acquisition of the necessary land for the permanent AEW&C area at McClellan will bring about a corresponding delay in the beneficial occupancy dates of programmed permanent facilities. Interim proposals to provide the pierced steel planking parking mat for unit aircraft and 30,000 square feet of interim floor space have been forwarded. The parking mat completion date is estimated to be 1 April 1955. It is anticipated that the floor space request will receive early approval. A period of 120 days from the date of approval should see the completion of required construction.

f. Aircraft Configuration: As reported in my previous progress letters to your headquarters, much effort has been directed to analysis of mission aborts, air and ground. It appears that fundamental design deficiencies exist. The details of this analysis will be made a part of next month's report. A Configuration Board has been established within this headquarters to review not only this item, but to analyze the need for configuration changes and other modifications required to enable unit aircraft to accomplish the required airborne mission. This Board will identify and propose a coordinated pattern for required modifications of unit aircraft as the program develops. Initial meetings have been held and the first group of proposed modifications are being forwarded for approval this week.

6. The past months have brought to light several factors which are evident as the primary causes of the program slippage. These are:

a. Personnel and Materiel Authorizations: Delays in the

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publication of essential equipment tables and Tables of Organization, which are the basis for requisitioning of all personnel and materiel resources, have made it impossible to initiate requisioning action in time to meet programmed aircraft and unit build-ups. This has been further enlarged by existing T/D authorization principles which automatically create personnel deficiencies. Examples: Initial T/D authorization of a twelve-man crew, as compared to a projected T/O authorization and requirement for an eighteen-man crew. Another is the T/D authorizations of Otis units discussed elsewhere in this letter.

b. Inadequate procurement lead time necessary to provision radar components as required by the program and its aircraft utilization goal.

c. Lack of established training sources, facilities and equipment to train the technicians required by the AEW&C program activations and aircraft deliveries.

d. A to-be-expected absence of technical knowledge of the AEW&C program and its concept of operations which makes it difficult to identify the urgency of individual personnel and materiel requirements as they affect the program. This factor has been most evident in the personnel actions referred to in paragraph 3, above.

7. Summary:

a. Serious slippages have developed in the AEW&C program. Although they are particularly evident in the Personnel and Materiel areas, they have a pronounced adverse affect upon the capability of the command to operate and maintain unit equipment at the pace required to meet operational readiness objectives.

b. Corrective actions to erase the effects of the program slippage cause factors listed in paragraph 6 of this letter have been limited to a "crash" type short-range solutions. A definitive long-range corrective action pattern to remedy those causes is not in being.

c. Existing deficiencies have already combined to make it a certainty that this command will be unable to carry out its assigned mission prior to scheduled inactivation in August, 1955. In the absence of immediate and substantial corrective action, I do not believe that any significant degree of the airborne early warning and control potential will be available to the air defense system for a considerable period beyond programmed operational readiness dates.

8. The airborne early warning and control operation is a complex one. Its requirements for materiel and personnel are new and unique to the Air Force. The operating doctrines represent new problems to air defense operations. I believe that too much time has already been

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lost in accomplishing the fundamental and prime actions necessary to carry the program beyond the initial activation phase into a recognizable operating status. Maximum results of the overall resource are not being realized at a rate consistent with the effort which has been expended in this program.

9. As the program advances, the problems of swift channeling and action to meet AEW&C program requirements increase. The problems are particularly real when viewed in light of the foregoing report, and the fact that March, 1955, will bring about an AEW&C operation in both the WADF and EADF areas. I propose to discuss this requirement, and the overall command problems, with Generals Vincent and Bergquist during a visit next week. From that discussion, I hope to arrive at positive recommendations for possible solution.

KENNETH H. GIBSON
Brigadier General, USAF
Commander

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Hq 8th Air Division (AEW&C), 8DCDR, Subject: Progress Report

WDCDR (7 Jan 55) 1st Ind 20 January 1955

HQ WESTERN AIR DEFENSE FORCE, Hamilton Air Force Base, Hamilton, California

TO: Commander, Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado

1. Progress Report of the 8th Air Division (AEW&C) for the period June through December 1954 is forwarded for your information.

2. Following are pertinent comments on the progress report:

a. Personnel

(1) Reference paragraph 3a.

(a) A personnel requisition was submitted to Headquarters USAF by your headquarters on 6 December 1954 for a total of 273 officers and 1,488 airmen. Headquarters USAF has advised that the earliest possible date of arrival for personnel requisitioned from USAF will be on or after March 1955. In view of the slippage indicated, a new time phasing was forwarded to your headquarters on 8 January 1955, including the number of airmen required by specialty, month and place of assignment with totals as follows:

To 551st AEW&C Wing, Otis AFB

March	April	May	Total
286	302	156	744

To 8th Air Division Hq, McClellan AFB

290	321	133	744
			1,488

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(b) In addition to the above, 168 airmen are being assigned from Strategic Air Command and Air Training Command to fill school quotas for Special Electronic Courses, and subsequent utilization as 30132/52 AEW Electronic Maintenance Mechanics. These airmen are being assigned in increments of 24 per class., PCS to 8th Air Division, with TDY at Lockheed Special Training Courses. This particular course was established as a stop-gap procedure to train "3" level airmen until Technical Training Air Force Schools can reach programmed output in this career field. The previous training received by Strategic Air Command airmen may limit subsequent upgrading capability beyond the 30152 skill level. Input to the 30173 career field will be obtained from the most highly qualified airmen in 30152/72 AFSC. Support from TTAF Schools has decreased considerably during the last 6 months due to nonavailability of specialized training equipments. Therefore, although the latest schedule of output from TTAF Schools has not been received by this headquarters, there are definite indications that substantial slippage may be expected. In view of this anticipated decrease of trained personnel, action is being taken to increase the capability of the Lockheed Electronics Training Courses. Firm figures should be available after the forthcoming conference on 18 January 1955 between USAF, TTAF, ADC, WADF and Lockheed representatives.

(c) The remainder of the personnel authorized and to be provided from sources available to Headquarters ADC, totaling 271 officers and 203 airmen, are time phased to report during January, February and March 1955, with adjustments provided for the special requirements of Otis Air Force Base.

(2) Reference paragraph 3b.

(a) This headquarters has, to this date, requested, received and allocated a total of 402 quotas for special training courses which were utilized by the 4701st AEW Squadron and other units of the 8th Air Division. These quotas cover all phases of aircraft maintenance, electronics familiarization, maintenance and installation, pilot and panel engineer courses, and special training on navigation and communications equipment. Quotas requested by the 8th Air Division have been processed as expeditiously as possible, with the result that approximately [illegible]5% of requested training quotas have been filled.

(b) In the event additional special training courses are required by the 8th Air Division, the Director of Training, this headquarters, will make arrangements to procure quotas within the shortest possible period of time. At the present time, however, the 8th Air Division is requesting release from special training quotas, indicating that they are capable of conducting a high percentage of this training within the unit. This headquarters is not aware of any deficiencyin procuring outside training sources to train air crews and technicians for the AEW&C program.

(c) As noted in paragraph 3b, the proposed AEW&C training program of November 1[illegible]5[illegible] was disapproved by your headquarters. Basically, this program would have substantially decreased or eliminated requirements for special training at factory and TTAF Schools, for those personnel being assigned to Otis AFB. Now that the proposed special training of these personnel at McClellan AFB has been disapproved, it is reasonable to assume that an increase in factory and TTAF special training courses will be required for successful activation of the Otis AEW&C unit. To date no substantial increase in requests for training quotas has been received by this headquarters. Any substantial delay by the 8th Air Division in requesting special training quotas will naturally result in a subsequent delay in the receipt of qualified, productive airmen. The 8th Air Division has been directed to evaluate over-all special training requirements for the forthcoming nine months period and submit these requirements to this headquarters.

b. Operations

(1) Reference paragraph 6a.

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(a) Activation of AEW&C units on both a T/O and T/D basis has been accomplished in strict compliance with the approved AEW&C program. Any delay in this respect, as indicated in the Progress Report, is not known to this headquarters. The existence of T/D authorization principles which automatically create personnel deficiencies is questionable. The intent of this statement is unknown, since the principles involved are not identified. T/D authorizations are governed by specific personnel allotment vouchers and spaces authorized are identified in the Unit Manning Documents. The personnel deficiencies mentioned could be the result of procurement procedures, wherein it is not always possible to furnish required personnel immediately upon receipt of authorization.

(b) Information concerning the 18-man crew requirement has been previously submitted on the UMD's for the 8th Air Division. Problems on the T/D authorizations for the units at Otis AFB were forwarded by 1st Indorsement to letter from 8th Air Division, Subject: AEW&C Tables of Distribution, 17 December 1954.

c. Materiel

(1) Reference paragraph 5b. Neither Headquarters, Air Materiel Command nor Gentile knows what quantity of spares have been pr cured in support of the peculiar electronic equipments. As a result, Air Materiel Command is attempting to determine the total amount of spares which have been received by the Air Force. This amount will be compared to Air Defense Command's requirements and the difference will be placed on order with the Navy. Lead time will preclude any immediate improvement in this situation.

(2) Reference paragraph 5c. Recommend your headquarters advise Headquarters USAF that Air Training Command's levy on existing resources is unacceptable and that their requirements be reviewed and reduced until such time as adequate spares are available.

(3) Reference paragraph 5d. Do not concur with removing equipments for bench mock-ups under the provisions of

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Hq 8th Air Division (AEW&C), Subject: Progress Report (Cont'd)

AFR 57-4. Whatever is needed should be removed and like items placed on AMFE.

3. It appears that the progress report presents very little in the way of progress, but is more of a deficiency list. Although the progress report has presented the major problem areas which have been encountered during the past few months, many of these problems are inherent in any newly activated organization. In every instance necessary action has been, or is being, taken by your headquarters to resolve major problems far in advance of the programmed operational readiness dates. In addition, it is understood that these major problems areas were foreseen by your headquarters and were given full considera- tion in establishing operational readiness dates which could reasonably be met. Therefore, this headquarters does not concur with the statement contained in paragraph 7c regarding capability of the AEW&C units to meet operational readiness dates.

WALTER E. TODD
Major General, USAF
Commander

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Subject: Progress Report
To: M&O From: O&T Date: 17 Feb 1955 Comment #1
C&E
DCS/O (In Turn)

1. The seventh in the series of monthly progress reports submitted by 8th Air Division is forwarded for your information.

2. Reference is made to paragraph 4.b. of subject report pertaining to operations. The training of aircrews was discussed with representatives of ATRC during their recent visit to this headquarters. Based on the limited Air Force requirement, it was mutually agreed that ADC would train the aircrews for RC-121 aircraft. Since no attempt is made in the report to evaluate the number of trained aircrews versus air crews available, it is impossible to determine the specific deficiency in the trained aircrew program.

3. Reference is made to paragraph 7c of basic report and paragraph 3 of 1st Ind by WADF. The operational ready dates as stated in our operational plan are 1 March 1956 for Otis and 1 January 1957 for McClellan. We have approximately 12½ months to achieve the operational capability in WADF and with expeditious corrective action to eliminate aircraft functional deficiencies, the date remains a realistic goal.

4. Since the report contains items of interest to Materiel and Personnel, a disposition form for forwarding the report to those offices is attached.

BEN I. MAYO, JR.
Colonel, USAF
Ch, Opnl Plans Div
Ext. 2661-3

JOHN C. MEYER
Colonel, USAF
Director, O&T
Ext 2212-3

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ADOOT-P1 6 Apr 55

SUBJECT: 8th Air Division (AEW&Con) Mission and Assignment

TO: Commander
Eastern Air Defense Force
Stewart Air Force Base
Newburgh, New York

1. As a result of the meeting convened at this headquarters on 28 March 1955, necessary action is being taken to assign the 8th Air Division directly to this headquarters, effective 1 May 1955, with the 551st and 552d AEW&Con Wings assigned to the Division. We believe this assignment of the 8th Air Division (AEW&Con) will provide maximum centralized effort in the development of airborne early warning and control resources into an operable weapons system at the earliest possible date. This organizational structure is an interim position in our ultimate goal of obtaining two AEW&Con Divisions with subsequent assignment of a Division to Eastern and Western Air Defense Forces.

2. Inclosed is a proposed ADC Regulation containing the mission, organization, and responsibilities of the 8th Air Division (AEW&Con). Certain operating procedures have been defined in the attachment to the regulation as being necessary in this type organizational structure. Regulations and directives pertaining to procedures in the Personnel area are being reviewed by the Air Defense Command staff for applicability. Instructions will be forwarded at a later date if deemed necessary.

3. Your comments and recommendations on the mission directive are requested to provide mutually acceptable operating procedures. Your recommendations and those of WADF will be incorporated where possible in preparation of the final ADC Regulation. Representatives of the 8th Air Division will visit your headquarters prior to 23 April 1955 to discuss matters associated with this assignment.

4. It is requested that your reply reach this headquarters not later than 1 May 1955.

BY ORDER OF THE COMMANDER:

1 Incl
Proposed ADCR w/Atchmt
(4 cys)
Info Cy To: Comdr, 8th ADiv

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HEADQUARTERS
AIR DEFENSE COMMAND
ENT AIR FORCE BASE
COLORADO SPRINGS, COLORADO

GENERAL ORDERS)
NUMBER 10)

4 April 1955

REASSIGNMENT OF THE HEADQUARTERS, 8TH AIR DIVISION (AIRBORNE EARLY WARNING AND CONTROL) AND CERTAIN OTHER UNITS.--1. Effective 1 May 1955 the following units at locations indicated are relieved from assignment to Western Air Defense Force and are assigned to the Air Defense Command without change in strength or station.

Headquarters, 8th Air Division (Airborne Early Warning and Control), McClellan Air Force Base, California
963rd Airborne Early Warning and Control Squadron, McClellan Air Force Base, California
964th Airborne Early Warning and Control Squadron, McClellan Air Force Base, California
552nd Periodic Maintenance Squadron, McClellan Air Force Base, California
552nd Electronics Maintenance Squadron, McClellan Air Force Base, California
Headquarters, 551st Airborne Early Warning and Control Wing, Otis Air Force Base, Massachusetts
960th Airborne Early Warning and Control Squadron, Otis Air Force Base, Massachusetts
961st Airborne Early Warning and Control Squadron, Otis Air Force Base, Massachusetts
551st Electronics Maintenance Squadron, Otis Air Force Base, Massachusetts
551st Periodic Maintenance Squadron, Otis Air Force Base, Massachusetts

Subassignment of component units of the 8th Air Division will remain as follows.

Headquarters, 551st Airborne Early Warning and Control Wing assigned 8th Air Division (Airborne Early Warning and Control)
963rd Airborne Early Warning and Control Squadron assigned 8th Air Division (Airborne Early Warning and Control)
964th Airbonre Early Warning and Control Squadron assigned 8th Air Division (Airborne Early Warning and Control)
552nd Electronics Maintenance Squadron, assigned 8th Air Division (Airborne Early Warning and Control)
552nd Periodic Maintenance Squadron assigned 8th Air Division (Airborne Early Warning and Control)
960th Airborne Early Warning and Control Squadron assigned 551st Airborne Early Warning and Control Wing
961st Airborne Early Warning and Control Squadron assigned 551st Airborne Early Warning and Control Wing

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GO 10, Hq ADC, Ent AFB, Colorado Springs, Colo, 4 Apr 55,
para 1, cont.

551st Electronic Maintenance Squadron assigned 551st Airborne Early Warning and Control Wing
551st Periodic Maintenance Squadron assigned 551st Airborne Early Warning and Control Wing

2. No change in court martial jurisdiction over units reassigned by this order.

3. Action directed herein will be reported in accordance with Air Force Regulation 20-49.

4. Authority: Air Force Regulation 20-27.

BY ORDER OF THE COMMANDER:

OFFICIAL:

GEORGE F SMITH
Major General, USAF
Chief of Staff

W J Birmele
W J BIRMELE
LT COL, USAF
Asst Comd Adj

DISTRIBUTION
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5 - Units concerned

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ADCR 24-12

ADC REGULATION)
24-12)

HEADQUARTERS AIR DEFENSE COMMAND
Ent AFB, Colorado Springs, Colo.
20 June 1955

ORGANIZATION - AIR DIVISIONS, AIR BASES AND UNITS

Organization and Mission of the 8th Air Division (AEW&Con)

1. Mission. The mission of the 8th Air Division (AEW&Con) is:

a. To provide airborne early warning and control in the air defense combat zone. This includes:

(1) Station patrol to extend the contiguous land based surveillance and control capability.

(2) Emergency replacement duty for inactive land based and/or picket ship surveillance and control stations, and

(3) Augmentation for saturated land based surveillance and control stations.

b. To support operations of the Strategic Air Command and the Military Air Transport Service as required.

c. To participate in the United States Air Force collateral mission of antisubmarine warfare.

d. To augment Air Weather Service Reconnaissance by observing, recording, and transmitting weather information. Such assistance will be provided as a secondary mission and on a non-interference basis with primary AEW&Con functions.

e. To administer, equip, train, and prepare for combat in accordance with directives, policies, and schedules issued by this or higher headquarters, such units and combat crews of the United States Air Force as may be designated, assigned, or attached to the 8th Air Division (AEW&Con).

2. Organization. To carry out its mission, the 8th Air Division (AEW&Con) is provided a headquarters and such units as may be assigned or attached by this headquarters.

3. Responsibilities. The 8th Air Division (AEW&Con) Commander will exercise command jurisdiction over all units assigned to the 8th Air Division (AEW&Con) and such jurisdiction over attached units or forces as directed by competent authority. The 8th Air Division (AEW&Con) Commander will be directly responsible to the Commander, Air Defense Command, to:

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a. Command, organize, administer, train and equip all personnel assigned in accordance with applicable directives.

b. Develop, in collaboration with air defense forces, policies, plans, doctrines, techniques, procedures, and facility requirements for the employment of AEW&Con units in the combat zone.

c. Develop airborne intercept control procedures for the employment of interceptors in the combat zone.

d. Conduct AEW&Con unit training for air defense operations.

e. Coordinate AEW&Con operations with air defense force commanders.

f. Coordinate with research and development activities, matters pertaining to the utilization and integration of AEW&Con in the SAGE system.

g. Advise Headquarters ADC on matters pertaining to AEW&Con maintenance engineering, supply support, and aircraft configuration to the end that proper command and staff action may be taken by ADC with appropriate agencies and/or major air commands.

h. Participate in air defense exercises and maneuvers as directed by this headquarters.

4. Direct Communication. The Commander, 8th Air Division (AEW&Con), is authorized direct communications on matters pertaining to his assigned mission and responsibilities with the following commanders:

a. Air defense forces.

b. Cambridge Research Center.

c. Air Materiel Areas and AMC depots (except authority to request central procurement actions).

d. Military flight service centers.

(ADOOT)

BY ORDER OF THE COMMANDER:

OFFICIAL:

W J Birmele

W. J. BIRMELE
Lt Colonel, USAF
Asst Comd Adj

GEORGE F. SMITH
Major General, USAF
Chief of Staff

1 Attachment:
Admin Practices and Staff Opns

DISTRIBUTION:
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ADMINISTRATIVE PRACTICES AND STAFF OPERATIONS - HEADQUARTERS 8TH AIR DIVISION (AEW&Con)

1. Direct Communications. As outlined in paragraph 4 of basic Regulation.

2. Materiel.

a. Supply support for units assigned to the 8th Air Division (AEW&Con) will be obtained through normal base supply channels.

b. 8th Air Division (AEW&Con) will consummate necessary logistic support arrangements as required and in accordance with AFR 11-4 and 87-2.

c. Supply assistance required by units assigned to the 552nd AEW&Con Wing will be obtained in accordance with ADCR 67-4 by submission through command channels to Headquarters 8th Air Division (AEW&Con). Problems which cannot be resolved at Division level will be forwarded to Headquarters ADC.

d. Units assigned to the 551st AEW&Con Wing will obtain supply assistance in accordance with ADCR 67-4 except that problems which cannot be resolved by the 551st AEW&Con Wing headquarters will be referred to Headquarters EADF for action with information copy to 8th Air Division (AEW&Con).

e. 8th Air Division (AEW&Con) will be responsible to insure that applicable supply tables are requisitioned.

f. Requisitions for command controlled items will be submitted through the 8th Air Division (AEW&Con) to Headquarters ADC.

g. Initial UAL's will be prepared by Headquarters ADC for units assigned to the 8th Air Division (AEW&Con). These UAL's will be reviewed by 8th Air Division (AEW&Con) and returned to Headquarters ADC for approval and revised publication. Later changes to the UAL's will be processed in accordance with AFR 67-83 and AFR 150-8.

h. The 8th Air Division (AEW&Con) will insure that necessary equipment requisitions are submitted for all items of organizational property authorized in the UAL.

i. 8th Air Division (AEW&Con) and intermediate wing headquarters will establish equipment review boards in accordance with AFR 150-8. UAL change requests will be prepared and submitted in accordance with AFR 67-83. Recommended changes to basic equipping documents and special issue requests will be submitted in accordance with AFR 5-25 and AFM 67-1.

Attachment 1, ADCR 24-12, 20 June 1955.

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j. Authority is delegated to the 8th Air Division (AEW&Con) to approve changes in the Unit Support column of the UAL for which the T/A basis of issue is related to the number of personnel assigned. The 8th Air Division (AEW&Con) is further authorized to approve quantitative changes to unit support equipment items that do not exceed the allowances listed in current T/A's and ECL's. Information copies of all actions taken in accordance with the above will be forwarded to Headquarters ADC, ATTN: ADMMC-2B.

k. Local purchase requirements will be furnished by the support base in accordance with DAF policy enunciated in Air Force Procurement Instruction 1-452. Cash purchasing privileges will be under the jurisdiction of the support base commander as prescribed by AFPI 3-604.50(f)(1).

l. Vehicles will be authorized and carried on the UAL of the Support Base Motor Vehicle Squadron.

m. Justification for vehicle requirements will be submitted to the support base. Support base will submit UAL Change Requests through command channels to the appropriate major air command.

n. Vehicles operated by 8th Air Division (AEW&Con) will remain under the operational jurisdiction of the support base.

o. Channels for facility planning and programming actions are through the appropriate air defense force (in whose area the base is located) to Headquarters ADC. Technical assistance will be provided by the support installation. Requirements and justifications will be established by the 8th Air Division (AEW&Con). The installations engineer staff of the support base and the appropriate air defense force will be utilized for establishment of criteria. Coordination with other major air commands will be accomplished by Headquarters ADC.

p. Technical engineering projects will be prepared by the support installation and forwarded directly to Headquarters ADC with information copies to the 8th Air Division (AEW&Con) and appropriate air defense force. Final technical review and approval will rest with Headquarters ADC or Headquarters USAF for all projects exceeding the support installation commander's approval authority, except when an 8th Air Division (AEW&Con) unit is tenant on the base of another major air command. In this event, Headquarters ADC will effect proper technical review and obtain approval of the major air command concerned.

q. Authority to request central procurement actions from AMC activities remains the responsibility of Headquarters ADC and is not delegated to the 8th Air Division (AEW&Con).

r. Materiel or test requirements generated by the 8th Air Division (AEW&Con) and which require action by ARD Centers will be submitted through ADC.

3. Comptroller.

a. Funds.

(1) Fund requirements for Headquarters 8th Air Division (AEW&Con) and 552d AEW&Con Wing, tenant on McClellan Air Force Base, covering TDY, pay of civilian personnel and special requirements peculiar to the activity(s) (reference paragraph 40204, AFM 172-1) will be forwarded from Headquarters 8th Air Division to Headquarters ADC. This headquarters will establish budget authorization and allot funds directly to the support base, and copies thereof will be furnished to Headquarters 8th Air Division. Monthly status of funds reports will be forwarded directly from the support base to Headquarters ADC, with information copies to the 8th Air Division.

(2) Fund requirements for the 551st AEW&Con Wing at Otis Air Force Base will be consolidated with other ADC units on the base and will be funded through normal ADC funding channels. Special projects which pertain solely to the 551st AEW&Con Wing will be funded by Headquarters ADC through normal ADC channels upon receipt of approval by Headquarters 8th Air Division (AEW&Con) and higher authority as required. With exception of special projects, no identification of funds for support of 551st AEW&Con Wing will be made.

b. Reporting Channels. Reports, wherever feasible, will be submitted through channels. Certain exceptions because of time limits will require direct reporting from the 551st AEW&Con Wing to Headquarters ADC with information copies to the 8th Air Division (AEW&Con). For example: Morning Reports, V-2 Reports, 110 Series Reports. Details of these reporting channels will be transmitted from ADC to Headquarters 8th Air Division (AEW&Con) for further dissemination to units concerned. Finalized reporting procedures will be contained in ADCM 174-1.

4. Operations. a. Command, administration, and operational control of AEW&Con organization is vested in the Commander, 8th Air Division (AEW&Con). Operational control of AEW&Con aircraft when on-station will be exercised by the air division (defense) commander in whose sector the aircraft is operating.

b. 8th Air Division (AEW&Con) will provide AEW&Con to defense forces consistent with immediate defense, training and weapon development requirements.

c. On-station commitments for sector coverage will be made by the AEW&Con wing commander concerned, and will be consistent with priority of AEW&Con effort as established by Headquarters 8th Air Division (AEW&Con). Requests for AEW&Con sector coverage will be made direct to the AEW&Con wing.

d. Upon declaration of Air Defense Readiness, warning Yellow or Red, all AEW&Con resources will revert to the defense region commander. In the interim, the Commander, 8th Air Division (AEW&Con) will participate in staff actions with defense regions for the inclusion of AEW&Con in emergency war plans.

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58

ADOOT-B1 28 Feb 1955

SUBJECT: (Unclassified) Airborne Early Warning and Control Organization

TO: Director of Operations
Headquarters USAF
Washington 25, D. C.

1. This headquarters received authorization for the 8th Air Division (AEW&Con) in message your headquarters, AFOMO-O-3, 41134, 16 April 1954, to letter this headquarters, subject as above, 25 March 1954. The authorization for the 8th Air Division (AEW&Con) exists only until such time as the 551st Wing is activated at Otis AFB in July of 1955. Upon review of the current status of our AEW&Con program, I believe a re-evaluation of the future AEW&Con organization is in order.

2. During the early phases of aircraft build-up and the inherent problems of integrating a new weapon system, most of the activity has centered around McClellan AFB. As the aircraft inventory continues to expand, similar problems pertaining to integration of the system are now becoming prevalent at Otis AFB. The development of tactics and techniques and the coordination of operational procedures with the air defense divisions concerned present a continuing requirement beyond July 1955 for the 8th Air Division (AEW&Con).

3. The operational suitability test results to date indicate seven major functional deficiencies in the RC-121C&D aircraft. Correction and elimination of all functional limitations in the shortest possible time period are mandatory. The necessary supervision, coordination, and followup to insure accomplishment of corrective measures can best be monitored by the 8th Air Division (AEW&Con). Many of the deficiencies involve research, development, and manufacture-some or all of which are not envisioned as being corrected prior to July of 1955

4. Your headquarters is well aware of the tremendous dollar investment in the AEW&Con program. In aircraft alone, the Air Force has programmed a total of twelve squadrons-an investment of $384,000,000. The tremendous number of personnel required for a 24-hour day, 7-day week operation, training, logistical problems, and the base facilities required in support of this program, compound to warrant continued leadership and guidance by a general officer.

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SUBJECT: (Unclas) Airborne Early Warning and Control Organization (Cont'd)

5. The concentration of command in the 8th Air Division (AEW&Con) at McClellan AFB has made it possible to devote a high degree of attention to operating details of each c mmand element. This attention has resulted in the development of operating and maintenance standards which apply to all AEW&Con activities. The standardization and development objective during the build-up period must continue in order to achieve an operational readiness capability of the AEW&Con units at the earliest possible date.

6. I urgently request you reconsider the author zation for the 8th Air Division (AEW&Con) to permit retention beyond July of 1955. Our intention is to assign the division directly under this headquarters at an early date, and to have the division exercise control of both East and West Coast units. Attached for your consideration is a staff study which recommends accordingly.

7. This headquarters has presently under study the eventual AEW&Con organizational structure. The results of this study to date indicate that an end position of two air divisions is the most desirable. Detailed recommendations will be forwarded at a later date.

1 Incl
AEW&Con Staff Study

FREDERIC H. SMITH, JR.
Major General, USAF
Vice Commander

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HEADQUARTERS
AIR DEFENSE COMMAND
Ent Air Force Base
Colorado Springs, Colorado

SUBJECT: AEW&Con Organization

PROBLEM:

1. To determine the organizational structure for airborne early warning and control units in the air defense system.

FACTORS BEARING ON THE PROBLEM:

2. The organizational structure for AEW&Con units must conform to accepted standards for span of control, homogeneous assignment and delegation of authority.

3. The Air Defense Command is currently programmed for seven AEW&Con tactical squadrons. To support three tactical squadrons, a periodic maintenance squadron and an electronic maintenance squadron are currently programmed. The seventh squadron, being by itself, will require augmentation to provide maintenance support. (TAB A)

4. One Air Division (AEW&Con) is currently authorized to manage and supervise the integration of airborne early warning and control units into the air defense system. (TAB B)

5. The ADC requirement for five additional AEW&Con tactical squadrons has been favorably considered by Hq USAF. (TAB C)

6. Aircraft electronic functional deficiencies are limiting the capability of the RC-121C&E to perform the stated operational mission. (TAB D)

7. Air Force investment in each RC-121 type aircraft is approximately $3,200,000. Present contracts for procurement total 82 aircraft.

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0741

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a total dollar investment of $262,400,000. Five additional squadrons plus the programmed seven will represent a total investment of $384,000,000 for 120 aircraft.

8. Presently programmed operating bases are at McClellan AFB, California, Otis AFB, Massachusetts, and Seymour-Johnson, North Carolina.

9. Future operating bases are planned for McChord AFB, Washington, Norton AFB, California and Brookley AFB, Alabama. (TAB E)

10. Personnel resources will be required as outlined in the proposed non-T/O manning document for a Headquarters, Air Division (AEW&Con). (TAB F)

ASSUMPTION:

11. It is assumed that production contracts for aircraft to equip five additional squadrons will provide continuous flow of RC-121D aircraft from Lockheed Aircraft Corporation.

DISCUSSION:

12. The 8th Air Division (AEW&Con) was activated 1 May 1954, stationed at McClellan AFB, and assigned to Headquarters, Western Air Defense Force. During the early phases of aircraft build-up and the inherent problems of integrating a new weapon system, most of the activity centered around McClellan. As the aircraft inventory continues to expand and with the integration of the AEW&Con function into Eastern Air Defense Force as well as a continued build-up and expansion in Western, consideration must be given to the establishment of adequate command and operational channels.

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13. The Air Defense Command received authorization for the 8th Air Division (AEW&Con) only until such time as the 551st AEW&C Wing is activated at Otis in July of 1955. The management and supervision of the AEW&Con Units in the development of tactics and techniques, coordination of operational procedures with the air defense division concerned and the conduct of normal day-to-day operations is considered beyond the scope of authority or accomplishment of a Wing Headquarters. The requirement for rapid and practical solutions to the complex operational problems associated with the RC-121 can best be accomplished by an AEW&Con Division Headquarters.

14. To provide maximum utilization from the currently authorized 8th Air Division (AEW&Con), consideration is being given to assignment of the division directly under ADC at an early date. The operational control of the 551st and 552d Wing will be under Eastern and Western Air Defense Forces respectively. Command and administrative control of the Wings will be under 8th Air Division. The 8th Air Division will function primarily as a central control group to manage and supervise the initial integration of AEW&Con into the air defense system. Considering the current authorization of 3035 officers and airmen for each operating base, the program encompasses major logistical problems as well as the initial operational factors previously outlined. The retention of the 8th Air Division is considered absolutely essential to the successful accomplishment of the initial operating and integrating phase.

15. The operational suitability test results to date indicate

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seven major functional deficiencies in the RC-121C&D aircraft. Correction and elimination of all functional limitations in the shortest possible time period is mandatory. The necessary supervision, coordination and follow-up to insure accomplishment of corrective measures pertaining to the various commands and the aircraft manufacturer can best be monitored at the 8th Air Division Headquarters. As many of the deficiencies involve research, development and manufacture, it is imperative that the 8th Air Division be retained beyond its currently authorized date of August 1955 to monitor and advise as to the necessary Air Defense Command actions pertaining to these matters.

CONCLUSIONS:

16. Under present operating conditions (consolidated on the West Coast), the authorization and assignment of the 8th Air Division is suitable.

17. Retention of the 8th Air Division beyond Aug 1955 is essential to the continuing program development.

ACTION RECOMMENDED:

18. Hq USAF approve the retention of the currently authorized 8th Air Division (AEW&Con).

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From: Hq USAF, Washington D. C.
To: Comdr, Air Defense Command

From AFOMO-O-3 41134 1. Reference your letter, ADOMO, subj: "AEW&C ORG", 26 Mar 54. A preliminary analysis of the mission and function of an AEW&C Group indicates the responsibility accruing to such an organization exceeds that which is normal to a Group Hq. When compared to Tactical Units of SAC, wherein 3 Combat Sqs, one per Maintenance Sq, one Armament and Electronics Maintenance Sq and one Field Maintenance Sq constitute elements organized into a wing, an AEW&C Wing Hq appears to be justified in lieu of a Group Hq. 2. Current programs will reflect activation of the 551 AEW&C Gp Hq at Otis AFB, June 55, and the 552 Gp Hq at McClellan AFB, 1st Qtr 1956. Action will be taken to convert these units from Gp Hq to Wg Hq. 3. The AEW&C Wgs to be activated (Par 2 ABV) are considered to be operational units. However, since there is a requirement to develop tactics, techniques and procedures, etc., for AEW&C, as outlined in your AEW&C Div Charter, we concur that an interim arrangement for supervision of this effort is required. Therefore a DAF letter will be published to constitute and activate a T/D AEW&C Div effective 1 May 54. This div will continue until the 3 AEW&C Sqs become operational at Otis AFB, and the 551st AEW&C Wing is activated, at which time the TD Division will be inactivated. 4. The proposed T/D for an air div is approved and troop spaces will be auth in the next PAV, eff for Sep 54 reporting. Pers will come from your own resources until troop space authns become effective.

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0745

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01000	1	COMMAND																		
	2	Commander	0002D	1		1														B/Gen
	3	Vice Commander	1416	1		1														
	4	Aide	7024	1						1										
	5	Steno Specl	70252															1	1	
				3		2				1								1	1	
03000	1	UNIT ADMINISTRATION																		
	2	Admin Off	7024	1					1											
	3	Clerk	70250		2									1	1					
				1	2				1					1	1					
04000	1	UNIT SUPPLY																		
	2	Supply Helper	64010		1												1			
	3	Apr Orgn Supply Specl	64131		1											1				
	4	Orgn Supply Specl	64151		1										1					
	5	Apr Clerk	70230		1											1				
					4										1	2	1			
07000	1	PERSONNEL																		
	2	Pers Staff Off	7316	1				1												
	3	Apr Clerk	70230		1											1				
	4	Clerk	70250		1										1					
	5	Steno Specl	70252															2	2	
	6	Apr Pers Affairs Specl	73231		1											1				
	7	Class Specl	73250		2									1	1					
	8	Pers Specl	73251		3									1	2					
	9	Pers Tech	73270		2							1	1							
				1	10			1				1	1	2	4	2		2	2	

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0746

ORGANIZATION

SECTION CODE	LINE NO.	TITLE	AFSC	TOTAL OFF	TOTAL AMN	COL	LT COL	MAJ	CAPT	LT	W/O	M/SGT	T/SGT	S/SGT	A/1	A/2	A/3	TOTAL CIV	GS	REMARKS
12100	1	EDUCATION																		
	2	Education Specialist	75230		1									1						
					1									1						
17000	1	COMPTROLLER																		
	2	Comptroller	0056D	1			1													
				1			1													
19000	1	ANALYSIS																		
	2	Management Tec	80170		1							1								
					1							1								
21000	1	BUDGET																		
	2	Budget Off	6736	1					1											
				1					1											
23000	1	STATISTICAL SERVICES																		
	2	Stat Svcs Off	6834	1					1											
	3	Apr Stat Specl	68130		1											1				
	4	Stat Specl	68150		1										1					
	5	Clerk	70250		1										1					
				1	3				1						2	1				
27000	1	OPERATIONS																		
	2	Deputy	0036D	1		1														
	3	Opns Staff Off	1416	1			1													
	4	Acft Observer, Radar Intcpt	1564	1				1												
	5	Acft Control Staff Off	1616	1			1													
	6	Intcpt Controller	1644	7				2	5											
	7	Comm Elec Staff Off	3016	1				1												

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T/O, T/D, T/D UMD AIR DIVISION HEADQUARTERS, REW[illegible]

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A SECTION Digit	A SECTION Line No.	B TITLE	C AFSC	D TOTAL OFF	D TOTAL AMN	D COL	D LT COL	D MAJ	D CAPT	D LT	D W/O	D M/SGT	D T/SGT	D S/SGT	D A/1	D A/2	D A/3	E TOTAL C/V	E GR	F REMARKS
27000		OPERATIONS (Continued)																		
	8	ECM Off	3024	1				1												
	9	Comm Off	3034	1					1											
	10	ACW Supv	27350		10									[illegible]	6					
	11	ACW Supv	27370		7							1	6							
	12	Comm Specl	29150		10									5	5					
	13	Comm Cntr Supv	29170		1							1								
	14	Crypto Opr	29250		5									1	4					
	15	Radio Opr	29351		5									1	4					
	16	Air Tran Supv	60170		1							1								
	17	Apr Clerk	70230		1											1				
	18	Clerk	70250		2									1	1					
	19	Steno Specl	70252															1	1	
	20	Admin Supv	70270		2								2							
				14	44	1	2	5	6			3	8	12	20	1		1	1	
28000	1	FLYING SAFETY																		
	2	Flying Safety Off	1444	1				1												
				1				1												
29000	1	INTELLIGENCE																		
	2	Intelligence Off	2054	1					1											
	3	Intell Opns Tec	20470		1								1							
	4	Clerk	70250		1										1					
				1	2				1				1		1					
35000	1	MATERIEL																		
	2	Dir of Materiel	0046D	1			1													
	3	Comm Elec Staff Off	3016	1				1												
	4	Acft Maint Staff Off	4316	1				1												

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5000		MATERIEL (Continued)																		
	5	Supply Staff Off	6416	2				1	1											
	6	Air Electronics Supt	30100	1							1									
	7	Acft Rad Maint Tec	30170		1								1							
	8	ACW Rad Maint Tec	30172		1								1							
	9	Abn EW Radar Tec	30173		1							1								
	10	Abn ECM Tec	30174		1								1							
	11	Acft Maint Tec	43171B		2							1	1							
	12	Supply Insp Tec	64172		1								1							
	13	Orgn Supply Supv	64173		1							1								
	14	Supply Records Supv	64174		1								1							
	15	Apr Clerk	70230		1											1				
	16	Clerk	70250		3									1	2					
	17	Steno Specl	70252															2	2	
	18	Admin Supv	70270		1							1								
				6	14		1	3	1		1	4	6	1	2	1		2	2	
7000	1	ADJUTANT																		
	2	Admin Off	7024	1					1											
	3	Apr Clerk	70230		1											1				
	4	Clerk	70250		2									1	1					
	5	Steno Specl	70252															1	1	
	6	Admin Supv	70270		1							1								
				1	4				1			1		1	1	1		1	1	
3000	1	INFO SERVICES																		
	2	Info Svcs Off	7224	1					1											
	3	Admin Supv	70270		1								1							
	4	Info Specl	72150		1									1						
				1	2				1				1	1						

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0749

T/O, T/D, T/D-A UNIT AIR DIVISION HEADQUARTERS [illegible]

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A SECTION CODE	LINE NO	B	C AFSC	D TOTAL OFF	TOTAL AMN	COL	LT COL	MAJ	CAPT	LT	W/O	M/SGT	T/SGT	S/SGT	A/1	A/2	A/3	TOTAL CIV	GR	F REMARKS
54120	1	[illegible]							1											
	2	Med Off Asst [illegible]	[illegible]																	
	3	Med Admin Sp	[illegible]																	
84000	1	COMM & ELECTRONICS							1											
	2	Air Electronics Off	305..	1					1											
				1																
92520	1	MOTOR VEHICLE OPN													1					
	2	Vehicle Opr	60350		1										1					
					1															
		RECAPITULATION																		1 B/[illegible]
		Officers		34		3	4	10	15	1										
		WO		1							1									
		Airmen			89							10	17	20	33	8	1			
		Civilians																7	7	

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USAF PROPOSED EXTENSION OF AEW&C PROGRAM

UNIT	BASE	FY 1957 1	2	3	4	FY 1958 1	2	3	4	FY 1959 1	2	3	4
551 AEW&C Wg	Otis AFB												
960 AEW&C Sq	Otis AFB												
552 AEW&C Wg	McClellan AFB												
963 AEW&C Sq	McClellan AFB												
961 AEW&C Sq	Otis AFB												
964 AEW&C Sq	McClellan AFB												
962 AEW&C Sq	Otis AFB												
965 AEW&C Sq	McClellan AFB												
966 AEW&C Sq	Seymour-Johnson AFB												
X AEW&C Wg	Seymour-Johnson AFB												
955 AEW&C Sq	Seymour-Johnson AFB												
956 AEW&C Sq	Seymour-Johnson AFB												
957 AEW&C Sq	McChord AFB												
X AEW&C Sq	Norton AFB												
X AEW&C Sq	Brookley AFB												
TOTAL SQS		7	7	7	7	7	7	9	10	11	12	12	12

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59

ADOMD

5 Jul 55

SUBJECT: Reorganization of 8th Air Division (AEW&Con)

TO: Director, Manpower and Organization
Headquarters United States Air Force
Washington 25, D. C.

1. Reference is made to your 1st Ind, 14 March 1955, to our letter (Secret) Subject: "(Unclassified) Airborne Early Warning and Control Organization," dated 23 February 1955. Since receipt of referenced indorsement and approval to retain the Hq 8th Air Division for an extended period of time, this Headquarters has restudied the manning requirements for the Division Headquarters and forwards these requirements herewith. In order to understand these requirements more thoroughly, some background information is also of assistance and is provided below.

2. The 552nd AEW&Con Wing will be activated on 8 July 1955. Activation of its subordinate units, now numbering five, began at McClellan AFB in December 1954. The Headquarters, 8th Air Division was confronted with the dual problem of performing wing functions relative to these new units while attempting to develop plans and policies for the entire AEW&Control program, to the detriment of the latter mission.

3. As a solution, a provisional wing was activated. No additional spaces were available; the wing was manned out of the resources of the 8th Air Division and Western Air Defense Force. This resulted in a division of responsibility between the Division headquarters and the wing. The resulting apparent lower manning requirement for the Division headquarters did not reflect the responsibilities manned by the wing. During the past several months the Division (including the wing) has been manned over 200%. It is not believed that a determination of the eventual requirements of the Division can be based upon this provisional situation.

4. With receipt of authority to continue the 8th Air Division, that headquarters submitted a proposed organization and manning (Incl #1) comprising 20 officers, 20 airmen and 5 civilians. This strength, it is believed, has been discussed with your headquarters. The proposal was referred to appropriate members of the ADC staff and serious deficiencies were discovered. It was apparent that the Division failed to realize that reassignment directly under this headquarters would require performance

0752

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of additional functions beyond those required in their previous status. Further, support rendered the Division headquarters by the provisional wing and overmanning under present arrangements cannot continue. The authorizations for the 552nd AEW&Com Wing were not designed to support its parent Division.

5. After study by the ADC staff, a meeting was held to determine manning requirements. Principal participants were the Commander of the 8th Air Division, Vice Commander of Western Air Defence Force and representatives from DCS/O, C&E, and M&C of this headquarters. It was found that the Division manning did not provide for the inspection and security functions and that Hq ADC could not assume the additional workload involved in the expanded AEW program. The Division Commander had assumed that he would be able to provide an Aviation Medicine Section within each AEW&Com Wing, however, due to austere manning in medical activities, the Command Surgeon found that an Aviation Medicine Section could only be provided at Division level and that this section, which was previously included in the Division UMD, should be reinstated. In the Material area, the Division Commander had assumed that the workload involved in processing Engineering Change Proposals would be handled by Hq ADC. Since the Material staff at Hq ADC is already operating at capacity level, it was not possible nor desirable to place this function at Hq ADC level. As a matter of interest, there are over 125 ECPs currently pending on the RC 121 aircraft with more anticipated in the near future. Until the aircraft and its electronic gear is made more adaptable for performance of the AEW mission, a greatly enlarged Material workload can be anticipated in the 8th Air Division headquarters.

6. Another major item not included in the 8th Air Division's recommended UMD was that of standardization. The requirement for institution of standardization boards within the command for fighter type units was submitted to you by our letter, dated 20 May 55, subj: "ADC Headquarters Manning Requirements"; standardization within the AEW&Com program was excluded from this study. The requirement for one complete crew for standardization purposes is considered a necessity and was mutually agreed as being a requirement to be added to the Hq 8th Air Division. A few other areas were discussed - where previously the Adjutant's function had been accomplished through over-manning and joint usage of the Wing Adjutant Section, it is now necessary to provide a separate Adjutant's office because of the requirement for separation of the respective sections due to facility limitations. It is still anticipated, however, that the Unit Administration and Unit Supply functions for the Division will be performed by the corresponding section of the Wing Headquarters. One individual in each of these functional areas is provided to augment the Wing activity and provide the necessary additional man hours required.

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7. The final manning requirements are reflected in the attached Form 1222 and supporting data (Incl #2). Since the present authorization of the Division is obsolete, no attempt is made to compare new functional requirements with authorization. Using the Division Commander's proposal as a departure point, additional information is attached on military spaces added to this proposal which are not covered in this letter.

8. Special mention is made here of the grade requirement for Colonels for the Deputies for Personnel and Materiel. These two areas will be very critical during the ensuing year. The position of the Air Division directly under this headquarters places these Deputies in the same relationship to their headquarters as their counterparts at Air Defense Force level. The entire AEW&Con program of the Air Force is within the Division. All of the problems peculiar to this operation, in terms of personnel skills, training and distribution and materiel and maintenance for an untried aircraft of tremendous complexity fall upon their shoulders. It is essential that men of the highest caliber be procured for these functions. The same situation pertains to the lesser positions in the headquarters.

9. The same reasons which dictated the necessity for the continuance of the Division during the development period of Airborne Early Warning and Control dictate that the manning be adequate for the accomplishment of its mission. Favorable early consideration of these requirements is requested.

FOR THE COMMANDER:

2 Incls:
1. 8th ADiv proposed manning
2. Form 1222

MEMO FOR RECORD: As aresult of reassignment of 8th Air Div. directly under this hq, its continuation for another year in the activation of a second AEW Wing in July, a restudy of of personnel requirements of the Division Hq was accomplished. This letter states our recommendations for a new organization and increased personnel requirements to Hq, USAF.

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60

COMMANDER, AIR DEFENSE COMMAND

COMMANDER, WESTERN AIR DEFENSE FORCE, HAMILTON AIR FORCE BASE, HAMILTON, CALIFORNIA

COMMANDER, EASTERN AIR DEFENSE FORCE, STEWART AIR FORCE BASE, NEWBURGH, NEW YORK

COMMANDER, 8TH AIR DIVISION (AEW&CON), MCCLELLAN AIR FORCE BASE SACRAMENTO, CALIFORNIA

(UNCLASSIFIED) ADOOT-81 ____ 1381 ____. Headquarters United States Air Force has appropriated retention of the 8th Air Division until June 1956. This headquarters tentatively appropriated the date of 1 April for assignment of the 8th Air Division directly to this headquarters. Request personnel from each adequate headquarters visit this headquarters on 24 March to discuss concepts of operation and organization structure with the 8th Air Division assigned directly under Headquarters Air Defense Command. Name, rank, serial number of visiting personnel, date and hour of arrival, and accommodation desired should be furnished this headquarters earliest practicable date.

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HEADQUARTERS
9TH AIR DIVISION (AEW&C)
McClellan Air Force Base
McClellan, California

27 Jun 1955

SUBJECT: Monthly Progress Information Letter (May 1955)

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. Attached for your information is the progress evaluation of the 9th Air Division (AEW&C) for the month of May 1955.

2. Approximately [illegible]0% of the total scheduled mission effort during May was devoted to radar training operations, with 32% of the total hours flown being radar time. This represents the current radar capability limited by electronics maintenance capabilities in terms of available spares, aircrew and maintenance technicians. No appreciable increase in radar effort is expected during the month of June. The requirement for aircrew transition training will effectively absorb the flying hours available in aircraft in which radar equipment is inoperative.

3. Progress at McClellan Air Force Base appears to be consistent with our program in spite of apparent problems in the personnel area. Progress at Otis has been critically curtailed by the several deficiencies enumerated below.

The problem areas common to both the McClellan and Otis units are:

a. Shortage of aircrew personnel; especially Directors, Radar Technicians and Radar Operators.

b. Shortage of aircraft maintenance and radar maintenance personnel. This is extremely critical in the radar maintenance field (AFSC 30xxx) where only 12% of the vital authorized "7" level technicians are assigned. The absence of qualified personnel in this field is apparent by the excessive high percentage of aircraft not mission ready due to failure of communications and electronics equipment.

c. Shortage of Aircraft Instrument Repairmen (422xx) and Electrical Repairmen (423xx) will be the limiting factors to the number of dock crews we can organize during the next 60-90 day period.

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Hq [illegible]th Air Div (ADC) McClellan AFB, Calif., Subj: Monthly Progress Information Letter (May 1955)

5. Problem areas primarily peculiar to units at Otis are:

a. Supply support: Electronics equipment out for parts has rendered an average of [illegible]% of our possessed aircraft at Otis ineffective for radar missions while 11% of our possessed aircraft have been out of commission for parts during the past month.

b. Construction lag: The slippage in the construction program at Otis is seriously and adversely affecting our progress at that location. Lack of adequate maintenance facilities being most severely felt.

6. The June program for the 551st Wing at Otis is 1000 flying hours of which 250 hours is to be devoted to radar training time. Units at McClellan have a 1750 flying hour commitment to meet during June with [illegible] hours being devoted to radar time. In July the program is to fly 1300 hours with 3[illegible]0 radar hours at Otis AFB and [illegible] hours with 1000 radar hours at McClellan AFB.

1 Incl:
Progress Evaluation
[illegible]th Air Div, May 55

/s/t/ KENNETH H. GIBSON
Brigadier General, USAF
Commander

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PROGRESS EVALUATION
8th Air Division (AEW&C)
May 1955

	McClellan	Otis
1. Flying Program, RC-121:		
Program objective (hours)	1600	1200
Revised program (hours)	[illegible]	650
Accomplished (hours)	[illegible]:50	727:20
Per cent of in-commission time flown	21.2%	14.1%
2. On-Station Performance:		
Total AOC hours programmed	[illegible]	190
Total AOC hours accomplished	[illegible]:50	114:55
Per cent accomplished	[illegible]	60.5%
On-station time scheduled	[illegible]	--
Effective hours on-station	[illegible]:20	--
Per cent accomplished	[illegible]	--
Total AOC missions scheduled	61	18
Total AOC missions accomplished	[illegible]	14
Per cent accomplished	80.3%	78%
Aborts - Radar	11	0
Per cent	18.3%	0
Aborts - Mechanical	1	0
Per cent	1.6%	0
Aborts - Other	0	4
Per cent	0	22%
3. In-Commission Rates, RC-121: (Based on "Possessed" Aircraft)		
In-commission	62.[illegible]%	30.5%
AOCP	0.02%	11.7%
Periodic Maintenance and Inspection	26.[illegible]%	4.0%
Mechanical defect	10.6%	3.6%
4. Aircraft status at 0[illegible]00 (0[illegible]00 sample each Wednesday):		
Mission ready	23.3%	35.6%
Aircraft only inoperative	5.6%	17.2%
C&E only inoperative	26.6%	32.3%
Both Aircraft and C&E Inoperative	43.3%	14.7%
5. Personnel Status on 31 May:		
Officers authorized	36[illegible]	370
Officers assigned	2[illegible]6 (80.7%)	185(50%)
Airmen authorized	1612	1683
Airmen assigned	1217(75.5%)	7[illegible]3(46%)

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6. Percent of Final Program Accomplished (1 June):

Aircraft:	McClellan	Otis
Program	63.3%	46.6%
Assigned	60.0%	43.3%

Figures above represent 9 RC-121's at McClellan, 8 RC-121D's at McClellan, 13 RC-121D's at Otis and 1 RC-121D on loan to ARDC at South Weymouth, Massachusetts, but do not account for 1 RC-121C crashed at Climatic hangar, Eglin AFB. Percentages are based on the 1 April 1955 delivery scheduled which calls for 33 RC-121 C&D aircraft to be delivered prior to 1 June 1955.

Personnel:		
Program	[illegible]	80%
Assigned	72.[illegible]%	46%

7. Aircrew Data:

Total complete crews authorized	50	50
Total complete crews assigned	[illegible]	3
Percent of total	[illegible]	6.0%

	McClellan			Otis		
	Authorized	Assigned Qualified	Assigned in Tng	Authorized	Assigned Qualified	Assigned in Tng
Pilots	56	16	*0	56	9	13
Co-Pilots	14	8	26	[illegible]	15	[illegible]
Navigators	50	20	38	50	17	16
Directors	150	39	30	150	16	35
ECM Operators	100	11	12	100	[illegible]	[illegible]
Flight Engineers	50	30	35	50	13	12
Radar Operators	300	76	84	300	14	[illegible]
Radio Operators	50	17	54	50	20	55
Radar Technicians	150	10	19	150	6	3

*Class graduated 27 May; next class scheduled for 6 June.

8. Support Personnel:

Aircraft Maintenance (40XXX, 42XXX, 43XXX)	McClellan	Otis	Total
Authorized "7" Level	156	205	361
Assigned "7" Level	145	70	215
Authorized "5" Level	283	283	566
Assigned "5" Level -	113	74	107

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Progress Evaluation, 8th Air Division (AEW&C), May 1955

Radar Maintenance (30xxx)	McClellan	Otis	Total
Authorized "7" level	211	233	444
Assigned "7" level	26	28	54
Authorized "5" level	43	43	86
Assigned "5" level	68	70	138

2. Recapitulation of Officer Personnel:	McClellan	Otis
Aircrew officers	177	163
Non-crew officers	76	22
Assigned, not present for duty	43	---
TOTAL	296	185

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Subject: Monthly Progress Information Letter, 8th Air Division
dtd 27 June 1955

To: Mgt Anal From: PRT Date: 29 Jul 55 Comment No. 1

1. The following are our comments on the attached 8th Air Division's Progress Report:

a. Aircraft Controllers. Manning of 8th Air Division in the controller field will be 72% by November. This will result from a projected input of 96 controller school graduates in September and October. In addition, the 8th Air Division will be overmanned in navigators by October. The navigators can be cross-trained as controllers.

b. Radar Technicians and Radar Operators. Our records indicate that 8th Air Division is manned at 60% for Radar Maintenance Technicians. The ADC average is only 60% manning in this field. We project an 80% manning of 8th Air Division by November. Input will be primarily technical school graduates (3 level). Manning for Radar Operators is 50% of the present 500 authorizations. We project an assigned strength of 377 radar operators in November. This will be 67% of the projected authorizations of 1956. We will check with the 8th Air Division to determine if their training capacity can absorb any additional 3 level input in this specialty.

c. Aircraft Maintenance (AFSC 431X1B). 8th Air Division is presently manned at 57% in Aircraft Mechanics. We project a manning of 81% in November. It is anticipated that the 7 level authorizations will be 100% manned.

d. Aircraft Instrument Repairmen (AFSC 422XX) and Electrical Repairmen (AFSC 423XX). Here we again concur in a shortage of 5 level personnel. Both these areas are hard-core and are in short supply Air Force wide. The only inputs that can be expected will be 3 level personnel, of which 8th Air Division has been receiving the bulk of our allocations.

e. Pilots. The 8th Air Division has a projected authorization of 350 pilots. As of 30 September 212 pilots will be assigned. Requisitions for pilots for October contained a requirement for 31 1st pilots and 37 co-pilots. The personnel requisition for a November reporting date contained a reqirement for 51 1st pilots and 9 co-pilots. This is in line with the ratio of pilots and co-pilots required by 8th Air Division. Headquarters USAF has informally indicated that there will be no problem in obtaining adequate numbers of potential 1st pilots and co-pilots. It is believed that the number of pilots based on a 2.5 crew ratio can be maintained in equality with the number of aircraft possessed.

f. ECM Operators. There is a world-wide shortage in this specialty. Headquarters USAF has been allocating apprentice radio operators to this command in vast numbers for training into ECM. 8th

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Subj: Monthly Progress Information Letter, 8th Air Division dtd 27 June 1955 (Contd)

Air Division will have 405 radio operators assigned against a projected authorization of 175. The surplus of 230 airmen can be trained against the ECM operator requirement. 8th Air Division training capability will determine the manning level in this acute shortage area. Outside manning assistance to support 8th Air Division's 7 level ECM shortage will continue.

/s/t/ RALPH W. DEPPE
Lt Colonel, USAF
Ch, Prog Anal
Ext 2505/2700

/s/t/ G. B. SIMLER
Colonel, USAF
Director, PRI
Ext 2592/2700

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0762

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18 Mar 1955

From: COMDR ADC
To: COMDR WADF, Hamilton AFB, Hamilton, Calif.

(SECRET) ADMAC-4 0045. Urmsgs WDMAC-4 50-1131, 3 Feb 55 and WDMAC-4-50-1276, 15 Mar 55. Fol info is furn as req in ref msgs: /1/ 32 ea RC-121 type acft are curr being procured for asgmt to this comd. One of these acft, SN 51-3836, was lost to salvage shortly after rec which reduces the total that w/b avail to this comd fr 32 to 31 ea. /2/ There are curr 7 AEW&C Sqs activated or scd for activation. These 7 units w/b initially equip with 10 acft ea. After the seventh unit has rec 10 acft, the remaining 11 acft w/b asg to all units as attrition repl or comd spt as they are rec fr pdn. /3/ Sta loc and activation and equip scd of these 7 units are as fols:

Unit	Base	Activation Dt	Equipping Period
960th	Otis AFB	Mar 55	10 acft now assigned
963rd M	McClellan AFB	Mar 55	" "
964th	McClellan AFB	Mar 55	Mar and Apr 55
961st	Otis AFB	Dec 54	Apr through Aug 55
962nd	Otis AFB	Jul 55	Aug through Oct 55
965th	McClellan AFB	Aug 55	Nov 55 through Jan 56
966th	Seymour-Johnson AFB	Nov 55	Feb 56 through May 56

FYIG it is curr planned to activate and equip 3 addl AEW&C Sqs during 3rd qtr FY-58 and possibly 2 addl sqs subq to that pd. Your hq w/b furn with unit designation, sta loc and equip scd of these addl units as soon as that info becomes firm.

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HEADQUARTERS
8TH AIR DIVISION (AEW&C)
McClellan Air Force Base
McClellan, California

63

8DOPR

16 Mar 1955

SUBJECT: Report of Air Force - Navy AEW&C Conference
7, 8 and 9 March 1955

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. The basis of this report is premised upon the meeting held 7, 8 and 9 March, at Lockheed Aircraft Corporation, Burbank, California, attended by LAC, the Navy and the Air Force. This meeting was chaired by the BUAER, U. S. Navy. This meeting resolved that the Air Force must take a very definite attitude toward the AEW&C program in its entirety. The aircraft developed by the Navy to meet the Navy AEW&C concept very definitely does not fall within the technological purview of the Continental Air Defense Command's concept of AEW&C missions. This report is divided into applicable portions portraying the inherent weaknesses of the entire procurement, engineering cognizance and operational criteria affecting the RC-121 model aircraft.

2. OPERATIONAL CRITERIA: The AEW&C aircraft presently produced by LAC is being configured for more than one mission. On the Navy side, the aircraft must function in AEW barrier operations, fleet protection operations and offensive strike control operations, whereas the Air Force configuration requires one that must be compatible with the present and programmed CONAD ground environment system. The variance in the above cited Navy and Air Force missions for this aircraft preclude utilization of an identical vehicle. For example, Navy specifications require installation of a Dead Reckoning Tracer (DRT) plotting board, (a high cost item), an item for which the Air Force has no use. The item must be removed and in its place, an air situation display board must be installed in Air Force aircraft to permit mission accomplishment. Engineering costs for an air situation display board are informally estimated by LAC at $140,000, with cost per installation of $3,600 each. Other examples of Navy equipment requirements for which the Air Force has no need are: VHF communication, strengthened baggage compartments, auxiliary power unit, etc., to provide mobility for fleet operations in foreign areas. On the other hand, there are equipments within the aircraft for which the Navy operations feel they have no use but which have a use in Air Force operations.

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0764

(Example: R-267/ARR-27 Video Relay Receiver - Cost: $800).

3. ENGINEERING COGNIZANCE: The past and current engineering for this aircraft is primarily designed to meet Navy mission requirements. Lack of Air Force experience in this type operation during initial procurement evidently forced the Air Force to accept Navy design. Since that time, however, with the increased Air Force experience in AEW&C operations and the current expansion of this program, it is mandatory that the Air Force participate in current and future engineering of AEW&C aircraft if this equipment is to fulfill the Air Defense Command mission. It is believed that this participation will lend added emphasis to the expeditious development of equipment vital to the accomplishment of the Air Force mission. Although many requirements are common to both Air Force and Navy, the urgency of correction of equipment deficiencies within the Navy is somewhat lessened by the fact that it is possible for them to change tactics of employment to minimize these deficiencies, whereas the Air Force does not enjoy this flexibility. One instance of this is the APA-57B (Ground Stabilization Unit). Inaccuracies of this unit do not seriously affect the Navy's operations, whereas it is unacceptable to the Air Force because of a requirement for accurate positioning of targets for relay to the ground radar system.

4. JOINT PROCUREMENT. It is my belief that joint procurement is not satisfactory for this aircraft because of dissimilar Air Force and Navy missions. Under the present system, equipments are installed for which the Air Force has no requirement. These equipments must subsequently be removed and replaced with items which meet Air Force requirements. This is a gross waste of resources, money and time. The presently known and programmed production for AEW&C aircraft has been greatly expanded over the original concept. The Air Force investment will approach one billion dollars. Considering the cost involved for an aircraft that does not fully meet Air Force requirements, it may be advisable at this time to consider establishment of two production lines.

5. CONFERENCE EFFECTIVENESS: It is obvious that meetings of this type are useful only for the exchange of information since the conference chairman, Commander John B. Anderson, stated that he had no authority to make commitments or direct action required for program achievement. Further he stated that the minutes of the conference could not reflect statements of requirements or assignments of corrective actions. To be effective, future conferences of this nature must be attended by personnel, both Air Force and Navy, who have the authority to make commitments and direct action required for program achievement.

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6. RECOMMENDATIONS:

a. That the dissimilar AEW&C missions of the Air Force and Navy, and the resulting effect on the aircraft configuration, be recognized at all levels of command within the Air Force.

b. Action be taken to permit Air Force participation in current and future engineering of AEW&C aircraft, if this equipment is to fulfill the Air Defense Command mission.

c. Consideration be given to the establishment of a second production line for Air Force AEW&C aircraft that meet Air Defense Command mission requirements with engineering and production under Air Force cognizance.

d. Future AEW&C conferences be attended by Air Force and Navy personnel who have the authority to make commitments and direct action required for program achievement.

7. Detailed information regarding aircraft discrepancies, discussion of fixes, etc., is contained in conference minutes which will be published on or about 16 March 1955.

8. The above recommendations have been discussed with, and are concurred in by Major General William T. Hefley, Commander, Sacramento Air Materiel Area.

/s/t/ KENNETH H. GIBSON
Brigadier General, USAF
Commander

cc: Comdr, WADF
Comdr, SMAMA

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3 May 1955

64

Brigadier General Kenneth H. Gibson
Commander 8th Air Division (AEW&C)
McClellan Air Force Base
McClellan, California

Dear Ken:

I have just received your report of the Navy and AEW&C Conference which was held at Lockheed in March 1955 and have studied it quite closely.

I heartily agree with you that the Air Force must take a very definite attitude toward the AEW&C Program in its entirety in order to make it successful on a timely basis. Our greatest problem has been in obtaining the whole-hearted cooperation and effort from the various AMAs and Navy BuAer and their realization that anything less will greatly jeopardize the entire program. I have personally written numerous letters on this problem, and I do believe we are making considerable progress.

It is apparent that the RC-121 program has suffered for the following reasons: 1. Purchase of an off-the-shelf aircraft. 2. Navy procurement. 3. Inadequate provisioning. 4. An extremely complicated radar platform which is a concept new to the Air Force. Any of these reasons would hamper the integration of this Weapons System into the ADC inventory. All four factors have seriously jeopardized this program and make it mandatory that all Air Force and Navy agencies work together in overcoming all obstacles.

I do not believe a separate production line is the solution to our problems, at least not for the remaining aircraft on contract. As you know we are to receive the last aircraft in August of 1955. Setting up a separate line would take months of planning and the cost would undoubtedly be prohibitive. However, this thought might have considerable merit for any future procurement.

I can't go along with you that this basic aircraft will not fulfill both Navy and Air Force missions. In studying the minutes of this meeting and talking with my staff, I can see that although the Navy is willing to tolerate the present inadequacies of the electronic systems and do not appear to be striving for perfection, I'm quite certain that they would accept the closer tolerances that we must have for our AEW&C.

One of the greatest difficulties with Navy procurement has been the lack of timely exchange of information between Navy and Air Force

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agencies concerning modifications and test results. This problem appears to be solved, or at least is approaching a solution. The RC-121 Weapons System Project Office receives proposed airframe and engine modifications from the Navy and forwards them to us for our concurrence. This policy will also be followed for the electronics systems. Gentile will receive all proposed electronic system changes and their Modification Review Board, with members of our command in attendance, will pass on all electronic modifications.

I realize that Gentile has not done this in the past and there is a considerable backlog of electronic "fixes" which the Navy has already incorporated. Gentile is clearing up this backlog by assigning tech order numbers to Navy Electronic Materiel changes and Electronic Materiel Bulletins and distributing them to all concerned.

It is apparent that this aircraft must have many deficiencies corrected before it becomes an effective weapons system. Many of these revealed deficiencies have no "fix" at the present time; other deficiencies are undergoing research and development, while still others are yet to be investigated. It is not possible to correct the majority of these deficiencies in production aircraft because of the lead time involved. Consequently, corrective action must be accomplished on a retrofit basis. I have asked the RC-121 Weapons System Project Office to take immediate steps to expedite action on those deficiencies which require further engineering, development and test and have expressed this command's desire that corrective action should not be handled on a piecemeal basis but as a "package-fix" program.

Air Force Regulation 20-10 clearly prescribes the policy and responsibilities for the operation of the Air Force Weapons Systems Project Office. Headquarters AMC has executive responsibility for this aircraft, and I am holding them primarily accountable for the initiation, direction, supervision, and results pertaining to the timely actions required on any part or phase of this Weapons System. Consequently, I have instructed my staff to work in close harmony with the RC-121 Weapons System Project Office in brining about the improvement in the RC-121's ability to perform its mission.

During the past RC-121 Weapons System Group Meetings, a sub-committee was formed to take necessary action on test and service revealed aircraft system deficiencies. This sub-committee, composed of members of the 8th Air Division, WADC, Headquarters AMC, Gentile, SMAMA and Headquarters ADC, will formalize the necessary action which will be required to modify the RC-121 aircraft to a suitable Weapons System.

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0768

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Brigadier General Kenneth H. Gibson
Page three

At the present time, only the Phase V all-weather test has been completed and published. The Navy has also completed some electronic system tests and the APG OST test results will soon be published. These tests have generated numberous problems for modifications and further testing. Many of these proposed modifications have already been acted upon by the Weapons System Project Office and Lockheed, and are being incorporated in future production aircraft. In order to clarify this entire situation in regards to our firm aircraft requirements, the RC-121 Weapons System Project Office will schedule a conference to be held during the latter part of June or the first part of July 1955. Members of the 8th Air Division, ADC, Headquarters USAF, Navy, AMC, WADC, SMAMA, and Gentile will be present at this meeting. The objectives of this meeting are: 1. To establish a status of corrective action to date. 2. To establish other requirements for corrective action on deficiencies revealed by testing and service organizations. 3. To establish a sound production installation and retrofit program to accomplish desired changes.

I believe that with the help and guidance of your command in pursuing the above outlined program, we can overcome most of the obstacles which beset us and affect the developmental and logistical matters pertaining to this Weapons System.

Sincerely,

MARSHALL S. ROTH
Major General, USAF
Deputy Chief of Staff, Materiel

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Subject: RC-121 Deficiencies
To: ADMAC From: ADMAC-2A3 Date: 25 Apr 55 Comment #1

1. It cannot be stated with certainty that this basic aircraft will not fulfill both Navy and Air Force missions. During the course of the meeting at LAC the Navy indicated that they were satisfied with the loose tolerances of the APS 20, APS 45 and the Navigation System, and consequently do not appear to be striving for better engineering of this equipment. However, this does not imply that they would not accept the closer tolerances that the Air Force must have for their AEW&Control.

2. It is believed that a separate production line for Air Force aircraft is not feasible for the remaining aircraft on contract. The last aircraft is scheduled to be delivered in August 1956. This separate line may have considerable merit for any future contracts.

3. Our greatest problem is in obtaining the whole-hearted cooperation and effort from the various AMA's and Navy BuAer and their realization that anything less will greatly jeopardize the entire program.

4. It is apparent that the RC-121 program has suffered for the following reasons: 1. Purchase of an off-the-shelf aircraft. 2. Navy Procurement. 3. Inadequate provisioning. 4. Extremely complicated radar platform - A concern new to the Air Force.

a. Anyone of the above reasons would hamper the integration of this Weapons System into the ADC inventory. All 4 reasons seriously jeopardize this program and make it mandatory that the Air Force must take a very definite attitude toward the AEW&C program in order to make it successful on a timely basis.

b. Purchase of an off-the-shelf aircraft has resulted in an aircraft which is not all-weather. This aircraft will require radome deicing boots and further all-weather testing.

c. Navy Procurement has resulted in considerable delay in obtaining handbooks, Air Force required modifications, technical data, etc. One of the greatest difficulties with Navy Procurement is the lack of timely exchange of information between Navy and Air Force agencies concerning modifications and test results. For example, the APGC team briefed this Command 28 January 1955 on the results of the OST testing to date. During this briefing they stated that the Navy testing was trailing 6 months behind the Air Force testing. However, during the course of the meeting held at LAC 7-9 March 1955 it was apparent that the Navy testing of electronic equipment was ahead of the Air Force and their results far exceeded the APGC test. This was due mainly for two reasons. First, the Navy had the latest "fixes" incorporated on their equipment and second the Navy maintenance was superior to ours.

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0770

d. To further elaborate on the lack of information between the Navy and Air Force, this problem appears to be solved in regards to the engine and air frame. The RC-121 W.S.P.O. receives all proposed air frame and engine modifications from the Navy and forwards them to us for our concurrence. However the electronics portion has not been solved by Gentile. Gentile has not taken a definite action towards this program and this continues to be the major problem area. For example, Gentile, some months ago, received a list of approximately 36 "fixes" to the electronic systems which the Navy has already incorporated. Gentile must take these Navy "fixes" in the form of Navy Electronic material change, publish technical orders and distribute them to the field. These kits are free and are stored in Navy warehouses. To date, Gentile has not published the necessary technical orders and the kits still remain in Navy warehouses.

5. During the February meeting of the RC-121 Weapons System Group a subcommittee was formed to take necessary action on test and service revealed aircraft systems deficiencies. This subcommittee composed of members of WADC, Headquarters AMC, Gentile, SMAMA and 8th AAC met again 21 April 1955 to formalize the necessary action which will be required to modify the RC-121 aircraft to a suitable Weapons System. At the present time only the Phase V all-weather test has been completed and published. The APG OST is scheduled for completion in May 1955. The Navy has also completed some electronic systems tests. All of these tests have resulted in numerous proposals for modifications and further testing. In order to clarify this entire situation the W.S.P.O. will schedule a conference to be held during July 1955. Members of ADC, Headquarters USAF, AMC, WADC, Navy SMAMA, 8th AD, and Gentile, will be present at this meeting. The objectives of this meeting are: 1. To establish requirements for corrective action for known deficiencies revealed by testing and service organizations. 2. To establish the status of corrective action to date. 3. To establish a sound production installation and retrofit program to accomplish the desired changes.

/s/t/ VINCENT J. BRACHA Major, USAF Ch, Lockheed Acft Br Ext 2033	/s/t/ JACK D. BECKELMAN Lt Col, USAF Ch, Acft Maint Div Ext 2043-2142

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Subject: AEW&Con Conference at Lockheed - 7, 8, and 9 Mar 55
To: DCS/O From: O&T Date: 6 Apr 55 Comment #1

1. Reference is made to your note relative to USAF Air Council briefing.

2. The major problem areas in aircraft functional deficiency were common to both Navy and Air Force. We believe these requirements can be incorporated in the aircraft, and although time consuming, Lockheed, Navy, and Air Force are all working toward the earliest possible solution.

3. Considering the actions taken to date and the fact that Hq USAF personnel attended the meeting, we do not consider the matter of sufficient magnitude at this time to warrant the Air Council presentation based on the APGC briefing of 28 Feb 55. ADC staff actions relative to determining engineering cognizance and joint procurement of AEW&Con aircraft now appear to be the major problem areas. The attached DF to DCS/M states our position relative to these 8th Air Division (AEW&Con) recommendations.

BEN I. MAYO, JR.
Colonel, USAF
Ch, Opnl Plans Div
Ext 2561 - 3

JOHN C. MEYER
Colonel, USAF
Director, O&T
Ext 2212 - 3

1 Incl
DF

To: O&T From: DCS/O Date: 13 Apr 55 Comment #2

Concur.

KENNETH P. BERGQUIST
Major General, USAF
DCS/Operations

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Subject: Report of Air Force - Navy AEW&Con Conference 7, 8, & 9 Mar 55
To: DCS/M From: DCS/O Date: 5 Apr 55 Comment No. 2

1. Your attention is invited to the attached correspondence from Headquarters 8th Air Division (AEW&Con).

2. Variance between Navy and Air Force requirements in the AEW&Con aircraft utilization is clearly outlined in paragraphs 2 and 3 of Brigadier General Gibson's letter. Accepting these facts, I am hesitant to state that the Air Force must have engineering cognizance and that joint procurement is unsatisfactory. It appears that many of our objections of equipments installed in the aircraft have resulted as a fault of the Air Force-Navy procedures to accomplish the desired engineering changes rather than from the joint procurement system itself; further, most of the functional discrepancies found in the aircraft were common to both Navy and Air Force.

3. Reference paragraphs 6b and c. Representatives from your staff sections attended the cited conference at Lockheed Aircraft Corporation. These personnel are familiar with the problem areas involved to obtain an aircraft which will perform the stated ADC mission. Determination of the best method whereby the Air Force can obtain these aircraft should include the requirement for selling such a proposal to Hq USAF and the resultant deviation from Department of Defense policies on joint procurement.

4. Request you take action as deemed necessary on the inclosed correspondence.

/s/t/ KENNETH P. BERGQUIST
Major General, USAF
DCS/Operations

1 Incl
n/c

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Subject: Report of Air Force - Navy AEW&C Conference 7,8, and 9 Mar 55
To: DCS/O From: P&R Date: 28 Mar 55 Comment No. 1

1. Your attention is invited to the attached correspondence. The contents deal with procurement and modification matters pertaining to the AEW&C aircraft (Ref. Para 6).

2. This directorate does not agree that a dissimilarity in USAF and USN AEW missions exists to the degree that would preclude the utilization of an identical aircraft by both services. However, it is agreed that it is mandatory that the Air Force (with ADC operational guidance) participate in current and future engineering of AEW&C aircraft if this equipment is to fulfill the ADC mission.

3. Reference paragraph 2 of attached letter where it is inferred that the Air Force has no need for equipments that would allow mobility of AEW&C operations. This directorate feels that a requirement for mobility does exist and such a requirement was reflected by this headquarters in our comments to the proposed USAF GOR AD-3c for an AEW&C support system forwarded to USAF in January of this year.

4. It is suggested this correspondence be recharged to DCS/M for determination of the best method whereby the Air Force will have control over the configuration of the AEW&C aircraft procured for the Air Defense Command.

/s/t/ C. S. GLENN
Lt Col. USAF
Chief, Systems Div, P&R
Ext 2521

/s/t/ E. A. HERBES
Colonel, USAF
Director, P&R
Ext 2216-7

SECRET

Subject: Report of Air Force - Navy AEW&C Conference 7, 8 and 9 Mar 55
To: DCS/O From: P&R Date: 28 Mar 55 Comment No. 1

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3. Reference paragraph 2 of attached letter where it is inferred that the Air Force has no need for equipments that would allow mobility of AEW&C operations. This directorate feels that a requirement for mobility does exist and such a requirement was reflected by this headquarters in our comments to the proposed USAF GOR AD-3c for an AEW&C support system forwarded to USAF in January of this year.

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/s/t/ C. S. GLENN
Lt Col, USAF
Chief, Systems Div, P&R
Ext 2521

/s/t/ E. A. HERBES
Colonel, USAF
Director, P&R
Ext 2216-7

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27 May [illegible]

SUBJECT: (UNCLASSIFIED) Report of [illegible] Supporting System Survey, 11 - 20 April [illegible]

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. Enclosed are four copies of subject report prepared by the Directorate of Readiness and Materiel Inspection, Office of The Inspector General, USAF.

2. Deficiencies in the program were attributed in part to the absence of control of the program within your headquarters.

3. Your comments are requested relative to the validity of the requirement for more complete control of programs of this type. Comments are invited concerning other portions of the report.

BY ORDER OF THE CHIEF OF STAFF:

1 Incl
[illegible] Rpt (4 cys)

[illegible]
Major General, U.S. Air Force
Acting Deputy Inspector General for Inspection
The Inspector General

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Subj: [illegible] Rept of [illegible]

[illegible]

4. [illegible] the following problems were experienced:

(1) Real estate acquisition difficulties were encountered. This situation was not inherent in this Headquarters and has just recently been resolved by Headquarters USAF.

(2) Delays in the construction of MCP (Military Construction Program) items due to lack of real estate interests following the final siting and design of essential facilities.

(3) Restrictions established by directives that require Headquarters USAF approval for the construction of interim facilities which duplicate in part those items programmed in MCP.

(4) Austerity considerations precluded providing facilities of the total square footage required to satisfy the entire deficiency because of their interim nature pending MCP construction.

(5) Certain of the individual projects exceeded the approval authority of this headquarters and Headquarters USAF, and required the approval of the Secretary of the Air Force, subject to determination of urgency in the interest of National Defense.

c. Interim facilities at Otis Air Force Base were also subject to the considerations, approval requirements and austerity standards cited above, with such specific problems as:

This correspondence is classified ________ in accordance with Para ________ AFR 205-1; 24 Jul 53, for the reason (s) stated.

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[illegible] OCF of TIO, Norton AFB, Calif Subj: (UNCL) Rept of RC-121 Supporting Systems Survey, 11 - 26 April 1955

4. In addition, efforts were made to obtain and install the latest equipment in the aircraft, so as to provide reliable and extended service. Due to the long development time now required for complete equipments, further delay in waiting for complete reliability before utilization would not only increase our maintenance and supply support, but would undoubtedly leave us with obsolete systems in the interim. Consequently, a compromise was effected to provide reasonably reliable and current equipment. It is apparent now that the acceptance of these aircraft was premature. Aircraft should have gone to ARDC and APGC for complete testing and suitability evaluation.

5. Initially, project offices and monitoring agents were set up within headquarters structure to plan the acceptance and future development of the weapon in an operational environment. As the program grew, the 8th Air Division was formed and brought into the picture. These agents and/or headquarters have collected a wealth of data on existing deficiencies and passed them on in the form of recommended fixes or requests for action to accomplish fixes. This command does not have the power of decision to accomplish the action toward making weapons acceptable. We can only state our requirements and take such action as we can to expedite a decision.

6. Although the lack of control has affected this program, it is believed that the greatest problem is the lack of emphasis given to this weapon System, Air Force wide. This program is suffering because many Air Force agencies apparently do not realize that a great deal of extra effort must be expended in order to resolve the numerous problems encountered by this command when it accepted this untried and unproven weapon. Added emphasis on this program at USAF level would provide the following:

a. Release additional manpower for the proper monitoring and supervision of this program at Baker, Headquarters USAF, Headquarters AMC, Headquarters ADC.

b. Cut down the long time consuming ECP processing system.

c. Release additional maintenance and operating funds for the numerous modifications that are required and will be required to modify this aircraft into an effective weapons system.

d. Expedite shipment of spares from contractor plants and also expedite additional spares which have been or will be provisioned for.

e. Expedite "fixes" necessary to improve the search radar, air ground communications systems, navigation systems, radome de-icing system.

f. Expedite publication of handbooks 1 through 7 peculiar to the RC-121.

7. Proper recognition of these serious deficiencies in the weapon would provide for establishing a high priority project, with funds incl-

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[illegible]

[illegible] For example, it wasn't until 1 January 1953 [illegible] to the Air Defense Command. Also, in [illegible] relating to this subject [illegible] in the acceptance of the Navy [illegible] and it wasn't until after we had received [illegible] which are now causing the trouble [illegible] Navy aircraft then in production [illegible] time enough to prepare [illegible] for its effective support.

11. In view of the above factual data, it is recommended that adequate [illegible] be given the using service when new systems are assigned to insure [illegible] consideration of all phases of development, equipping, testing, [illegible], and procurement.

FOR THE COMMANDER:

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MAINTENANCE ADCM -66-5

AIR DEFENSE COMMAND MANUAL

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RC-121 STANDARDIZATION MANUAL

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AIR DEFENSE COMMAND

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ADC Manual)
66-5)

Headquarters Air Defense Command
Ent AFB, Colorado Springs, Colorado
1 April 1955

FOREWORD

1. **Purpose.** This Wing Maintenance Manual provides a complete text for commanders and maintenance personnel which will insure a uniform understanding of the organization, functions, and management of the wing maintenance organization. It is intended that this Manual provide the detailed information essential to permit AEW&C wings to establish a standardized system of maintenance and to illustrate how the principles of management may be applied to obtain maximum efficiency and quality. It is basically written to portray operation of a tenant wing on a base in the Zone of Interior.

2. **Scope.** This Manual applies to all AEW&C wings of the Air Defense Command.

3. **Responsibility.** a. Commanders of all AEW&C wings are responsible for implementing and monitoring the procedures outlined herein. This Manual has been designed to generally fit the operational requirements of all AEW&C wings. Minor deviations to fit local requirements may be authorized, in writing, by the wing commander. However, approval for major deviation from the prescribed organization will be obtained from Hq Air Defense Command.

b. All commanders are responsible for controlling the issue of copies of this Manual. This control must insure that individuals furnished copies because of duty assignment leave them with their successors upon change of duty assignment or transfer. Copies will not be classified as "personal property." In addition, the control must insure that changes to the Manual are furnished to, and currently posted by, individuals possessing copies of this Manual.

4. **Changes to Manual.** Recommendations for improvement, additional data to be included, or changes in content are encouraged from all units and individuals and will be submitted, through channels, to Headquarters, Air Defense Command, Attention: Deputy Chief of Staff for Materiel.

BY ORDER OF THE COMMANDER:

GEORGE F. SMITH
Major General, USAF
Chief of Staff

OFFICIAL:

WALTER W. ROBINSON
Colonel, USAF
Command Adjutant

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AEW&C Tactical Sqs	24
Hq AMC	4
Major Air Commands	2
Navy BUAER	10

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1. The initiation of the AEW&C program into the United States Air Force has resulted in the development of a large aircraft with extremely complex equipment. Maintenance on a systematic, planned basis is required to support this weapon with its programmed high utilization rate. Advancements in the field of maintenance management have been made to permit implementation of a planned, systematic concept of maintenance. It is recognized that the days of the "one man know it all" system has passed and personnel must now be teamed and specialized in the maintenance of specific systems and components. However, the requirement for a crew chief to be assigned to, be responsible for, and have "pride of ownership" in one specific aircraft still exists. This assigned crew chief will insure that the specialized aircraft maintenance is a coordinated effort to provide the weapon as required for accomplishment of the AEW&C mission.

2. A standardized system of maintenance for large aircraft with complex systems has been developed in recent years. This system resulted from the recognition that specialists are required to maintain the complex electronics systems in the aircraft. The AEW&C aircraft has the most complex electronics systems of any aircraft in the Air Force today. The application of a standardized system of maintenance to the growing AEW&C program is mandatory to provide wing management personnel with procedures for planning, scheduling, controlling and producing effective maintenance.

3. The following basic objectives for a wing maintenance organization must be compatible with the operational mission to insure that maximum support is provided:

a. To provide, support, and enforce a definitive and standardized maintenance engineering system for all AEW&C wings which will provide the highest quality maintenance at the proper time and in the required quantity.

b. To insure effective, efficient, and economical use of skill, manpower, facilities, equipment, and supplies. The above objectives are not listed in the order of their importance.

4. The integration of an organizational structure and its functions into a system to accomplish these objectives requires that periodic inspections and similar maintenance be accomplished on a schedule by the support squadrons. The pooling of wing resources for accomplishment of periodic inspections and similar type maintenance is desirable to achieve maximum efficiency.

5. The wing maintenance engineering system prescribed in this Manual is based on four primary functions; namely, PLANNING, SCHEDULING, CONTROLLING, and PRODUCING. All are of equal importance and are dependent upon each other if a strong, balanced effort is to be maintained.

6. Planning, the first function, is accomplished by the AEW&C wing commander, director of materiel, director of operations, chief of maintenance, air base group commander, and base supply officer. This level must clearly establish a program that balances mission with maintenance capability and supply support availability. This centralized wing planning group must analyze the flying program, identify and classify the extent and effect of limiting factors, determine needed maintenance requirements, determine the capability to meet the flying commitment, and establish an aircraft utilization program to insure that balance is maintained.

7. Scheduling, the second function, is necessary to permit maintenance to operate at a fairly constant level, with balanced activity of personnel and facilities to prevent a recurring cycle of peak loads alternating with periods of recovery and incomplete utilization. This can only be obtained by recognition of the mandatory planning factor that all of the aircraft and equipment in the wing inventory are not available all of the time. A certain percentage of the aircraft will be out of commission for scheduled maintenance and inspection, and a certain percentage will be rotated through the depots for the time phased scheduled maintenance program.

8. Controlling, the third function, is accomplished by the chief of maintenance, the standardization team, and the maintenance control and quality control units. This level must insure that maintenance of the highest quality is available at the proper time and in the required quantity. This centralized controlling group, by knowledge of maintenance workload pro-

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vided by planning and scheduling, will direct managerial supervision over production and quality control through cognizance of the capabilities of personnel to perform their assigned duties.

9. The controlling of maintenance assets to insure that the efforts of all maintenance activities are coordinated to achieve the maintenance objective is divided into three operating units. The first is MAINTENANCE CONTROL. Based on the determined workload, this unit must establish priorities, schedule jobs, aircraft, and equipment movements; control and dispatch specialists; and monitor job status and progress based on the determined workload.

a. It is essential that work be planned. Every effort must be made to select aircraft and equipment as far in advance as possible so predictable work (special inspections, accessories, and equipment requiring replacement, electronic testing, etc.) can be accomplished and allowances for unpredictable maintenance calculated. The unpredicted maintenance can be integrated with the regular periodic inspection into a planned maintenance operation.

b. Data relative to maintenance status and capability must be available and accurate to permit proper job planning, scheduling, and controlling for production. Therefore, it is mandatory that a centralized component prepare and analyze statistical data, maintain aircraft and systems records, monitor TO compliance status. To insure that equipment and facilities are properly used, it is necessary that equipment job time be analyzed, equipment and space allocations assigned, and maintenance transportation controlled.

c. Monitorship of materiel requirements at the controlling level must be established to anticipate and eliminate conditions that could adversely affect the effectivity of the maintenance organization. This functional component will monitor the validity of shop and bench stock levels, verify and maintain AOCP/AFNE status, monitor the requisition and distribution of TOC kits, insure timely delivery of supplies, and maintain continual liaison with base supply.

10. The second operating unit of control is QUALITY CONTROL. The function of this unit is to gauge the quality of production. Quality control is a management tool through which substandard maintenance can be isolated, cause factors of unacceptability found and eliminated, and a maintenance quality standard maintained. In addition to the normal progressive inspection of maintenance performed by specific supervisors, quality inspectors at unpredicted times during the job progression will examine the work performed. This examination will be guided by prepared forms, which, on a sampling basis, lists the items to be scrutinized. A quality rating is determined by analyzing the detected system discrepancies which are categorically valued as safety of flight, major and minor items.

11. The third operating unit of control is TRAINING CONTROL. It has become increasingly obvious that the requirement exists for complete control and management of local training. The required skill level for the AEW&C program can not be furnished from the USAF formal training program, and the constant turnover of personnel tends to keep the skill levels low. Accordingly, a maintenance training control unit must be established as an integral part of the wing maintenance element.

a. Essentially, maintenance training control is responsible for keeping proficiency as high as possible. As formal training decreases, the demands for on-the-job and local formal training will increase more than proportionately. Therefore, it is imperative that these training resources be judiciously used. Maintenance training control must establish and maintain skill inventories, compute training requirements, develop and schedule training programs, recommend formal training quotas, maintain training records, and evaluate proficiency.

12. PRODUCING, the fourth function, is accomplished by the periodic maintenance squadron and the electronic maintenance squadron on a cooperative basis and serves as the physical instrument for accomplishment of maintenance operations. These squadrons carry out the planned sequence of periodic inspection operations through the use of detailed work sheets or cards. This permits the appropriate mechanic to do a prescribed job in a given area at a specific time. It is essential that each producing activity plan the use of resources, accomplish scheduled maintenance, regulate job and area assignments, report and accomplish unscheduled maintenance, repair or evacuate reparable items, apply quality standards, accurately report manhour expenditures, and insure maintenance and supply discipline.

CHAPTER 2

ORGANIZATION

SECTION I - GENERAL

1. The objective of this chapter is to provide the knowledge and understanding essential to the organization and management of the AEW&C maintenance organizations. This will be accomplished by presenting the proven practices of management and by showing how they may be applied to your function.

2. You will not become an efficient maintenance supervisor by reading this Manual or any other publication. You can, however, learn to be a good maintenance supervisor by studying and practicing the principles on which this chapter is based. The principles of management are proven, but to make the most of them you must adapt your leadership techniques and managerial ability to your own particular problems.

3. This chapter will provide you with a guide for the correct organization and operation of your function in the maintenance organization. It is primarily concerned with the application of sound management principles and contains few technical details. Every effort has been made to produce a guide which is easy to read, is interesting and easily understood, and can be correctly interpreted.

4. The organization charts contained in this Manual are called "shadow charts." The shading is used only for presentation -- to draw the visual connection between a particular block on the chart and its functional description. The shadow must not be interpreted as an indication of the span of control or supervisory spread of any unit.

5. Each section of Chapter 2 concerns one unit of the AEW&C maintenance organization. Insofar as practicable, each unit is covered in complete detail from the organizational and management aspects. Each section is divided into five major parts in order to simplify and standardize presentation. The five parts are:

a. **Function.** A concise description of the general function of the designated unit.

b. **Responsibility and Authority.** The authority of the unit and a definitive listing of its responsibilities.

c. **Personnel.** Pertinent remarks concerning personnel assignments and utilization within the unit.

d. **Relationships.** A brief outline of the primary relationships which the unit must maintain.

e. **General Narrative.** A descriptive and detailed explanation of the organization and operation of the unit with basic emphasis on the application of management principles. This part contains a detailed development to portray how the unit fulfills its assigned responsibilities.

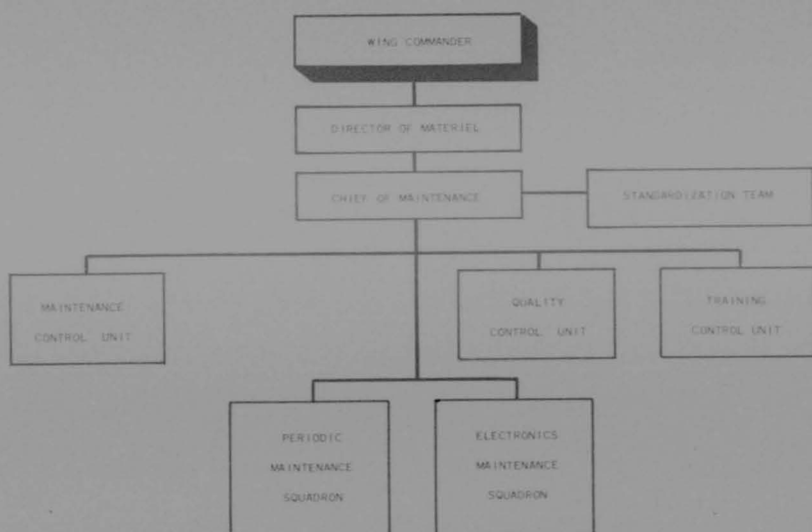
6. Chapter 3 of this Manual contains, in narrative form, a general discussion of maintenance management, and a management check list which will be of value to all supervisors. Each supervisor should read and thoroughly understand at least that section of Chapter 2 covering his particular function of maintenance and Chapter 3 of this Manual. Also, it is recommended that all supervisory personnel study AFM 35-15, "Air Force Leadership."

7. At wing level, this organization actually does not change basic responsibilities. This organization, and allied manning documents, merely establish a capability by staffing the director of materiel's office to aid the assumption of already existing responsibilities for the control and coordination of maintenance. To obtain adequate control and coordination it was found necessary to centralize quality control and maintenance control. We have established two new organizations for centralized control of (1) periodic aircraft inspection and maintenance, and flight line maintenance, and (2) electronics inspection and maintenance.

8. Many persons have interpreted this specialization of maintenance to mean that all authority is vested in the chief of maintenance. This is not correct and is a major management failing to guard against. Authority must be decentralized to the maximum consistent with assigned responsibilities. We cannot have an organization whose every action is dependent upon the direction of one individual. Each unit supervisor must be permitted to operate his own activity consistent with the priorities and policies established by the chief of maintenance. Many personnel affected by the new organization may have a feeling that their authority is being usurped. This is not the case but some interpretations placed on the organization may make it seem so. It is the purpose

of this chapter to outline the organization and explain what has to be done, how to do it, and why it is being done. Specialized maintenance is a proven system of getting the job done quickly, efficiently, and at minimum cost. Team-work is essential. If every man will cooperate and enthusiastically perform his duties, this maintenance organization will progress to the mutual benefit of all concerned.

SECTION II
WING MAINTENANCE
FUNCTIONAL CHART



1. **Function.** Through the director of materiel, the wing commander will direct the organization, manning, and functioning of all maintenance activities in a manner which will insure proper balance between operational requirements and maintenance capabilities.

2. **Responsibility and Authority.** The wing commander is responsible to the air division or air defense force commander for establishing the maintenance organization outlined in this Manual, for directing the maintenance activities, and coordinating the operational and support functions of the wing, in a manner which will provide safe, dependable, mission-ready-aircraft and equipment in the required quantity.

3. **Relationships.** a. **General.** The responsibilities of the wing commander demand that close relationships be established and maintained with higher headquarters, subordinate commanders, and the wing staff. Without this relationship, the perspective of the commander is limited and poor decisions will result from the lack of understanding and acknowledgement of mutual problems.

b. **Higher Headquarters.** The commander will insure operational and readiness capability of the wing by maintaining high quality standards for maintenance and by coordination of the efforts of wing support elements to produce the number of mission-ready aircraft, vehicles, and equipment required to accomplish the wing mission.

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c. **Wing Director of Materiel.** The wing commander will assign the responsibility for the direction and coordination of the wing maintenance organization to the director of materiel and will utilize this directorate in all matters pertaining to these functions.

4. **General Narrative.** a. The wing commander has final responsibility for all activities and functions of the wing. Insofar as maintenance is concerned, the wing commander must delegate the operational responsibility to his director of materiel who, in turn, must delegate it to the chief of maintenance. This delegation of responsibility in no way lessens the responsibility of the wing commander, nor does it lessen the necessity for him to retain a close relationship with the maintenance activities of the wing.

b. It is important that the wing commander direct the establishment of a maintenance organization in accordance with this Manual. To insure effective and efficient operation of his maintenance organization, he must comply with the organizational structure and insure that all affected squadron commanders are aware of their maintenance responsibilities and their position with relation to the chief of maintenance. The efficiency of the maintenance organization is proportional to the support given it by the wing commander. Minor variations from this Manual, which do not violate or compromise its concepts, may be authorized in writing by the wing commander.

c. The wing commander must continually survey his organization to insure retention of the balance that must exist between maintenance capability and operational requirements. An over-balanced condition favoring either maintenance or operation will gradually and surely result in a loss of wing effectiveness. Some indications of a failing balance are: (1) aircraft available but not flown (2) aircraft, or equipment not available as scheduled (3) excessive overtime by maintenance personnel; etc. The organizational balance may be destroyed by excessive requirements placed on either maintenance or operation and the wing commander must correlate his activities so that this condition does not occur.

d. In conjunction with the retention of the maintenance-operation balance, the wing commander must insure that the maintenance organization is adequately supported by all other activities of the wing. Supply and transportation support must be provided as required by maintenance. Maintenance personnel must be used in essential maintenance tasks and skilled technicians should not be diverted to stock chasing, vehicle driving, or similar duties. Where possible, supplies should be delivered by supply to the aircraft, shop, or dock, and vehicles should be driven by regularly assigned drivers. Other supporting activities must be required to provide support to maintenance activities in accordance with current plans, schedules, and requirements.

e. The wing commander should be aware of the quality of maintenance required and accomplished by the wing. Caution must be exercised to prevent the establishment of quality standards of such magnitude that maintenance requirements cannot be met without excessive overtime. This does not mean that mediocre maintenance will be accepted in order to preserve a normal duty day. However, quantity and quality will suffer when personnel are overworked. Long periods of continued overtime are normally unnecessary and should be analyzed carefully to determine and correct the cause. Frequently it will be found that the urgency was not factual, the job exceeded the requirement, or some similar easily corrected reason was the cause for overtime.

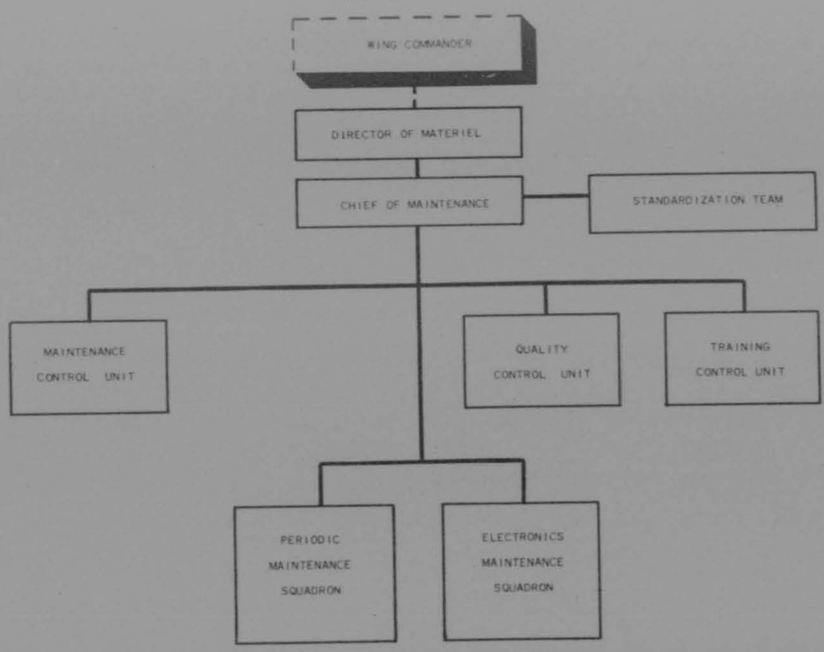
f. Within each wing the commander will establish an aircraft scheduling committee consisting of himself, the director of materiel, director of operations, and chief of maintenance. The committee will meet at the call of the commander once each month to establish a broad standing pattern of aircraft utilization. This may consist of a plan to fly a fairly constant number of aircraft each day, or some variation thereof. The committee will establish the flying requirements of the wing but will not select the actual aircraft to be flown. Aircraft selection to meet the established requirement will be accomplished by the maintenance control unit. The pattern established must provide the wing with the aircraft necessary to meet all training and readiness requirements and, also, permit maintenance to operate at a fairly constant level with balanced activity of personnel and facilities.

g. The commander will conduct the aircraft scheduling meeting in a manner which will insure that the operational requirements and maintenance capabilities are in consonance. The director of operations should present his requirements, specifying exactly what the status of each aircraft should be (i.e. what equipment must be operational, etc.). These requirements must be based upon training needs and ordered missions known at the time of the meeting. The director of materiel and chief of maintenance will give specific indication of capability to meet the requirements.

h. It must be emphasized that aircraft scheduling cannot be accomplished on the basis of 100% of the authorization or 100% of the wing inventory. Rather, consideration must be given to those aircraft lost from the wing to time-phase reconditioning, periodic maintenance, etc. Insofar as practicable, scheduling by the wing scheduling committee should be restricted to flying-hour requirements with actual aircraft selection and scheduling accomplished by the maintenance control unit on the basis of the hour requirements agreed upon.

i. Equipment scheduling need not be accomplished at the same level as aircraft scheduling. However, the wing commander must insure, by his actions and directives, that equipment maintenance scheduling is accomplished by the maintenance activity and complied with by all using activities. Since the actual utilization assignment of the vehicles will be made by the air base group, sufficient coordination must take place between that group and the maintenance activity to insure adherence to established maintenance schedules. When a vehicle is due for periodic maintenance, or repair, it must be released by the using activity in sufficient time to meet the schedule.

SECTION III
WING MAINTENANCE FUNCTIONAL CHART



1. **Function.** The director of materiel will direct and coordinate all functions of the maintenance organization for the wing commander. He will establish policy, analyze statistical data, and plan implementing procedures to insure maximum efficiency and mission effectiveness of the wing. His office will interpret and implement the policy of higher authority and advise the wing commander in all materiel matters.

2. **Responsibility and Authority.** The director of materiel is responsible to the wing commander for insuring efficient accomplishment of the assigned maintenance functions. The authority necessary to carry out the maintenance function will be delegated to him by the wing commander. This authority will be delegated to subordinates assigned responsibility for specific phases of the maintenance function.

3. **Relationships.** a. **General.** Complete dissemination and coordination of information is essential to cooperation and understanding among the organizations accomplishing specific phases of the maintenance function. It is essential that the director of materiel require frequent meetings of key personnel to stress the importance of active cooperation and coordination of functions and to discuss matters of interest to all.

b. **Wing Commander.** The director of materiel is responsible to the wing commander for the accomplishment of the maintenance function, for coordination of all maintenance activities in a manner which will satisfy the operational requirements of the wing, and for keeping him advised of the status and capability of the maintenance organization.

c. **Director of Operations.** The director of materiel will actively participate in the establishment of a policy whereby the operational requirements of the wing are planned, scheduled, and coordinated with the operations, supply, and maintenance functions. He must insure that the director of operations has current information relative to the capabilities of maintenance, and that operations planning is in consonance with that maintenance capability.

d. **Director of Personnel.** He must insure that the director of personnel has current information relative to the assignment of and requirement for maintenance personnel.

e. **Air Base Group Commander.** The director of materiel will coordinate with the air base group commander relative to the support required and received from the air base group.

f. **Chief of Maintenance.** He will utilize the chief of maintenance as the wing staff maintenance officer, consult him on all maintenance problems, and insure that he complies with the policies and requirements of higher authority. The director of materiel will permit the chief of maintenance to manage the maintenance organization consistent with established command policies and requirements.

g. **Base Supply Officer.** The director of materiel will coordinate with the base supply officer to insure an effective supply which adequately supports the wing maintenance organization.

h. **Contractor Technicians.** He will coordinate the activities of assigned contractor technicians to insure full use of their skills and will monitor their availability and efficiency and insure compliance with pertinent directives.

4. **General Narrative.** a. The director of materiel functions as the directional head of the wing maintenance organization. He will require the establishment and staffing of a maintenance organization in compliance with this Manual and any deviations authorized by the wing commander. He will assign to the chief of maintenance the responsibility for the supervision and management of the maintenance organization and delegate him authority commensurate with that responsibility.

b. The director of materiel is charged with the responsibility for the direction and coordination of all phases of maintenance within the wing. It is not expected that he will concern himself with the minute details of operation or the solution of minor problems. Insofar as possible, he should permit his maintenance staff officer, the chief of maintenance, to run the show. He must, however, remain aware of the general status of the maintenance organization and its major problems. His participation in maintenance should be proportionately the same as the wing commander's participation in materiel.

c. This wing maintenance organization provides the director of materiel with a well-staffed maintenance organization. The chief of maintenance is his staff maintenance officer. There is no justification for the establishment of a duplicate function of an additional staff maintenance officer.

d. The maintenance staff must be

0302

assigned the responsibilities for aircraft and equipment maintenance. Insofar as practicable, the maintenance organization should process all maintenance correspondence and reports, receiving only staff coordination from the director of materiel. It is extremely important that the director of materiel insure that the chief of maintenance complies with and enforces the policies and requirements established by the wing commander or higher authority. For this reason, it is essential that he approve maintenance SOPs or directives prior to publication, eliminating duplications or conflicting instructions.

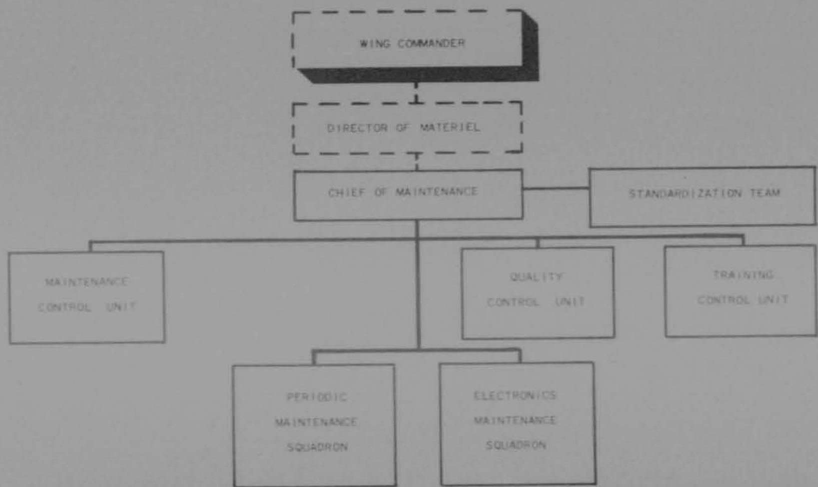
e. The director of materiel must act as the balance wheel of the maintenance organization. He must listen to and pass upon the major conflicts or disagreements which arise between the chief of maintenance and the various squadron commanders. He must attempt to solve these problems to the satisfaction of all concerned. He must insure that the maintenance organization is held firm and that the chief of maintenance follows the chain of command; i.e., the chief of maintenance reports to the director of materiel and not to the wing commander. The chief of maintenance should confer with the wing commander only with the knowledge of the director of materiel. Arrangements other than this will break down the organizational structure and destroy the control established by the director of materiel.

f. The director of materiel must insure that he coordinates establishment of the wing aircraft operational requirements so that adequate materiel support may be provided. He must require that the chief of maintenance keep him informed of maintenance capabilities so that he may, in turn, inform and advise the wing commander and director of operations. Similarly, he must insure that aircraft operations planning is in consonance with the materiel capabilities. In this connection he must assist the wing commander in maintaining balance between operations and maintenance so that maximum wing effectiveness is realized. Similar coordination and action is required to insure compliance with maintenance schedules for vehicles and equipment.

g. As the wing materiel officer, the director of materiel must coordinate the materiel needs of the maintenance organization with the materiel activities of the air base group (supply, etc.). He must obtain support in harmony with maintenance requirements. In this function he will be required to maintain close relationships with the air base group materiel officer and the base supply officer.

h. One staff officer from the directorate of materiel will be appointed on wing orders as the wing aircraft distribution officer. As such, this officer will be responsible for compliance with all pertinent directives regarding aircraft distribution. He will closely coordinate all aircraft distribution activity with the chief of maintenance and all affected maintenance activities. He must insure a careful and deliberate execution of the aircraft distribution function.

SECTION IV
WING MAINTENANCE
FUNCTIONAL CHART



1. **Function.** The chief of maintenance will supervise and manage the entire maintenance effort of the wing and advise the director of materiel in all pertinent matters. He will provide direction and guidance for all maintenance activities and interpret and implement maintenance policies of higher authority.

2. **Responsibilities and Authority.** a. The chief of maintenance is responsible to the director of materiel for supervising and managing the wing maintenance organization to insure quality maintenance and availability of the maximum number of mission-ready aircraft and equipment. He will be delegated authority commensurate with his responsibilities.

b. The chief of maintenance will:

(1) Plan and direct the over-all conduct of flight line, periodic, electronics, and equipment maintenance to obtain the maximum number of mission-ready aircraft and equipment.

(2) Issue and implement sound maintenance policies and procedures for effective operation of the wing maintenance organization.

(3) Effectively use the standardization team in establishing maintenance standards for the wing and in the improvement of the wing maintenance organization.

(4) Coordinate with the director of operations in the establishment of aircraft operational requirements.

(5) Schedule and control all maintenance and repair on a planned basis which will insure maximum availability of safe, mission-ready aircraft and equipment.

(6) Maintain records to provide current information essential to the planning and management of the maintenance organization.

(7) Establish an effective system of specialist dispatch for electronics and periodic maintenance squadron specialists to insure prompt dispatch and efficient utilization.

(8) Determine the adequacy of support to all phases of aircraft, electronic, and equipment maintenance.

(9) Insure appropriate maintenance support of the wing training aids.

(10) Establish a vigorous and continuing program for the timely submission of unsatisfactory reports.

(11) Schedule, and monitor all technical order compliances.

(12) Direct the conduct of quality inspections and flight tests and insure positive action to correct and prevent recurrence of irregularities noted.

(13) Coordinate with supply activities to insure availability of parts and materials when and where required.

(14) Control and cannibalization of aircraft and equipment.

3. **Personnel.** a. The chief of maintenance will monitor the availability and utilization of all maintenance personnel. In addition, he will coordinate the establishment and application of maintenance training programs.

b. He will make recommendations to the director of personnel with respect to:

(1) Priority of maintenance personnel assignments.

(2) Reassignment of maintenance personnel to maintain an equitable distribution of skills and experience.

(3) Requirement for the fulfillment of quotas for maintenance training, local and off-base.

(4) Staffing the maintenance, materiel, quality, and training control units with the best qualified personnel for the jobs.

4. **Relationships.**

a. **Director of Materiel.** He is responsible to the director of materiel for the successful supervision and management of wing maintenance activities.

b. **Director of Operations.** The chief of maintenance will coordinate operational planning and advise the director of operations of maintenance capabilities to meet operational requirements.

c. **Director of Personnel.** The chief of maintenance will advise and assist the director of personnel in matters pertaining to maintenance personnel.

d. **Squadron Commanders. (Periodic and Electronics Maintenance.)** He will establish and maintain direct and close contact with the squadron commanders in the direction of maintenance accomplishment; encourage command support for correction of inspection discrepancies; insure that the squadrons actively cooperate in mutual assistance and in the solution of maintenance problems.

e. **Standardization Team.** The chief of maintenance will use the standardization team to establish maintenance standards for the wing and to investigate and determine the cause of sub-standard maintenance. He will use the team as technical advisers, instructors, and demonstrators of quality maintenance.

f. **Quality Control Unit.** He will provide maximum support to the quality control unit to insure that adequate emphasis is placed on correction of discrepancies discovered. The chief of maintenance will use this unit as the "eyes and ears" of maintenance and supply support, and encourage its activities. He must carefully monitor reported major discrepancies or sub-standard quality to ascertain areas of weakness and the need for further investigation by the standardization team.

g. **Maintenance Control Unit.** He will insure that the maintenance control unit schedules, directs, and controls the performance of all maintenance, consistent with existing policy. This activity will be required to analyze maintenance reports and statistics, man-hour information, etc; advise and recommend corrective action; and through the materiel control branch insure that all maintenance activities receive necessary supply support. The chief of maintenance will emphasize to all maintenance activities that the maintenance control unit is the nerve center and will operate as the brain of the wing maintenance organization.

h. **Training Control Unit.** He will coordinate with this unit in the establishment and use of maintenance training programs and facilities for increasing technical proficiency and for providing career progression within the maintenance field.

i. **Contractor Technicians.** The chief of maintenance will insure full utilization of contractor technicians in their authorized consultant, advisory, or instructor capacities. He will establish, in coordination with the director of materiel, correct assignments of contractor technicians and review the activities and reports of each to determine utilization and actual requirements.

j. **Base Supply Officer.** He will maintain, in conjunction with the materiel control branch, close relationship with the base supply officer to coordinate maintenance equipment and materiel requirements and insure that maintenance activities comply fully with the procedures and policies of the base supply activity.

k. **Other Activities of the Air Base.** The chief of maintenance must maintain close relationships with other air base support activities (motor vehicle squadron, etc.) to coordinate maintenance support requirements, and insure compliance with established base policies and directives.

5. **General Narrative.** a. The chief of maintenance is the executive manager of the wing maintenance organization. He must be highly qualified in leadership, management, and organization. Because this is the top active management position of the maintenance organization, the application of leadership and management principles must be paramount here if it is to be required of other maintenance supervisors.

b. One of the more important functions of the chief of maintenance is the establishment and maintenance of close relationships with the squadron commanders. He should establish personal contacts with these commanders to keep them entirely familiar with the maintenance operation. It is not intended, under this maintenance concept, that the chief of maintenance assume or usurp any command responsibilities, nor is it intended that he or the Director of Materiel be an intermediate commander between the squadron and the wing commanders.

c. All squadron commanders concerned with maintaining wing equipment are responsible to the wing commander. However, because of the complexity and scope of the maintenance activity, the wing commander has delegated the necessary authority to the chief of maintenance to direct and supervise the over-all maintenance activity of the wing. If a support squadron commander cannot resolve a maintenance difficulty with the chief of maintenance, or the director of materiel, it is only logical and proper that the matter be referred to the wing commander for decision.

d. The maintenance officer of the squadron is actually responsible to and works for the squadron commander. However, for expediency and to balance the maintenance effort throughout the wing, the chief of maintenance or the maintenance control officer will normally transmit directives and instructions directly to the maintenance officer. It is the squadron commander's prerogative to insist that he personally sanction all maintenance control actions within his squadron, but to do so would be impracticable. The most efficient operation is achieved when the maintenance control unit is permitted to deal directly with the squadron maintenance officers on routine matters while the chief of maintenance and squadron commanders work together on major items and the over-all phases of maintenance without becoming submerged in the details.

e. The chief of maintenance must function strictly as an executive. It is particularly important that personnel selected to fill the staff and supervisory position in the maintenance organization be the best qualified personnel available for those positions. He must decentralize authority to the maximum and have dependable assistants with whom he can entrust authority and who will assume responsibility.

f. Responsibility must be clearly defined and assigned to specific functions of the organization. It is a responsibility of the chief of maintenance to ascertain through frequent personal interviews that key supervisors have a complete and thorough knowledge of the organization and their responsibilities, duties, and authority. He must be helpful and emphasize this attitude by the definite acts of assistance.

g. Planning and scheduling of the over-all maintenance function at this level of maintenance management is vital. Every action and decision must be based on a careful analysis of facts. For this reason, a sound administrative system is required to gather and correlate the information essential for effective planning and management. Factual data relative to utilization, availability, and status of manpower, equipment, and materials must be joined together and studied before a plan or schedule is established. It must be understood that the efficiency of this concept of maintenance depends upon:

(1) Centralized Control.
(2) Decentralized Authority.
(3) Clear Delineation of Responsibility.

h. The chief of maintenance will supervise the maintenance control unit and require that unit to issue and implement sound maintenance policies and procedures for the effective operation of the maintenance organizations. The chief of maintenance will authenticate all Maintenance Information Letters (MILs) or local maintenance directives under command line of the wing commander.

i. To provide the chief of maintenance with the administrative machinery necessary to direct and control mainten-

0306

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ance, the following units have been established within the maintenance organization:

(1) Standardization Team.
(2) Maintenance Control Unit.
(3) Quality Control Unit.
(4) Training Control Unit.

j. The control function, comprising the above units, must be organized as a compact unit strategically located with relation to the other units of the maintenance organization. **They must be provided with an adequate communications and transportation system to insure the rapid transmission of maintenance data control of work in progress, and movement of personnel.** Effective control of maintenance requires a constant flow of data from the operating units to the control function in order that a cooperative plan of action may be developed and promptly executed on a scheduled basis.

k. The chief of maintenance must be constantly alert to the balance of work within the maintenance organization. The chief of maintenance must continually monitor and observe maintenance activity to insure that the status of maintenance in progress is in accordance with the maintenance plan. Immediate action will be taken to forestall or correct any unbalanced situation.

l. The planning and directing responsibility of the chief of maintenance will be accomplished through full use of the maintenance control, quality control, and training control units. The chief of maintenance will provide the maintenance control unit with the basic wing requirements as developed from coordination and scheduling meetings with the director of operations and other staff agencies. The maintenance control unit will develop and implement the detailed planning and scheduling of maintenance necessary to meet the established schedules and will direct and control the wing maintenance activities to insure fulfillment of wing requirements.

m. The chief of maintenance will require the maintenance control unit to review all maintenance inspection and flight test reports, and all corrective action indorsements, to ascertain the quality of maintenance accomplished, the airworthiness of assigned aircraft, serviceability of vehicles and equipment, the adequacy of corrective action, and to determine the areas of weakness within the maintenance organization. Positive action will be taken to eliminate the causes of recurring discrepancies, to correct the areas of weakness, to improve the quality of maintenance, and to increase the mission capability of the wing. It is important that the chief of maintenance obtain the active cooperation and participation of the squadron commanders in the correction of inspection discrepancies and the elimination of causes for substandard maintenance quality. Frequent personal contacts with the squadron commanders relative to the quality control unit should produce for him considerable information as to the effective value of the inspection reports, adequacy of inspection coverage, assistance rendered by the unit, and other pertinent factors. He must insure that this unit operates in a manner which will receive the enthusiastic support of the commanders and all maintenance personnel and which will instill a true sense of quality discipline in all personnel.

n. To assist in developing acceptable maintenance standards, and to provide a technical advisory unit, the chief of maintenance is provided with a standardization team. He should utilize this team to investigate areas of maintenance deficiency and/or substandard quality to determine the cause and recommend corrective action. He must require that, in the course of investigation, the team instruct and actually demonstrate, by performance, high quality maintenance. The team will be composed of highly qualified personnel, skilled in their career fields. The chief of maintenance should frequently assemble the team for a discussion of the maintenance organization and its problems and encourage their participation in the solution of those problems, both technical and managerial. He must encourage the team to recommend changes in procedures which will increase the effectiveness of the maintenance organization.

o. Correct utilization of the standardization team will constitute fulfillment of one phase of his responsibility for maintenance training. In addition, he will require the training control unit to establish a program which will insure that all maintenance personnel receive the training required to maintain technical proficiency, to progress through their career field, and to advance in grade and responsibility. He must coordinate such programs and insure full use of existing base facilities including MTDs, contractor technicians, and base schools. The wing must continue the effective training of assigned personnel to sustain over-all combat potential. **Primary emphasis will be giv-**

en to training in areas of deficiency rather than general over-all training. These areas may be determined by various means including, but not limited to, written evaluation tests, standardization team interviews, etc.

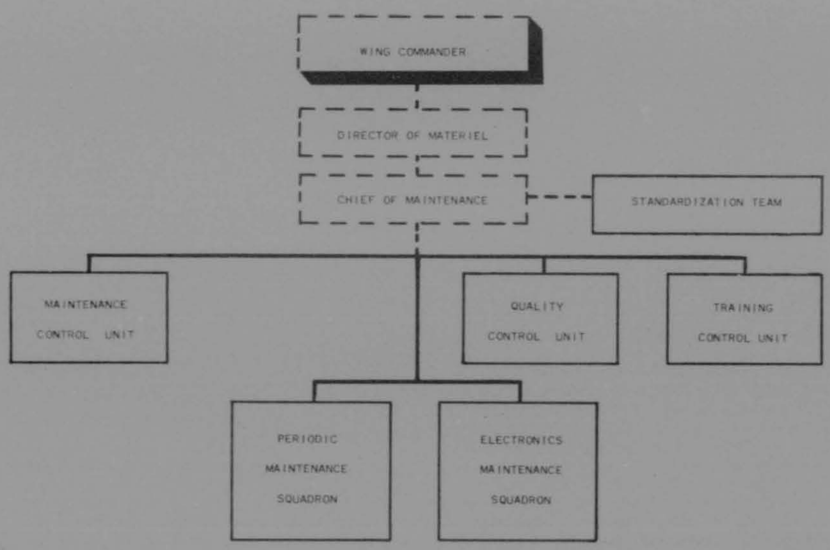
p. The chief of maintenance, as the wing staff maintenance officer, will insure that assigned contractor technicians are fully and properly utilized in accordance with current directives. To insure correct utilization, the chief of maintenance must establish a definite office area for the contractor technicians and be aware of their availability at all times. He should know each assigned contractor technician personally and utilize his ability to the maximum in the maintenance training program. Particular attention will be given the actual requirements of the wing. Action will be taken to effect reassignment when the need for any or all contractor technician assistance no longer exists.

q. Supply discipline must be practiced and enforced by the chief of maintenance. He must insist upon full utilization of all materiel and insure maximum exploitation of shop capabilities to augment the supply system by effective reparable processing. Insofar as practicable, he will require the bench check of items prior to their classification as reparable. In this connection, he will also designate, through the appropriate maintenance officer, selected personnel who will be the only personnel authorized to sign condition tags, including reparable tags. Copies of all such authorization lists will be furnished the base supply officer, materiel control, and quality control. The economical operation of the maintenance organization will depend to a great extent upon the supply discipline attitude instilled by the chief of maintenance.

SECTION V

WING MAINTENANCE

FUNCTIONAL CHART



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1. **Function.** To determine, and recommend to the chief of maintenance, acceptable and equitable maintenance standards to assist in improving the quality of maintenance accomplished within the wing. The team will investigate areas of maintenance deficiency and report findings and corrective recommendations to the chief of maintenance. It will demonstrate the performance of quality aircraft maintenance where necessary and appropriate.

2. **Responsibility and Authority.** a. The standardization team is responsible to the chief of maintenance and must be delegated authority to establish maintenance quality standards for the wing.

b. The standardization team will:

(1) Determine, and recommend to the chief of maintenance, acceptable maintenance standards for the wing.

(2) Indoctrinate maintenance personnel in the established maintenance standards and their individual and collective responsibilities in equaling or surpassing those standards.

(3) Advise the chief of maintenance of the areas of deficiency, lack of proficiency, etc., and recommend corrective action to include improvement in maintenance methods, policies, and procedures.

(4) Insure that all maintenance personnel are familiar with current appropriate technical publications affecting wing assigned aircraft, vehicles, and equipment.

3. **Personnel.** The team will be manned with the best qualified personnel available under current tables of organization. Personnel appointed to the standardization team will not be assigned additional duties which require their absence from the team. Commanders are responsible for insuring that personnel appointed to the team serve for the maximum period of time commensurate with local conditions (such as stability of personnel) and the efficiency and effectiveness of the standardization program.

4. **Relationships.** a. **General.** Essentially, the standardization team is to serve as adviser and demonstrator of quality maintenance to all maintenance personnel. Therefore, the relationship existing between the team and other activities of the maintenance organization is extremely important to the success of the program.

b. **Wing Commander.** The standardization team must have the support of the wing commander and his staff in order for its value to be fully realized. Its investigations and recommendations must be fair, impartial, and accurate so that the wing maintenance organization is effectively improved.

c. **Chief of Maintenance.** The standardization team is assigned to the wing headquarters and will function as a unit under the direct supervision of the chief of maintenance. The team will serve as technical adviser to the chief of maintenance. Accordingly, the team must weigh its recommendations carefully to insure that procedures are sound prior to submission to the chief of maintenance. The team is potentially one of the most effective tools available to the chief of maintenance; however, it must be fully utilized in order for its effect to be profitably realized in the maintenance organization.

d. **Quality Control Unit.** The team must work closely with the quality control unit in order to be aware, through discrepancy write-ups, of the maintenance quality failings and areas of maintenance deficiencies of the wing. Close coordination is required to insure joint understanding and interpretation of technical requirements and established maintenance standards.

e. **Training Control Unit.** The close connection between training and standardization dictates the requirement for a harmonious, cooperative relationship between the team and the training control unit.

f. **All Maintenance Activities.** Close contact must be established and maintained with all maintenance activities to insure understanding of the purpose and goal of the team. This relationship is extremely important because of the advisory responsibilities of the team. It is essential that the maintenance personnel to whom it demonstrates quality maintenance, or to whom it advises, accept the assistance in the manner in which it is intended to be received. Acceptance of and adherence to the established standards should be voluntary, and the use of directive authority limited, if the relationship is correctly established.

g. **Wing Abort Board.** The team must study the reports of the wing abort board to determine maintenance causes for aborts and corrective action required to prevent recurrence.

5. **General Narrative.** a. The primary purpose of the standardization team is to assist in increasing the quality of maintenance accomplished within the wing. The program must be aimed at assisting maintenance personnel in quality

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improvement by actual demonstration of quality maintenance methods and procedures. Therefore, it is extremely important that only highly qualified personnel, capable of quality maintenance demonstration, be appointed to the team. Each appointee must be highly skilled in his specialty and aware of the most effective and efficient maintenance procedures. The program must be given the necessary emphasis by all command and supervisory personnel so that the wing may achieve the desired standard of maintenance quality.

b. The object in appointing personnel to the standardization team is to make available to lesser trained personnel the knowledge of experienced personnel well schooled in high quality maintenance performance. Each appointee will provide quality training to the personnel of his career field. As a team member he must be an example to other personnel of his career field.

c. All personnel assigned to the standardization team will function as a technical adviser in their respective fields to the team chief. The team as a whole is the technical adviser to the chief of maintenance. It will train other maintenance personnel by actual demonstration of the performance of high quality maintenance. Each team member must be constantly on the alert for malpractices, faulty procedures, or below-standard maintenance quality. When on-the-spot correction is not feasible, appropriate recommendations for corrective action will be made to the team chief.

d. The team will be required to investigate areas of maintenance deficiencies and recommend improvements in procedures which will correct the deficiencies, increase maintenance quality, and/or improve efficiency. Normally, the team will investigate on its own initiative, consistent with the over-all policy established by the chief of maintenance. The need for investigation may be determined from many sources available to the chief of maintenance and the team. Some of these sources are:

(1) Quality Inspection Reports.
(2) Discrepancy Trend Charts.
(3) Unsatisfactory Reports.
(4) Personnel Reports.
(5) Engine Change Data.
(6) Breaks in the Maintenance Schedule.
(7) Aircraft Abort Reports.
(8) Equipment Damage Reports.

e. When investigating areas of deficiency, the team will attempt to find the predominant cause or causes of the deficiency. The investigation must be wholly impartial and assume a "show me" attitude. It should be made a matter of record by use of a locally devised format which would permit a synopsis recording of each interview, etc. In general, the obvious reasons for substandard quality will vary with each investigation. For example, while many aircraft have some of the basic causes, almost always the predominant cause for substandard quality will be different for each aircraft. Each aircraft, then, must be considered separately. Even though the team is composed of personnel with extensive experience and high professional competence, they still must obtain facts to help solve the wing maintenance problems. Practically speaking, this will be accomplished by:

(1) Observing certain crews or individuals at work,
(2) Interviewing personnel
(3) Supervisory check of maintenance accomplished,
(4) Analysis of past maintenance records of aircraft, vehicles, equipment, or crews.

f. Following the investigation, the team will recommend corrective action to the chief of maintenance. The corrective action may be any one, or combination, of many possibilities. It may be a change in technique, policy, quality standard, procedure or method. The recommendations submitted should be complete. That is, the error or fault must be pointed out and the recommended change fully described. The chief of maintenance should need only to sign his name to approved changes in order to place them in effect.

g. When correcting malpractices, should the correction be technique, procedure, etc., the team will devote the maximum practicable emphasis on actual demonstration. In order to actually demonstrate the performance of quality maintenance it will frequently be necessary to utilize other specialist personnel who have consistently accomplished high quality maintenance. However, care must be exercised to prevent the use of such personnel if it will affect the normal maintenance routine. The use of these personnel will always be coordinated with their immediate supervisor to permit necessary schedule changes, work assignment, etc.

h. When the investigation leads into problems outside the area of maintenance control (supply, transportation, etc.), the team will present all available information

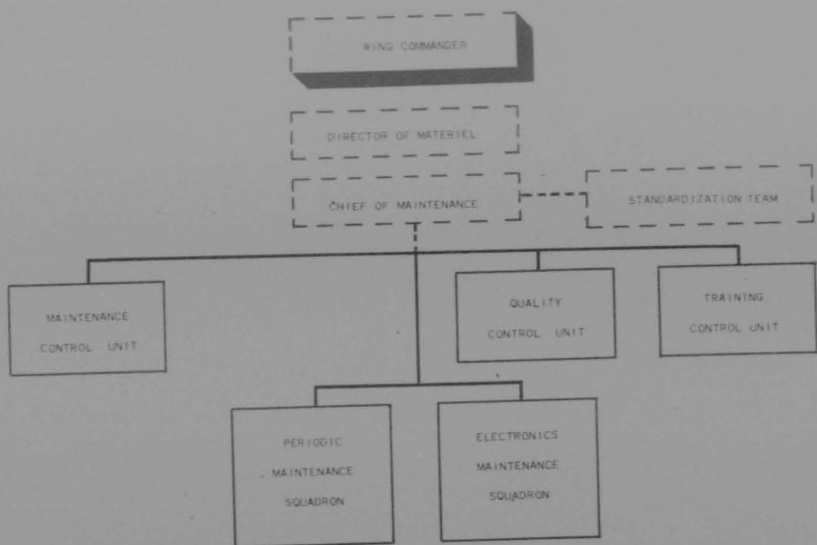
0310

to the chief of maintenance for necessary coordination with the affected agency, or for reference to the director of materiel. **The team must be particularly careful in situations of this type to insure that all the facts are obtained.**

i. The team chief will establish a technical order familiarization chart in accordance with TO 0-20A-1. He will require all members of the team to be familiar with all current technical publications relative to their specialty. This is essential to the success of the program and will be continually stressed in meetings, interviews, and discussions. The team cannot be expected to correctly demonstrate high quality maintenance if they are not current in these publications.

j. The standardization team is charged with the responsibility for determining, and recommending to the chief of maintenance, acceptable maintenance standards for the wing. When standards are approved by the chief of maintenance, the team will coordinate with the training control unit to insure that the standards are included in the training curricula of all wing maintenance training facilities (MTD's, base schools, etc.).

SECTION VI
WING MAINTENANCE
FUNCTIONAL CHART



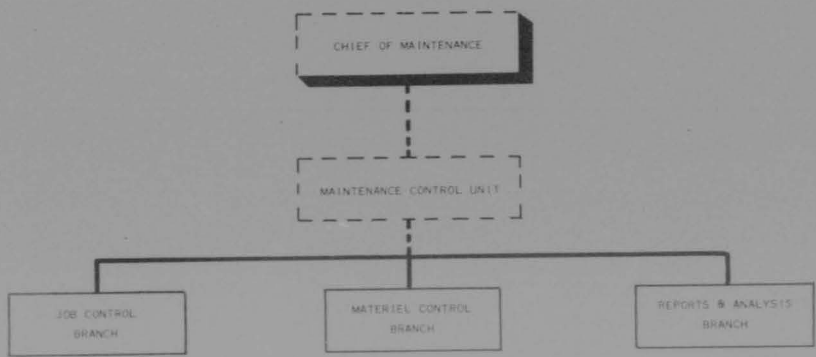
1. **Function.** This unit will analyze maintenance requirements, plan maintenance operations, schedule maintenance performance, schedule mission aircraft, control maintenance activities, maintain pertinent records, and conduct all contract maintenance activities for the wing.

2. **Responsibility and Authority.** a. The maintenance control officer is the assistant chief of maintenance and will be responsible to the chief of maintenance for accomplishing the functions assigned the maintenance control unit. This unit will implement the policies of the chief of maintenance and coordinate, control, and direct the activities of all wing maintenance functions.

b. The maintenance control unit will

MAINTENANCE CONTROL

ORGANIZATIONAL CHART



plan, schedule, and direct the operation of the maintenance organization to insure availability of the required number of safe, dependable, mission-ready aircraft, vehicles, and equipment.

c. The maintenance control unit will be divided into three branches which are: (1) reports and analysis; (2) job control; (3) materiel control.

(1) The reports and analysis branch will:

(a) Monitor the availability and utilization of maintenance personnel.

(b) Establish and control a central reporting and administration system for all maintenance reports and correspondence.

(c) Maintain all maintenance control unit correspondence, records.

(d) Collect the data necessary to measure the efficiency of the maintenance organization.

(e) Maintain charts, graphs, and/or tables required for analysis and presentation.

(f) Conduct all necessary analyses.

(g) Establish maintenance performance standards for the wing.

(h) Maintain the historical records for wing assigned aircraft.

(i) Maintain an individual aircraft records jacket file for each wing assigned aircraft.

(j) Establish a procedure for documenting and reporting technical order compliance.

(k) Maintain TOC charts, files, or similar records for each assigned aircraft in accordance with TO 0-20A-1.

(l) Prepare and distribute anticipated component replacement lists for periodic inspections of wing assigned aircraft, vehicles, and equipment.

(2) The job control branch will use the information provided by the records and analysis branch to manage and direct the maintenance organization and will:

(a) Plan all maintenance operations to provide maximum production with minimum delay.

(b) Schedule and control the movement of aircraft, and equipment through all phases of maintenance.

(c) Establish work priorities and coordinate maintenance activities to insure an orderly flow of maintenance work in conformance to established schedules.

(d) Maintain the status of all aircraft, and equipment maintenance in progress.

(e) Keep the chief of maintenance advised of maintenance capabilities for use in planning aircraft use.

(f) Maintain the status and location of all wing assigned aircraft, and develop and publish a wing aircraft parking plan.

(g) Maintain the status of vehicles and aircraft support equipment.

(h) Direct the dispatch of electronics, specialist shop, and equipment maintenance specialists in accordance with established priorities.

(i) Coordinate with the standardization team in the development of plans and data for improving methods, procedures, working conditions, quality, and organization.

(j) Establish an effective communi-

0312

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cation and transportation system to provide immediate information and movement of personnel to and from all maintenance activities.

(k) Coordinate with the quality control unit in the selection of aircraft and equipment for quality inspections.

(l) Allocate aircraft to meet mission schedule and commitments.

(3) The materiel control officer is responsible to and works for the maintenance control officer. The materiel control officer will:

(a) Keep the maintenance control officer advised of the over-all supply situation as it affects the wing maintenance organization.

(b) Establish a system to effectively anticipate and procure parts and supplies in a manner which will insure delivery of the required items at the required time and place.

(c) Maintain liaison with the base supply activities to insure the availability of adequate supplies and equipment to support maintenance requirements.

(d) Establish and monitor flight line shop, and dock stock supply levels in coordination with the appropriate maintenance officers.

(e) Verify AOCP and ANFE requisitions and maintain, by aircraft, or equipment serial number, current AOCP and ANFE status.

(f) Be aware of the current list of critical items and recommend reparable processing schedules and priorities.

(g) Monitor the expeditious routing of reparable property to supply and maintenance facilities, and coordinate in the establishment of a wing master repair schedule of critical items.

(h) Coordinate with the base supply officer to insure that all TOC kits and parts required for wing aircraft are obtained, assembled, stored, and issued as requested by the maintenance control officer.

(i) Monitor the requisitioning of TOC kits and parts for mission aircraft and allied equipment.

(j) Recommend cannibalization to the maintenance control unit when such action is deemed advisable in the best interests of the wing.

(k) Maintain files of pertinent supply catalogs and technical publications required for effective operation.

(l) Obtain necessary items to keep the preissue stocks in the shops at the established levels.

3. **Personnel.** The maintenance control unit will continually study the manning of the maintenance organization, make recommendations for changes, and monitor the availability and utilization of maintenance personnel.

4. **Relationships.** a. **General.** The efficient use of maintenance manpower and facilities will be achieved only by the establishment of carefully prepared schedules coordinated with all related functions. In this respect, the relationships of the maintenance control unit are of extreme importance to the successful operation of the maintenance organization since it is here that the maintenance plans and schedules are prepared and initiated.

b. **Chief of Maintenance.** The maintenance control officer is responsible to the chief of maintenance for the efficient management and supervision of the maintenance organization. He must determine the maintenance capability and keep the chief of maintenance advised of the capabilities of the maintenance organization to absorb off-base school quotas, training schedules, etc.

c. **Standardization Team.** The unit will recommend to the chief of maintenance the use of the standardization team to investigate areas of maintenance deficiency as indicated by the analyses of maintenance reports and data.

d. **Quality Control Unit.** The job control branch will coordinate inspection and flight test schedules to minimize disruption of the schedules of other maintenance functions.

e. **Training Control Unit.** The maintenance control unit will coordinate on all training schedules to minimize disruption of maintenance schedules.

f. **All Squadrons.** This unit will maintain a close relationship with all squadrons to determine that the maintenance product is satisfying requirements as to quality and quantity. It will assist in eliminating manpower loss due to uncoordinated squadron activities. It will direct, control, and advise all activities of the maintenance organization and obtain the assistance and recommendations of all supervisors.

5. **General Narrative.** a. The maintenance control unit is the planning, scheduling, coordinating, and controlling center of the maintenance organization. As such it is the nerve center of the maintenance function. In effect, the maintenance control officer is the production man-

ager of the maintenance organization responsible for insuring that the efforts of all maintenance activities and personnel are coordinated to achieve the objective represented by the maintenance schedule.

b. For most efficient production capability, the maintenance organization must have one unit specifically charged with the responsibility for collecting factual and statistical data; establishing performance standards; planning, scheduling, and coordinating maintenance activities; and analyzing maintenance efficiency. To provide this, the maintenance control unit is established and placed under the control of the chief of maintenance. To efficiently execute the functions of the maintenance control unit, **an effective communications and transportation system must be established.** Failure to establish this basic requirement or control its utilization will result in a general loss of maintenance efficiency.

c. The maintenance control unit should operate as a compact unit occupying space adjacent to the office of the chief of maintenance. This arrangement permits ready access to all maintenance data and promotes better relationships and personnel utilization.

d. This unit must provide all maintenance supervisory personnel with information on what is to be done and when completion is required. Efficient use of maintenance facilities will be obtained by the establishment of carefully prepared maintenance plans and schedules coordinated with all activities directly or indirectly concerned. Such planning and scheduling, when well conceived and executed, results in more efficient use of facilities and manpower and a smoother flow of high quality maintenance.

e. Before scheduling can take place, the maintenance control unit must obtain current and accurate information which will permit determination of the maintenance requirements and formulation of a plan. Information must be obtained on operational requirements, total number of aircraft and vehicles available, manpower availability, performance standards, the time available to accomplish the job, the availability of materials, etc. The effective use of maintenance assets depends entirely on the ability of the maintenance control unit to analyze and use available information and plan accordingly.

f. This unit must continually monitor all maintenance activities to insure compliance with established schedules and performance standards and to determine unbalanced work loads. Particular attention will be given to information which indicates the beginning or development of unbalanced conditions. An unbalanced condition is one in which any one activity is depending too heavily on another. Every effort must be made to insure that each activity is accomplishing the maintenance for which it is responsible. Because of the importance of these control measures the control unit is separated into three branches, each of which is further discussed below.

g. **The Reports and Analysis Branch.**

(1) Generally, this branch will provide the performance and statistical data essential to planning and directing maintenance operations, scheduling maintenance performance, and controlling maintenance activities.

(2) A basic requirement is to obtain accurate information on the availability and utilization of maintenance personnel. Personnel assignments must be determined and compared with authorization. Absentee factors must be computed to permit forecasting of manpower availability. Absence must be studied to determine and eliminate the causes, wherever practicable. Information must be obtained on what has been accomplished by how many persons in each function of maintenance. This information will further serve to provide a measure of the efficiency of the organization. The manpower information thus acquired may then be applied to known requirements and a plan developed. Consider a hypothetical situation, involving the periodic maintenance dock crew.

(a) The daily attendance reports indicate that an average of 20% of assigned personnel are normally absent due to leave, sick call, squadron duty, etc. This, if determined to be the acceptable average, becomes a planning factor and provides a potential of 80% of assigned strength. If this information is applied to the dock crew, production requirements and production standards can be established. Appropriate adjustment can then be made from recorded data and a performance standard established. These standards are used for maintenance planning and applied to monitoring production to schedule and control the work of the crew.

(b) The chief of maintenance has delegated the authority, and assigned the responsibility, for supervising and managing the periodic maintenance dock. It is, however, necessary for the maintenance control unit to analyze and be aware of operating trends. Assistance must be rendered and decisions coordinated with the supervisor to improve performance standards, improve job methods, eliminate materiel bottlenecks, and reduce absenteeism and indirect time to the minimum. The maintenance control officer will require the dock crew supervisor to provide current information at definite time intervals which will permit analysis and comparison with established performance standards. In this way the maintenance control unit stays "on top" of the dock's capabilities and is alert to changing conditions which may affect maintenance.

(3) The establishment of a central reporting and administration system for maintenance reports and correspondence will result in improved reporting accuracy, timely submission, correct preparation, inclusion of all pertinent information, and reduce "paper-work" in other maintenance activities. For example, the daily 110 information can be forwarded from records available to or maintained by the maintenance control unit. Other maintenance reports should be processed in the same manner. All reports for which the required information is available to the maintenance control unit should be prepared and submitted by them. Correspondence concerning any activity, or phase, of the maintenance organization should be prepared in final form by the maintenance control unit. In some cases it may be advisable to require the basic content of the correspondence to be prepared in draft form by the activity with final preparation in the maintenance control unit.

(4) To assist in the performance of the functions of the maintenance control unit it is necessary that certain data be collected and presented for ready use. In most cases the data collected (flying time; commission status of aircraft and equipment; backlog; manpower availability; etc.) can be easily presented, for ready use, in the form of tables, charts, and graphs. Care must be taken to avoid overburdening the reports and analysis branch with an excessive quantity of these presentations. Only the essential tables, charts, and graphs should be maintained and they should be as simple as possible.

(5) The establishment of performance standards within the maintenance organization is of extreme importance. Standards are essential to good management. We must establish standards before we can adequately plan, schedule, or analyze our maintenance operations. The standards established must be the best and most economical that can be devised. A realistic standard must meet the following criteria:

(a) **Attainability.** Any average group of workers under normal working conditions must be able to meet the standard with a reasonable expenditure of effort.

(b) **Applicability.** The standard must apply equally to the operating conditions of similar units.

(c) **Permanence.** Standards must not be subject to casual change.

(d) **Equitability.** The standard must furnish an equitable basis for comparison. Any deviation should reflect difference in effort, ability, or quality of supervision.

(6) The objective of the maintenance organization is to surpass, in effectiveness and economy, our previous maintenance performance. The degree to which we attain this objective cannot be determined without analysis. The reports and analysis branch is charged with the responsibility for conducting the necessary analyses.

(7) A very important phase of the work of this branch is coordinating in the development of plans and data for improving methods, procedures, quality, working conditions, and organizations. Much of this work will be accomplished by other units. For example, an analysis of reports may indicate that working conditions in a certain maintenance activity are affecting efficiency. This information and a recommendation for inspection should be passed to the chief of maintenance. From this point, the quality control unit, standardization team, and maintenance personnel may work on improvement with resulting increase in efficiency and effectiveness.

(a) The standardization team may be used to assist in the development of improved methods and procedures when faults are discovered through analysis. For example, the man hours required to accomplish an engine change may be fluctuating widely around the established performance standard. The branch should recommend to the chief of maintenance that the standardization team be assigned the responsibility for investigation and establishment of a standard procedure, step by step, by which the engine change crews will function. Further analysis, after a period of application of the new standard

0315

procedure, will determine the efficiency increased, need for further study, required training etc.

(b) The need for quality improvement may be determined from analyses of abort reports, quality control reports, aircraft status reports, historical records, etc. The standardization team and the quality control inspectors may be used in this respect to recommend necessary corrective action. Continuing review of the quality inspection reports will define certain areas in which quality is low due to apparent weaknesses. When these facts are known, the standardization team may be used to actually demonstrate the correct, high-quality manner of performance.

(c) Organizational improvements are the most difficult to determine and apply. Studies of the organizational structure should be undertaken only when the requirement for change has been definitely established. Organizational changes are for the most part prohibited due to the requirement for a standard organization in all wings. Frequently, however, minor organizational changes which will result in increased effectiveness may be made, with the written approval of the wing commander.

(8) Aircraft and equipment historical records serve as a means of permanently recording compliance with technical instructions, transfers of equipment, operating times at transfer, modifications, associate equipment installed, the periods during which installed, and other remarks pertaining to the history of the equipment. Historical files and records are of importance to the Air Force and must be properly processed. The reports and analysis branch is the central records unit in the maintenance organization and is responsible for insuring that this is accomplished. It is essential that files and records be correct and legible at all times. Entries will be made in compliance with TO 0-20A-1, and other pertinent directives.

(9) This branch will make all local entries on the following aircraft forms:

(a) AF Form 60A - Technical Instruction Compliance Record (Aircraft).

(b) AF Form 60B - Technical Instruction Compliance Record (Engine).

(c) AF Form 61 - Propeller or Rotor Blade Historical Record.

(d) AF Form 114 - Cylinder Compression Record.

(e) -7 Technical Order - Winterization Instructions and Check List.

(10) The maintenance control officer will initial the "Engineering Officer" and "Inspector" columns of AF Forms 60A, 60B, and 61, certifying completion of work directed by technical instructions provided he has obtained a copy of appropriate accessory change and TOC form, signed by the responsible maintenance officer and a quality control inspector, or qualified supervisor.

(11) All aircraft accessory changes performed by any function of the maintenance organization will be entered on the Part II, DD Form 781 (Formerly AF Form 1). Entries will include the serial number of the newly installed accessory, aircraft or engine operating time at installation, and the name of the individuals performing the work. On receipt of the completed Part II, necessary entries will be made on the appropriate historical records by this branch.

(12) All maintenance performed on winterization equipment installed on aircraft will be reported to the records unit by entry on the Part II. On receipt of the completed Part II this information will be transcribed to the winterization instructions and check list (-7 TO) for that aircraft.

(13) Completed periodic inspection work books, work sheets, or work cards will be reviewed by the branch to determine completeness and the need for entries or changes in historical records. When all the records are made current following the completion of a periodic inspection, the branch will prepare an anticipated component replacement list for the next scheduled periodic inspection for that aircraft. **The list will be prepared from available records and forwarded to the materiel control branch for necessary action with the requisitioning activity.**

(14) An individual jacket file will be established and maintained for each wing-assigned mission aircraft. The jacket file will contain:

(a) Completed Parts II, III, and IV, DD Form 781 (Formerly AF Form 1).

(b) AF Form 60A. Technical Instruction Compliance Record (Aircraft).

(c) AF Form 60B. Technical Instruction Compliance Record (Engine).

(d) AF Form 61. Propeller or Rotor Blade Historical Record.

(e) AF Form 114. Cylinder Compression Record.

(f) Current Winterization Instructions and Check List (-7 TO).

(g) Periodic Inspection Work Books, Work Sheets, or Work Cards.

(h) Preflight and Postflight Work Sheets. (Completed).

0316

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(i) Flight Test Check Lists. (Completed).

(j) Copies of Technical Inspections and Indorsements.

(k) Correspondence and miscellaneous papers relating to transfer, acceptance, IRAN, and other individual aircraft matters.

(l) A record sheet on which quality control inspectors will record their names and the date of each inspection of the aircraft records contained therein.

(15) All items included in the jacket file will be retained for the periods specified by applicable directives. Forms for which no other retention period is specified will be retained for six months. AF Forms 263 and related correspondence will not be retained in the individual aircraft jacket file. AF Forms 263 will be maintained and filed in the periodic maintenance squadron.

(16) Prior to the periodic maintenance and inspection pre-dock meeting held by the maintenance control unit, the records and analysis branch and the crew chief will review the records and files of the aircraft scheduled for entry into the dock. Irregularities in the records and forms will be brought to the attention of the flight line maintenance officer for corrective action prior to entry into the dock. All time replacement, and special inspection requirements, will be checked against the anticipated component replacement check list prepared after the last periodic inspection. Changes to the original list will be immediately furnished the requisitioning activity. The records officer, or his representative, will attend the pre-dock meeting and bring with him all pertinent records and forms and a current copy of the anticipated component replacement list.

(17) When aircraft are scheduled for TDY movement, the chief of maintenance will determine, prior to departure, what aircraft records will be required and whether or not they will accompany the aircraft. The records which are to accompany the aircraft will be checked for accuracy and completeness and prepared for the TDY movement by the branch. The prepared records will be delivered to the individual designated by the chief of maintenance as responsible for their safekeeping during the TDY movement. Whenever possible, the aircraft records, other than the current Parts II and III, will not be carried in aircraft to which they apply. When a large number of aircraft depart on TDY, all the records will be carried in one aircraft. When on TDY status, the aircraft records will be maintained in a central location.

(18) One copy of each technical publication affecting the type of aircraft assigned the wing will be forwarded to the records and analysis branch by the quality control unit. Upon receipt, the branch will review the publication and review all pertinent aircraft records to determine which of the assigned aircraft are affected. The unit will make the necessary entries on the aircraft records and technical order compliance chart for the aircraft in accordance with Technical Order 0-20A-1.

(19) When new technical orders affecting assigned aircraft are received, the branch will inform the affected squadron so that proper entries may be made on the DD Form 781 (formerly AF Form 1) as pertain to deferred maintenance.

(20) The reports and analysis branch will work in close coordination with the wing aircraft distribution officer to insure that all records on transferred or received aircraft are current, accurate, and in compliance with pertinent directives. This unit will advise the wing aircraft distribution officer of all factors affecting aircraft distribution, as evidenced by the appropriate aircraft records.

h. **Job Control Branch.**

(1) This branch, using the information available from the records and analysis branch, will plan, schedule, and control the operation of the maintenance organization. A prerequisite to aircraft maintenance planning is a sound flying schedule which allows operations the required flying hours and provides sufficient ground time for accomplishing quality maintenance. Flying schedules must provide maximum aircraft utilization, consistent with maintenance capability, to prevent the waste of maintenance manhours resulting from peak workloads and periods of idleness. When the flying schedule is firm, the job control branch will develop a schedule designed to accomplish the planned requirement. This branch will select the aircraft to fly to meet the schedules. The welfare of maintenance personnel (duty hours, overtime, etc.) must be considered in all work schedules.

(2) Maintenance planning must include predictable maintenance factors such as periodic maintenance, postflight inspections, known replacement schedules, etc. Allowances must be made for unpredictable maintenance such as engine failures, turbo failures, vehicle damage, etc. Full

0317

consideration must be given electronics requirements so that the maintenance plan is complete and less susceptive to last minute changes.

(3) A good example of aircraft maintenance planning may be found in the proper operation of the periodic maintenance activity. Similar planning will be accomplished for vehicle and equipment maintenance. The example quoted here is only an example and is not intended as policy. Calculations are based only on minimum requirements to meet a specified operational need. The purpose of the example is to show a basic plan and the evaluation of a basic schedule from that plan. The point to be remembered is: Adequate control of maintenance required planning and scheduling to provide an average "hours to next inspection" for all wing assigned tactical aircraft of one-half or more of the periodic inspection cycle. (i.e. 50 hours for 100 hour inspection aircraft, etc.).

(a) Planning factors to be used are:

1. 30 aircraft assigned.
2. 172 hours per month per a/c programmed.
3. 5,160 flying hours per month.
4. 100 hour periodic inspections.
5. 25 hour Post Flight inspection.
6. 51.5 total periodic inspection per month.
7. 39 periodic inspections to be accomplished by the periodic maintenance squadron or contract maintenance.
8. 12 ea. 400 hr. cycle IRAN and 100 hr. periodic inspections to be accomplished by contract maintenance or depot maintenance.
9. 8 ea. inspection docks.
10. 29 men per dock.
11. 156 post flight inspections per month.
12. 5 periodic inspections per dock per month.
13. 19.4 post flight inspections per dock per month.
14. 8 hours per duty day.
15. 24 duty days per month per man.
16. 192 duty hours per month per man assigned.
17. 38 duty hours per periodic inspection per dock.
18. 1,102 man hours per periodic inspection.
19. 1 periodic inspection completed every 4.6 dock duty hours.

(c) Approximately three days prior to scheduled entry into the dock for periodic inspection, the maintenance control unit will conduct a pre-dock meeting to plan for the requirements of the inspection. At this meeting all matters pertaining to the inspection will be planned insofar as possible. TOCs and other maintenance requirements to be accomplished in the dock will be confirmed. The materiel control unit will provide information on supply action on anticipated parts. Specialist requirements will be projected and scheduled for dispatch and all questions of inspection requirements will be resolved.

(d) A note of caution must be injected at this point: When an aircraft fails to fly the anticipated number of hours prior to the scheduled entry into periodic maintenance, the maintenance schedule should be adhered to. This would appear, on the surface, to produce more inspections. However, there will be no noticeable increase in workload. The smoother operation which follows conformance to established schedules will increase the effectiveness of the maintenance organization.

(4) To maintain control of maintenance in accordance with established schedules it is essential that a system of work priorities be established and followed. Without a priority system, maintenance supervisors will be unable to determine which maintenance is to be given emphasis over other. Dispatching of specialists, unit change crews, and other maintenance work (reparable property, etc.) cannot be balanced with established schedules unless a priority system is used.

(5) When a sound priority system is followed, the result will be an equitable distribution of all facilities including manpower, equipment, and materials. This, in turn, will enable the maintenance organization to meet its schedules and standards. The flow of work will become semi-automatic in that assignments will be controlled and productive effort will be applied in the right direction. Concurrently, then, we are balancing our facilities with our workload.

(6) Priorities alone will not solve the problem of meeting the schedule but they will help. With priorities we must also balance our personnel assignments and reduce workload fluctuations. This sounds difficult but it can be reduced to an easily understandable operation.

(a) Balancing our personnel assignments means we must provide each activity with the personnel necessary to complete the required work. Also, we must attempt in every way to insure that each activity produces a volume of work in correct proportion to the work of the other activities. When our personnel and our workload are correlated on a planned basis we have assurance that work will flow without congestion.

(b) Another way of balancing our people with our workload is to provide each activity with a degree of flexibility. This will ease our problem by making possible the temporary loaning or borrowing of individuals to smooth out peak loads. One means of providing flexibility is to cross-train personnel within career fields. For example, an engine mechanic from the docks might easily be temporarily placed on duty in engine conditioning. Correspondingly, a heat and ventilation mechanic from this specialist shop could be used temporarily in dock maintenance. Other applications of this idea are obvious.

(c) Reducing work load fluctuations is a primary factor in continued ability to meet established schedules. Our schedule is based on known work loads. That, in itself, is stabilization. However, no matter how carefully the work is planned and scheduled certain fluctuations will occur. These "peaks and valleys" can normally be offset by regulating work backlogs, balancing work assignments, and preplanning supply requirements.

(d) Another, but more difficult manner, is to obtain more out of your available resources. That is, increase efficiency so that more maintenance is accomplished by the same people using the same tools, equipment, and facilities. This procedure requires very careful attention to detail and considerable st[illegible], and cannot be accomplished by direc[illegible]

1. For example, if th[illegible]ck schedule indicates that mainten[illegible]can barely hold its own under curr[illegible]inspection time (manhours and calen[illegible] days) it would be advantageous to st[illegible]y dock operation for efficiency improvement. A very close, tight schedule allows no variation without undesirable results. Therefore, to provide a margin allowing variation while holding to the standard work week, it is necessary to lower the "in dock" time. Lowered "in dock" time will provide a cushion for variation, provided maintenance quality remains high. The lowered "in dock" time might be achieved by increased use of specialists; by more carefully planned and timed individual work assignments; by thorough pre-dock planning as far in advance as practicable; by preplanning and pre-positioning supply requirements; by pre-scheduling specialists for definite time and job assignments; by close study and reduction of indirect time; or by other methods.

(7) It is necessary that the maintenance control unit maintain the status of maintenance in progress. It is essential that the status be current and factual. The shifting of specialists, individual changes in priority, and other management actions depend entirely on factual status information. The job control branch must know the status of the aircraft, or items of equipment and the maintenance in order to accomplish its control function.

(8) Proper maintenance scheduling is one of the most important factors in the success of any maintenance organization. In this type of maintenance it assumes an even greater importance. A sound maintenance schedule results from maintenance planning based on operational requirements. Aircraft requirements are embodied in the flying schedule established by the wing aircraft scheduling committee. The flying schedule, maintenance plan, and maintenance schedule should be presented in visual form to provide all personnel with easily understandable information.

(a) One of the first requirements of scheduling is to find out how many aircraft are going to fly, when they are to fly, and for how long. This requirement is fulfilled by the flying schedule established in coordination with the director of operations. Operations must have enough aircraft to fulfill their mission requirements and maintenance must know when and for how long the aircraft are available for maintenance. Maintenance must select the aircraft to fill the established schedule.

(b) In order for maintenance to fulfill its obligations we must provide the required number of aircraft at the specified time. Scheduling and planning within the maintenance organization is the only way in which this job can be properly accomplished. The job control branch will accomplish the top-level scheduling for the maintenance organization. This schedule will include the date and hour as far in advance as practicable when scheduled events such as preflight, postflight, and periodic inspections will be performed. Thus, by scheduled control of our predictable maintenance and control of available maintenance resources, we keep within our capability those unpredictable (hence unscheduled) needs, such as cylinder change. The schedule thus established must be retained and every effort made to prevent its disruption.

(c) Scheduling does not end in the maintenance control unit. Each individual activity must do realistic scheduling on its own. They must consider manpower, supplies, facilities, tools, and the master maintenance schedule.

(d) Aircraft maintenance schedules should not be forced by an attempt to "fly-out" the schedule. That is, if an aircraft is scheduled for the docks on the 15th, and on that date it has only 95:00 hours instead of its scheduled 100, it should enter the dock as scheduled. Adequate control of maintenance requires that established schedules be maintained in a manner which will prevent "peaks and valleys" in the maintenance workload.

(9) In order to adequately plan, schedule, and control maintenance the job control branch must have a sound schedule. In every case, however, maintenance must be prepared to give specific indication of their capability to meet wing requirements. This can only be accomplished by being "on top" of all maintenance activities, knowing the workload and capability of each activity, the established maintenance plans and schedules, and pertinent information on assigned aircraft, and equipment (commission status, AOCP, ANFE, periodic maintenance schedule, etc).

(10) An essential to job control is the knowledge of what jobs have to be done and when and where they must be accomplished. For our purposes this information includes the status and location of each wing assigned aircraft and major item of equipment.

(11) The establishment of defined parking areas and, where practicable, specific aircraft locations is essential to the rapid and efficient dispatch of specialist personnel, inspectors, etc. When a parking plan is prepared it must be approved by the squadrons concerned, director of operations, provost marshal, and fire marshal prior to publication. After publication the plan must be distributed as widely as possible to permit rapid area identification by all affected personnel. Some parking plans in use number the individual aircraft locations within a specific area. Any suitable system may be used but a definite parking plan is required.

(12) The dispatch of specialists from the electronics or periodic maintenance activities will be accomplished by the job control branch through the electronics or shop maintenance supervision office. Job priority will be designated by the job control branch in accordance with the established priority list. This branch must be continually alert for specialist dispatch delays. With an adequate and effective communications and transportation system specialist dispatch should be immediate. Definite corrective action must be taken to minimize time loss on the flight line, or in the docks, due to the lack of specialist personnel when required.

(13) In order for the maintenance organization to operate efficiently, it is extremely important that an effective communication and transportation system be established. The system must permit the immediate and rapid transmission of instructions and requests, and the movement of specialist personnel or supply materiel. In conjunction with the establishment of the system we must also establish procedures for the effective usage of the systems. The systems, once established, should be constantly reviewed to insure that maximum service is being realized.

(a) The communications requirements of the organization are a radio net and intercom net. The radio net is primarily intended for flight line and periodic maintenance support while the intercom system provides rapid communication between the more immobile activities of the maintenance organization.

1. The radio net will be established to provide mobile radio communications between the flight line and periodic maintenance activities and the maintenance control unit and base supply activities.

2. The two-way radio in the flight line and periodic maintenance activities should be installed in the vehicles assigned. That vehicle should be used to circulate around the aircraft parking area but should not normally leave that area. The vehicle should be driven by an individual having knowledge of the aircraft and the maintenance problems encountered. Procedures for use of the vehicle must be published by the chief of maintenance.

3. The intercom net should be established basically in accordance with Figure 1. An established procedure must be published and implemented wing-wide to insure understanding of the system and effective use.

i. **Materiel Control Branch.**

(1) The materiel control branch is established primarily to anticipate the supply requirements of maintenance and insure that they are made known to the supply agency. It must monitor the supply situation as it pertains to the maintenance

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organization. The materiel control branch will act in the name of the maintenance control officer to eliminate logistical conditions adversely affecting the efficiency or effectiveness of the maintenance organization. To accomplish this, the branch must assist all maintenance activities in anticipation of their supply needs as far in advance as practicable. Personnel of this branch must have access to base supply and warehouses so that they may be aware of the general supply situation.

(2) The materiel control branch will keep the job control branch informed of the over-all supply situation, make recommendations for the improvement of supply action, and recommend equipment distribution when inequalities exist. The efforts of this activity must be continually directed toward increasing the maintenance output by insuring that adequate action is taken to make equipment and supplies immediately available to maintenance personnel when and where required.

(3) Each maintenance activity of the wing is responsible for initiating supply action for materiel required to support its maintenance. When maintenance requirements cannot be satisfied by normal supply sources, the maintenance activity is responsible for notifying this branch. This branch when informed of the unsatisfied maintenance requirements will investigate, in coordination with the base supply officer, all possible wing sources for the required items.

(4) Particular attention will be given to ACCP, and ANFE requirements of the maintenance organization. Each such requisition will be cleared through the materiel control branch prior to submission to base supply. The branch will research the request for availability of the required part before verifying the requisition. Verification will be in compliance with current directives affecting AOCP and ANFE requisitions. The branch will insure that these requirements are accurate and in consonance with actual need.

(5) The materiel control branch will monitor the cannibalization of aircraft and equipment. He will recommend to the job control officer any cannibalization necessary, and insure that TO 1-1-637 is complied with. A locally devised form will be used to authorize cannibalization. The form will contain the approval signature of the wing commander or the chief of maintenance. Authorization slips will be filed by aircraft, vehicle, or equipment serial number in the materiel control branch until replacement parts are received and installed. Authorization for cannibalization will be signed only by the chief of maintenance. No delegation of this authority will be made except during absence or off-duty hours when the individual representing the chief of maintenance may sign authorization slips for him.

(6) The materiel control branch will maintain current status of AOCP and ANFE items and submit required AOCP/ANFE reports. The items will be listed in serial number. The status will include information as to the current supply action on the items listed. Daily follow-up with the base supply function is necessary until the parts are received.

(7) The critical items list maintained by the base supply officer will be periodically reviewed by the materiel control branch as an aid in determination of supply action. The branch will recommend to the base supply officer any issue controls and priorities of items on the critical list until such time as an adequate level is available. The materiel control branch should not agree to the removal of an item from the wing's critical item list until the stock level is suitable for normal consumption needs, regardless of the established station stock level.

(8) The materiel control branch will establish and maintain an effective liaison with the base supply office to recommend establishment and maintenance of stock levels adequate for normal maintenance requirements. Initial levels of flight line, shop, and dock supplies will be established by the materiel control branch and the affected maintenance activity. When the items and quantities are agreed upon, the maintenance activity will requisition the established requirements through normal supply channels. Changes in the levels will be accomplished only with the approval of the materiel control branch. To lessen the time involved in requisitioning replacement items for flight line, shop, and dock stocks, or for pre-issue levels, preprinted Issue Slips, AF Form 446, may be used. Each shop or dock should inventory their expendable supplies periodically, and the materiel control branch must review the stock levels for purposes of adjustment and control once each 45 days. The branch will periodically inspect to insure that such stocks are properly stored and cared for and that discrepancies are made known to the responsible maintenance officer and the maintenance control unit.

(9) A continuing study of supply action will be conducted by this branch to

0321

determine factors causing supply delays. Each delay will be analyzed and action taken to bring the matter to the attention of the appropriate supply officer for correction. Every effort will be made to eliminate supply delays and provide the required part at the work location at the proper time without loss of maintenance manhours. **The philosophy should be adopted that maintenance personnel will not leave their working areas for supplies but, rather, that the supplies will be delivered to them when and where required.**

(10) The materiel control branch will arbitrate on all problems between maintenance and supply. It will investigate and act upon all supply problems found in the maintenance organization. Continuous observation will be made to insure that the supply policies of the base supply officer are complied with by maintenance personnel.

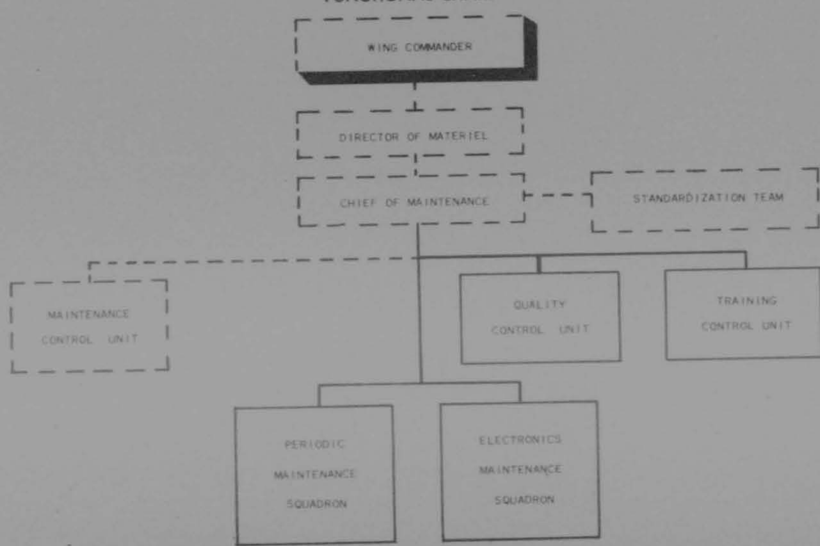
(11) The processing of reparables generated within the maintenance organization must be a subject of continuous investigation and emphasis by the branch. This branch must insure that all reparables are expeditiously processed. Repair schedules and priorities will be established by the maintenance control unit in coordination with the materiel control branch for the processing of reparable items. Schedules must prevent the accumulation of dormant backlog of reparable items and insure immediate repair of critical items consistent with the demands of the maintenance organization. **Priority should always be given to the requirements of the flight line and periodic maintenance activities.** The expeditious processing of reparables is of extreme importance to both maintenance and supply. The materiel control branch must periodically check all activities to insure that reparable items are processed as soon as practicable. Items of reparable nature will not normally be permitted to accumulate for "group" processing. All reparable property being turned in will be clean and correctly tagged. Whenever practicable, the items will be in suitable containers (i.e., cans, boxes, etc.).

(12) The materiel control branch will assist all maintenance activities in anticipating their supply requirements. When an anticipated replacement components list is received from the records and analysis branch, the materiel control branch will forward one copy to the requisitioning activity and retain one copy. On the retained copy, the unit will record information furnished by the requisitioning activity on the supply status of each item. Prior to the periodic inspection and maintenance planning meeting, this branch will recheck the list with the requisitioning activity and initiate the necessary supply action to insure delivery when and where required.

(13) Technical order parts and kit requests will be consolidated and requisitioned by the materiel control branch for all wing-assigned combat aircraft and allied equipment. Technical order accomplishment will be controlled by the use of appropriate Aircraft Accessory Change and TOC forms.

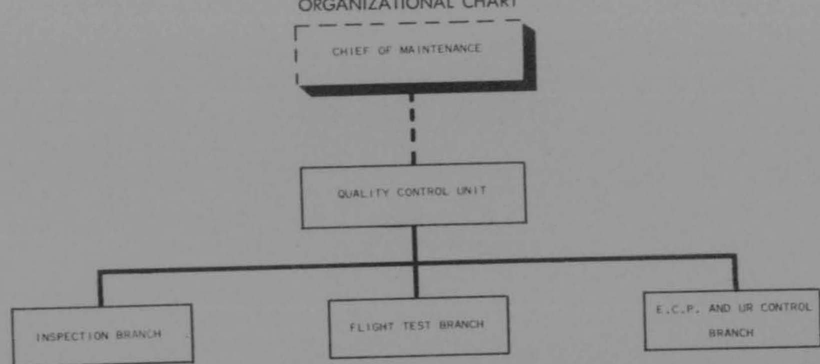
0372

SECTION VII
WING MAINTENANCE FUNCTIONAL CHART



1. **Function.** This unit will perform frequent inspections of aircraft, and ground power equipment to determine the quality of maintenance accomplished. All flight tests will be conducted under the supervision of this unit and in accordance with current directives. The unit will review, analyze, and process all unsatisfactory reports and engineering change proposals and maintain a current technical publication file for the maintenance control unit.

QUALITY CONTROL ORGANIZATIONAL CHART



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2. **Responsibility and Authority.** a. This unit is responsible to the chief of maintenance for the efficient accomplishment of the assigned function. The authority for accomplishment will be delegated by the chief of maintenance. This unit will not be delegated directive authority.

b. The quality control unit will:

(1) Accomplish a quality inspection on each aircraft, as required by applicable directives.

(2) Accomplish a quality inspection each month on approximately 25% of in-commission flight line aircraft, and a representative number of vehicles and items of equipment actually in use.

(3) Maintain a master set of aircraft records (AF Forms 60A, 60B, 61, and, when applicable, 60B(1)) for each type aircraft assigned the wing.

(4) Maintain master copies of preflight, postflight and periodic inspection work cards for wing aircraft. The master work cards will be used to periodically check the master copies maintained by each flight line and/or periodic maintenance activity.

(5) Perform quality inspections each 90 days on ground servicing and motorized equipment, and other maintenance equipment, assigned each maintenance activity.

(6) Conduct other inspections as required to keep the chief of maintenance and squadron commanders informed of the quality of maintenance; conformance to established procedures; condition of maintenance forms, reports, records, and files; condition and status of equipment and areas.

(7) Prepare and submit inspection reports and maintain adequate trend charts of inspection results.

(8) Periodically check aircraft weighing procedures and the maintenance of weight and balance records.

(9) Perform flight tests in accordance with the provisions of TO 1-1-300 and other pertinent directives.

(10) Accomplish a flight test check list during each flight test.

(11) Maintain a master maintenance information file and a current file of technical publications and other pertinent publications required by the chief of maintenance and his staff to efficiently accomplish the maintenance mission.

(12) Review, analyze, and process all wing unsatisfactory reports and ECPs to insure compliance with current directives.

(13) Establish and maintain an effective and vigorous program to insure the proper and timely submission of unsatisfactory reports and maintain data necessary to determine unsatisfactory report trends.

(14) Assist other wing activities as required in the preparation of unsatisfactory reports.

(15) Keep the chief of maintenance and maintenance control officer advised of unsatisfactory report trends, unsatisfactory conditions affecting safety of flight, and conditions affecting mission capability. Review and disseminate applicable information of action taken on unsatisfactory reports.

3. **Personnel.** a. The quality control officer will coordinate with the chief of maintenance to insure that the unit is staffed with the most qualified personnel available and that all quality inspectors are assigned to and controlled by this unit.

b. Flight test personnel will be selected in compliance with TO 1-1-300.

c. The quality control officer will be a qualified flight test maintenance officer, AFSC 4334, fully experienced in the predominant type and model aircraft assigned to the wing.

4. **Relationships.** a. **General.** The importance of coordinated action, honest reports, and tactful contacts is emphasized. All relationships must be friendly, cooperative, and courteous. This unit has no command or directive authority and must report and advise in a manner which will insure willing cooperation throughout the maintenance organization.

b. **Chief of Maintenance.** The quality control unit is responsible to the chief of maintenance and will submit their reports and recommendations to him. This unit must function as the "eyes and ears" of the chief of maintenance and must, through their reporting, keep him informed on the quality of maintenance accomplished and the areas of deficiency existing in the maintenance organization.

c. **Standardization Team.** The unit will establish and maintain close contact with the standardization team to insure joint understanding and interpretation of technical requirements and establish maintenance standards. It will inform the team of deficiency and recommend investigation where necessary.

d. **Training Control.** The quality control unit must work in close coordination with the training control unit and insure that all indications of training needs are made known to them.

e. **Maintenance Control Unit.** Close coordination must be maintained with the maintenance control unit to insure that the inspection schedule does not conflict with the maintenance schedules.

f. **Squadron Commanders.** (Tactical squadrons, periodic and electronics squadrons, etc.). The quality control unit will establish and maintain a close personal contact with the squadron commanders to keep them informed of the quality of maintenance accomplished and the general condition of their maintenance activities. The responsibility for establishing and maintaining this close contact lies with the quality control officer and not with the squadron commander. The quality control officer must determine that the commander is aware of the general status of his maintenance organization and the discrepancies found therein. The personal contact is essential. Written reports are matters of record and form an effective method of obtaining the commander's action; however, the quality control officer must insure that his inspection coverage meets the requirements of the commander, that his inspections are helpful, that his inspectors are capable, and that his suggestions and recommendations are sound and intelligent. In essence, the quality control officer must exert every effort to obtain the enthusiastic cooperation and support of the commanders.

g. **All Maintenance Personnel.** The quality control inspectors must maintain a cooperative and harmonious relationship with all personnel of the maintenance organization. Their approach must be honest, direct, helpful, friendly, and, whenever practicable and consistent with available time, instructive.

5. **General Narrative.** a. The quality of inspection, flight test, unsatisfactory report functions, and ECP review are combined in this unit because of the relation of each to aircraft safety of flight, vehicle safety of operation, and quality of maintenance. Quality must be continually observed through inspection of all phases of maintenance, investigation of maintenance procedures, analysis of equipment failures, and the actual flight test of the end product of the aircraft maintenance activities.

b. It is through this unit that the chief of maintenance, maintenance supervisors, and squadron commanders receive the information by which the quality of maintenance may be evaluated. It is important that the chief of maintenance recognize the part that quality inspectors play in the improvement of maintenance quality. This unit must be staffed with the most capable, qualified, and experienced personnel available.

c. The success or failure of quality control depends on the command action taken on quality control reports. This emphasizes the importance of the relationship between the quality control unit, the chief of maintenance, and the commanders responsible for maintenance accomplishment. We must remember that quality cannot be inspected into any product but must be built into the product (i.e., maintenance accomplished). The action taken on quality control reports is a fair measure of the effectiveness of this unit. The initiative lies with the quality control officer to establish a relationship with the squadron commanders which will insure adequate corrective action on reported discrepancies. This relationship should be such that the same action is received on verbal reports as on written reports. The quality control officer should make frequent visits to each squadron commander and each major maintenance supervisor to determine whether his inspection coverage is adequate, whether inspection reports are helpful, and if inspectors are of assistance. Where possible, without sacrificing their quality position, the inspectors should help and assist the maintenance personnel by instruction in the correct method, procedure, or technique.

d. The complete and unqualified support of the chief of maintenance is essential to the successful accomplishment of the quality control function. A very close relationship with all maintenance personnel must exist. To merit confidence and active support, the quality control unit must render complete, accurate, and impartial reports with practical and intelligent recommendations that will aid in the correction of discrepancies or irregularities. This unit can be an invaluable tool to the supervisors of the maintenance organization; however, like most tools, it must be properly used if full benefits are to be realized.

e. The quality control officer will review all inspection and flight test reports, and any corrective action comments entered thereon, to ascertain the quality of his inspection coverage. A careful cross-check of inspection reports against flight test reports, etc., may indicate where individual inspectors are inadequate, careless, etc. Such review is essential to insure complete coverage and to point out deficiencies in assigned personnel.

f. **Flight Test**

(1) Flight test of aircraft has two very important and distinct functions. The first and most important function is to insure that the aircraft is safe for flight and capable of performing its assigned mission. This is accomplished through inspection and functional test of the aircraft and its operating systems in flight. The second function is to accurately determine and report the quality of maintenance performed as revealed by the flight test.

(2) Flight test will be performed in accordance with TO 1-1-300 and other pertinent directives. Sufficient flight test crews will be assigned by wing special orders to additional duty with the quality control unit. These crews will perform flight tests under the supervision of the quality control officer. He must insure that flight test crew personnel are current in flying requirements, highly qualified, and familiar with current flight test requirements. Test flights will not be used for training purposes. Under no circumstances should aircraft be flown on any mission, other than flight test, until all required maintenance has been completed and the aircraft released by the quality control officer or his designated representative. A crew must not be permitted to accomplish the test flight as the first portion of a standard training mission but will be required to land immediately following completion of the flight test.

(3) Members of flight test crews are chosen because of their high qualification in flying skill and technical knowledge. It is their job to ascertain and verify the airworthiness and combat-readiness of aircraft upon completion of maintenance as outlined in TO 1-1-300. They must remember that they are conducting the flight test so that their fellow crewmen will have an aircraft safe to fly and capable of accomplishing the assigned mission. This type of testing has a purpose which is easily understood. We must insure that our aircraft are capable of doing the job they are required to do. Test flights are insurance for this and are the final determination of airworthiness. They must not become so routine that they are treated passively. Each flight test crew member will be briefed as to his individual responsibilities prior to each test.

(4) A flight test check list will be accomplished for each flight. Each crew member will carefully evaluate each item on the check list relative to his crew position during the flight. All discrepancies will be written on the form in sufficient detail to explain the trouble and make expeditious corrective maintenance action possible. The completed check list will be given to the maintenance officer of the activity designated by the job control branch as responsible for the correction of reported flight test discrepancies. Corrective action on reported discrepancies will be indicated on the flight test check list which will be forwarded to the maintenance control unit as expeditiously as possible. The maintenance control unit will review the completed check list and corrective action entries and refer major discrepancies to the chief of maintenance, who will direct necessary action to correct or eliminate the causes for discrepancies reported. After review, the completed check list will be filed in the individual aircraft jacket file in the records and analysis branch.

(5) Upon completion of flight test, the crew will return the aircraft to the last activity which accomplished maintenance requiring the flight test.

g. **Quality Control.**

(1) To provide consistency in quality inspection methods, and standardization of quality measurement, all quality inspection personnel will be assigned to and controlled by this unit. The quality control officer will dispatch quality inspectors to the various phases of maintenance in the numbers required to determine the quality of maintenance accomplished.

(2) The concept of quality control is that a quality inspection will be conducted by quality control inspectors after heavier type maintenance (such as period and field maintenance) to determine and report the quality of maintenance accomplished. This is the primary responsibility of the quality inspection section, but their activities are not limited to this alone. Additional coverage or assistance given to the maintenance organization must be left to the discretion of the chief of maintenance and the quality control officer, consistent with wing requirements. In this respect, the quality control officer will provide inspection coverage as dictated by need. He must use considered judgment to insure that equitable quality control inspection is provided all phases of maintenance, including activities such as the power plant branch of field maintenance, equipment maintenance on the flight line, etc. If his analysis of quality inspection reports indicate unsatisfactory conditions building up in any activity, he should increase the coverage provided that

0326

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activity. The inspection frequencies specified in this Manual are minimum requirements only and should be amplified as dictated by local conditions.

(3) The number of personnel authorized this section prevents their inspection of every item of maintenance performed in the maintenance organization; in fact, there should be no need for them to inspect every item. The assigned inspectors must be used to determine the quality of maintenance accomplished. They should not be used for follow-up inspection of maintenance performed to correct discrepancies determined by their quality inspections. To do so is a waste of valuable ability that can be better utilized in quality determination. "Over the shoulder" inspection is generally undesirable and defeats the purpose of our quality control unit.

(4) The responsibility for inspection for aircraft safety of flight does not lie with the quality control inspector. This responsiblity (safety of flight and operational safety) lies with supervisory personnel (maintenance officers and designated qualified maintenance supervisors). These individuals are authorized and are responsible for checking and clearing the work accomplished by their personnel and for clearing red cross conditions on aircraft. For example, the clearance of maintenance prior to "cover-up" (replacement of rocker box covers, landing gear limit switch adjustment, ignition timing, etc.) will be accomplished by the responsible maintenance officer or other designated qualified maintenance supervisors. The quality inspectors must approach their inspection with a viewpoint of safety of flight or operation as a primary consideration. The responsibility for safety of flight or operation will remain with the maintenance supervisors.

(5) All maintenance supervisors are safety inspectors and must understand that safety maintenance checks are among their primary responsibilities. To insure aircraft safety of flight quality maintenance, certain maintenance supervisors, because of high technical qualifications, will be further designated to check and clear maintenance performed to correct red cross safety of flight conditions.

(6) In order that the quality control concept may be carried out, the responsibility for one inspection of maintenance performed is given to (1) the technician level (71) in each specialty; and, (2) responsible maintenance officers. Normally, the inspection of the maintenance accomplished will be performed by the technician level for the particular specialty involved. When the worker is of technician level (71), he is qualified to act as his own inspector for clearing the work accomplished.

(7) Inspection by the appropriate technician level, supervisor level, or maintenance officer level is mandatory:

(a) Upon completion of any maintenance, repair, and/or component part or accessory replacement required to remove either the aircraft, engine, or any electronics system from a red cross status.

(b) At replacement of any major aircraft, engine, or electronics system component or accessory (i.e. control surfaces, cylinders, propellers, APS-20 antenna, APS-45 units).

(c) For all maintenance, repairs, adjustments, or replacements accomplished solely by three-level personnel.

(8) Inspection is not mandatory for any maintenance, repair, adjustment, or replacement normally considered as being organizational maintenance, provided:

(a) That the maintenance, repair, adjustment, or replacement is accomplished by either a qualified five-level, or higher, mechanic or specialist, or:

(b) That the maintenance, repair, adjustment, or replacement by a three-level mechanic or specialist is accomplished under the personal supervision and direction of a qualified five-level, or higher, mechanic or specialist.

(9) The supervisory personnel should at all times feel free to call upon the quality control unit for inspection assistance and advice. The quality inspectors should be available and willing to inspect specific items when requested by any maintenance supervisor when, either due to lack of knowledge or doubt of the allowable tolerance, he, the supervisor, does not feel qualified to make the decision. The production of maintenance quality is the responsibility of supervisory personnel, whereas the determination of maintenance quality is the responsibility of the quality control unit. Therefore, even though a quality inspection is completed, and all reported discrepancies are cleared, the inspector is **not** responsible for the safety of flight status of the aircraft or safety of operational status of the vehicle or equipment.

(10) The electronics and periodic maintenance squadron commanders must be authorized to designate certain qualified supervisory personnel of each shop to sign condition tags for items processed through

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their respective shops. Periodic checks will be accomplished by the quality inspectors to insure retention of high quality standards. A current copy of each authorization list will be furnished the quality control unit and the base supply officer.

(11) The quality control officer should schedule the inspections necessary to obtain maximum coverage and determine the over-all wing maintenance quality.

(12) An inspection schedule will be prepared to insure a periodic inspection of each activity of the maintenance organization at the minimum intervals listed herein. Quality inspectors should be periodically rotated in their inspection assignments to maintain over-all proficiency. Inspector personnel will be dispatched by the quality control officer as required to meet the inspection schedule, or whenever requested by a maintenance activity for an authorized purpose.

(13) The quality control unit will establish a master set of AF Forms 60A, 60B, 61 and, when applicable 60B(1), for each type aircraft assigned the wing. All entries on the master forms will be in accordance with TO 0-20A-1. Once each month they will be checked against the consolidated record of the status of technical order compliance maintained in the records and analysis branch. The master forms will be used as a check list when inspecting the individual aircraft jacket files maintained by the records and analysis branch.

(14) The individual aircraft files maintained by the records and analysis branch will be inspected by qualified inspectors in conjunction with each aircraft inspection or each 90 days, whichever is earlier. The inspection of the jacket file will be conducted in a manner which will insure that the records are being maintained in compliance with TO 0-20A-1, and other pertinent directives.

(15) Each activity of the maintenance organization will be inspected once each 90 days to determine the quality status of all assigned ground servicing, motorized, and other maintenance equipment. Reports will be prepared for each inspection accomplished. The original copy of the inspection report will be furnished the squadron commander of the activity inspected and a copy will be forwarded to the chief of maintenance. Corrective action on reported discrepancies will be expeditiously forwarded by indorsement to the director of materiel and wing commander and returned to the chief of maintenance for review.

(16) Periodically, the quality control unit will observe the procedures used to weigh wing aircraft. Concurrently, the weight and balance records of the aircraft being weighed will be inspected to insure compliance with AFR 60-20, TO 1-1B-40, and other pertinent directives. The weight and balance records of each aircraft will be inspected at least once each 90 days to determine the quality of record maintenance. This may be accomplished in conjunction with the inspection of the individual aircraft jacket file or any other time as determined by the over-all inspection schedule.

(17) The quality control officer will keep the chief of maintenance informed of the areas of recurring discrepancies and recommend to him the need for increased emphasis on corrective action or the advisability of investigation by the standardization team. When investigation is recommended, the quality control officer will insure that the standardization team is furnished full information leading to the recommendation, including copies of the pertinent inspection reports, etc.

(18) The quality control officer will initiate the follow-up on any correspondence necessary for clarification of technical directives where the intent is not clear or specific. Questions in reference to the intent or interpretation of technical publications will be answered by the quality control officer for the chief of maintenance.

(19) The quality control officer will review each incoming technical publication and ECP's to determine whether or not it applies to the type, model, or series aircraft assigned the wing. The quality control officer will bring each pertinent publication to the attention of the maintenance control officer and recommend, from a technical viewpoint, how compliance may be effected.

(20) All limited technical publication files maintained within the maintenance organization will be inspected each 90 days for completeness and compliance with TO 0-4-1, or other pertinent directives.

(21) A technical order familiarization chart will be maintained for all personnel of the quality control unit. The quality control officer will implement a procedure to insure that pertinent incoming publications are read and understood by all quality control personnel. The unit will monitor the dissemination of technic-

al information by conducting personal checks with personnel on the flight line, in the docks, and in the shops to determine that such personnel are familiar with pertinent directives, are provided ready access to technical files, are familiar with the use of the files, etc.

(22) The analysis function is designed to analyze the inspection, flight test, and unsatisfactory reports to pinpoint maintenance "soft spots" and areas of deficiency. This analysis is, in turn, used as source information for quality control planning and scheduling and is passed on to the various supervisors to assist them in their efforts to raise maintenance quality.

(23) Each inspection, flight test, and unsatisfactory report must be carefully reviewed and analyzed from the viewpoint of the entire wing maintenance effort. Consideration must be given to previous reports, conditions discovered, etc., to insure that all analyses are complete and thorough. The quality control officer will keep the chief of maintenance informed, as a result of analysis, of the quality of maintenance accomplished, "soft spots," etc.

(24) An important part of the analysis function is the maintenance discrepancy trend charts and quality rating data. Use of charts and graphs will simplify the analysis function and provide a simple graphic media of presenting certain types of quality information. In addition, graphic aids will portray many areas of training needs upon which the training control unit may concentrate as necessary

h. **Unsatisfactory Reports.**

(1) The quality control unit will monitor and process all unsatisfactory reports. Processing will include station numbering, checking for completeness, and accuracy of preparation. A system will be established which will insure proper and timely submission of an unsatisfactory report in every case warranted. The unit will provide assistance as required in preparation of the reports.

(2) Successful use of the unsatisfactory report system depends principally upon the understanding of the system by all personnel. The quality control officer must be the foremost advocate of the importance of each maintenance activity supporting the established system. Further, he must continually emphasize the fact that correction of unsatisfactory conditions of AF equipment and systems cannot be expected until these conditions are reported frequently enough to point out that the discrepancy is not an isolated case. Also, since the action taken is dependent upon the information contained in the report itself, this unit must emphasize the importance of accurate detail in the report. The description of the unsatisfactory condition, and the allied data, must be sufficiently clear so that no possibility of misunderstanding exists. Each unsatisfactory report should be studied and evaluated and the findings incorporated in the forwarding indorsement, when applicable.

(3) Whenever practicable, evaluation of station reports should be compared with information in the UR Digest and other publications to provide the means for local correction of unsatisfactory conditions. Recommended corrective action must be analyzed to insure applicability to the reported condition. A continual evaluation of unsatisfactory reports must be accomplished to provide maintenance supervisors with information on the number of recurring failures, reasons for failure, inadequacies, etc. By establishing trends, inspectors and supervisory personnel will have a knowledge of the maintenance "soft spots" and the foundation for sound corrective action. The trend of unsatisfactory reports should be maintained in graphic form for periodic presentation to the records and analysis branch for evaluation in connection with other maintenance data.

(4) A procedure will be established to insure that activities initiating unsatisfactory reports are informed of the answers received. This unit will review and disseminate applicable information from the UR Digest, TO 0-10-1, and other sources. Whenever practicable, this unit should use the base newspaper, or other local publication, to publicize unsatisfactory reports, answers, new publications received, etc. However it is accomplished, the unit must insure the widest possible dissemination of quality information.

(5) The quality control unit must use initiative in devising systems to simplify and expedite the preparation and processing of unsatisfactory reports. If desired by the chief of maintenance, this unit may actually prepare all wing unsatisfactory reports from work sheets prepared by other activities.

0379

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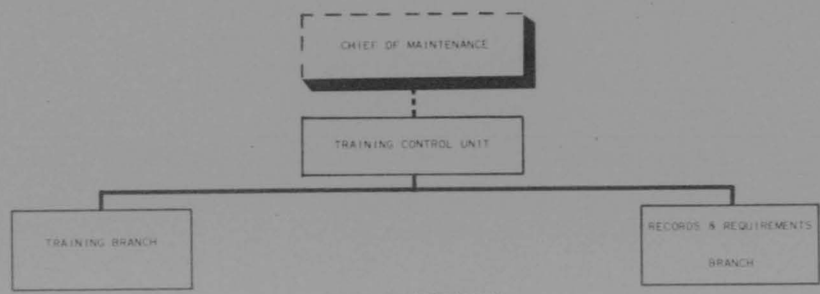
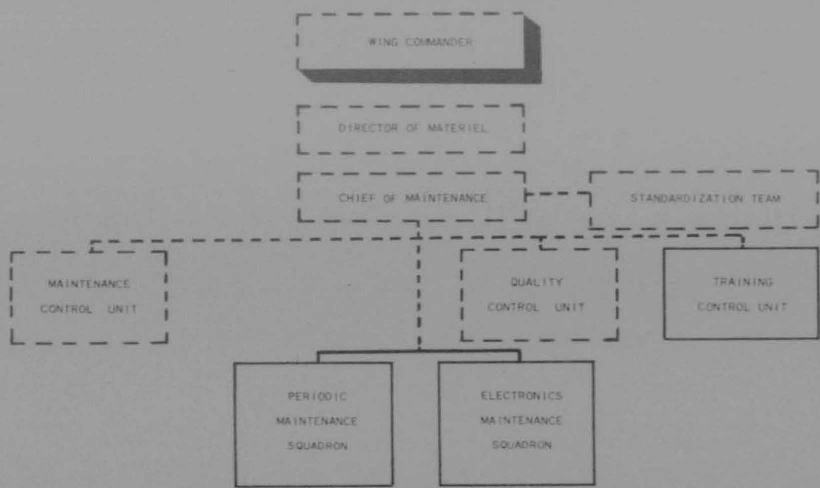
SECTION VIII



WING MAINTENANCE
FUNCTIONAL CHART



TRAINING CONTROL
ORGANIZATIONAL CHART

1. **Function.** The training control unit will establish and maintain a maintenance testing and evaluation program designed to point out areas of training needs in individual maintenance personnel and for the wing as a whole. The unit will establish training requirements and facilities to eliminate deficiencies and will coordinate training schedules with the maintenance control unit to minimize disruption of the maintenance routine.

2. **Responsibility and Authority.** a. This unit is responsible to the chief of maintenance for accomplishment of all maintenance training responsibilities. This unit will not be delegated directive authority.

b. The training control unit will:

(1) Insure the implementation and continuation of an adequate, carefully planned maintenance training program to train-out maintenance deficiencies.

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(2) Establish and maintain a testing program to evaluate maintenance proficiency and define areas of training needs.

(3) Insure that the training program is phased to provide, proficiency, career progression, management, and on-the-job training, as necessary.

(4) Coordinate training schedules with the maintenance control unit to minimize disruption of maintenance activities, plans, and schedules.

(5) Coordinate training requirements with the available facilities (MTD, contractor technicians, base schools, etc.).

(6) Take necessary action to insure adequate space availability for classrooms, etc., required to fill maintenance training needs.

(7) Conduct and/or monitor all maintenance training to insure that adequate training methods are used.

(8) Coordinate with all appropriate supervisors when necessary to use personnel from any other maintenance activity to provide specialized training.

(9) Assist supervisory personnel in the conduct of OJT programs.

(10) Prepare and submit all maintenance training reports in compliance with pertinent directives.

(11) Maintain all maintenance training records and files.

3. **Personnel.** a. The OIC, training control unit, will be appointed on wing orders as the wing maintenance training officer.

b. Personnel assigned this unit must be qualified by schooling, experience, and personality for training duties.

c. When specialized training is required for which adequate personnel are not assigned, the training officer will take necessary action to obtain the services of a qualified specialist to conduct the training.

4. **Relationships.** a. **General.** A tailored educational and training program will increase the effectiveness of the maintenance organization. The program designed for this purpose must provide minimum interference with the progress of maintenance. However, the training function cannot be relegated to a "poor cousin" role. The training control unit, through their normal relationship with other maintenance activities, must encourage active participation in planning a progressive program. The benefits received from this program will be directly proportional to the emphasis and support given it by the wing.

b. **Chief of Maintenance.** This unit must keep the chief of maintenance informed of the status of the training program and the current schedule. All scheduling and policy matters will be approved by the chief of maintenance prior to action by the training control unit.

c. **Maintenance Control Unit.** The training officer will insure that all maintenance training schedules are coordinated with the maintenance control unit to minimize disruption of maintenance plans and schedules. Every effort must be made to establish schedules that will permit the desirable combination of maximum training and maximum maintenance accomplishment.

d. **Quality Control Unit.** The training control unit must establish close liaison with the quality control unit to insure a free interchange of thought relative to maintenance training and training requirements.

e. **Standardization Team.** The function of the standardization team is closely allied to that of the training control unit since standardization is, in part, training. For this reason, a close working relationship must exist between the two activities so that both work toward the same goal. Coordination of training requirements with the team will lead to its active participation in the program.

f. **Maintenance Activities.** The training control unit must maintain a friendly, cooperative, and helpful relationship with all maintenance activities. The unit must insure that the training program is designed to fill the needs of the activities and the individuals. The active and cooperative participation of the maintenance activities will be dependent upon this relationship. Training schedules should be made known to the activities as far in advance as practicable so that adequate planning may be accomplished to provide for attendance of affected personnel.

g. **Squadron Commanders.** All maintenance training schedules (testing, evaluation, classroom, etc.) must be made known to the affected squadron commanders so that necessary action can be taken to insure attendance of trainees. A close relationship is essential since the commanders retain a certain responsibility for insuring adequate training of their personnel.

h. **Base Training Facilities.** The training control unit must establish a close, cooperative relationship with available base training facilities (i.e. MTDs, base schools, contractor technicians). The

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need for this is obvious since varying degrees of the training requirements will be filled by these activities. Emphasis must be placed on need and quality rather than quantity of training.

5. **General Narrative.** a. The Air Force is faced with an ever increasing need to insure the progress of maintenance personnel in experience and skill level. It is, of course, desirable that all qualified maintenance personnel be afforded the best possible training available. For this purpose, the formal training courses conducted under the auspices of Air Training Command are recognized as the best available to us. However, if the programmed limitations imposed on ATRC preclude adequate formal training, the wing commander must qualify his maintenance personnel through local training programs. This local maintenance training responsibility will be delegated by the wing commander thru channels to the training control unit.

b. Once the individual maintenance man has obtained knowledge through schooling or other training, he must be trained to develop his skill and his ability to perform on the job. This must be a continuous effort in which each individual gains experience and knowledge through day-to-day association with co-workers and supervisors and is supplemented by local training in classrooms or on-the-job.

c. All maintenance supervisors must recognize the necessity for conducting a continuous and comprehensive training program. The training control unit is charged with the responsibility of establishing this program. The training program must insure that maintenance personnel are provided an opportunity to progress to the maximum limit of their technical and administrative abilities. The training development will not be confined to initial training of a maintenance man, but will be continued in a manner which will permit career progression and provide increased proficiency and on-the-job training. Thus, the supervisor and the training control unit have a concurrent responsibility for developing maintenance personnel simultaneously with discharging their responsibility for high quality production.

d. It is recognized that tactical units should continue minimum flying training to attain and/or retain individual and crew proficiency. However, flying training should not be conducted at the expense of flight safety or development of an adequate maintenance capability at the earliest practicable date. Commanders must realize that mission fulfillment includes accomplishment of specific maintenance requirements. The thinning of our available maintenance "know-how," and the requirement for rapidly attaining a maintenance capability, make it mandatory that a vigorous maintenance training program be inaugurated and pursued by each wing.

e. To facilitate the accomplishment of the training function, the unit is formed in two branches;

(1) **Records and Requirements Branch.**

(a) All training, local or formal ATRC courses, will be recorded on appropriate records in accordance with current directives. Individual training files will be maintained, by the records and requirements branch for all local training accomplished, for all evaluation test results, etc. The individual record files will be used as source material for establishment of requirements, preparation of course outlines, etc. For this reason, and for pertinent classification action, it is essential that these records be accurate and current at all times. Entries should be made, or records initiated, immediately upon completion of testing, evaluation, training, etc.

(b) The Air Force is faced with an ever increasing need to assure the progress of maintenance personnel to greater experience and higher skill level. In recognition of the requirement for planned proficiency training for maintenance personnel, the records and requirements branch must institute a testing program designed to indicate the specific training needed for each individual. This will permit economic use of personnel and facilities and will prevent costly overlap in maintenance training. The intent, here, is to test our maintenance personnel by means of a comprehensive examination covering their individual specialty. Each test must then be analyzed and the area or areas of deficiency within the job defined. This is followed by training to eliminate the deficiency area or areas. This is, basically, the deficiency training program and is based upon the assumption that the individual has previous experience or training in his specialty.

(c) Upon completion of any individual or group testing, or upon receipt of deficiency information from the standardization team or quality control unit, the records and requirements branch will immediately analyze and evaluate the results. The analysis will portray individual and collective deficiencies which will form

0332

the basis for training action. The results of the analysis and evaluation will be tabulated and given to the training branch with recommendations pertaining to priority of training and type of training (OJT, etc.).

(d) Upon completion of any training, the training branch will immediately forward to the records and requirements branch, all pertinent data with reference to:

1. Personnel trained.
2. Type of training.
3. Length of each phase of training.
4. Grades of trainees, if appropriate.
5. Other appropriate information.

This information will be immediately posted to the individual records and all action taken to insure necessary official personnel record entries, classification action, etc.

(e) Based upon current directives, the branch will establish local procedures to insure that all required training reports are made accurately and on time. Necessary information for such reporting will be taken from available records and will not normally be solicited from individuals or any maintenance activities.

(2) **Training Branch.**

(a) When training requirements are determined, by means of evaluation testing or any other media, this branch will prepare the necessary schedules and outlines. The requirement, schedule, and outline will be coordinated with available base training facilities and a tentative class and instructor schedule made. Following this agreement, the schedule will be coordinated with the maintenance control unit and the affected squadrons to insure minimum disruption to maintenance activities and maximum availability of trainees. With all necessary coordination the schedule will be made firm and all trainee personnel informed.

(b) When available base training facilities cannot provide the required training (lack of qualified instructors, classroom space, etc.), the training branch will make other arrangements. For example, the automotive maintenance officer may be able to provide classroom area and a fully qualified instructor for certain types of training required. Whenever such action is necessary, the branch will insure that proper coordination is accomplished and all affected personnel are in agreement.

(c) Each class or individual undergoing training will be guided by a course outline provided by the training branch. These outlines may be of local construction or may be outlines and curricula prepared for similar formal ATRC courses. In all cases, however, the training will be selected to fill specified needs and maintenance personnel will not normally be exposed to the "shotgun" form of training wherein all phases of a subject or specialty are presented.

(d) On-the-job training to increase maintenance capability is a desirable means of drawing upon the skill and experience of capable and qualified personnel to aid in training those of lesser skill. However, an OJT program must be closely controlled and carefully planned in order to maintain a desire on the part of the individual to learn. A careless OJT program is worse than none since it frequently destroys the initiative of both the instructor and the learner.

(e) Normally, the on-the-job training program of a wing can be divided into two phases. Phase One would be that part of the program designed to increase individual proficiency. This phase would normally be slanted toward those maintenance personnel who have previously taken training but are found to be deficient in one or more areas in their career field. Phase Two would be that part of the program designed to train an individual from the beginning of a given career field. This type program would normally be intended to prepare an individual for the assumption of basic duties in the selected career field.

(f) It is preferred that for entry into Phase Two OJT an airman possess the prerequisites for entry into the corresponding formal training course (USAF Training Prospectus), or as prescribed in current training directives if there is no formal course. There would, of course, be no similar prerequisites for Phase One OJT, proficiency training.

(g) Management training forms an integral part of the over-all training program of the wing. A high degree of management skill and knowledge is essential for all maintenance supervisors and those being groomed for such positions, so that the wing may give increased and regular attention to the economy and effectiveness of its operational mission. Part of this training may be acquired by careful scheduling of maintenance personnel into established base management training classes and schools. Another part of this training may be obtained by utilization of management analysis personnel, and similar

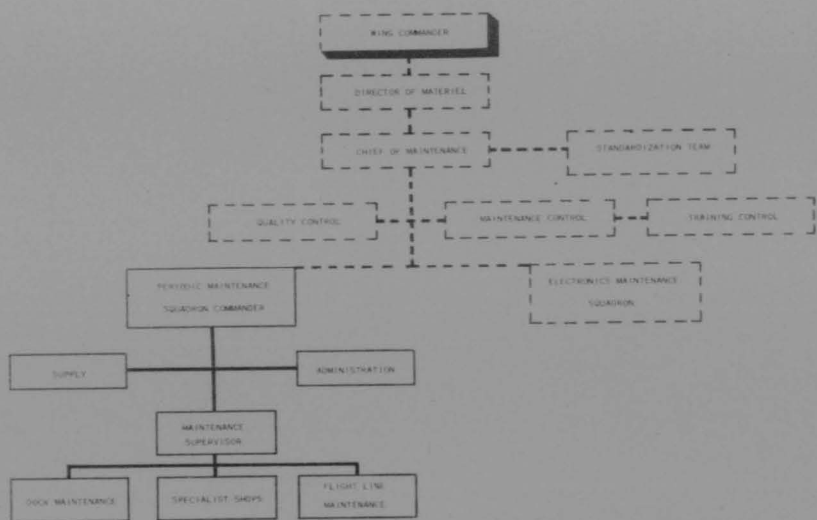
0333

professional personnel available within the wing.

(h) A concentrated educational and training program will increase the effectiveness of the maintenance organization. Each maintenance supervisor, as part of the wing training program, will be exposed to a planned program designed to explain the reasoning behind the wing maintenance organization and, in particular, his specific place and responsibilities. Each supervisor should be made aware of the concept, operation, and functions of the organization and the individual and collective responsibilities for the accomplishment of the wing mission. Where possible and practicable, the MTD assigned the wing should conduct this training in conjunction with their regular curricula. When an MTD is not available, the course will be planned and outlined by the training control unit personnel, the standardization team, or personnel selected by the chief of maintenance.

(i) In addition to the above types of training, the training control unit will advise maintenance supervisors of the training value of careful selection and distribution of skills in work assignments. The proper distribution of skills will constitute a training program which is simple to control and highly effective. Wherever possible, skills should be grouped in a manner which will provide highly trained personnel working with lesser trained. In addition, this skill grouping will help to ease the training problem inherent in specialization of skills such as is necessary in the Air Force today. Scheduled rotation of personnel through the various jobs in their career field will help to eliminate improper and inefficient specialization within specialty.

SECTION IX
WING MAINTENANCE
FUNCTIONAL CHART



1. **Function.** As directed by the maintenance control unit, this squadron will perform all periodic flight line maintenance and special inspections on assigned aircraft and will accomplish maintenance on assigned ground power and ser-

vicing equipment. Field and depot maintenance on air frame, engine, ground power and servicing equipment will be performed by the host base.

2. **Responsibility and Authority.** The periodic maintenance squadron commander is responsible to the wing commander for the organization and functioning of the periodic maintenance activity and for the accomplishment of quality maintenance by his squadron. However, the wing commander, through the director of materiel, has assigned the responsibility and delegated the authority to the chief of maintenance for the direction of the maintenance function of the wing. Therefore, the normal contact for the squadron commander in the accomplishment of his maintenance responsibilities is the chief of maintenance.

3. **Personnel.** The periodic maintenance squadron commander is responsible for the efficient utilization of all personnel assigned his squadron. He will also insure that specialist assistance is requested from field maintenance activities whenever required. He will conduct the necessary studies to determine optimum dock, shop, and flight line manning and insure, insofar as practicable, that this manning is retained even if necessary to reduce the number of operating docks, shops or flight line crews.

4. **Relationships.** a. **General.** Specialization of the maintenance effort is climaxed in the periodic maintenance activity. It is here that personnel from all phases and activities of the maintenance organization are required to work in close contact with positive coordination. The effectiveness and capability of this squadron is largely dependent upon other maintenance activities. Therefore, the relationships between the periodic maintenance squadron and the other maintenance activities are extremely important.

b. **Chief of Maintenance.** The commander must establish and maintain direct and close contact with the chief of maintenance so as to remain aware of major maintenance problems and policies. He must actively support the chief of maintenance and require the periodic maintenance activity to comply with the established maintenance policies and procedures of the wing. He should advise the chief of maintenance when he feels that any maintenance directives or policies are contrary to the best interests of the wing.

c. **Maintenance Supervisor.** The maintenance supervisor is the manager of the periodic maintenance activity. He must be delegated the authority necessary to operate it in a manner consistent with established policies and directives. The commander must authorize the maintenance officer to work directly with the maintenance control unit in the normal day to day functioning of maintenance.

d. **Electronics Maintenance and Field Maintenance Squadron Commander, and Tactical Squadron Commanders.** The periodic maintenance squadron commander must coordinate with these commanders as necessary to obtain unified action, required support and mutual aid and assistance in accomplishing the assigned mission.

e. **Quality Control Unit.** The commander must use the quality control unit as a management tool to improve periodic maintenance operation. He must insure that positive corrective action is taken on reported discrepancies and must strive to prevent recurrence. He should advise the quality control officer of dissatisfaction with the assistance rendered, inspection coverage, etc. He must insure that this unit provided him with the quality control assistance necessary to meet his requirements.

f. **Standardization Team.** He must actively support and assist the standardization team in its investigations and studies of periodic maintenance operations so as to obtain maximum benefit from its functioning. The commander should recommend to the chief of maintenance those areas of periodic maintenance in which the team could be advantageously utilized.

g. **Training Control Unit.** He must actively support the established maintenance training program and insure that assigned personnel meet all pertinent training schedules.

5. **General Narrative.** a. The periodic maintenance squadron commander is responsible to the wing commander for the operation of his squadron. However, because of the complexity and scope of the maintenance activity, the wing commander has, through the director of materiel, delegated the necessary authority to the chief of maintenance to direct and supervise the entire maintenance activity of the wing. It is important that the periodic maintenance squadron commander recognize and understand his maintenance position and establish and maintain a close personal relationship with the chief of

0335

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maintenance. It is important that the commander be aware of the operation of the entire maintenance organization and its major problems. It is important to the chief of maintenance that, through this personal relationship, he be assured of the active participation of the commander in the correct and efficient accomplishment of high quality maintenance.

b. It is not intended under this maintenance concept, that the chief of maintenance usurp or assume any of the commander's responsibilities or prerogatives. Nor is it intended that he, or the director of materiel, be an intermediate commander between the squadron and wing commanders. The relationship here should be one of mutual coordination and cooperation, and the commander must inform the chief of maintenance of inefficiencies, faulty procedures, etc. If the commander cannot resolve a maintenance difficulty with the chief of maintenance, or the director of materiel, it is only logical for the matter to be referred to the wing commander for decision.

c. The maintenance supervisor is actually responsible to, and works for, the squadron commander. However, for expediency and balance in the maintenance organization, the chief of maintenance or the maintenance control officer should normally transmit maintenance directives and instructions directly to the aircraft maintenance supervisor. It is the squadron commander's prerogative to insist that he personally sanction all maintenance control actions affecting his squadron. To do so, however, would be impracticable. The most efficient operation will be achieved when the commander permits his maintenance officer to work with the maintenance control unit on routine maintenance matters. The commander and the chief of maintenance should work together on major items and the over-all phases of maintenance without becoming submerged in the details.

d. The periodic maintenance squadron is responsible for the accomplishment and quality of all periodic, flight line maintenance, and special inspections directed and scheduled by the maintenance control unit. Periodic maintenance will include all airframe, engine, flight line maintenance, and organization maintenance on ground powered and servicing equipment, except electronic maintenance, with available equipment and facilities within the allowable working period.

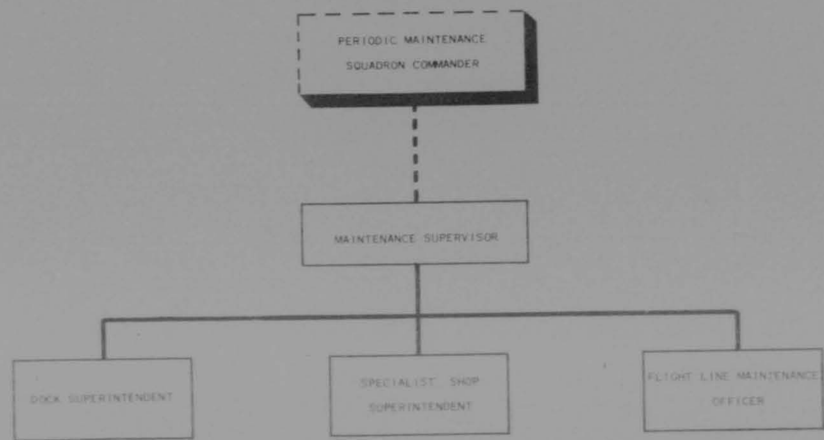
e. In view of the large man-hour potential represented in the periodic maintenance squadron and its impact on the effectiveness of the wing, the squadron commander and his maintenance supervisors will be constantly alert to possible improvements in operation. The wing can only fly the number of hours which can be supported by this squadron. Every effort must be made to decrease the out of commission time of an aircraft while retaining high maintenance quality. Assigned personnel and specialist assistance must be fully used. Wherever practicable, every operation should be preplanned and all necessary supplies and equipment prepositioned. Continual studies will be conducted by the squadron and the standardization team when available, to point out areas of weakness, inadequate planning, poor utilization of resources, lost time, and other factors influencing efficiency.

g. It is vital that the maintenance organization stay in balance. Each section must accomplish the correct amount of maintenance in relation to that accomplished by the other sections. The periodic maintenance squadron commander must have an active interest in maintaining this maintenance balance. He must insure that his supervisors assume an active responsibility in this respect, also. The docks must fully utilize their personnel in essential maintenance tasks and request specialist assistance when necessary by virtue of time, skill, or equipment limitations.

h. Reports submitted by the quality control unit should be carefully reviewed and analyzed by the periodic maintenance squadron commander to insure that adequate action is being taken and that the reports fulfill his requirements. The commander, through coordination with the quality control officer, may request additional coverage, change in technique, or any other variation that will make the quality control unit of more value to him. This unit will make every possible effort to be of help and assistance to the periodic maintenance squadron. However, the extent of their assistance will depend upon the desires and interests of the commander. He must develop within his squadron a positive attitude to correct reported discrepancies and recurrence.

6. **Function.** The maintenance supervisor will organize, man, and supervise the maintenance activity. He will insure adequate maintenance of assigned ground power and servicing equipment. He will advise the squadron commander and maintenance control unit of the current status of all work in progress.

PERIODIC MAINTENANCE
ORGANIZATIONAL CHART



7. **Responsibility and Authority.** a. The maintenance supervisor is responsible to, and works for, the periodic maintenance squadron commander. However, for expedient maintenance accomplishment, he must be authorized to work directly with the maintenance control unit for routine operation of the maintenance activity.

b. The maintenance supervisor will:

(1) Organize the periodic maintenance function generally as outlined in this Manual, in consideration of current manning authorizations.

(2) Manage and provide over-all supervision through the section chiefs to the maintenance activity.

(3) Insure the accomplishment of high quality inspections and maintenance.

(4) Be familiar with the status of maintenance in progress and the capability of each section.

(5) Fully use specialist support as required to maintain the dock schedules and support flight line maintenance.

(6) Study, develop, and improve maintenance tools, facilities, techniques, and procedures for expediting maintenance and increasing the quality of maintenance accomplished.

(7) Establish personnel controls necessary to obtain maximum availability and utilization of personnel working in each section.

(8) Schedule and insure accomplishment of organizational maintenance on assigned ground power and servicing equipment.

(9) Establish, in coordination with the materiel control branch, adequate dock and shop stocks for each dock and shop and insure through frequent inventories that adequate levels are maintained.

(10) Maintain master copies of periodic inspection work cards and insure that all cards issued to the docks are current.

(11) Prepare and submit unsatisfactory reports on all unsatisfactory conditions occurring within the periodic maintenance activity.

8. **Organization.** a. The maintenance supervisor will organize the periodic maintenance activity, within current manning authorizations, generally as outlined in the organization chart.

b. The periodic maintenance activity is designed to provide the basic personnel necessary to accomplish periodic inspection and maintenance on wing assigned mission aircraft. The aircraft crew will be considered part of the dock manning while an aircraft is undergoing periodic inspection and maintenance. The aircraft crew chief will assume the duties of assistant dock chief while his aircraft is in the dock. Specialist support will be obtained from the specialist shop and electronic maintenance as required to maintain the established schedule.

0337

9. **Relationships.** a. **Periodic Maintenance Squadron Commander.** The maintenance supervisor is responsible to and works for the periodic squadron commander. He must manage the maintenance activity in a manner consistent with the policies and requirements of the commander and must keep the commander informed of major difficulties encountered.

b. **Maintenance Control Unit.** Normally, the maintenance supervisor will work directly with the maintenance control unit on routine maintenance matters. A close, working relationship must exist between all maintenance officers and this unit. Routine maintenance instructions and directives must be fully complied with immediately.

c. **Standardization Team.** The relationship with this team should be very close and cooperative in order to obtain maximum benefits from its investigations and studies. The maintenance officer, in his efforts to cut out-of-commission time, should request its services whenever required.

d. **Quality Control Unit.** The requirement for a quality control inspection of aircraft leaving the docks necessitates a close, coordinating relationship with this unit to prevent maintenance delays and man-hour loss. In addition, the maintenance officer should initiate positive and continuous corrective action on reported discrepancies to improve the quality of maintenance accomplished.

10. **General Narrative.** a. The maintenance supervisor, as manager of the periodic maintenance activity, occupies a very important position in the maintenance organization. His application of sound management principles will be reflected in the maintenance efficiency of the wing. The importance of this position is emphasized by the realization that this activity, in effect, controls the number of flying hours available to the wing.

b. This officer is responsible for accomplishing high quality periodic inspection and maintenance on wing assigned mission aircraft. Maximum productivity and efficiency must be obtained from each dock and shop in order to provide the aircraft availability required by the wing. The maintenance officer must obtain cooperation and full utilization of support personnel, under this maintenance concept, to realize maximum production while maintaining balance in the maintenance organization.

c. The dock is the place where planning and scheduling really pay off. Every minute expended in planning, scheduling, and coordinating requirements will result in increased efficiency and less confusion in maintenance completion. Careful sequencing and timing of each operation and individual will result in higher quality and decreased "in-dock" time.

d. The maintenance supervisor must control his organization in such a manner that each supervisor is permitted to manage his own function in a manner consistent with established policies. The selection of personnel to fill supervisory positions should be based on supervisory ability as well as technical ability. The organization must be designed in a manner which will not demand more than the individual is capable of accomplishing. Insofar as practicable, the maintenance officer should supervise the activity through the dock, shop and flight line supervisors. The chain of command should be definitely outlined and followed.

e. In providing adequate supervision, the maintenance supervisor should place emphasis on definite job assignments, fixed work areas, and sequenced jobs, preferably in written form, so that individual mechanics are not subject to hurried instructions from his supervisor or assignment to congested work areas. Job instructions should be devised so that delays and interruptions are minimized. The time spent in job study and sequencing will result in increased efficiency and effectiveness. Detailed planning is a requirement for the effective operation of the periodic maintenance activity and the efficient utilization of assigned personnel. Mechanics assigned the docks, shops, and flight line are skilled, trained craftsmen whose normal responsibility is merely to do an assigned job. They should be employed in the most efficient, effective, and economical manner possible.

f. In addition to applying personnel management, the maintenance supervisor will continually study his facilities, tools, and equipment with a view toward improvement and modernization. Particular emphasis should be placed on the use and location of speed tools and maintenance equipment. The supervisory personnel of this activity must insure that, whenever practicable, all required tools, parts, and materials are brought to the mechanic to keep him on the job. Appropriate administrative procedures will be established to insure adequate control of tools and equipment.

g. Job descriptions will be prepared for each individual, and organization charts will be prominently displayed in each dock, shop, and flight line office. Frequent checks will be conducted to insure that all personnel know and understand individual responsibilities, duties, and command channels. All newly assigned personnel will be made aware of their duties, responsibilities, and place in the organization. The maintenance supervisor will continually observe personnel working within his activity to determine inefficiencies or below-standard performance. When such situations are discovered, immediate corrective action will be taken. Particular attention will be given to the performance of trainee and semi skilled personnel to assist them in performing quality maintenance and to prevent the formation of undesirable work habits.

h. The maintenance supervisor will monitor daily attendance reports. Absences will be checked and action taken to eliminate absenteeism. A manpower status board or chart will be maintained to reflect personnel status. It is the personal responsibility of this officer to have daily knowledge of the personnel authorized, assigned, and present for duty. Each dock, shop, or flight line chief will be contacted at frequent intervals during the day to determine current personnel status.

i. A program will be established to insure that all supply requirements of the periodic maintenance activity are anticipated as far in advance as practicable and made known to the appropriate supply agency. This can be partially accomplished by active coordination with the flight line maintenance officers and active participation in the periodic inspection pre-dock meetings. Adequate dock stocks are vital to the success of the periodic maintenance activity. The maintenance officer must require frequent inventories to insure that required supplies are available in established levels. Insofar as practicable, these supplies should be made available to the worker at his location. The mechanic should not leave his work area for parts but will have them available when and where required. Also, the maintenance officer must instill a supply discipline program that will insure the expeditious processing of reparables and protection of supplies from pilferage. Hoarding will be discouraged.

j. All maintenance personnel must be made aware of the reparable processing procedure and the exchange facility established by the pre-issue levels of certain components. Maximum use of the prescribed bench test and necessary exchange of serviceable items for reparables improves the maintenance capability of the wing and serves to prevent serviceable items from entering the reparable pipeline. To aid in this supply economy program, the maintenance supervisor will officially designate specific individuals who are authorized to sign AF Forms 50D. A copy of this authorization will be forwarded the quality control unit, materiel control branch, and base supply officer.

k. The maintenance supervisor will insure that all maintenance accomplished is recorded on appropriate records in accordance with current directives. He will ascertain that quality maintenance has been performed and that all discrepancies have been corrected prior to releasing the aircraft for test flight.

l. It is essential, for planning and scheduling, that the maintenance supervisor know the status of maintenance in progress, difficulties encountered, and the relation of maintenance progress to the established schedule. Action will be taken to report status changes at intervals required by the maintenance control unit and to eliminate "bottle-necks" or factors delaying maintenance. Personnel shifts between docks, shops, and flight line will be made when maintenance status indicates inability to meet the established schedule.

m. The maintenance supervisor must insure that an adequate training program exists for the periodic maintenance activity. Each assigned individual should be made aware of the opportunities in his maintenance career field and encouraged to take advantage of these opportunities. Particular attention should be given to training in deficiency areas rather than general, over-all training. Each airman should be offered and encouraged to participate in training toward the next higher skill level.

n. The maintenance supervisor must have current knowledge of the status and availability of authorized tools and equipment. When equipment is inadequate or deficient in any manner, he will initiate corrective action in accordance with current directives. Organizational maintenance on assigned ground power and servicing equipment will be scheduled and accomplished in accordance with current directives.

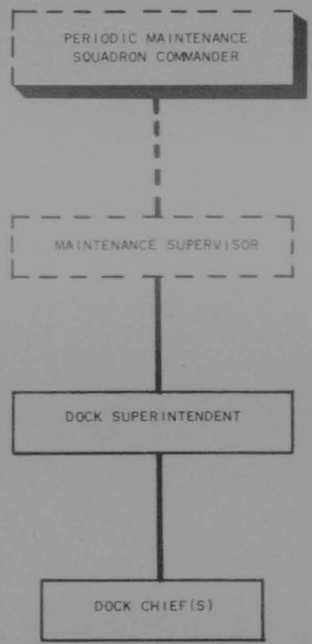
o. Unsatisfactory reports will be prepared and submitted on all unsatisfactory conditions occuring in the periodic maintenance activity. The maintenance supervisor must review each unsatisfactory re-

0339

port to insure accuracy and completness and remain aware of the unsatisfactory conditions.

p. In conjunction with the quality control unit and the standardization team, the maintenance supervisor will continually review periodic inspection requirements and make appropriate recommendations for change to inspection requirements. All such changes should be forwarded through channels, with substantiation, to facilitate review and action.

PERIODIC MAINTENANCE ORGANIZATIONAL CHART



11. **Functions.** Under the direction of the maintenance supervisor, the dock superintendent will supervise and manage the dock maintenance activities.

12. **Responsibilities.** a. The dock superintendent is directly responsible to the maintenance supervisor for the supervision and management of the dock maintenance section.

b. The dock superintendent:

(1) Directly supervises the dock maintenance activity through the dock chiefs.

(2) Spot checks maintenance accomplished in the docks to insure high quality performance.

(3) Plans and schedules the work, with the assistance of the dock chiefs, to insure full utilization of all personnel and a smooth flow of maintenance in accordance with established schedules.

(4) Assigns specific responsibilities and delegates commensurate authority to each dock chief and recommends personnel changes to the maintenance officer.

(5) Insures that organizational maintenance on assigned equipment is

0340

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scheduled and accomplished in accordance with current directives.

(6) Insures prompt and accurate aircraft maintenance and status reporting.

13. **Relationships.** a. **Maintenance Supervisor.** The dock superintendent works for the maintenance supervisor and must keep him informed of maintenance difficulties and the status of maintenance in progress. He must manage and supervise the dock maintenance activity consistent with the policies of the maintenance officer and recommend changes for improving efficiency.

b. **Maintenance Control Unit.** He will keep the maintenance control unit informed of the status of possessed aircraft and the status of maintenance in progress. He must be constantly aware of the overall maintenance schedule and insure that the schedule of the docks are in consonance. He must insure that the maintenance control unit is promptly informed of specialist support requirements.

c. **Standardization Team.** The dock superintendent must assist the team as much as possible during its investigations and visits to the docks and insure that improvements recommended by the team are followed. He must realize that the team is designed to help him help himself. He should feel free to request its services wherever necessary and should insure that the team receives the correct reception and cooperation.

d. **Quality Control Unit.** The quality control unit will be of high value to the docks if the dock superintendent adopts the correct attitude. He must insure a cooperative attitude throughout the periodic maintenance activity. The relationship should be such that the quality control unit receives the same enthusiastic corrective action on verbal reports as on written.

e. **Dock Chiefs.** The dock superintendent must maintain a direct supervisory relationship with the dock chiefs. He should accomplish all supervision and direction through these personnel and limit other individual contacts to the minimum.

f. **Other Maintenance Supervisors (Shop Chiefs, Flight Line Chief, etc.).** A close relationship should exist between the dock superintendent and his counterparts in other maintenance activities so that cooperative action is obtained with minimum delay or discussion. There should be a free exchange of maintenance thought and suggestions so that wing maintenance effectiveness may be increased.

14. **General Narrative.** a. The dock superintendent is the manager of the dock maintenance activity and is responsible to the maintenance officer for efficient operation of the maintenance function. He is the assistant to the maintenance officer and is responsible for aiding him in the accomplishment of assigned functions. With the concurrence of the maintenance officer, the dock superintendent will be responsible for the proper placement and assignment of personnel. He must have daily knowledge of personnel authorized, assigned, and present for duty.

b. To obtain balance and provide upgrade training in each function, the dock superintendent will insure that lesser qualified personnel are assigned with skilled personnel and will perform frequent checks to determine the need for additional training. He should then request the necessary training and, as required, assistance from the training control unit and standardization team. Personnel must not be assigned responsibilities beyond their capabilities.

c. In coordination with the dock chiefs, the dock superintendent will plan and schedule maintenance to meet the schedule established by the maintenance control unit. He will monitor the progress of maintenance to insure that the schedule is being met. Insofar as practicable, he must anticipate delays, supply needs, etc., and take appropriate action to prevent scheduling delays.

d. The dock superintendent will periodically inspect the maintenance accomplished in the docks to insure quality. He will accomplish these supervisory inspections to insure that established standards are being met and to determine areas of maintenance deficiency. The responsibility for safety of flight status of the aircraft lies with the supervisory personnel and not with the quality control unit. These checks will be in addition to any prescribed or requested quality control inspections. The dock superintendent, or his designated qualified supervisors, should normally clear, in accordance with TO 0-20A-1, the majority of maintenance falling within the scope of their authority. Whenever the dock superintendent feels that he is not qualified to check and clear a particular item or installation it is essential that he request additional coverage and assistance from the quality control unit.

e. The dock superintendent will ascertain by his spot inspections and close relationship with the dock chiefs that the

0341

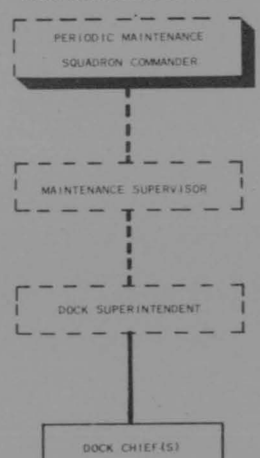
aircraft in the docks are receiving quality maintenance. He will advise all maintenance personnel of the production and quality standards established by the maintenance control unit. Failure to attain established standards should be studied and action taken to eliminate unsatisfactory conditions. He will perform periodic checks of all periodic inspection work cards, and appropriate forms to insure accurate and complete entries.

f. Specialist support will be fully used in accomplishing maintenance which is beyond the capabilities of assigned personnel and equipment, or which will exceed the available time. By frequent checks and constant observation the dock superintendent will insure that the requirements for specialist support are expeditiously relayed to the maintenance control unit and that required personnel are obtained promptly. He will make every effort to insure that specialist requirements are made known in advance of need so that adequate planning and scheduling may be accomplished.

g. The dock superintendent is responsible for the effective and efficient use of assigned personnel, and will institute controls necessary to keep personnel on the job. Specific break periods should be scheduled and controlled. Sign out sheets or boards should be used to record the absence, time of departure, and approximate time of return of all personnel. Every effort must be made to eliminate the necessity for a man to leave his work area for any reason. The dock superintendent must insure the judicious use of personnel and equipment to get the job done in accordance with the established schedule. Adequate planning and scheduling should virtually eliminate the necessity for overtime. The dock superintendent will constantly strive to substitute good management for excessive overtime work. A sound human relations approach will result in willing cooperation and higher morale with resultant higher quality.

h. The dock superintendent will insure that adequate emphasis is placed on the normal housekeeping functions. He will insure that possessed aircraft, the docks, equipment, and maintenance area are well policed, in good repair, and safe for use. He will be constantly alert for safety and fire hazards and accident conditions and will take immediate corrective action to rectify conditions and/or remove the hazards. Necessary administrative procedures must be implemented to insure adequate control of tools and equipment and maximum availability when and where required.

PERIODIC MAINTENANCE
ORGANIZATIONAL CHART



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15. **Function.** The dock chief will supervise the accomplishment and insure the quality of periodic and post flight inspection and maintenance on aircraft scheduled into the dock.

16. **Responsibilities.** a. The dock chief is responsible to the dock superintendent for the accomplishment and quality of periodic and post flight inspections and maintenance on aircraft assigned to his dock.

b. The dock chief will:

(1) Organize and operate the dock generally in accordance with this Manual, consistent with current manning authorization.

(2) Insure the performance of quality periodic inspection and maintenance.

(3) Supervise and coordinate the work of the dock in a manner which will insure that established maintenance schedules are met.

(4) Notify the maintenance control unit of maintenance requirements beyond the technical or schedule capabilities of the dock and fully utilize specialist support personnel.

(5) Insure complete and accurate recording of all maintenance accomplished.

(6) Report the status of work in progress.

(7) Supervise assistants and specialist personnel to obtain full utilization, high quality maintenance, and compliance with current directives and SOPs.

17. **Relationships.** a. **Dock Maintenance Superintendent.** The dock chief works for the dock maintenance superintendent and must keep him informed of the status of maintenance in progress, problems encountered, and assistance required.

b. **Crew Chief.** The crew chief assumes the responsibilities of assistant dock chief while his aircraft is in the dock. The crew chief has the individual responsibility for his aircraft at all times. Therefore, a close, cooperative relationship must exist between these two. The dock chief must accept his aid and assistance and insure that all maintenance accomplished satisfies the requirements of the crew chief.

c. **Records and Analysis Branch, Maintenance Control Unit.** The dock chief must provide this branch with recorded information on the maintenance accomplished and should maintain close coordination to insure that all forms and records are accurate.

d. **Standardization Team.** He must utilize the standardization team as an aid to improving the efficiency of the dock and to increase the quality of maintenance accomplished. The dock chief must provide and insure full cooperation to the team during its investigations and visits in the dock.

e. **Quality Control Unit.** The dock chief must use the quality control unit and its reports to define areas of training needs and maintenance improvement. He should maintain a relationship which will provide the quality inspection coverage required and desired by him.

18. **General Narrative.** a. The dock chief has a very important job in the maintenance organization. He must accomplish, in an efficient, high-quality manner, all periodic, post flight and special inspection and maintenance on aircraft scheduled into his dock by the maintenance control unit. The effective supervision of the personnel assigned to or working in his dock is his principle function. He is responsible for the quality of maintenance performed in the dock and for meeting maintenance schedules. To assist him, he has engine chiefs and an aircraft general chief to whom he must assign specific responsibilities and delegate commensurate authority. Also, the aircraft crew chief will act as assistant dock chief while his aircraft is in dock.

b. The dock chief must have current knowledge of the personnel authorized, assigned, and present for duty. He will review daily attendance records and take necessary action to reduce absent time to the minimum. Personnel controls must be devised and implemented to keep his workers on the job. "Coffee" breaks should be scheduled and controlled in a manner which will not interfere with the progress of maintenance and established schedules. The dock chief must at all times know the location of assigned personnel. Sign out boards showing name, destination, time of departure, and estimated time of return should be used.

c. The dock must be managed to provide a procedure which will minimize lost motion and inefficiency. This may be best accomplished by sequencing and phasing the work of dock and support personnel. Each individual must be assigned specific jobs to be accomplished at definite times to prevent work area congestion, confusion, or loss of time. Planning must include full consideration of all phases of the inspection, including electronics and the application of power to the aircraft. The goal of the dock chief's planning and scheduling must be lowered air-

0343

craft time in the dock at no expense to maintenance quality. The retention of high maintenance quality is a primary responsibility of the dock chief.

d. Constant attention must be given to the status of maintenance in progress so that the dock chief will be constantly aware of his position in relation to the established schedule. He must be fully aware of the work status of his dock at all times. It is necessary that he constantly plan and schedule to insure that specialist requirements, supply needs, etc., are known and prepared for as far in advance as practicable. A delay in the schedule caused by the lack of a specialist is a direct reflection on the supervisory abilities of the dock chief. Conversely, there is no credit due the dock chief who has unemployed specialists available at his dock. Full and efficient utilization of all personnel must be achieved.

e. The dock chief cannot place sole reliance for quality determination on the quality control unit, but will periodically inspect the various phases of maintenance accomplished by his mechanics. By frequent inspection of the work being accomplished, the dock chief will stay "on top" of his crew and be aware of the weakness in his organization. He must know who is doing what at all times so that his "in-dock-training" can be focused toward a definite goal -- to raise the qualifications of all personnel and the quality of maintenance accomplished. In this manner he is helping his dock produce high quality maintenance. The responsibility for the safety of flight status of the aircraft in the dock does not lie with the quality control unit but does lie with the dock supervisory personnel.

f. By being "on top" of his crew, the dock chief will be in a position to foresee specialist needs in advance. As the need becomes known, he will immediately inform the maintenance control unit so that required specialists can be scheduled and dispatched. To be effective, the specialists must be on the job in the dock at the time best suited for their particular function. Power requirements, availability of the work area, and amount of work to be accomplished must be fully considered when planning specialist utilization.

g. The aircraft crew chief acts as assistant dock chief while his aircraft is in the dock. The dock chief will insure full use of the crew chief's knowledge of the aircraft and his supervisory ability.

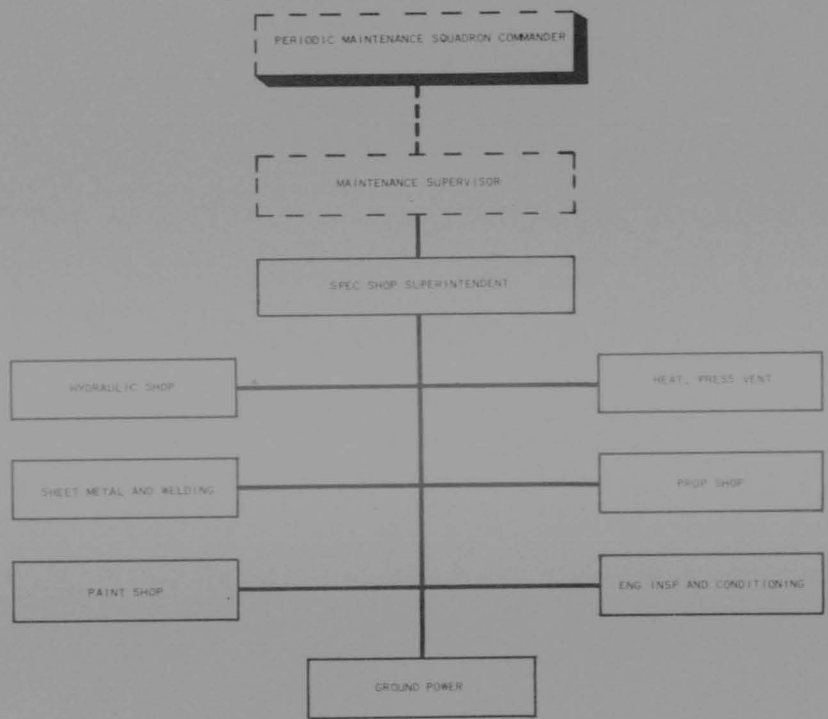
h. The dock chief will insure that the inspection is performed in accordance with current inspection requirements and pertinent technical directives. He will review all completed inspection forms to insure that entries are completed and correct and that all discrepancies have been corrected. When discrepancies exist that cannot be corrected within the scheduled time, he will inform the maintenance control unit so that necessary rescheduling can be accomplished. He must cooperate in every way with the quality inspectors to permit fast and efficient quality inspection without delaying the maintenance schedule.

i. The dock chief will keep the dock maintenance superintendent informed of the status of maintenance in progress in his dock, and in particular, of any delays encountered. When a definite time is determined for removal from the dock, he will inform the dock superintendent so that necessary arrangements may be made for post-dock runup and maintenance, test flight, engine conditioning, etc.

j. The dock chief will do everything practicable to provide his workers with the tools and parts they need on the job. The dock supply personnel must be fully utilized in order to prevent the misuse of maintenance personnel waiting parts, chasing stock, etc. The effective utilization of dock personnel will be in proportion to the time and detail expended in predock planning and supply anticipation.

k. Supply discipline, as well as maintenance and quality discipline, will be practiced and enforced by the dock chief. All supplies, parts, or materiel in the work area will be maintained in a secure manner, adequately protected from pilferage and weather, correctly tagged, and clean. Hoarding will be neither practiced nor tolerated. Reparable property will be placed in supply channels as expeditiously as possible.

FIELD MAINTENANCE
ORGANIZATIONAL CHART



19. **Function.** Under the direction of the periodic maintenance supervisor the specialist shop superintendent will supervise and manage the specialist shop section.

20. **Responsibilities.** a. The specialist shop superintendent is responsible to the periodic maintenance supervisor for the supervision of the shops of the specialist shop section and the quality of maintenance accomplished.

b. The specialist shop superintendent is responsible for:

(1) Insuring prompt accomplishment of specialist dispatch and work orders in accordance with established priorities.

(2) Manufacture and/or repair of aircraft parts and assemblies fabricated from sheet metal, cloth, canvas, leather, wood, when directed by the maintenance control unit.

(3) Welding, heat-treating, aircraft parts and assemblies and items pertinent to aircraft maintenance, in accordance with equipment authorizations and available facilities.

(4) Painting of aircraft, parts, and assemblies, and equipment pertinent to aircraft maintenance.

(5) Engine conditioning, cylinder change, engine change on assigned aircraft.

(6) Maintenance of the heating, ventilation, and pressurization equipment.

(7) Supply required specialist support to change and perform maintenance of hydraulic units.

(8) Supply required specialist support to change and perform maintenance

0345

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on propeller and propeller systems.

(9) Perform organizational maintenance on ground power and servicing equipment.

(10) Dispatch all ground power and servicing equipment.

(11) Organizational maintenance on all assigned ground power and servicing equipment.

(12) Maintenance of pertinent maintenance records and limited technical files.

21. **Organization.** The specialist shop section will normally be composed of the following shops. However, variation from this listing may be made, consistent with current manning and assigned equipment.

a. Sheet Metal Shop and Welding.
b. Heating, Pressurization and Ventilation Shop.
c. Hydraulic Shop.
d. Propeller Shop.
e. Engine Inspection and Conditioning Shop.
f. Paint Shop.
g. Ground Power Shop.

22. **Relationships.** a. **Periodic Maintenance Supervisor.** The specialist shop superintendent is responsible to, and works for, the periodic maintenance supervisor. He must supervise the shops in a manner consistent with the policies of the periodic maintenance supervisor and must keep him informed of major difficulties encountered. He will normally work from the shops maintenance office where centralized control is established.

b. **Shop Chief.** The shops superintendent must maintain a direct supervisory relationship with the shop chiefs of the shops and should normally accomplish all supervision and direction of the shops through these personnel.

c. **Other Maintenance Supervisors (Maintenance Officers, Line Chiefs, etc.).** A close relationship should exist between the specialist shop superintendent and other maintenance supervisors so that maintenance accomplished which is not equal to established quality standards is expeditiously reported and corrected.

d. **Standardization Team.** The specialist shop superintendent must assist the team as much as possible during its investigations and visits so that maximum improvement is obtained from its observations and recommendations. He should feel free to request team assistance at any time.

e. **Quality Control Unit.** The quality control unit will be of tremendous assistance to the specialist shop superintendent if he adopts the correct attitude toward it. He will insure expeditious and continuous action on reported discrepancies so that the quality of maintenance accomplished remains high at all times. He should request the assistance of this unit whenever he feels that their services may be necessary.

23. **General Narrative.** a. The specialist shop section is composed of those shops which accomplish organization maintenance as directed by work orders and specialist dispatches issued by the maintenance control unit. The majority of shop work and reparable units will be processed through this branch, therefore, large backlogs of work will accumulate if this activity is not closely monitored. The specialist shop superintendent will recommend distribution of work to field maintenance and/or to be shipped off the station when pertinent. The work assigned this branch will be closely observed to insure that only work essential to the accomplishment of the wing mission is being accomplished.

b. Aircraft parts and assemblies required to return an aircraft to an in-commission status will be processed in accordance with established priorities. The shops of this branch will provide maintenance support to all other wing activities as directed by the maintenance control unit. Work of non-aircraft nature should be accomplished only when directed by work order issued by the maintenance control unit.

c. The specialist shop superintendent is the manager of the section and is responsible to the periodic maintenance supervisor for the efficient accomplishment of all work assigned. The specialist shop superintendent is an assistant to the periodic maintenance supervisor and will assist him in every manner in accomplishing the shop maintenance function. With the concurrence of the maintenance officer, the specialist shop superintendent will be responsible for the proper placement and assignment of shop personnel. He must have daily knowledge of the personnel authorized, assigned, present, in the shop, and on dispatch from each shop.

d. To maintain balance and provide training in each shop, the specialist shop superintendent will insure that lesser qualified personnel are assigned to work with skilled personnel. He will perform frequent checks, in conjunction with the shop chiefs, to determine the need for additional training. He should then request the

0346

necessary training and, as required, the assistance of the training control unit and/or standardization team.

e. In coordination with the shop chiefs, the specialist shop superintendent will monitor the progress of maintenance to insure that the schedule is being met. Insofar as possible, he will anticipate delays, supply needs, etc., and take appropriate action to prevent delays or slowdowns.

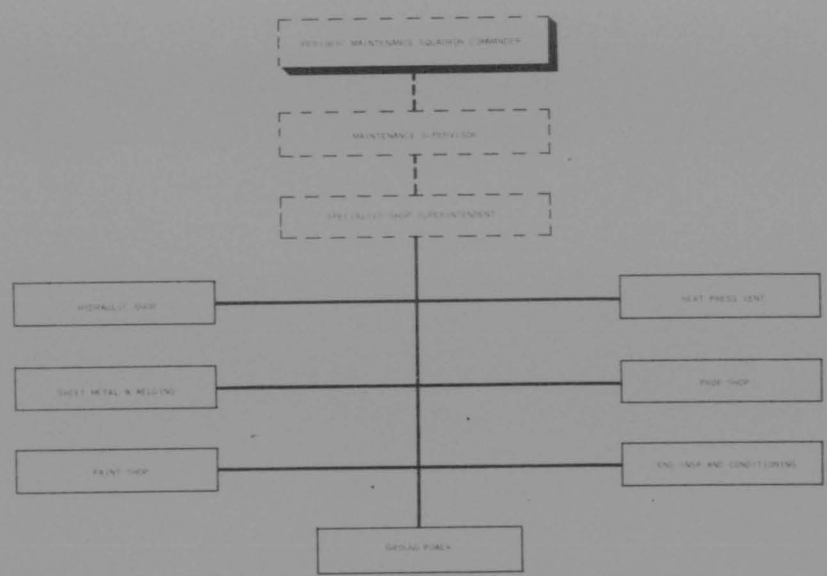
f. The specialist shop superintendent will periodically inspect the maintenance accomplished by assigned personnel to determine quality. He will accomplish these supervisory inspections to insure that established standards are being met and to determine areas of maintenance deficiency. These inspections will be accomplished in accordance with TO 0-20A-1 and will be in addition to any prescribed or requested quality control inspections. Whenever the specialist shop superintendent feels he is not qualified to check and clear a particular item, it is essential that he request assistance from the quality control unit.

g. The specialist shop superintendent is responsible for the effective and efficient utilization of assigned personnel and will institute controls necessary to keep personnel on the job. In coordination with the maintenance supervisor, specific break periods will be scheduled and controlled. Sign out sheets, status boards, or similar devices must be maintained to record the location of assigned personnel. This is important to the expeditious dispatch of specialists directed by the maintenance control unit.

h. Ground power and servicing equipment assigned the branch is vital to the successful accomplishment of the assigned mission. The specialist shop superintendent must insure that all such equipment is maintained in a manner which will insure maximum availability of serviceable equipment.

FIELD MAINTENANCE

ORGANIZATIONAL CHART



24. **Function.** Under the direction of the specialist shop superintendent, the shop chief will supervise the accomplishment of high quality maintenance by his shop.

25. **Responsibilities.** a. The shop chief is responsible to and works for the specialist shop superintendent. He is responsible for the accomplishment and quality of all work directed by the maintenance control unit or the specialist shop superintendent.

b. The shop chief will:

(1) Supervise and manage his shop in a manner which will insure the fast and efficient accomplishment of high quality maintenance in compliance with current directives and SOPs.

(2) Schedule the work to insure full utilization and maximum training of assigned personnel.

(3) Insure complete and accurate recording of all maintenance accomplished.

(4) Report, as required, the status of all work in progress.

(5) Perform periodic checks of maintenance accomplished to insure quality and determine areas of deficiency requiring closer supervision.

(6) Maintain the shop and all assigned equipment in a neat serviceable condition.

(7) Insure that all property, material, and supplies are secure and protected, and that reparable property is expeditiously processed.

26. **Relationships.** a. **Specialist Shop Superintendent.** The shop chief works for the specialist shop superintendent and must keep him informed of the status of maintenance in progress, personnel status, problems encountered, and assistance required. The chief must serve as the top technical adviser to the specialist shop superintendent insofar as shop capability and performance is concerned.

b. **Materiel Control Branch.** The shop chief must assist the materiel control branch in the establishment of shop stocks of expendable items and insure that the authorized list is sufficient for needs.

c. **Standardization Team.** The standardization team will be provided full cooperation during its visits and investigations. A close relationship should exist so that maximum advantage may be gained from the findings and recommendations of the team.

d. **Quality Control Unit.** The shop chief should use the quality inspectors and their reports to improve the quality of maintenance accomplished and to define the areas where further supervision is required. He must insure positive and continuous corrective action on reported discrepancies and should request additional quality inspections when he feels this is necessary to improve shop operation or maintenance quality.

27. **General Narrative.** a. The shop chief works for and is responsible to the specialist shop superintendent. He is the top technical man in his specialty in the field maintenance activity and will keep the branch chief informed of the technical and practical capabilities of the shop. He will supervise and manage the shop in a manner which will insure the expeditious and efficient completion of all specialists dispatch, repair, TOC, or manufacture work directed by the maintenance control unit.

b. To insure efficiency, the shop chief must have current knowledge of the personnel authorized, assigned, and present for duty. In addition, he must know which individuals are currently on specialist dispatch or are working in the shop. He must also review the shop daily attendance reports and take necessary action to increase his manpower availabilty. Insofar as practicable, the shop chief will plan his work in a manner which will insure that each individual knows what jobs he is to perform and when.

c. Constant attention will be given to that status of all work in progress so that the chief is constantly aware of his maintenance position in relation to the schedules of the maintenance control unit. It will be necessary for him to constantly plan and schedule the work of the shop to insure that priorities are met, full personnel utilization is achieved, and specialists are dispatched as directed by the maintenance control unit. A delay in specialist dispatch may result in disruption of the schedules of other maintenance activities and personnel.

d. The shop chief is responsible for insuring that quality maintenance is accomplished by his personnel. He will periodically inspect the maintenance accomplished to determine quality and areas of maintenance deficiency where additional supervision is required. He will accomplish these inspections in addition to any prescribed or requested quality control inspections. These inspections will aid him in insuring high quality maintenance and will put him in the position of knowing the strength and weakness of his shop. In

0348

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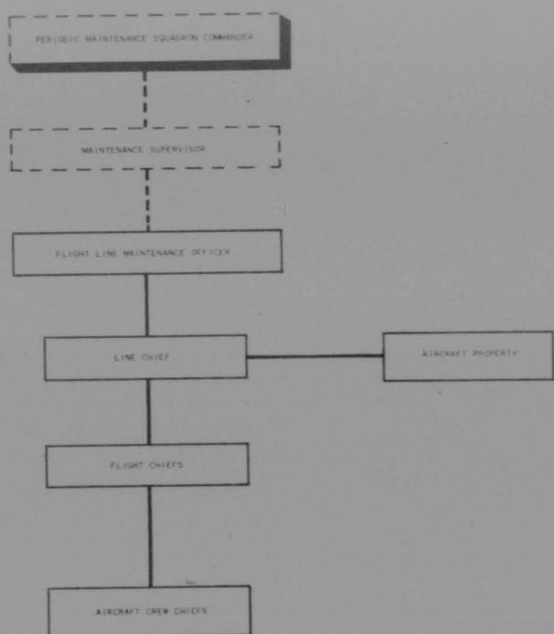
this way he is supervising and assisting his personnel to produce with quality.

e. Much of the efficiency and effectiveness of the shop will be determined by the serviceability of assigned equipment and availability of authorized equipment. The shop chief must be aware of his equipment authorization and insure that he has that equipment on hand or that the responsible supply officer has it on requisition. The equipment available will be maintained in accordance with current directives. Insofar as practicable, the shop chief will assign specific responsibilities for equipment maintenance to designated individuals. In addition, he should maintain a schedule, and insure compliance with that schedule, for routine preventive maintenance operations (lubrication, cleaning, etc.) on his equipment and shop area facilities.

f. Supply discipline, as well as maintenance discipline, must be practiced and taught by the shop chief. All supplies, parts, or materials in the shop will be maintained in a secure manner adequately protected from unauthorized use and the elements. They will be clean and correctly tagged or stored in appropriately identified bins or containers. Hoarding will be discouraged. Care should be exercised to insure that authorized stock levels are not exceeded.

g. Because of the testing facilities available and the technical knowledge of shop personnel, the shop chief will insure that unsatisfactory reports are prepared and submitted on all unsatisfactory conditions reported by the shop.

FLIGHT LINE MAINTENANCE ORGANIZATIONAL CHART



0349

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1. **Function.** The flight line maintenance section of the periodic maintenance squadron is responsible for accomplishment and quality of flight line maintenance on assigned aircraft to include preflight inspection, servicing, and minor maintenance. It will maintain aircraft 263 property and records.

2. **Responsibility and Authority.** a. The flight line maintenance officer is responsible to and works for the maintenance supervisor. For expedient maintenance accomplishment he must be authorized to work directly with the maintenance control unit for purposes of routine operation of the flight line maintenance activity.

b. The flight line maintenance officer will:

(1) Organize the flight line maintenance activity generally as outlined in this Manual in consideration of current manning authorization.

(2) Manage and provide over-all supervision through the line chief to the flight line maintenance activity.

(3) Insure the performance of quality maintenance on assigned aircraft.

(4) Fully use specialist support and supervise the work accomplished by specialist personnel.

(5) Establish personnel controls necessary to obtain maximum availability and utilization of assigned personnel.

(6) Inventory, store, and account for all aircraft 263 property in accordance with TO 0-35D-263.

(7) Support the established maintenance training program.

(8) Prepare and submit unsatisfactory reports on all unsatisfactory conditions occurring within the flight line maintenance activity.

3. **Organization.** a. The flight line maintenance officer will organize the flight line maintenance activity generally as outlined in the organization chart.

b. The flight line maintenance activity is designed to provide minimum strength basic aircraft crews to service the aircraft and accomplish minor and preventive maintenance between routine inspection periods. Work required beyond the technical capability of assigned personnel and their authorized equipment, or which will exceed the allowable working time, will be reported to the maintenance control unit for specialist assistance.

4. **Relationships** a. **General.** The flight line should normally enjoy the highest priority in the maintenance organization; therefore, it is particularly important that the flight line maintenance officer maintain a close relationship with the supervisors of the supporting maintenance activities as well as with the maintenance control unit. This is the activity on which depends the state of balance of the maintenance function.

b. The flight line maintenance officer is responsible to, and works for, the squadron maintenance supervisor. He must keep him informed of major maintenance difficulties encountered. He must manage the maintenance activity in a manner consistent with the policies and requirements of the commander.

c. **Maintenance Control Unit.** A close working relationships must exist between the flight line maintenance officer and the maintenance control unit. Normally, the flight line maintenance officer will work directly with this unit in the performance of his routine duties in much the same manner as the various squadron commanders work with each other. Routine maintenance directives or instructions must be complied with immediately.

d. **Quality Control Unit.** He must cooperate with the quality control unit to obtain maximum benefit and efficiency improvement from the inspectors and their reports. The flight line maintenance officer must take positive corrective action on reported discrepancies so as to improve his activity.

e. **Standardization Team.** The goal of the team is to improve the quality of maintenance accomplished and should receive active assistance from the flight line maintenance officer. He should not be content to wait for the team to come to him, but should request aid through recommendations to the chief of maintenance for specific investigations.

f. **Training Control Unit.** He must work in close liaison with the training control unit to insure that all trainee personnel attend classes, etc. as scheduled and that required training is programmed.

g. **Other Maintenance Officers.** The flight line maintenance officer must establish and maintain a close, harmonious relationship with the other maintenance officers of the wing so that maintenance problems are easily resolved and all participate in a coordinated effort.

5. **General Narrative.** a. The flight line maintenance officer is the top manager of the flight line. He must manage the activity in a manner which will insure the proper balance of the maintenance organization. This is particularly important

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since his activity has the highest priority in the maintenance organization. He must not attempt more maintenance than his organization is manned or equipped to perform. He must not call for specialists to accomplish work which is within the capability and allowable working time of his organization, and he must not defer maintenance to be accomplished at a later date in the docks or by field maintenance.

b. The flight line maintenance officer is responsible for accomplishing quality flight line maintenance on assigned aircraft. Maximum productivity must be obtained from each assigned individual, and the support of other functions of maintenance must be judiciously used under the specialization concept.

c. This officer, with assistant flight line maintenance officers, must constantly monitor all functions of the flight line. They must be constantly alert for inefficiencies or maintenance below acceptable standards. Emphasis will be given to quality of maintenance and quality of management. It is important that particular attention be given to the establishment of proper and congenial relations between the flight line and all supporting maintenance activities. The flight line maintenance officer is responsible to do his part to correct conditions or situations where friction exists. When friction between the flight line and support activities cannot be eliminated by personal contact, the flight line maintenance officer must inform the maintenance control unit of the situation for necessary correction.

d. The flight line maintenance officer must decentralize authority by charts, and job descriptions should be prominently displayed in the activity. The maintenance officer will insure that specific responsibilities and authority are known and understood by each individual. All incoming personnel should be briefed on the maintenance organization and informed of their specific duties, responsibilities, and authority. He will observe the chain of command and supervise through his line chief to retain supervisory continuity in the organization. He should not circumvent intermediate supervisors by working directly with the crew chiefs or individual mechanics. Each man should have but one "boss" and all instructions should come through him.

e. Roll calls will be held in the maintenance areas as required. Absence must be monitored and actions taken to eliminate contributing factors. A manpower status board depicting personnel assigned, present, TDY, etc. will be maintained. It is the specific responsibility of the flight line maintenance officer that he have daily knowledge of the personnel authorized, assigned, and present for duty. The span of control is such that this officer will have the opportunity to know "first-hand" at all times the status of crews, aircraft, equipment, etc. He must inform the squadron commander when he believes that squadron duties or similar causes are reducing his effectiveness.

f. The flight line maintenance officer will insure that all maintenance is performed in accordance with established schedules and is properly recorded in accordance with TO 0-20A-1. Specialist assistance will be requested as required and closely monitored to insure full use and quality maintenance. The flight line maintenance function will not normally accomplish major unit changes. Periodic maintenance other than preflight inspections will not be performed on the flight line. The flight line maintenance officer will use specialist assistance and provide maintenance supervision in such a manner that quality maintenance is produced with minimum overtime work.

g. A program will be established by the flight line maintenance officer which will insure that the supply requirements of that activity are anticipated, as far in advance as practicable, and made known to the appropriate supply activity. Supply difficulties will be brought to the attention of the materiel control branch for necessary action. All AOCP and ANFE requisitions will be cleared through the materiel control branch for verification prior to supply processing. The maintenance officer should keep informed on the status of supply action on all AOCP, ANFE, or other priority requisitions. Wherever practicable, parts and supplies will be delivered by the supply activity to the crew chief, and maintenance manhours will not be used in chasing parts.

h. The flight line maintenance officer must exert every effort to avoid supply situations which necessitate cannibalization. This can be reduced to the minimum through adequate supply anticipation and careful maintenance troubleshooting. Every effort will be made to insure that only unserviceable items enter the supply channels as reparables. The false economy of indiscriminate "remove and replace" must be impressed upon all personnel. Each serviceable item entering the reparable processing pipe-line is an unnecessary expense that reduces the Air

0351

Force's capacity to provide all requirements when and where required. To assist in this control program, the flight line maintenance officer will designate, by official written media, specific indivduals who are authorized to sign AF Forms 50D, Reparable or Rework Tag. Copies of these authorizations will be provided the quality control unit, materiel control branch, and base supply officer.

i. Efficiency in the flight line maintenance activity is greatly dependent upon the availability of authorized equipment and tools. The maintenance officer must know the authorization, status, and availability of tools and equipment. If equipment deficiencies or inadequacies exist, appropriate corrective action will be taken in accordance with applicable directives. The flight line maintenance officer is responsible to inform the proper authority of equipment deficiencies and insure that equipment not on hand is on requisition.

j. To provide maximum availability of aircraft parts and accessories, the flight line maintenance officer will insure that all reparable property is returned to the appropriate supply agency with the least practicable delay. Reparable property will be cleaned and tagged and, whenever practicable, will be returned to supply channels in suitable containers.

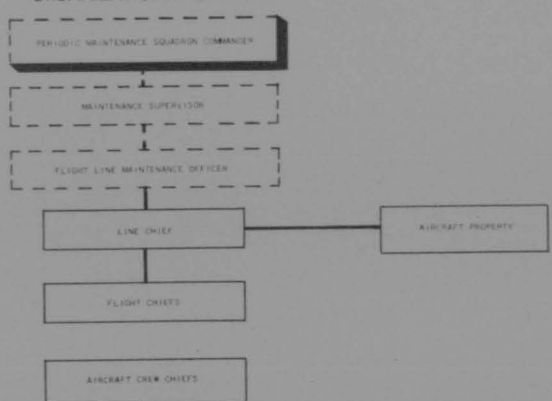
k. The flight line maintenance officer must insure that the assigned equipment is adequately and efficiently used. He must continually review that portion of the communication and transportation equipment assigned his activity to insure that maximum service and use is being realized.

l. The flight line maintenance officer will work in close liaison with the training control unit to insure that an adequate training program is scheduled and conducted for the flight line maintenance activity. Each assigned individual will be made aware of the opportunities in his maintenance career field and encouraged to take advantage of those opportunities. Each airman should be given thorough training in his particular skill, offered and encouraged to participate in training toward the next higher skill level.

m. The flight line maintenance officer will maintain a master copy of appropriate preflight work cards for the aircraft assigned. The master copies will be physically retained in the flight line maintenance office. The maintenance officer will insure that all work copies of the preflight work cards are checked against the master copies and made current prior to issue and use by flight crew personnel. The maintenance officer should conduct, in coordination with the quality control unit and standardization team, a continuing review of preflight inspection requirements. All recommendations for change in inspection requirements should be forwarded through channels, with justification, for necessary review and action.

FLIGHT LINE MAINTENANCE

ORGANIZATIONAL CHART



0352

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6. **Function.** Under the direction of the flight line maintenance officer, the line chief will supervise and manage the flight line maintenance activity.

7. **Responsibilities.** a. The line chief is directly responsible to the flight line maintenance officer for the supervision and management of the flight line maintenance activity.

b. The line chief will:

(1) Directly supervise the flight line maintenance activity through the flight chiefs.

(2) Assign specific duties and delegate commensurate authority to each flight.

(3) Plan and schedule the work of the flight chiefs and recommend necessary personnel and equipment changes to the maintenance officer.

(4) Sign off red cross symbols in accordance with TO 0-20A-1 when deemed necessary or upon request of the flight chief.

(5) Assist assigned personnel in solving technical problems.

(6) Insure that maintenance is accurately recorded and reported, and investigate indications of abnormal maintenance delays and similar problems.

(7) Spot check and evaluate the maintenance accomplished on assigned aircraft and equipment.

8. **Relationships.** a. **Flight Line Maintenance Officer.** The line chief works for the flight line maintenance officer and will keep him informed of maintenance difficulties and the status of aircraft and the maintenance in progress. He must manage the flight line consistent with the policies of the maintenance officer and recommend to him any changes deemed necessary for improving efficiency.

b. **Maintenance Control Unit.** He will keep the maintenance control unit informed of the status of assigned aircraft and the status of maintenance in progress. He must keep informed of the over-all maintenance schedule and insure that the maintenance schedule of the flight line is in consonance with it. He will request specialist assistance when necessary and insure efficient utilization of specialist personnel received.

c. **Standardization Team.** The line chief will assist the team as much as possible during its investigations or visits to the flight line and insure that the quality improvements recommended by the team are followed. The line chief must recognize that the team is a tool to insure that the team members receive the correct reception by flight line personnel.

d. **Quality Control Unit.** The line chief must be an advocate of the quality control unit if that unit is to be of value to the flight line. He must be energetic in the application of corrective action on reported discrepancies and should exert every effort to prevent recurrences. The relationship should be such that the line chief and the quality inspectors receive the same action on verbal reports and requests as they do on written.

e. **Flight Chiefs.** The line chief must maintain a direct supervisory relationship with the flight chiefs. He should accomplish all flight line maintenance supervision and direction through these individuals and limit his contacts with other assigned personnel to the minimum.

f. **Other Maintenance Supervisors (Shop Chiefs, Dock Chiefs, Etc.).** A close relationship should exist between the line chief and his counterpart in the other maintenance activities so that cooperative action is obtained without delay or debate.

9. **General Narrative.** a. The line chief actually manages the flight line maintenance activity and is responsible to the flight line maintenance officer for its efficient operation. Under the general direction of the maintenance officer, he should be responsible for the proper placement and assignment of personnel. He must have current knowledge of the personnel authorized, assigned, and present for duty. He must carefully select his flight chiefs on the basis of their ability to manage and supervise as well as for their technical ability.

b. To obtain balance and provide up-grade training, the line chief will insure that lesser trained personnel are assigned to work with skilled personnel He will accomplish frequent checks to the extent required to determine the need for additional quality control coverage or standardization team investigation and request these additional services. He should use these two units to maximum advantage in obtaining improvement in his organization. Both are units established for his benefit and will be requested whenever necessary.

c. In coordination with the flight chiefs, the line chief will plan and schedule the activities of flight line maintenance to meet the schedule established by the maintenance control unit. He must constantly monitor the progress of maintenance to insure that the schedule is being

0353

met. Insofar as practicable, he will anticipate delays, supply needs, etc., and take appropriate action to prevent scheduling delays. He should refer problems which he cannot solve to the maintenance officer or the maintenance control unit for action.

d. The line chief will periodically check the maintenance accomplished on the flight line to determine quality. He must do this as a supervisory inspection to insure that established standards are met and that areas of maintenance deficiency are determined. This supervisory inspection is in addition to the quality control inspection required by the maintenance control officer or requested by the maintenance officer. The line chief and his designated qualified supervisors should normally check and clear the majority of the items falling within the scope of their authority. The responsibility for safety of flight status of the aircraft does not lie with the quality control unit. This responsibility does lie with the supervisory personnel. Whatever these supervisors do in this connection is in line with actually producing quality, whereas the quality inspectors only determine the quality produced. The supervisory inspections will be accomplished in accordance with TO 0-20A-1. Whenever the line chief feels that he is not qualified to check a particular item or installation, it is essential that he request additional coverage and assistance from the quality control unit.

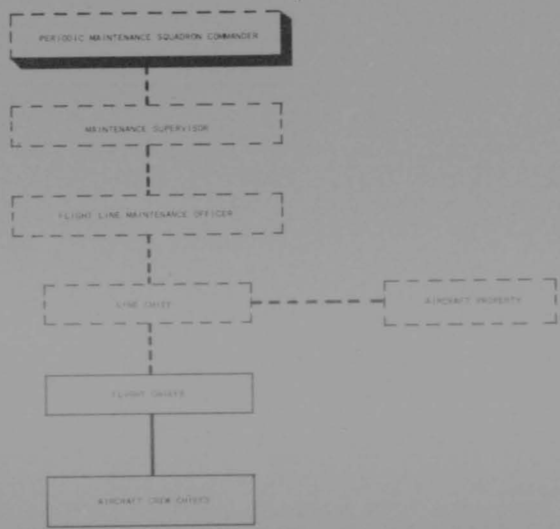
e. Maintenance of the DD Form 781 (Former AF Form 1), with the exception of the Part V, is a responsibility of the flight line maintenance activity. The line chief should inspect the DD Form 781 of each assigned aircraft at least once each week paying particular attention to accuracy of all entries and the status of delayed discrepancy entries. Delayed discrepancy entries will be investigated and the causes for delay determined. Every effort must be made to hold the delayed discrepancies to the minimum. It is particularly vital to insure that maintenance is not deferred because of an approaching periodic inspection. The requirement for the flight line to maintain the state of balance in the maintenance organization must be continually recognized and acted upon by the line chief.

f. The line chief is responsible for the direct supervision of the flight line and the effective and efficient utilization of assigned personnel. He must institute the controls necessary to keep personnel on the job. Every effort will be made to preclude the necessity of any individual leaving his place of work for tools, parts, or any other miscellaneous reasons. Under a heavy workload the usual tendency is to work the personnel longer hours. Frequently, however, the judicious use of personnel and equipment in accordance with a carefully prepared plan and schedule should accomplish the job without consistent overtime. The line chief, through the flight chiefs, should strive to substitute good management, planning, and personnel utilization for overtime. Sound human relationships are very important to successful operation and high morale.

g. During the course of his supervision, the line chief will insure that adequate emphasis is placed upon the normal housekeeping functions. He will insure that aircraft and parking areas are kept as clean as practicable, that equipment is in good repair and safe for use, and that reparable property is expeditiously processed to supply channels. He will be constantly alert for hazards and accident conditions and take immediate corrective action to rectify these conditions and remove the hazards.

h. The aircraft 263 section will function under the direct supervision of the line chief. The line chief will insure that the 263 property of all assigned aircraft is adequately stored, protected, and accounted for in accordance with current directives.

FLIGHT LINE MAINTENANCE
ORGANIZATIONAL CHART



10. **Function.** The flight chief will supervise the accomplishment of flight line maintenance on aircraft assigned his flight and coordinate with the line chief to plan and schedule the work of assigned personnel and specialist assistance. He will insure accuracy of all aircraft and maintenance records maintained by the crew chiefs of his flight.

11. **Responsibilities.** a. The flight chief is directly responsible to the line chief for the efficient operation of the flight and the accomplishment and quality of maintenance on assigned aircraft.

b. The flight chief will:

(1) Insure accomplishment of quality maintenance by constant surveillance and spot checks of the work of assigned crews and specialist support received.

(2) Know at all times the current status of aircraft assigned the flight and all maintenance in progress.

(3) Supervise and control, through the crew chiefs, all personnel assigned to or working with the flight, and assist in solving technical problems.

(4) Accomplish daily checks of flight line entries on the DD Form 781 and other records to insure accurate and complete maintenance recording, and investigate indications of maintenance failings.

(5) Maintain cleanliness of the flight line area and expedite the processing of reparable items to supply channels.

(6) Prepare and submit unsatisfactory reports on unsatisfactory conditions occurring within the flight.

12. **Relationships.** a. **Line Chief.** The flight chief works directly for the line chief and must maintain a close relationship with him. He should supervise and manage his flight in consonance with the policies of the line chief and flight line maintenance officer. He must keep the line chief informed of the status of assigned aircraft and the status of work in progress.

b. **Crew Chiefs.** All supervision of the flight should be conducted through the crew chiefs. The relationship with the crew chiefs should be very close and helpful.

13. **General Narrative.** a. The flight chief must determine the status of each

0355

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aircraft assigned the flight and the status of all maintenance in progress and keep the line chief informed. The DD Form 781 for each assigned aircraft will be checked daily for accuracy and completeness of maintenance recording. The flight chief will insure that all maintenance accomplished is recorded and that completed forms are expeditiously forwarded to the maintenance control unit.

b. Regular spot checks will be accomplished by the flight chief to insure that aircraft are being maintained in a satisfactory manner consistent with the established quality standards of the wing. Particular attention must be given the possibility that discrepancies are not immediately corrected. Maintenance will be deferred when it is possible and practical to correct the discrepancies noted. At this point in the maintenance organization, retention of the state of balance assumes its greatest importance. The flight chief will be constantly alert to any conditions arising which may affect the balance and must take immediate corrective action to remedy the condition.

c. The flight chief is authorized to check and sign-off maintenance symbols on the DD Form 781 in accordance with TO 0-20A-1. In doing this, he is accomplishing one part of his supervisory responsibilities and is assisting the personnel of his flight to produce high quality maintenance. Through the medium of these supervisory maintenance checks, the flight chief will become aware of the training requirements of his flight and can recommend appropriate action to the line chief. Whenever he feels that he is not qualified to clear a particular maintenance operation, he should request the assistance of the quality control unit. He must use this unit to assist him in producing the maximum effectiveness from his flight.

d. The flight chief is responsible for managing the activities of assigned personnel to obtain maximum efficient utilization. He will make all duty assignments in coordination with the line chief and should endeavor to assign his less skilled personnel with qualified personnel. He is responsible to have current knowledge of personnel authorized, assigned, and present for duty and to recommend to the line chief any changes deemed necessary to increase personnel availability and utilization.

e. The flight chief will be required to use all the principles of management to keep his assigned aircraft in commission. He must plan, direct, and control, in coordination with the maintenance officer and the line chief, the day by day activities of the flight. The basic aircraft maintenance crew is the minimum required to accomplish flight line maintenance. Therefore, the flight chief must insure full utilization of all support and assigned personnel in accomplishment of this maintenance.

f. Every effort will be made to keep assigned personnel on the job by eliminating the reasons for absence or extraneous functions. Whenever possible, parts and equipment should be made available to the worker on the job when required. Personnel will not be permitted to leave the working area for any reason unless authorized by the flight chief. All "coffee" breaks will be scheduled and controlled as directed by the line chief. Sign out sheets or boards should be used to record absence from the job, destination, and expected time of return to permit the flight chief to adequ..tely maintain his personnel controls.

g. In order to provide additional capability to the wing, the flight chief will insure that all reparable property is expeditiously processed to supply channels. Reparable items will be clean, correctly tagged, and, when practicable, returned to supply in suitable containers. The flight chief must impress on his personnel the urgent need for economy of operation. Hoarding serviceable or reparable items will be discouraged. The flight chief must insure operation in a manner which will permit the base supply activity to fully support the squadron in the manner required and desired. This cannot be achieved if cooperation on the part of maintenance is not provided. The flight chief will assist his crew chiefs in the anticipation and requisitioning of parts required for flight line maintenance and insure that appropriate supply activity is correctly notified.

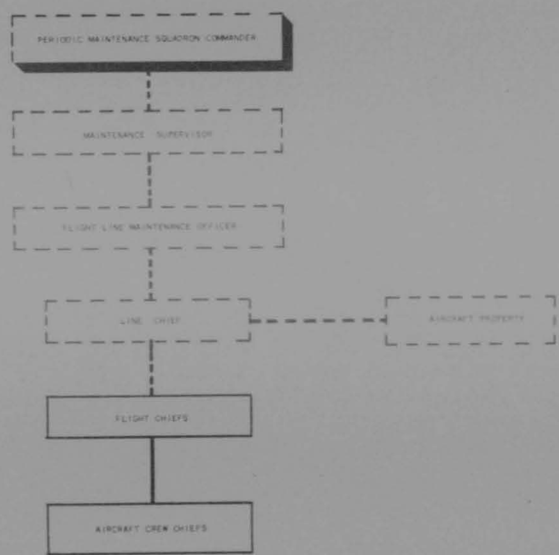
h. The flight chief must be constantly alert for unsatisfactory conditions within his flight. He will inform the line chief of those conditions which he cannot correct himself, but which are correctable locally. He will encourage submission of unsatisfactory conditions which are discovered in equipment, parts, etc., as outlined in TO 0-35-D-54.

i. The flight chief will insure that all equipment and facilities, including the parking areas, assigned the flight are maintained in clean, serviceable condition.

Through his constant supervision of the flight he can observe the housekeeping practices of assigned personnel and direct necessary improvement or changes. The effectiveness and efficiency of the flight may frequently be gaged by the condition and appearance of its assigned equipment and facilities.

FLIGHT LINE MAINTENANCE

ORGANIZATIONAL CHART



14. **Function.** The crew chief will supervise the accomplishment of and insure the quality of all maintenance on his assigned aircraft. He will supervise and train assistants and maintain familiarity with current technical directives.

15. **Responsibilities.** a. The crew chief is responsible to the flight chief for the accomplishment and quality of maintenance performed on his assigned aircraft.

b. The crew chief will:

(1) Maintain the aircraft in a safe, dependable, clean, mission-ready condition.

(2) Supervise all maintenance accomplished on the assigned aircraft. Accompany the aircraft through all phases of maintenance and assume the duties of assistant chief while the aircraft is undergoing periodic or postflight maintenance.

(3) Supervise assistants and specialist support personnel to obtain full utilization, high quality maintenance, and compliance with current directives and SOPs.

(4) Insure that all maintenance performed on the aircraft is correctly recorded on the Part II, DD Form 781.

(5) Inform the flight chief of all changes in aircraft status.

(6) Insure that all property, supplies, and materiel are secure and protected, and that reparable units are expeditiously processed.

(7) Report unsatisfactory conditions to the flight chief.

16. **Relationships.** a. **Flight Chief.** The crew chief works directly for the flight chief and must keep him informed of the status of the aircraft, problems encount-

0357

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ered, or required.

b. **Dock Chiefs.** While his aircraft is undergoing postflight or periodic inspection and maintenance, the crew chief becomes assistant postflight or assistant dock chief. He must assist the chief in supervising maintenance completion and must inform the chief of any maintenance accomplishment which he believes to be below acceptable quality.

c. **Flight Crew.** The crew chief must maintain a close relationship with the flight crew and, in particular, the aircraft commander and flight engineer. This relationship should encourage the discussion of maintenance discrepancies and participation of the flight crew in maintenance of aircraft.

17. **General Narrative.** a. The crew chief has the individual responsibility for maintenance of aircraft to which he is assigned. The entire maintenance organization functions to assist him in fulfilling his responsibility. He is responsible for supervising all maintenance accomplished on the aircraft and is the individual most familiar with its overall condition. The condition of the aircraft is a direct responsibility of his at all times and all specialist assistance will be generally supervised by the crew chief under the "customer" concept.

b. The crew chief or his assistant will accompany their aircraft through all phases of maintenance. While the aircraft is in the periodic maintenance dock (or undergoing postflight inspection) the crew chief will assume the duties of assistant dock chief. In this capacity he will actively participate in the general supervision and direction of maintenance accomplishment and will accept only quality maintenance. The retention of high quality is a primary responsibility of the crew chief. In the event the crew chief is not satisfied with the maintenance accomplished and cannot reconcile the condition with the personnel concerned, he must inform the dock chief or other supervisory personnel of the unsatisfactory condition and request necessary corrective action. The responsibility for the safety of flight status of his aircraft belongs to the crew chief, basically, and not with the quality control unit.

c. This maintenance organization provides only minimum strength basic crews for the flight line maintenance function to accomplish preventive maintenance and servicing between routine periodic inspections. The successful functioning of the organization is based upon each activity accomplishing that maintenance for which it is manned and equipped; therefore, the crew chief plays a large part in determining the degree of successful operation. The maintenance organization becomes unbalanced if the crew fails to carefully and thoroughly accomplish his maintenance which is beyond the capabilities of his crew, their equipment, or their available time. Correspondingly, he must not request specialist support if it is not actually required.

d. Each individual working on the aircraft will be directly responsible to the crew chief except during the accomplishment of postflight or periodic inspection and maintenance. During these phases the crew chief still has the responsibility for accepting only quality maintenance. As the crew chief or assistant dock chief, he is responsible for insuring that personnel and skills are utilized in the most efficient manner and that reasons for inefficiency or ineffectiveness are made known to the proper authority for corrective action. Each individual should be permitted to work at essential tasks for his full duty day.

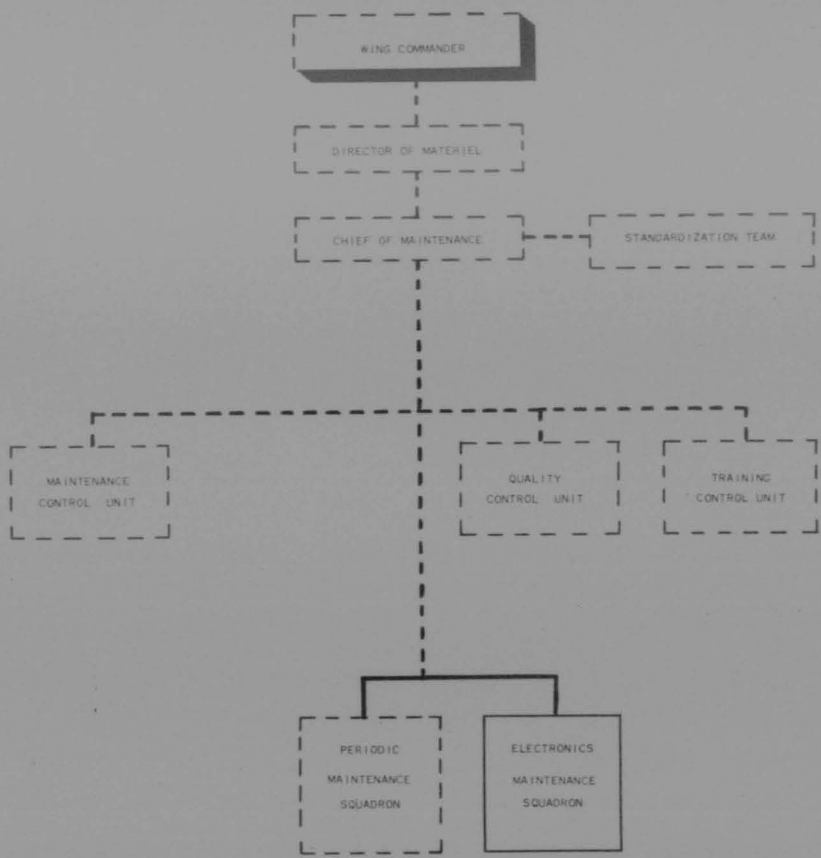
e. Maintenance planning and scheduling, from an overall viewpoint, is accomplished by the maintenance control unit. However, each supervisor is required to plan and schedule the work of his subordinates to enable his section to meet their part of the master plan and schedule. Planning is an important part of the crew chief's job. Failure to plan properly and coordinate the plan with the related maintenance activities will cause serious delays which will disrupt the over-all plans and schedules. It is impossible to accurately predict every condition which will arise on the aircraft; however, if all predictable maintenance requirements are planned and scheduled, maximum maintenance and supply support may be provided and the crew chief may more efficiently fulfill his responsibilities.

f. The crew chief or his assistant should actually enter or monitor each entry on the Parts II and III, DD Form 781, after the accomplishment of maintenance on the aircraft. The crew chief will frequently visit the records and analysis branch to check the records on his aircraft to insure that they are current and accurate, and to determine approaching maintenance requirements. Each change in aircraft status must be reported to the flight chief to enable him to adjust his plans and schedules accordingly and to inform the maintenance control unit.

0358

g. Supply discipline and economy, as well as maintenance and quality discipline and economy, will be practiced and enforced by the crew chief. All supplies, parts, or materiel in the work area must be maintained in a secure manner, adequately protected from pilferage and weather, correctly tagged, and clean. Hoarding will be neither practiced nor tolerated. Reparable property will be cleaned, tagged, and turned in to supply channels as expeditiously as practicable. Every effort will be made to insure that serviceable items do not enter the reparable pipeline.

SECTION X
WING MAINTENANCE
FUNCTIONAL CHART



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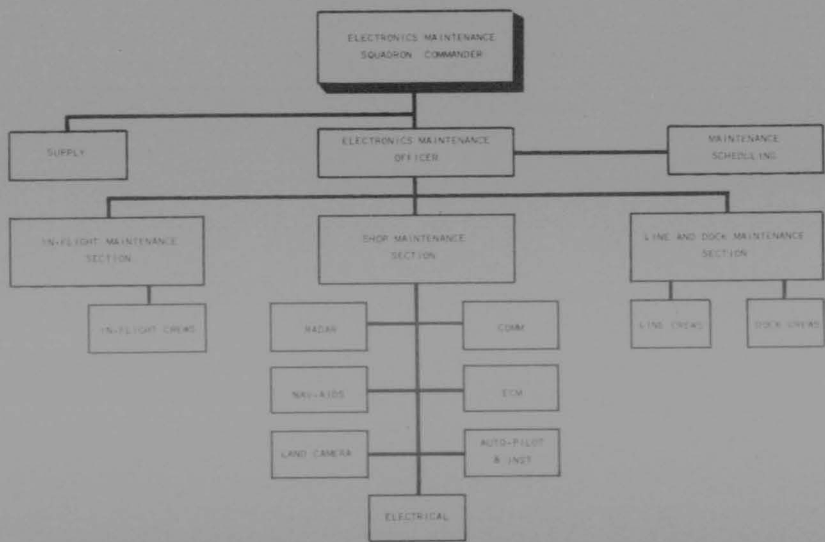
ELECTRONICS MAINTENANCE
ORGANIZATIONAL CHART



1. **Function.** This squadron will provide flight-line, periodic, inflight, and field maintenance for all wing electronics equipment, and perform field maintenance on communications equipment installed in maintenance and supply expediter system.

2. **Responsibility and Authority.** a. The electronics maintenance squadron commander is responsible to the wing commander for the organization and functioning of the electronics maintenance activity and for the quality accomplishment of all electronics maintenance. However, the wing commander through the director of materiel has assigned the responsibility and delegated the authority to the chief of maintenance for the direction of the wing maintenance function. Therefore, the normal contact for the commander in the accomplishment of his maintenance responsibility is the chief of maintenance.

3. **Personnel.** a. The electronics maintenance squadron commander is responsible for the efficient utilization and effective training of all personnel assigned the squadron. He must insure that all specialist support directed by the maintenance control unit is expeditiously dispatched.

b. **The Commander must insure that his squadron is staffed with sufficient qualified personnel to adequately support the wing.** Local schooling and training facilities must be fully used to maintain high proficiency and obtain necessary cross-training. Wherever practicable, he should team lesser qualified personnel with skilled personnel to obtain maximum benefits from experience and technical knowledge.

c. Contractor technicians assigned the squadron must be carefully monitored and scheduled to insure full utilization in the authorized consultant, maintenance, engineering, and training capacity.

4. **Relationships. a. General.** The electronics maintenance squadron occupies a unique position in the maintenance organization. It is responsible for supply and maintenance of all electronics equipment assigned to the wing. Therefore, close, cooperative, and harmonious relationships are essential. The commander must insure that these relationships are established and maintained.

b. **Chief of Maintenance.** The com-

0360

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mander must maintain direct and close contact with the chief of maintenance so as to remain aware of major maintenance policies and problems. He must actively support the chief of maintenance and require that the electronics maintenance activity comply with established maintenance policies and procedures. He should advise the chief of maintenance when he believes that any maintenance directives are contrary to the best interest of the wing.

c. **Electronics Maintenance Officer.** The maintenance officer is the manager of the electronics maintenance activity. He should be delegated the authority to operate the maintenance activity in his own manner consistent with established policies and directives. The commander must authorize the maintenance officer to work directly with the maintenance control unit in the normal day-to-day maintenance functions.

d. **Supply Officer.** The supply officer is the manager of the technical and unit supply. He should be delegated the authority to operate the supply activity in his own manner consistent with established policies and directives. The commander must authorize the supply officer to work directly with the base supply officer in normal day-to-day supply functions.

e. **Quality Control Unit.** The electronics squadron commander must use the quality control unit as a management tool to improve the operation of, and the quality of maintenance accomplished by the electronics maintenance squadron. He must insure that positive and continuous corrective action is taken on reported discrepancies and must make every effort to prevent recurrence. He should advise the quality control officer of dissatisfaction with assistance rendered, inspection coverage, report contents, etc.

f. **Standardization Team.** The electronics maintenance squadron commander must actively support and assist the team in its investigations and studies of the electronics maintenance activity. Where practicable, the commander should recommend to the chief of maintenance those areas in his squadron in which the team could be used advantageously.

5. **General Narrative.** a. The electronics maintenance squadron commander is responsible to the wing commander for the operation of his squadron. However, because of the complexity and scope of the maintenance activity, the wing commander has, through the director of materiel, delegated the necessary authority to the chief of maintenance to direct and supervise the entire wing maintenance activity. It is important that the commander recognize and understand his maintenance position. He must establish and maintain a close relationship with the chief of maintenance so that he may be aware of the operation of the entire maintenance organization and its major problems. This is vital since his squadron is responsible for accomplishing flight line, in-flight, periodic, and field maintenance on electronics equipment assigned to or installed in wing aircraft. The chief of maintenance must be assured of the active participation of the electronics squadron commander in the correct and efficient accomplishment of high quality maintenance.

b. It is not intended under this maintenance concept that the chief of maintenance usurp or assume any of the commander's prerogatives or responsibilities. Also, it is not intended that he, or the director of materiel, be an intermediate commander between the squadron and wing commanders. The relationship should be one of mutual coordination and cooperation. If the commander cannot resolve a maintenance difficulty with the chief of maintenance or the director of materiel, it is only logical for the matter to be referred to the wing commander for decision.

c. The electronics maintenance officer is responsible to, and works for, the squadron commander. However, for maintenance balance and expediency, the chief of maintenance or the maintenance control officer should normally transmit routine maintenance directives and instructions directly to the maintenance officer. It is the commander's prerogative to insist that he personally sanction all maintenance control. To do so, however, would be impracticable. The most efficient operation will be achieved when the commander permits his maintenance officer to work directly with the maintenance control unit on routine maintenance matters.

d. The electronics maintenance squadron is designed to provide centralized control of all electronics maintenance. It is organized on the systems-maintenance concept and must provide for the maintenance and inspection of electronics components of the entire aircraft and the repair and/or reclamation of unserviceable components of parts. The repair, inspection, maintenance, or reclamation of telephone, teletype, and TWX equipment, or radio sets organizationally assigned to the air base group, will not be accomplished by this activity.

0351

e. The combat effectiveness of the wing is greatly dependent upon the efficiency of, and quality of maintenance produced by this squadron. Therefore, it is extremely important that proven management principles be applied by all supervisory personnel. The commander must be progressive in his thinking and aggressive in his policies to insure that all maintenance functions are operating efficiently and effectively. The degree of effectiveness in the utilization of assigned personnel, equipment, and facilities will bear a definite relationship with the mission effectiveness of the wing.

f. Each supervisor in the squadron will be required to be constantly aware of how many personnel are assigned his activity, how many are present for duty, and their current location and duty. The commander must insure that a system is established in the squadron which will permit this information to be known at all times and enable him to keep the maintenance control unit informed.

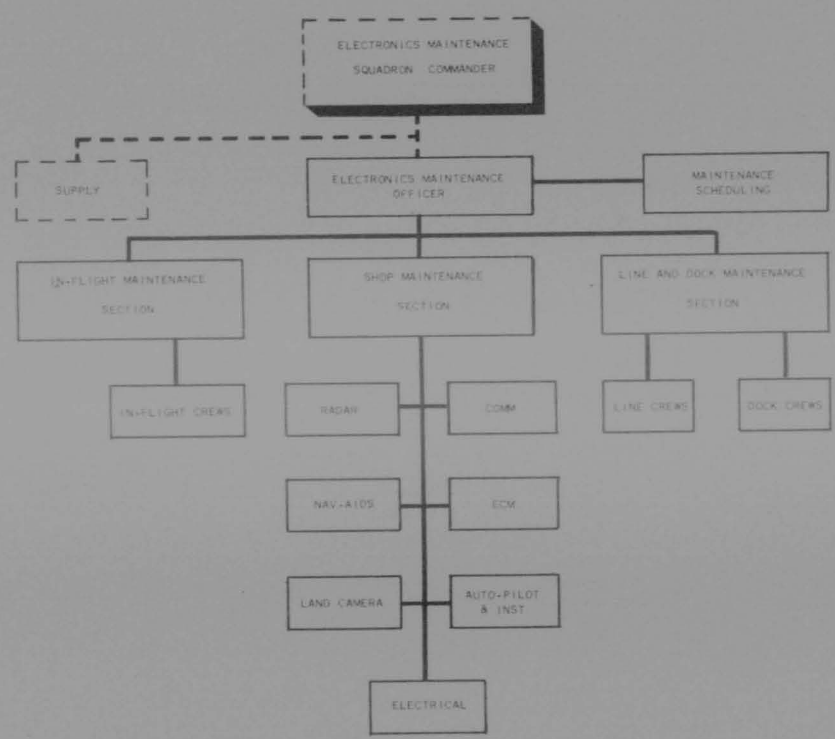
g. Particular attention will be given to the delegation of maintenance within the squadron so as to retain the desired state of balance between the line and dock, in-flight, and shop maintenance sections. Each section must accept a practical view of their designed capability. Each must accomplish that maintenance for which it is responsible and help to maintain balance in the maintenance organization. An unbalanced condition exists when the line and dock section fails to meet its responsibilities and overloads the shop maintenance section with reparable units or work for which they have not been scheduled. The commander will conduct frequent personal surveys to insure that the balance is maintained so that over-all wing effectiveness is not decreased.

h. Specialist support of all other maintenance activities will be expeditiously furnished when directed by the maintenance control unit. While a specialist is on dispatch, the squadron commander retains the responsibility for insuring that he accomplishes efficient, high quality maintenance. The commander will require that all supervisory personnel of the squadron make frequent checks of the maintenance accomplished by their personnel to insure quality and to determine areas of maintenance deficiency. Also, he will insist that emphasis be placed on the prompt dispatch of maintenance personnel and that they report ready to work with no requirement to return to the shop for tools, test equipment, etc.

i. Reports submitted by the quality control unit will be carefully reviewed and analyzed by the commander to insure that adequate corrective action is being taken and that the reports meet his requirements. He must realize that this unit exists to help him do his job. If he believes he is not receiving sufficient help, he should inform the quality control officer and recommend necessary changes to meet his requirements. He must develop within his squadron a position attitude of cooperation and assistance to obtain full value from the efforts of his unit.

0362

ELECTRONICS MAINTENANCE ORGANIZATIONAL CHART



6. **Function.** The maintenance officer will organize, man, and supervise the electronics maintenance activity in accordance with the concepts outlined in this Manual. He will provide expeditious specialist dispatch as directed by the maintenance control unit and advise the squadron commander of maintenance status, problems, and progress.

7. **Responsibility and Authority.** a. The electronics maintenance officer is responsible to and works for the electronics maintenance squadron commander. However, for expedient maintenance accomplishment he should be authorized to work directly with the maintenance control unit for routine operation of the maintenance activity.

b. The electronics maintenance officer will:

(1) Organize the maintenance activity generally as outlined in this Manual, consistent with current manning authorizations and wing assigned equipment.

(2) Accomplish maintenance, repair, reclamation, and inspection of all electronics equipment of the wing.

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(3) Maintain communications equipment installed in maintenance and supply expediter system.

(4) Be responsible for the maintenance of electronic components of instruments furnished the wing.

(5) Maintain current status of the electronics equipment installed in wing aircraft and keep the maintenance control unit informed.

(6) Provide expeditious dispatch of specialist personnel to other maintenance functions when directed by the maintenance control unit and maintain current status record of the location and availability of specialist personnel.

(7) Establish liaison with, and develop a utilization program for assigned electronics contractors technicians.

(8) Perform field maintenance on wing training aids.

(9) Schedule and perform organizational maintenance on assigned equipment.

(10) Prepare and submit unsatisfactory reports as appropriate.

(11) Maintain a current file of pertinent technical publications.

8. **Organization.** a. The organizational structure of the electronics squadron will follow the form shown by the chart. (Page 68). The organization of the sections and number of personnel to be assigned to each section will be dependent upon the work loads encountered in each section. Section work loads will be closely monitored to insure the best utilization of personnel, tools and test equipment.

b. Technical liaison is authorized between the in-flight, shop, line and dock maintenance sections for the coordination of maintenance and assignment of personnel.

c. A chief and foreman will be appointed to each section. Each of these supervisors will be delegated the authority necessary to accomplish the assigned responsibilities.

9. **Relationships.** a. **Electronics Maintenance Squadron Commander.** The maintenance officer is responsible to and works for the electronics maintenance squadron commander. He must manage the activity in a manner consistent with the policies and requirements of the commander and must keep the commander informed on maintenance difficulties encountered.

b. **Maintenance Control Unit.** Normally the maintenance officer will work directly with the maintenance control unit on routine maintenance matters. A close working relationship must exist since these two control and direct all electronics maintenance for the wing. The maintenance officer must keep the maintenance control unit constantly informed of the status of all electronics equipment and the status of all maintenance in progress. Both parties must be constantly aware of the overall wing maintenance schedule and the existing work load in order to establish suitable schedules and maintain overall effectiveness.

c. **Standardization Teams.** The maintenance officer will cooperate with the team in its investigations and studies so that maximum benefit may be obtained from its services. The team is a management aid which the maintenance officer should use to his own advantage in improving the quality of maintenance accomplished and the efficiency of the activity.

d. **Quality Control Unit.** A relationship of cooperation and coordination should exist between the quality control unit and the electronics maintenance officer. The maintenance officer should insure positive and continuous corrective action on reported discrepancies so as to improve the quality of maintenance accomplished and prevent recurrent discrepancies.

e. **Training Control Unit.** The maintenance officer must maintain a close relationship with the training control unit to insure that his organization is provided necessary training, and that trainee personnel meet established schedules.

f. **Line and Dock Maintenance Officer.** He must maintain close coordination with the aircraft flight-line maintenance officers to insure combat-readiness of assigned aircraft and meeting of flight schedules. This coordination is of vital importance in order that scheduled changes and unforeseen circumstances will have the minimum effect on accomplishment of the mission assigned the wing.

g. **Shop Maintenance Officer.** He will be responsible for the organization of the shop activities for the accomplishment of maintenance in the shop and assisting the line and dock maintenance section when requested. His section will be responsible for all field maintenance as well as assisting line and dock maintenance section. Close coordination must be maintained with the line and dock maintenance officer for the accomplishment of his maintenance mission and to obtain minimum "out-of-commission" time.

(3) Maintain communications equipment installed in maintenance and supply expediter system.

(4) Be responsible for the maintenance of electronic components of instruments furnished the wing.

(5) Maintain current status of the electronics equipment installed in wing aircraft and keep the maintenance control unit informed.

(6) Provide expeditious dispatch of specialist personnel to other maintenance functions when directed by the maintenance control unit and maintain current status record of the location and availability of specialist personnel.

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0365

h. **In-Flight Maintenance Officer.** His responsibility consists of assigning flight crews and the training of flight personnel. This will require close coordination with the shop, line and dock maintenance sections to insure the adequate assignment of flight personnel for training and assisting in maintenance duties.

10. **General Narrative.** a. The electronics maintenance officer is the top manager of the electronics maintenance organization. As such he is responsible to the squadron commander for organizing and operating this activity. Routine maintenance directives and orders should be passed directly from the maintenance control unit to the maintenance officer for accomplishment. The maintenance officer and all supervisory personnel must plan and schedule the work of their activities in a manner which will insure the accomplishment of quality maintenance in accordance with the master schedule established by the maintenance control unit. The time and effort expended in planning and scheduling maintenance will be directly reflected in the effectiveness of the wing.

b. The maintenance officer is primarily responsible for insuring the quality accomplishment of flight line, periodic, inflight, and field maintenance on all electronics equipment, and for obtaining maximum utilization of assigned personnel. In conjunction with his designated section chief and foreman, he must constantly monitor all electronics maintenance activities. They will be constantly alert for inefficiencies or maintenance quality below acceptable standards and must take necessary corrective action.

c. The responsibility for quality maintenance is an active responsibility. The maintenance officer will require that his supervisors periodically inspect the maintenance accomplished by their personnel. These supervisory inspections are necessary to determine quality and establish areas of maintenance deficiency. Supervisory inspections will be in addition to any prescribed or requested quality control inspections and must be accomplished in accordance with TO 0-20A-1. Whenever the supervisors or the maintenance officer believe they are not qualified to check a particular job, it is essential that the assistance of the quality control unit be requested.

d. All supervisory personnel must be aware at all times of the manpower availability and work backlog in their activity. They will exert every effort to obtain maximum personnel utilization so that the workload will remain in consistent proportion to the maintenance capability. Each individual will be assigned definite duties and responsibilities and delegated authority equal to the assigned responsibilities. Job descriptions will be prepared for each individual. Supervisors should be required to conduct frequent personal interviews to insure that each individual knows and understands his specific duties, responsibilities, and authority. Organization charts will be prominently displayed in each shop and office to outline the organization of the electronics maintenance squadron and depict its position in the maintenance organization. The maintenance officer must follow the established organizational structure. Normally, each man should have but one "boss" and all directions and instructions should come through the "boss."

e. Effective and efficient accomplishment of the electronics maintenance function requires that the maintenance officer know the current manpower status in the squadron. A manpower status board will be maintained to show personnel assigned, present, TDY, in shop, on dispatch, etc. This is particularly important to scheduling and retention of maintenance balance.

f. The maintenance officer and his designated supervisors must be constantly aware of the electronics workload and the priorities established by the maintenance control unit. The supervisory section of this activity will insure the expeditious dispatch of specialist personnel to other maintenance activities in accordance with the priorities established by the maintenance control unit. Specialist personnel must be immediately effective in order to insure the availability of the maximum quantity of serviceable, combat-ready electronics equipment. Any factors delaying or preventing accomplishment of this function, or the immediate dispatch of required specialists, will be immediately brought to the attention of the maintenance control unit for necessary action.

g. Maintenance supervisors must carefully analyze the time and man-hour information available from completed specialist dispatches to determine reasons for delay in job completion, causes for large manhour expenditure, and the efficiency of the specialist or team dispatched. Reasons for delays and excessive manhour expenditures shoud be thoroughly evaluated and action taken to eliminate

0366

the causes. In addition, the supervisory section must analyze the maintenance and manhour accounts and reports compiled by the maintenance control unit to determine inefficiencies, faulty procedures, need for increased supervision, etc. This analysis is of extreme importance to the improvement of the quality of maintenance and the quality of management.

h. The supervisory section will maintain the current status of all electronics equipment and will immediately report to the maintenance control unit all status changes as they occur. The planning and scheduling of electronics maintenance work will be organized to provide "In-Commission" status of the maximum quantity of assigned equipment. **The mission effectiveness of the wing is dependent on this concept.**

i. Reparable property will be processed in accordance with current directives and repair priorities established by the maintenance control unit. Large backlogs of reparable property will not be permitted to accumulate. The shop maintenance officer will designate certain qualified personnel to sign condition tags for items tested, repaired, or condemned in the shop since it is not feasible for an individual outside the shop to certify serviceability without completely reworking or retesting the unit. This will be accomplished in the form of a letter of authorization signed by the maintenance officer and bearing specimen signatures of the designated personnel. Copies of the letters will be furnished the base supply officer, materiel control branch, and the quality control unit. Also, one copy of the current authorization letter will be posted in the shop.

j. The maintenance officer will require his supervisory personnel to be continually alert for unsatisfactory conditions or equipment during the accomplishment of the electronics maintenance function. Unsatisfactory reports will be submitted when appropriate. They serve as the only practicable method of obtaining Air Force-wide equipment improvements with consequent reduction in malfunction, aborts, etc.

k. Adequate equipment maintenance is extremely important to the successful and efficient accomplishment of electronics maintenance. The maintenance officer will require that his section chiefs and foremen schedule and accomplish organizational maintenance and maintain appropriate preventive maintenance records on assigned ground servicing and motorized equipment in accordance with current directives.

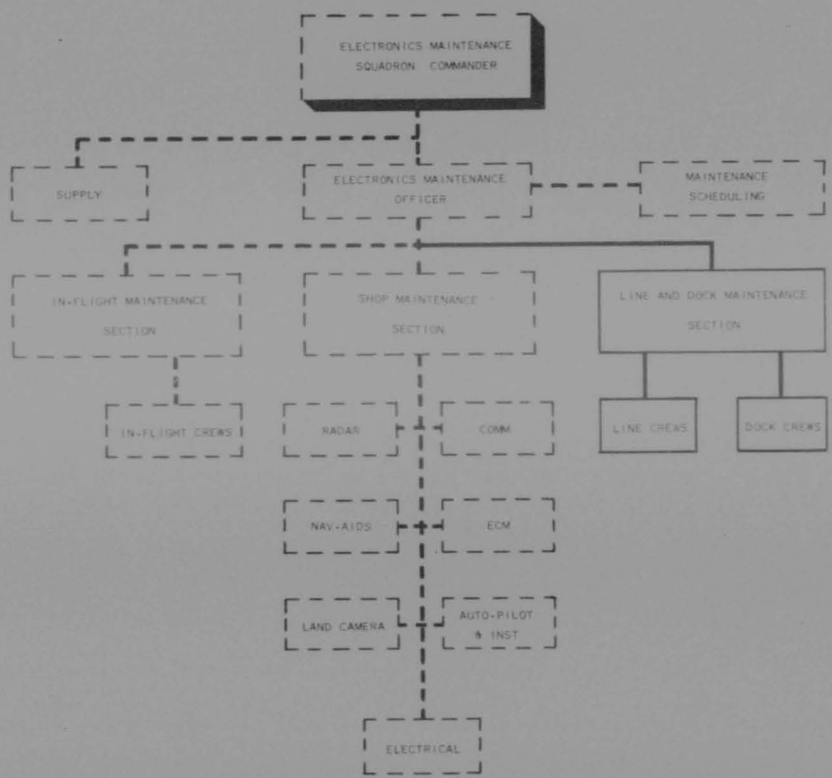
l. The various maintenance sections of the squadron, shown on the chart, will perform flight line, in-flight, periodic and field maintenance. Maintenance personnel will be assigned to the various sections for operational control. The scope of each section is described below:

(1) **In-Flight Maintenance Section.** This section will maintain all of the electronic equipment installed in the aircraft while in flight and assign personnel to the other sections when they are available for duty.

(2) **Shop Maintenance Section.** Will perform field maintenance on all electronic equipment assigned to the wing and in addition will assist the line and dock maintenance crews whenever possible. The internal organization of the shop is left to the judgment of the shop maintenance officer.

(3) **Line and Dock Maintenance Section.** This section will accomplish flight line and periodic maintenance of electronic equipment installed in all aircraft assigned to the wing.

ELECTRONICS MAINTENANCE
ORGANIZATIONAL CHART



11. **Function.** Under the direction of the electronics maintenance officer, the line and dock maintenance officer will manage the section.

12. **Responsibilities.** a. The line and dock maintenance officer is responsible to the maintenance officer for supervision of his section and the quality of maintenance accomplished.

b. The line and dock maintenance officer is responsible for:

(1) The accomplishment of flight line and periodic maintenance.

(2) Organizational maintenance on equipment and tools assigned to his section.

(3) Maintenance of pertinent records. (Shop maintenance section will maintain technical files.)

13. **Relationships.** a. **Electronics Maintenance Officer.** The line and dock maintenance officer is responsible to, and works for, the electronics maintenance officer. He must supervise the branch in a

manner consistent with the policies of the electronics maintenance officer and will keep him informed of major difficulties encountered.

b. **Line and Dock Maintenance Foreman.** The line and dock maintenance officer must maintain a direct supervisory relationship with the foreman of the section and should normally accomplish all supervision and direction through these personnel.

c. **Other Maintenance Supervisors.** A close relationship should exist between the line and dock maintenance officer and other maintenance supervision so that maintenance that is not equal to established quality standards can be expeditiously reported and corrected.

d. **Standardization Team.** The line and dock maintenance officer must assist the team as much as possible during its investigations and visits so that maximum improvement is obtained from its observations and recommendations. He should request the assistance of this unit whenever he feels that their services may be necessary.

14. **General Narrative.** a. The line and dock maintenance officer is the manager of the section and is responsible to the electronics maintenance officer for the efficient accomplishment of all work assigned. He is also an executive assistant to the maintenance officer and must assist him in every manner in accomplishing the electronic maintenance function. With the concurrence of the electronic maintenance officer, he will be responsible for the proper placement and assignment of section personnel. He must have daily knowledge of the personnel authorized, assigned, and present for duty.

b. Electronics parts and components required to return an aircraft to an in-commission status will be processed in accordance with established supply procedures.

c. To maintain balance and provide upgrade training in the section; the line and dock maintenance officer will insure that lesser qualified personnel are assigned to work with skilled personnel. He will perform frequent checks, in conjunction with the shop foremen, to determine the need for additional training. He should request the assistance of the training control unit for any additional training that is required.

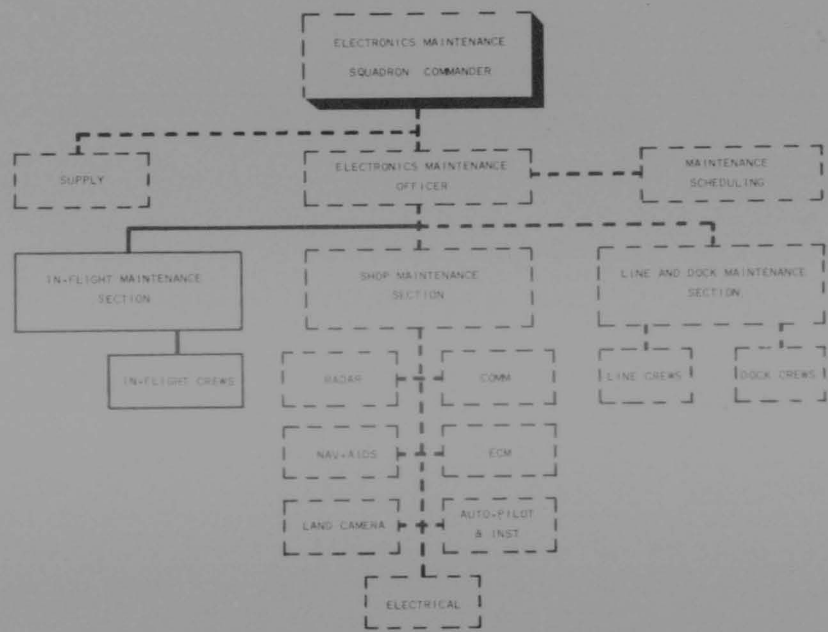
d. In coordination with the shop foreman, the line and dock maintenance officer will plan and schedule maintenance to meet the master schedule established by the maintenance control unit. He will monitor the progress of maintenance to insure that the schedule is being met. Insofar as possible, he will anticipate delays, supply needs, etc., and take appropriate action to prevent delays or slowdowns.

e. The line and dock maintenance officer will periodically inspect the maintenance accomplished by assigned personnel to determine quality. He must accomplish these supervisory inspections to insure that established standards are being met and to determine areas of maintenance deficiency. These checks will be accomplished in accordance with TO 0-20A-1 and will be in addition to any prescribed or requested quality control inspections.

f. The line and dock maintenance officer is responsible for the effective and efficient utilization of assigned personnel, and will institute controls necessary to keep personnel on the job. Sign out sheets, status boards, or similar devices must be maintained to record the location of assigned personnel. This is important to the expeditious dispatch of specialists directed by the maintenance control unit.

g. The line and dock maintenance officer will be intimately involved in the master maintenance scheduling accomplished by the maintenance control unit. Since he has the responsibility of all flight line and periodic maintenance of electronics equipment, it is essential that he carefully schedule his maintenance activities in coordination with the maintenance personnel of the various sections. Close coordination is particularly vital in connection with the accomplishment of pre-flight and post-flight inspections to insure fast return to the "in-commission" status, and aircraft availability for mission accomplishment.

ELECTRONICS MAINTENANCE
ORGANIZATIONAL CHART



15. **Function.** Under the direction of the electronics maintenance officer, the in-flight maintenance officer will supervise and manage the section.

16. **Responsibilities.** a. The in-flight maintenance officer is responsible to the electronics maintenance officer for the supervision and quality of the in-flight maintenance accomplished.

b. The in-flight maintenance officer is responsible for:

(1) The assignment of qualified personnel to flight crews.

(2) The assignment of personnel to the other sections for OJT training and assisting in maintenance.

(3) Maintenance of pertinent records in connection with his maintenance mission.

17. **Relationships.** a. **Electronics Maintenance Officer.** The in-flight maintenance officer is responsible to and works for the electronics maintenance officer. He will supervise the section in a manner consistent with the policies of the electronic maintenance officer and must keep him informed of major difficulties encountered.

b. **Shop Foreman.** The in-flight maintenance officer must maintain a direct supervisory relationship with the shop foremen of the section and should normally accomplish all supervision and direction of the section through these personnel.

c. **Other Maintenance Supervisors.** A close relationship should exist between the in-flight maintenance officer and the other section chiefs so that maintenance accomplished which is not equal to established quality standards is expeditiously reported and corrected.

d. **Standardization Team.** The in-flight maintenance officer must assist the team as much as possible during its investigations and visits so that maximum improvement is obtained from its observations and recommendations. He should feel free to request team assistance at any time.

e. **Quality Control Unit.** The quality control unit will be of tremendous assistance to the in-flight maintenance officer if he adopts the correct attitude toward it. He will insure a cooperative attitude throughout the section by evidencing acceptance and cooperation. He will insure expeditious and continuous corrective action on reported discrepancies so that the quality of maintenance accomplished remains high at all times. He should request the assistance of this unit whenever he feels that its services may be necessary.

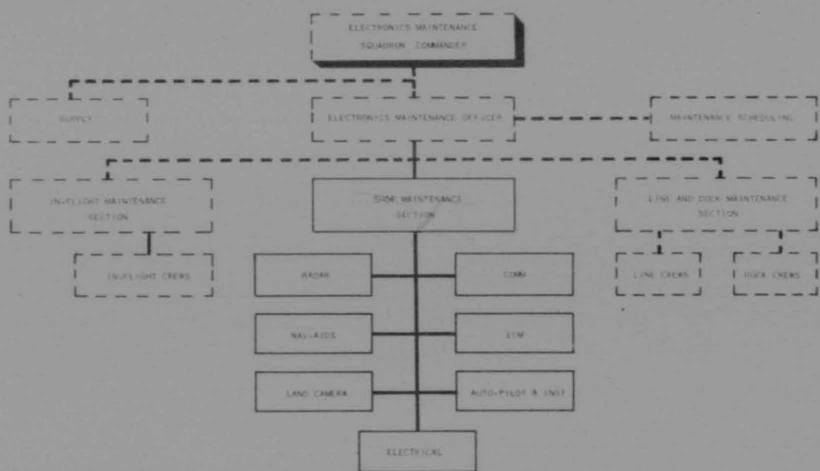
18. **General Narrative.** a. The in-flight maintenance officer is manager of the section and is responsible to the electronics maintenance officer for the efficient accomplishment of all assigned work. The in-flight maintenance officer is an executive assistant to the electronics maintenance officer and must assist him in every manner in accomplishing the electronic maintenance function. With the concurrence of the electronic maintenance officer, the in-flight maintenance officer will be responsible for the proper placement and assignment of section personnel. He must have daily knowledge of the personnel authorized, assigned, and present for duty.

b. To maintain balance and provide upgrade training in each shop, the in-flight maintenance officer will insure that lesser qualified personnel are assigned with skilled personnel. He will make frequent checks to determine what additional training is required and take the necessary action to obtain assistance.

c. The in-flight maintenance officer will periodically inspect the maintenance accomplished by assigned personnel to determine quality. He will accomplish these supervisory inspections to insure that established standards are being met, and to determine areas of maintenance deficiency. These checks will be accomplished in accordance with TO 0-20A-1.

d. The in-flight maintenance officer is responsible for the effective and efficient utilization of assigned personnel. Sign out sheets, status board, or similar devices must be maintained to record the location of assigned personnel.

ELECTRONICS MAINTENANCE
ORGANIZATIONAL CHART



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19. **Function.** Under the direction of the electronics maintenance officer the shop maintenance officer will accomplish field maintenance and assist the line and dock maintenance section when requested.

20. **Responsibilities.** a. The shop maintenance officer is responsible to the electronics maintenance officer for the supervision of the shop and quality of maintenance accomplished.

b. The shop maintenance officer is responsible for:

(1) Prompt accomplishment of all work orders in accordance with established priorities.

(2) Accomplishment of all electronics maintenance functions as directed by the maintenance control unit, including accomplishment of field maintenance on wing training aids.

(3) Organizational maintenance on all assigned equipment and tools.

(4) Maintain pertinent records and all technical files.

21. **Relationships.** a. **Electronics Maintenance Officer.** The shop maintenance officer is responsible to and works for the electronics maintenance officer. He must supervise the section in a manner consistent with the policies of the maintenance officer and must keep him informed of major difficulties encountered.

b. **Shop Foreman.** The shop maintenance officer must maintain a direct supervisory relationship with the shop foreman of the section and should normally accomplish all supervision and direction of the shops through these personnel.

c. **Other Maintenance Supervisors.** A close relationship should exist between the shop maintenance officer and other section officers to insure quality maintenance accomplishment.

d. **Standardization Team.** The shop maintenance officer will assist the team as much as possible during its investigations and visits so that maximum improvement is obtained from its observations and recommendations. He should feel free to request team assistance at any time.

e. **Quality Control Unit.** The quality control unit will be of great assistance to the shop maintenance officer if he adopts the correct attitude toward it. He will insure a cooperative attitude throughout the branch by evidencing acceptance and cooperation. He will insure expeditious and continuous corrective action on reported discrepancies so that the quality of maintenance accomplished remains high at all times. He should request the assistance of this unit whenever he feels that its services may be necessary.

22. **General Narrative.** a. The shop maintenance officer is manager of the section and is responsible to the electronics maintenance officer for the efficient accomplishment of all work assigned. The shop maintenance officer is an executive assistant to the electronics maintenance officer and will assist him in every manner in accomplishing the electronics maintenance function. With the concurrence of the electronics maintenance officer, the shop maintenance officer will be responsible for the proper placement and assignment of section personnel. He must have daily knowledge of the personnel authorized, assigned, and present for duty.

b. To maintain balance and provide upgrade training in each shop, the shop maintenance officer will insure that lesser qualified personnel are assigned to work with skilled personnel. He will perform frequent checks, in conjunction with the shop foremen, to determine the need for additional training. He should then request the necessary training from the control unit.

c. In coordination with the shop foremen, the shop maintenance officer will plan and schedule maintenance to meet the master schedule established by the maintenance control unit. He must monitor the progress of maintenance to insure that the schedule is being met. Insofar as possible, he will anticipate delays, supply needs, etc. and take appropriate action to prevent delays or slowdowns.

d. The shop maintenance officer will periodically inspect the maintenance accomplished by assigned personnel to determine quality. He will accomplish these supervisory inspections to insure that established standards are being met, and to determine areas of maintenance deficiency. These inspections will be accomplished in accordance with TO 0-20A-1 and will be in addition to any prescribed or requested quality control inspections.

e. The shop maintenance officer is responsible for the effective and efficient utilization of assigned personnel and will institute controls necessary to keep personnel on the job. Sign out sheets, status boards, or similar devices, must be maintained to record the location of assigned personnel.

f. Ground servicing and motorized equipment assigned the branch is vital to the successful accomplishment of the assigned mission. The shop maintenance officer must insure that all such equipment is maintained in a manner which will in-

0372

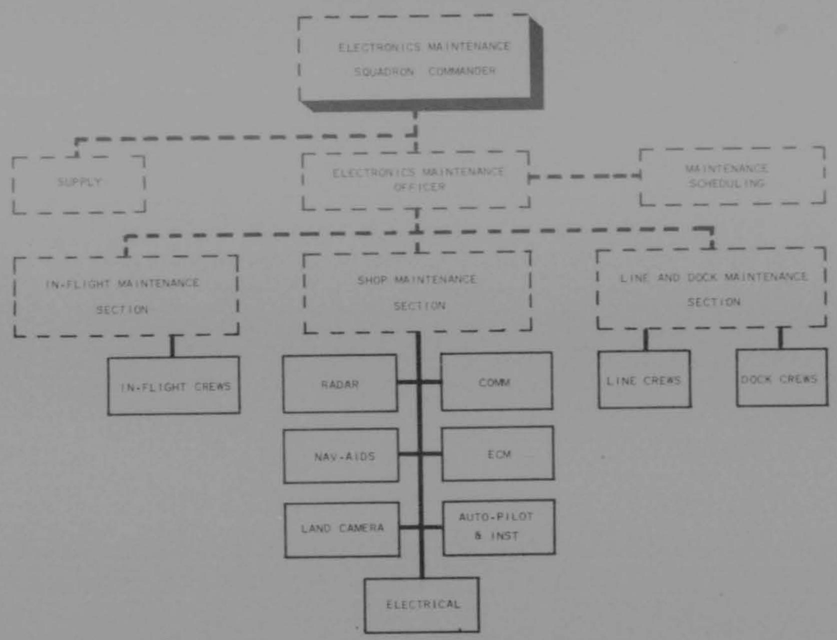
sure maximum availability of serviceable equipment.

g. The variety of electronics maintenance functions makes it imperative that the shop maintenance officer closely monitors the maintenance activity. He will accomplish maintenance in accordance with the priorities established by the maintenance control unit.

h. It is the responsibility of the shop maintenance officer to insure the shop is adequately supplied with tools, test equipment and spare parts for the accomplishment of the maintenance mission.

i. The shop maintenance officer is responsible for determining maintenance which is beyond the capability of his section.

ELECTRONICS MAINTENANCE
ORGANIZATIONAL CHART



23. **Function.** Under the direction of the section chief, the section foreman will supervise the accomplishment of high quality maintenance by his section.

24. **Responsibilities.** a. The section foreman is responsible to and works for the section officer. He is responsible for the accomplishment and quality of all work directed by the maintenance control unit or the section officer.

b. The section foreman will:

(1) Supervise and manage his section in a manner which will insure the fast and efficient accomplishment of high quality maintenance in compliance with current directives and SOPs.

(2) Schedule the work to insure full utilization and maximum training of assigned personnel.

(3) Insure complete and accurate recording of all maintenance accomplished.

(4) Report the status of work in progress.

(5) Perform periodic checks of maintenance accomplished to insure quality and determine areas of maintenance deficiency.

(6) Maintain the section and all assigned equipment in a neat, serviceable condition.

(7) Insure that all property, material, and supplies are secure and protected and that reparable property is expeditiously processed.

25. **Relationships.** a. **Section Officer.** The shop foreman works for the section officer and will keep him informed of the status of maintenance in progress, personnel status, problems encountered and assistance required. The foreman must serve as the top technical advisor to the section officer insofar as shop capability and performance is concerned.

b. **Materiel Control Branch.** The shop foreman must assist the materiel control branch in the establishment of shop stocks of expendable items and insure that the authorized list is sufficient for his needs.

c. **Standardization Team.** The standardization team must be provided full cooperation during its visits and investigations. A close relationship should exist so that maximum advantage may be gained from the findings and recommendations of the team.

d. **Quality Control Unit.** The shop foreman should use the quality inspections and their reports to improve the quality of maintenance accomplished and to define the areas where closer supervision is required. He will insure positive and continuous corrective action on reported discrepancies and will request additional quality inspections when he feels it necessary to improve shop operation or maintenance quality.

26. **General Narrative.** a. The shop foreman works for and is responsible to the section officer. He is the top technical man in his specialty in the maintenance activity and will keep the section officer informed of the technical and practical capabilities of the shop. He will supervise and manage the section in a manner which will insure the expeditious and efficient completion of repair, TOC and work directed by the maintenance control unit.

b. To insure efficiency, the section foreman must have current knowledge of the personnel authorized, assigned, and present for duty. In addition, he must know which individuals are currently on specialist dispatch or are working in the shop. Insofar as practicable, the shop foreman should plan his work in a manner which will insure that each individual knows what jobs he is to perform and when.

c. Constant attention will be given to the status of all work in progress so that the foreman is constantly aware of his maintenance position in relation to the schedules of the maintenance control unit. It will be necessary for him to constantly plan and schedule the work of the shop to insure that priorities are met, full personnel utilization is achieved, and specialists are dispatched as directed by the maintenance control unit. A delay in specialist dispatch may result in disruption of the schedules of other maintenance activities or personnel.

d. The shop foreman is responsible for insuring that quality maintenance is accomplished by his personnel. He will periodically inspect the maintenance accomplished to determine quality and definite areas of maintenance deficiency where additional training or supervision is required. He will accomplish these checks in accordance with TO 0-20A-1, which will be in addition to any prescribed or requested quality control inspections. These checks will aid him in insuring high quality maintenance and will put him in the position of knowing the strength and weakness of his shop. In this way he is supervising and assisting his personnel in quality production.

e. Much of the efficiency and effectiveness of the shop will be determined by the serviceability of assigned equipment and availability of authorized equipment. The shop foreman must be aware of his equipment authorization and insure that he has that equipment on hand or that the responsible supply officer has it on requisition. The equipment available must be maintained in accordance with current directives. Insofar as practicable, the shop foreman should assign specific responsibilities for equipment maintenance to designated individuals. In addition, he should maintain a schedule and insure compliance with that schedule for routine preventive maintenance operations on his equipment and shop area facilities.

f. Supply discipline, as well as maintenance discipline, must be practiced and taught by the shop foreman. All supplies,

0374

parts, or materials in the shop must be maintained in a secure manner adequately protected from unauthorized use and the elements. They should be clean and correctly tagged and stored in appropriately identified bins or containers. Hoarding will be discouraged. Care should be exercised to insure that authorized stock levels are not exceeded but are maintained.

g. Because of the testing facilities available, and the technical knowledge of shop personnel, the shop foreman must insure that unsatisfactory reports are prepared and submitted on all unsatisfactory conditions reported by the sections.

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CHAPTER 3

MAINTENANCE MANAGEMENT CHECK LIST

1. **Check List.** To assist you in applying the principles of management and to help you become a better supervisor, a management check list is provided. It is suggested that this check list be used daily until you become proficient in its application. In addition, it is recommended that you study AFM 35-15, "Air Force Leadership."

a. **Management of Time.**
(1) Delegate routine work.
(2) Do regular work efficiently.
(3) Accept special assignments.
(4) Accomplish creative work.
(5) "Never be too busy to find out how to become less busy."
(This does not mean for you to study ways to "goof-off." It does mean: Learn to study your work to determine whether the right people are doing the right jobs at the right time. You should supervise. Your people should work. Proper delegation of work is one way of "becoming less busy."

b. **Principles of Management.**
(1) Unity of Command.
(a) Each person knows his boss and whom he bosses.
(b) Each person reports to only one supervisor.
(2) Span of Control.
(a) Numbers. There is a limit to the number of men a supervisor can control.
(b) Distance. Work must be close to the one who does it.
(c) Time. Work should not be processed through too many hands.
(3) Homogeneous Assignment.
(a) Duties must not overlap. (Am I doing "Joe's" job?)
(b) Duties must be specific and clear cut. (What is my job?)
(c) Each function of every unit must be the responsibility of one individual, whenever practicable. (Who does this?)
(d) Every assignment must be within the range and capabilities of the individual to which assigned. (Is "Joe" qualified and capable to fill this assignment?)
(4) Delegation of Authority.
(a) Delegate authority equal to the assigned responsibility.
(b) Delegate authority to the maximum within assigned responsibilities.
(c) Establish definite line of authority. (Whom do I supervise? Who supervises me?)

c. **Functions of Management.**
(1) Planning.
(a) Why? - What?
(b) When? - Where?
(c) Who? - How?
(2) Organizing.
(a) Determine the jobs to be performed. (What do I have to do?)
(b) Set up the organization structure. (Who does what?)
(c) Make initial allocation of personnel, functions, responsibilities, and authority.
(3) Coordinate.
(a) Hold frequent meetings of key personnel.
(b) Interpret policies and regulations.
(c) Invite recommended changes to policy and procedures.

d. **Personnel Management.**
(1) Get the right man on the job.
(a) Establish the job requirement, then get the man.
(b) Utilize personnel classification.
(c) Reassign the jobs within the range of skill and capabilities.
(2) Increase the time available.
(a) Control the absent time.
(b) Keep the man on the assigned job.
(3) Stimulate the will to work.
(a) Improve the working conditions.
(b) Reduce overtime to the minimum. (Can this be done in standard duty hours?)
(c) Furnish the right incentives.
(4) Obtain maximum utilization of men and skills.
(a) Give the man a full days work.
(b) Schedule the man efficiently and keep him informed of his assignment.
(c) Question the requirement of every task. (Is this job necessary?)
(d) Improve the procedure or method of doing the work.
(e) Measure the results by employing control devices, such as inspection ratings, etc.

e. **Personnel Relations.**
(1) Apply the principles of leadership. (AFM 35-15)
(2) Take an interest in the individual.
(3) Fully utilize the man's abilities.
(4) Train the man to meet the job and jobs of higher skills.
(5) Show the man a method of improvement when correcting a fault.

0376

(6) Appraise the work of groups and individuals and take appropriate actions.

(7) Build the individual's confidence in organization.

(8) Listen to the ideas, suggestions, and criticisms of your men.

(9) Admit your errors.

(10) Inform your men of things affecting them or their work.

CHAPTER 4

DEFINITIONS

In general, the words and phrases employed in this Manual are standard terminology. However, to prevent misunderstanding and to promote standardization, the following definitions are provided:

Abort: A flight which is not carried to its scheduled completion.

(1) Ground Abort: A flight which does not become airborne within the specified time limit (AOC - one and one-half (1½) hours after scheduled take-off time).

(2) Air Abort: A flight which does not complete its assignment after it becomes airborne, consequently requiring the aircraft to land or to be diverted to a secondary assignment which it can satisfactorily complete, although an equipment malfunction prevents completion of the primary assignment.

Absent Time: Time lost from the job or duty assignment by reason of absence, either authorized or unauthorized. The types of absence are defined in "Accounts."

Accounting Ledger: A ledger for the daily recording of direct manhours expended.

Aircraft Accessory Change and TOC: A form printed on green paper, designed to provide control and documentation for aircraft accessory change and/or technical order compliance.

Analysis: The operation of studying pertinent management information, in the light of one's experience and the principles of good management, for the purpose of determining the best course of required management action.

AOC Mission: A scheduled function wherein one of the two aircraft, defined as flights below, is capable of performing the airborne early warning assignment.

Blanket Work Order: A work order issued monthly authorizing a specific repetitive job accomplishment.

Cancellation: A situation in which neither aircraft (two flights) assigned to accomplish an AOC mission can perform the mission. If one flight aborts, or is otherwise scratched, but the other flight becomes airborne within the stipulated time limit and accomplishes the AOC mission, the situation does not constitute a cancellation.

Cannibalization: The act of removing parts or accessories from one aircraft, or item of equipment, to install on another and, thus, make the latter in-commission, serviceable, or mission-ready. Cannibalization can only be approved by the wing commander or the chief of maintenance.

Critical Item: A critical item is a component, accessory, or part whose failure would directly affect either safety or flight, safety of operation, or mission capability.

Daily Attendance Record: A daily attendance record of assigned personnel for each activity of the maintenance organization.

Daily Manhour Utilization Record: A daily report to record direct, indirect, and absent time expenditure of designated maintenance activities.

Delay (AOC): A mission which is not begun on or before the scheduled time, but which does not begin within the specified time limit of one and one-half (1½) hours after scheduled take-off time.

Depot Maintenance: That maintenance performed on USAF Materiel requiring major overhaul or complete rebuilding of parts, assemblies, sub-assemblies, and/or the end item, including the manufacture, testing, and reclamation, as required. Depot maintenance supports lower categories of maintenance by providing technical assistance and performing that maintenance beyond the lower category capability.

Dispatching: The procedure of directing the flow of work to and from maintenance units in accordance with established schedules.

Dock, Shop, Flight Line Stock: A 15-day level of expendable nonrecoverable supplies required to support a specified maintenance activity.

ECL (Equipment Components List): A listing of components (tools, etc.) for kits and sets of equipment authorized a maintenance activity.

Field Maintenance: That maintenauthorized for, and performed by, designated maintenance activities in direct support of using activities. (Repair, testing, calibration, etc.)

Flight: An aircraft selected to perform an assignment, i.e., AOC, LRN, Transition, etc. An AOC mission normally has two aircraft assigned (two flights); primary and standby.

"H" Hour: The hour designated by the maintenance control unit when each periodic inspection will begin. Normally, the "H" hour will be made known to all affected maintenance activities at least six working hours in advance.

"H-Plus" Hour: The number of working hours after "H" hour when specific jobs or operations will be accomplished.

Indirect Time: The manhours connected with the operation of the activity but not expended in the direct accomplishment of authorized work.

In-Flight Discrepancies: Those malfunctions or discrepancies which occur or which are discovered after the aircraft is airborne.

Inspection Analysis Chart: A chart designed to provide an accumulative recording of irregularities and deficiencies, by inspection work card and item number. These trends are used to determine realistic inspection requirements.

Inspection Planning Meetings: A meeting conducted by the maintenance control unit to coordinate, plan, and schedule the inspection. This meeting will be conducted at least three days before the aircraft enters the dock and prior to the last flight of the aircraft before inspection.

Inspection Requirements: The maintenance and inspection requirements for a given type and model aircraft.

Inspection Work Card: A card designed to provide the mechanic or specialist with a detailed work guide telling what to do, where to do it, and how to do it.

Instruction Slip: The form used in field or armament-electronics maintenance activities to obtain aid from another shop in job completion.

Maintenance Control: The function of providing centralized coordination of all wing maintenance activities. It includes planning, scheduling, directing, coordinating, and controlling.

Management: The act of planning, scheduling, directing, and controlling.

Management Training: Training provided selected personnel to increase their managerial abilities and thus improve the operation of the maintenance organization.

Manhour: The time equivalent to one man for one hour.

Manhour Utilization: The percentage of available manhours actually expended on direct labor.

Manhours Assigned: The work capacity of the shop equal to the total number of personnel assigned multiplied by the number of work hours of the day (see "Work Day").

Manhours Available: The manhours assigned and borrowed minus manhours absent and loaned.

Materiel: The collective materials required in the operation of a maintenance activity which includes tools, equipment, supplies and other physical property.

Monthly Maintenance Summary Report: A monthly report summarizing the manhour and workload information pertinent to the maintenance organization.

On-the-Job Training: Training which can be best provided by close supervision and instruction while actually performing duties for which the training is required.

Overtime: Time expended over and above the usual or specified work day.

Planning: The process of determining the means and steps for attaining a goal.

Post-Dock: That portion of the periodic inspection, including flight test, accomplished after leaving the dock but prior to return to the flight line maintenance section.

Pre-Dock: That portion of the periodic inspection accomplished prior to entry into the periodic maintenance dock.

Pre-Issue Items: Items issued to designated maintenance activities in advance of actual need to permit build-up, inspection, calibration, etc., prior to installation and thus provide immediate availability of serviceable items to the user.

Proficiency Training: Training provided to increase the individuals' proficiency in his job and/or career field.

Quality: The degree of excellence required of a job or operation.

Quality Control: A function of inspection to insure that the end product conforms to certain prescribed standards of performance and workmanship, and to insure that their relationships to one another are properly maintained.

Quality Control Data Sheet: Pre-printed forms outlining the items and conditions to be inspected during a quality inspection. These forms provide the sampling data for quality ratings.

Quality Discrepancy: A form, printed on pink paper, designed to provide a record of discrepancies discovered by quality inspectors. These items become part of the unscheduled maintenance to be completed during the periodic inspection.

Quality Standard: The established degree of acceptable quality.

Reparable Units: Items of property no longer serviceable but warranting return to serviceable condition.

Scheduled Maintenance (Predictable Maintenance): That portion of the periodic inspection known in advance. These requirements are pre-printed on Inspection Work Cards and are normally directed by technical instructions.

Scheduling: The advance determination of the timing of various aspects of an operation, including timing of availability of facilities, supplies, and the personnel to accomplish the planned work.

Scratch: When a flight cannot meet its assignment and is deleted from the schedule, it is considered "scratched."

Sequence Chart: A chart to graphically portray what is done, in what order, at what time, and by whom.

Specialist Routing: The directing of specialist movement from the place of duty to the required job and location.

Supply Delivery: The concept which requires the supply activity to deliver to the user at his work location those supplies required for accomplishment of maintenance.

Time Standard: The established average time in manhours for performing a specific maintenance function.

TOC Kits (Parts): Those items required to complete a designated TOC for one aircraft, vehicle, or item of equipment.

Unscheduled Maintenance (Unpredictable Maintenance): Maintenance discovered in pre-dock or during the periodic inspection. When discovered, this maintenance is scheduled by use of the sequence chart.

Unscheduled Maintenance Description: A card designed to provide a method of recording all unscheduled maintenance, and to furnish a media for the dock chief to schedule the correction at a time convenient to the maintenance schedule.

Work Area: Defined areas of the airframe or engine in which mechanics or specialists are required to work. These areas are depicted on a work area chart and numerically identified.

Work Area Chart: A chart to display the work areas of an aircraft. This chart is a cut-away drawing of the aircraft. It specifically defines each work area and numerically identifies the area for cross-referencing to the inspection work cards and sequence chart. Work area charts will be conspicuously posted at the pre-dock and dock. By using a work area chart it is possible to prepare a work sequence which prevents overcrowding, interference, and interruption in a given area. (See also "Critical Area.")

Work Day: The established duty day (eight hours Monday through Friday, and four hours Saturday).

Workload: The quantity of work awaiting completion.

Workload Control: The function of scheduling workloads in relation to resources of manpower and equipment and responsibilities.

Work Order: Document issued by the maintenance control unit to authorize the expenditure of manhours in the performance of specific work.

Work Order Register: The document used to record essential information on work orders issued.

Work Order Request: A document prepared by an organization requesting issuance of a work order to accomplish a definite job.

52

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208

HEADQUARTERS
8TH AIR DIVISION (AEW&C)
McCLELLAN AIR FORCE BASE
SACRAMENTO, CALIFORNIA

EDOPR

SUBJECT: Progress Report

TO: Commander
Western Air Defense Force
Hamilton Air Force Base
Hamilton, California

1. Pursuant to conversation between the Vice Commander, Air Defense Command, and the Commander, 8th Air Division, this is the [illegible] of monthly reports concerning the activities, progress and program achievements of this command.

a. Organization and Personnel:

(1) Manning of Division units as of 28 February was as follows:

	McClellan		Otis	
	Officers	Airmen	Officers	Airmen
Authorized	236	2030	205	1082
Assigned	204	1233	27	217
% Manned	87%	60%	7%	20%

(2) The manning status shown above is 34% of total program strength.

(3) Major General [illegible] of Technical Training Air Force, ATRC, and members of his staff visited the Division [illegible] February to see at first hand the training requirements for the Airborne Radar Maintenance Technician.

0382

[illegible]

[illegible] 176

[illegible] Hours (Incidental) - 287

Mat. Timee, etc. - 376
 [illegible]

Of the 287 [illegible] hours, 131 were 100% effective and represent an overall 47% effectiveness for [illegible] operations.

(4) With the movement of the 4701st and the activation of the 966th Squadron at Otis, Provisional Wing responsibilities to the eastern operation came to an end. That wing is now stable and with the projected increase of personnel and operating effectiveness, it has been possible to identify yearly objectives for that command. Specific instructions, outlining flying and training goals for the coming year, have been forwarded. Reference my letter of 26 February which forwarded a copy of that directive for your information.

c. East Coast Operations:

(1) On 2 March, the Division staff met again with the EADF staff to review the progress made by that command in providing logistic and administrative support to the Otis element. A representative from the Sacramento Air Material Area attended this meeting.

(2) The meeting with General Nelson's staff and the visit to Otis to inspect the status of AEW&C progress in that area confirmed the previous position

0383

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Hq 8th Air Div (AEW&C), McClellan AFB, Calif., 8DOPR, Subj: Progress Report

Squadron at Otis and the additional crew and maintenance personnel which must be assigned in support of the aircraft operation. Reference paragraph 2 of this letter.

1. Material:

(1) Last month's Progress Report discussed the realignment of functions in the Maintenance Control organization. The realignment has been accomplished and personnel have been assigned in the necessary spots to accomplish required workloads. It is too soon to give a definite report on the efficiency of this reorganization. Present indications are, however, that the program is progressing satisfactorily. A separate report will be forwarded in approximately ninety days.

(2) Electronic Supply - A Weapons Phasing System meeting was held at Headquarters, AMC, on 16 and 17 February. A briefing was presented by AMC which reviewed the past three months concentrated effort to resolve the problem of electronic spares with the Navy. Action by AMC and the Navy to make available an additional twelve complete spare systems already on contract should materially improve the electronic picture by mid-summer. Additional action has been undertaken by SMAMA in conjunction with other depots having procurement responsibilities for Navy GFAE spares, to establish a procedure to ascertain the exact procurement status of all Navy GFAE items including electronics. As a result of the above actions, the electronic spare picture is the brightest that it has been to date.

(3) The aircraft spares and supply situation for [illegible] operations continues to be favorable. At the meeting with EADF, the SMAMA representative stated that [illegible] of all aircraft

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[illegible] California

[illegible] Colorado Springs, Colorado

[illegible] Division ([illegible]) for the [illegible] information.

[illegible] comments on the Progress Report:

[illegible] paragraphs 1a(1), (2), (3) and (4), [illegible] limit of [illegible] furnished from [illegible] paragraph 1a(4) has been [illegible] received from technical [illegible] level technicians. It [illegible] received from overseas will be at the [illegible]

3. Reference paragraphs 1a(2), (3) and (4), Eastern Air Defense Force has the [illegible] responsibility of furnishing interim and [illegible] operating facilities for the [illegible] program on the east coast.

4. Reference paragraph 1d(2), Sacramento Air Materiel Area is currently compiling a list of all contracts negotiated for Navy [illegible] system. The list will include all items (major components) procured for installation in production aircraft and as stock [illegible]. In addition, this list will indicate maintenance and overhaul [illegible] available within the Air Force supply system. It is anticipated that this list will be completed approximately 30 April 1955. Copies will be furnished your headquarters, this headquarters and the 8th Air Division ([illegible]) for information purposes.

FOR THE COMMANDER:

[illegible signature]

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HEADQUARTERS
8TH AIR DIVISION (AEW&C)
MCCLELLAN AIR FORCE BASE
MCCLELLAN, CALIFORNIA

8DOPR

10 Mar 1955

SUBJECT: Otis Air Force Base

TO: Commander
Western Air Defense Force
Hamilton Air Force Base
Hamilton, California

1. The movement of the 4701st AEW&C Squadron with ten aircraft from McClellan AFB was accomplished during the first week of March. Additional aircraft will be delivered to the 551st AEW&C Wing at the rate of two per month. July will see the activation of the 962nd AEW&C Squadron and a total of eighteen aircraft at that station. AEW&C personnel will approximate 1,000.

2. The base support and installations facilities required to accommodate the initial move of the 4701st AEW&C Squadron and the subsequent build up of the organization at Otis during the spring and summer of this year have been known for sometime. It became apparent to this headquarters as far back as last fall that the construction and runway resurfacing programs at Otis were not progressing at the rate required to accommodate the approved program. It was recommended then that action be initiated to delay the occupation of Otis in the interest of Air Defense Command objectives for AEW&C operational readiness, and effective utilization of aircraft and personnel. This headquarters was advised that Otis AFB would have interim facilities in place and on hand at the time of the programmed move to that installation.

3. Inclosure 1 to this letter shows the monthly flying hour requirement for the 551st AEW&C wing at Otis, which must be satisfied to meet operational readiness objectives for eastern AEW&C operations.

4. Inclosure 2 is a representative picture of the overall status of interim construction at Otis AFB. It was taken in February and from observations made during my 1 March visit to that installation, remains a true picture of the situation today. Specific comments in regard to the status of materiel items at that facility are contained in Inclosure 3.

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5. The condition of Otis AFB as a support facility for operations of this command is deplorable. With the exception of messing and bedding facilities, none of the promised interim operating facilities are available. An optimistic forecast for their availability in a useable condition is mid-summer.

6. The operating capability of this command at Otis AFB is limited to a transition type activity. There is no radar capability in existence at Otis today, either within the military element or the contracting agency at Idlewild. I cannot forecast when a favorable break will occur in this situation. It appears that there is a positive and identifiable delay of six months which must be gone through before the eastern phase of this operation is sufficiently on its feet to even start effective crew training and employment of a basic weapon costing in the vicinity of $5,000,000. In terms of non-utilization alone and predicated upon a ten-year expected life for the aircraft and its equipment, the cumulative daily cost of the stand down will exceed the total cost of the interim construction to say nothing of the cost in terms of delayed operational readiness.

KENNETH H. GIBSON
Brigadier General, USAF
Commander

3 Incls:
1. Monthly Flying Hr Requirement
2. Photograph (CONFIDENTIAL)
3. Status of Materiel Items

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Hq 8th AD, 8DOPR, subject: Otis Air Force Base

WDMAC-2B (10 Mar 55) 1st Ind 17 Mar 1955

HQ WESTERN AIR DEFENSE FORCE, Hamilton AFB, Hamilton, California

TO: Commander, Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado

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Hq 8th ADiv 8DCPR, Subject: Otis Air Force Base

ADMDM-1 (10 Mar 55) 2d Ind 1? Apr 1955

HQ AIR DEFENSE COMMAND, Ent AFB, Colorado Springs, Colorado

TO: Commander, Western Air Defense Force, Hamilton Air Force Base, Hamilton, California

1. It is recognized that certain slippages have occurred in the activation program at Otis Air Force Base. This headquarters has attempted to reduce these slippages to a minimum.

2. The statement in the basic communication to the effect that the 8th Air Division knew last fall that runway resurfacing programs at Otis were not progressing at the rate required to accommodate the approved program appears to be in error. There was no intention on the part of this headquarters to attempt resurfacing during the winter months. The approved program is to commence resurfacing in May with completion date of 1 September 1955. As far as is known by this headquarters, there is no reason why this program will not be met.

3. With regard to the construction of the interim maintenance buildings, it was known at the time of the September 1954 meeting with personnel from Hq 8th Air Division, that a gamble was involved because of the weather conditions anticipated to exist at Otis. However, this gamble was accepted on the basis that it would be better to prepare for construction rather than deliberately delay action until fair weather was assured. Consequently, authority was obtained to advertise for bids prior to the time that funds were available, in order to be in a position to go ahead with the construction program when funds were available and weather permitted. At the September meeting, hope was expressed that we could get the foundations in place prior to Thanksgiving. Release of funds by the Secretary of the Air Force, however, did not occur until late December 1954, and consequently, contracts could not be consummated and construction take place during the fall of 1954.

4. Installation of the wing-nose dock foundations was completed with only one month's delay. Subsequent change to dock configurations, over which this headquarters had no control or knowledge, now requires modification of these foundations and further delay in that portion of the construction program. Concerted effort is being made by this headquarters, Headquarters USAF, Headquarters AMC, and the contractor to fulfill our wing-nose dock requirements at the earliest practicable date.

5. The vehicle problem is a very difficult, as well as serious one. Congressional legislation does not permit the Department of the Air Force to procure vehicles (other than special purpose vehicles) to meet current requirements. For example, the entire Air Force was

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required to give up 6% of its vehicles for the purpose of meeting Air Defense Command's requirement of 503 for the Ground Observer Corps Program. Requisitions for special purpose vehicles were submitted to this headquarters in December 1954, January 1955, and, in one instance, February 1955. A list of these requisitions and the estimated delivery dates of the vehicles is attached as Inclosure #4. The picture is not good. However, action has been taken to improve delivery dates for this much needed equipment.

6. With regard to power. Power is being installed at the time the interim facilities are ready for occupancy. Buildings will be wired and plug-ins will be available. This is part of the contract for the buildings.

7. The contract with Lockheed Services, Idlewild, has been extended to include radar maintenance to the extent of their capability.

BY ORDER OF THE COMMANDER:

/s/t/ WALTER W. ROBINSON
Colonel, USAF
Command Adjutant

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Subject: Otis Air Force Base
To: C/S From: DCS/M Date: 2[illegible] Mar 1955 Comment #1

1. The attached letter from the 8th Air Division was forwarded to this office for action. I do not believe that the letter requires an answer; however, in the interest of passing along what information we have available, I have attached the 2d Indorsement. Basically, the letter seriously criticizes staff action in this headquarters. It criticizes DCS/O for the decision to move into Otis, regardless of capability of that base to support it. Secondly, it criticizes DCS/M for a lack of imagination in failing to recognize that they have cold weather at Otis. Thirdly, it establishes the operational readiness objectives as paramount for consideration over any other factors which go to make plans feasible. This includes such things as logistics support, personnel, availability of manning, etc.

2. General Gibson has been personally advised as to the status of nose-wing docks. The vehicle situation, which I recognize is very critical, is explained in my Indorsement. Interim maintenance buildings are behind schedule; however, everything is being done to expedite construction and completion. In connection with these items, I feel that the Commander, 8th Air Division, is unfair in his criticism after all the effort that was made to break these funds loose from the Secretary of the Air Force's office. With regard to the subject of power, the statement that there are no plug-ins is correct. These are included in the hangar and in the maintenance facilities. Power will be available when required.

3. I feel that we, in this headquarters, may have made a mistake in insisting that the move to Otis be made, in view of well known slippages in both the materiel and personnel areas.

4. If there are any additions that you desire to make to the attached Indorsement, I will be happy to collaborate with you.

MARSHALL S. ROTH
Major General, USAF
Deputy Chief of Staff, Materiel

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69

EADF Conference at 551st AEW&C Wing

[illegible] [illegible] 2 May 1955
Capt R. C. Dewey/[illegible]

1. A conference was called by Brigadier General [illegible], Vice Commander, EADF, to discuss the problems of the 551st AEW&C Wing. [illegible] with [illegible] prior to conference date to ascertain [illegible]. Captain R. C. Dewey, [illegible], was the only representative of [illegible]. The meeting convened at 0900 hours, 21 April 1955 at [illegible], Stewart Air Force Base, New York. Brigadier General [illegible], Commander, [illegible] Air Division, and his staff were present.

2. The following critical items which will affect the operational readiness date of the 551st AEW&C Wing, Otis Air Force Base were discussed.

a. Communication and Electronic Maintenance Building. At the March [illegible] the completion date for this building was extended from 1 April to 1 May. [illegible] it will be ready on time. [illegible] it is [illegible] completed [illegible] must be completed in six working days [illegible] wiring and a road to the building [illegible]. This building, with suitable test equipment installed, must be completed before any C&E maintenance can be performed on the [illegible] aircraft now assigned. Eighty percent of the required test equipment was on the base, the balance had been shipped by AMC on 7 April 1955.

b. Nose Docks: Very critical items with no work accomplished due to a change in type of docks specified. ADC approval required, but indicated not received to date. EADF DE stated that there had been considerable correspondence during past months with DE at ADC, but very little accomplished. Captain Dewey checked with Major [illegible] this headquarters, DE Section, and was advised that required footing specifications had been forwarded direct to Otis contractor and Major [illegible], [illegible] Air Division. Contractor started work on 25 April 1955.

c. Transportation - Vehicles. Eighty-three vehicles of all types are to be assigned to 551st Wing. Twenty-eight were on hand, with six more due during April. The balance were unaccounted for. EADF in general was short of vehicles.

d. Family Housing. This is in very short supply, with the reenlistment rate falling sharply as a direct result. Short range plans called for local construction of [illegible] units and [illegible] house units if the Army will release the buildings. [illegible] would fall within the [illegible]. Long range plans included [illegible] units [illegible] meeting scheduled for 26 April 1955 will discuss the long range plans.

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EADF Conference on 551st AEW&C Wing

DCS/M DCS/O 2 May 1955

Contd

a. The following items were discussed, but not considered critical at this time:

CRT Support Aircraft.

Aircraft Equipment and Supply.

Communications - Land Lines.

Personnel.

Budget Items.

3. A briefing on the concept of employing AEW&C aircraft was presented by Lt. Col. Russel Cheever, DCS/O, 8th Air Division. This was principally a review of operations to date at McClellan with the problems encountered in operating both the aircraft and radar.

4. There being no further business, the meeting was adjourned at 1150 hours.

KENNETH P. BERGQUIST
Major General, USAF
DCS/Operations

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HEADQUARTERS
8TH AIR DIVISION (AEW&C)
McClellan Air Force Base
McClellan, California

8 Feb 1955

8DOPR

SUBJECT: Progress Report

TO: Commander
Western Air Defense Force
Hamilton Air Force Base
Hamilton, California

1. Pursuant to conversation between the Vice Commander, Air Defense Command, and the Commander, 8th Air Division, this letter is the eighth of monthly reports concerning the activities, progress and program achievements of this command.

a. Organization.

(1) Manning of Division units is now at 47% of authorized officer strength and 47% of authorized airman strength. Numberical assignment is 205 officers and 1204 airmen, as compared to a total authorization of 421 officers and 2451 airmen.

(2) Officers and airmen to be assigned to the 551st AEW&C Wing at Otis AFB have been selected. Movement of these personnel has begun. It is expected that of the total of approximately 64 officers and 377 airmen involved, all will be in place at Otis by the end of March 1955.

(3) Organization of the Provisional AEW&C Wing at McClellan AFB has been accomplished in accordance with concepts outlined in letter, this Headquarters, Subject: "Request for Provisional Organization," dated 7 December 1954, and General Order 47, Headquarters, Air Defense Command, dated 28 December 1954.

b. West Coast Operations.

(1) During February and March, the transfer of crews and maintenance personnel and aircraft to the 551st Wing at Otis will reduce the operating capability of Division units on the West Coast. January provided the last opportunity available, prior to July 1955, to apply any significant test of Division operating capabilities after seven months of effort. Accordingly,

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Hq 8th Air Div (AEW&C), McClellan AFB, Calif., DCTR, Subj: Progress Report

I directed that effort be made during the month in all areas of the operation to determine what progress had been made during the last three months. The following shows the results of that effort:

OPERATIONS

	Nov.	Dec.	Jan.
Total Flying Hours	722	800	1020
OST Hours	97	106	140
AEW Hours (On-Station)	140	270	150
Effective AEW Hours	38	60	212
Navigation, Transition, Test, etc.	513	423	227

(2) The general improvement in operations may be attributed to a number of factors. The most tangible include:

(a) Use of Moffett NAS and other Bay Area airfields as mission take-off, turn-around and recovery bases to offset bad weather conditions which, in the past, have caused mission cancellations.

(b) The maintenance capability which is being generated as a result of continued training and operation, both individual and unit.

(c) Around-the-clock GCA availability at McClellan, instituted at our request as required mission support, to permit increased operations under bad weather conditions.

(3) Improvement in the performance of individual staff members and command acquisition of more knowledge of the AEW&C operation are admittedly intangible factors. I believe, however, they are very much present and are items of permanent permanent progress which strongly influence the pattern of improvement.

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c. East Coast Operations

(1) During the month, members of the Division Staff and myself conferred with General Nelson and the Eastern Air Defense Force Staff at his Headquarters. The conference agenda was primarily devoted to identification and review of the prime actions to be taken by Eastern Air Defense Force to provide the required logistic and administrative support for the 551st Wing at Otis AFB. Items discussed at the conference ranged from ramp control and communications requirements for AEW&C maintenance activities to package-type supply actions, to provide immediate support for the Wing activities. I was impressed with the success of this conference with General Nelson, have agreed to hold monthly meetings between his staff and the 8th Air Division staff to review current problems on a monthly basis. The next meeting is tentatively scheduled for 25 February. I will keep you advised of progress in this area.

d. Materiel.

(1) There were no major developments in the supply and electronic components pictures during the month. In the absence of additional procurement activities, last month's forecast of a 12 to 18 months delay in the procurement of the vital electronic components is still valid.

(2) During the month, a realignment of the functions of the Maintenance Control organization of the Wing was initiated. The changes are based on operating experience acquired since Maintenance Control procedures were instituted in October 1954. This period of operations was conducted under the concept established by the manning documents and organizational guidance received from Headquarters, Air Defense Command. That concept is patterned after airline operations and is designed for rapid servicing and turn-around of scheduled aircraft by a single crew of maintenance personnel. In the AEW&C operation, aircraft will not normally be re-scheduled for flight in less than 12 hours. This involves serveral

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maintenance crews and creates the requirement for continuity of the maintenance function, and clear identification of responsibility for its performance.

(3) To achieve that continuity and identification of maintenance responsibility, the functional re-alignment plan is directed to:

(a) Decentralizing the inspection function of the Quality Control Section to maintenance squadron level.

(b) Assigning specific responsibility for the overall maintenance status of each aircraft to one individual.

(4) This realignment action will be completed in February and I will include in next month's report the final actions taken in this area.

2. The analysis of mission aborts referred to in last month's report has been completed. The analysis covers operations for the December - January period and utilizes all mission data compiled under reporting procedures initiated in late November. The data also provides information on the causes of mission cancellation, in addition to abort factors, and identifies those areas of the operation which require special attention. Highlights of this analysis are as follows:

a. The total number of missions scheduled during each month was almost identical; 209 for December, 211 for January. There were eighteen (18) aborts in December, nine (9) in January.

b. An extract of the on-station operations and operational suitability test abort pattern from the above totals shows the following:

	December		January	
	OST	On-Station	OST	On-Station
Scheduled Missions	24	48	23	68
Aborts	3	12	0	9

The predominant cause item of these aborts was the APS-20. This equipment caused fourteen (14) of the twenty-four (24) aborts occurring during the period. The other ten (10) abort causes range from engine malfunction (2) to alternator difficulties, and on two occasions OST missions were aborted after the flights were airborne because of weather. The improvement in the January on-station abort picture indicates an increase in radar maintenance capability. This is also

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Hq 8th Air Div (AEW&C), McClellan AFB, Calif., SDGPR, Subj: Progress Report

reflected in the overall operations improvement discussed in preceding paragraphs.

c. During this period, on-station mission aborts averaged 30% whereas the average for operational suitability test missions was only 10%. This can be attributed to two factors. The first; Lockheed technicians are employed to support the aircraft committed to the test program, and secondly, they have a source of spares through their company that is not available to us through Air Force channels. These two factors coupled with the high technical skill level of the Lockheed technicians indicates that with adequate spare support and a skilled maintenance capability, it is possible to produce the desired mission effort.

d. A detailed account of mission abort and cancellation data is enclosed for your information. Except for known difficulties with the APS-20 and the APS-45, the data does not establish any major radar or mechanical trends which can not readily be remedied as the level of overall maintenance proficiency improves.

e. The high number of weather caused mission cancellations is a command imposed item to insure the highest safety-of-flight for this initial period of activation and crew training.

3. The concentration of the command at McClellan AFB has made it possible to devote a high degree of attention to operating details of each command element. This attention has resulted in the development of operating and maintenance standards which apply to all AEW&C activities. Retention and further development of existing standards and their uniform application to activities on both coasts will be the major Division objective during the build-up period. This standardization and development objective is the basis of my belief that a single AEW&C agency should continue to guide and develop the program until organization stability and operational readiness are achieved. It was the foundation of last month's recommendation to place this Division directly under Headquarters, Air Defense Command. I am looking forward to an early and favorable disposition of that recommendation.

1 Incl:
Dec & Jan Abort Data

KENNETH H. GIBSON
Brigadier General, USAF
Commander

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ABORT AND CANCELLATION DATA

DECEMBER

	Total Effort	On-Station Extract	OST Extract
Missions Scheduled	209	48	24
Cancellations	* 63	19	11
Aborts	18	12	3
Airborne	146	29	13
Effective	128	17	10

JANUARY

	Total Effort	On-Station Extract	OST Extract
Missions Scheduled	211	68	23
Cancellations	* 48	20	7
Aborts	12	9	0
Airborne	163	48	16
Effective	151	39	16

* Forty-four (44) of these cancellations were caused by weather conditions being below minimums.

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HEADQUARTERS
8th AIR DIVISION (AEW&C)
McClellan Air Force Base
McClellan, California

SDOIP

13 May 1956

SUBJECT: AEW&C Mission Aircraft Requirements

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. The "Operational Plan, Seaward Extension of Radar" your headquarters, 10 March 1954, identifies the flying hour requirement for mission operations of an AEW&C Wing as 168:30 hours per month per aircraft. This headquarters has recomputed that factor to arrive at the minimum requirement of 5034 total hours per month and an average utilization per aircraft per month of 167:48 hours (Inclosure 1). The latter figure is considered the absolute minimum requirement to accomplish the command mission and to meet operational readiness objectives for Otis Air Force Base and McClellan Air Force Base operations.

2. The maintenance requirement generated by 5034 monthly flying hours is shown in Inclosure 2. Inclosure 3 shows that the dock and dock crew capability to perform required maintenance must be at a near 100% manning and effectiveness. There is no margin for manning or assignment deficiencies.

3. Reference is made to paragraphs i, j and k of Inclosure 2, and paragraph 5 of Section II of the operational plan of 10 March 1954. The maintenance cycle requires an average of 13.3 aircraft under maintenance at all times. The total aircraft outages from AOCP/ANFE, therefore, must remain at less than 6% of in-commission aircraft to produce 15 operationally ready aircraft required for daily operation. A 6% AOCP/ANFE, rate for RC-121 aircraft and equipment is unrealistic and the depot supporting AEW&C operations has advised that the realistic AOCP/ANFE rate will approximate 6% AOCP and 20% ANFE.

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Hq 8th Air Div (AEW&C), McClellan AFB, Calif, SDOPR, Subj: AEW&C Mission Aircraft Requirements

4. The inclosed data indicates that the utilization goal of 172 hours per month for each unit aircraft will exceed AEW&C Wing maintenance capabilities, and a qualitative operational requirement exists for additional unit aircraft. Accurate determination of whether that requirement is finally identified as 3 or 6.1 (reference paragraph n, Inclosure 2) is not within the analysis capabilities of this command without resorting to "probability" factors which may or may not be acceptable to your headquarters. The 6.1 is a minimum requirement and it is possible that the final identification of this requirement may increase that figure even more.

5. Request that the research and analysis capability of your headquarters be applied to a confirming review of AEW&C unit aircraft requirements and the validity of this potential requirement be determined at an early date to insure that required program actions can be initiated in sufficient time to insure the required aircraft are in place prior to March 1956 for the 551st AEW&C Wing at Otis AFB and prior to January 1957 for the 552d AEW&C Wing at McClellan AFB.

6. Recognition of this requirement to provide additional unit aircraft for AEW&C Wings is not considered as invalidating previous proposals of this headquarters to activate the 966th AEW&C Squadron at McClellan AFB (reference Inclosure 4). Additional aircraft for the 551st AEW&C Wing will not require any augmentation of aircrew personnel, inasmuch as there will be no increase in the total flying hours of the mission operation. The maintenance resource at fully equipped strength, with the possible exception of minor augmentation of ground crews, is considered adequate to support the additional aircraft. Adequate parking facilities are available and the aircraft will be absorbed into the operation with no difficulty.

4 Incls
1. Acft Flying Rqmts
2. Maint Rqmts
3. Dock & Dock Crew Capabilities
4. Cy Ltr Hq 8th AD, dtd 11 May w/1 Incl

KENNETH H. GIBSON
Brigadier General, USAF
Commander

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Hq 8th ADiv, 8DOPR, Subj: (Uncl) AEW&C Mission Aircraft Requirements

ADMVP (13 May 55) 1st Ind 17 Aug 1955

HQ AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colorado

TO: Commander, 8th Air Division (AEW&C), McClellan Air Force Base, McClellan, California

1. Based on current developmental problems, this headquarters agrees with the conclusions reached in the attached study that maintenance capabilities are inadequate to support a mission aircraft utilization of 172 hours per aircraft per month. This problem is under study. The extent by which this goal will be missed, being dependent upon such factors as personnel, facilities and experience, is measurable only throug actual operations. At the present state of development, there is insufficient operational experience to test the validity of the factors utilized in your study, but they appear, if anything to be conservative.

2. With a full realization that AEW&C objectives cannot be fully met with programmed RC-121's, it is still not considered justifiable to procure additional expensive aircraft of this configuration at this stage of AEW&C systems development. We understand that your headquarters supports this view.

3. This headquarters is studying the alternate proposals stated in your letter, subject: "Proposed AEW&C Program Action," dated 19 May 1955, to determine the most feasible method of resolving this problem. The only apparent solution at this point is to limit your immediate operational objectives for the AEW&C system equipped with RC-121's and to procure aircraft of advanced configuration to meet ultimate requirements in a later time period.

BY ORDER OF THE COMMANDER:

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1. w/d 2 cys
2. w/d 2 cys
3. w/d 2 cys
4. w/d 2 cys

FREDERIC H. SMITH JR.
Major General, USAF
Vice Commander

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MEMORANDUM FOR THE RECORD

1. This letter is one of four dealing with proposed AEW&C program actions. These four letters listed below are interrelated. The first 3 delineate problem areas, while the fourth is a summarization of the other three in which the Commander, 8th Air Division (AEW&C) suggests four possible courses of action regarding their collective solution. They are:

a. "Proposal to activate the 966th AEW&C Squadron at McClellan Air Force Base," dated 11 May 1955.

b. "AEW&C Mission Aircraft Requirement," dated 13 May 1955.

c. "C-121C Aircraft Requirement," dated 13 May 1955.

d. "Proposed AEW&C Program Actions," dated 19 May 1955.

2. In this letter, "Proposed AEW&C Program Actions," dated 19 May 1955, General Gibson states that he does not consider it feasible or desirable to procure additional aircraft of the RC-121 configuration in its present state of development. He recommends instead that he be authorized to activate the seventh AEW&C squadron (966th) at McClellan Air Force Base and from its resources provide augmentation to his two wings to meet any deficiencies that develop in the early phase of operations.

3. Reference the letter, "Proposal to Activate the 966th AEW&C Squadron at McClellan Air Force Base," dated 11 May 1955, a DCS/O message requesting favorable consideration of this proposal will be answered by Hq USAF as soon as AMC reaction to the proposal is received.

4. This correspondence was sent to DCS/M and DCS/O and their comments are available on attached DF's.

5. A query from this headquarters to Commander, 8th Air Division (AEW&C) for more specific information concerning manpower augmentation requirements for an increase of six RC-121 aircraft per wing resulted in a reply that a total of eighteen airmen per wing would be required.

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D. C.

30 Mar 1955

AFOOP-AL

SUBJECT: Flying Hour Requirement for RC-121C/D

TO: Commander
Air Defense Command
ATTN: Director of Operations
Ent Air Force Base, Colorado

1. In developing each Flying Hour Program (PF) this Headquarters gives full consideration to the estimated rates and/or flying hours submitted by the major commands. Our objective in using all sources of programming information is to develop the most realistic Flying Hour Program possible and still increase the rates of flying operations as rapidly as resources permit toward full Peacetime Planning (PPF) objectives. We recognize that the estimates submitted by the commands are a valuable aid in this effort to maintain programs which are both realistic and accurate.

2. As a result, the flying hour programs published in the past by this Headquarters have been characterized by programmed flying hour rates which have remained relatively constant from year to year. Successive programs which are not characterized by this stability would be impractical from the standpoint of budget and procurement actions which cannot be easily or economically revised to reflect flying hour objectives that vary by more than ten (10) percent from program to program.

3. We have programmed flying hours for the RC-121C/D aircraft at the rates recommended for PF-57-1, in your letter ADOOT-B-2 subject: (Uncl) RCS AF-F12(OT), dated 30 Dec 1954. However, the resulting program represents a considerable reduction from the rates previously recommended by your Headquarters and programmed in PF-56-1. Furthermore, recommended programmed and actual rates have been far below the rates shown in the Peacetime Planning Factors Manual (Table 0-7-4) and your letter (Secret) subject: Proposed Operational Plan, Seaward Extension of Radar RC-121 C/D, dated 10 March 1954.

4. It is desired that you re-evaluate your flying hour requirements on RC-121 C/D aircraft for the remainder of FY'55 through FY'58 against those rates shown in PF-57-1 and the Peacetime Planning Factors Manual. Recommended changes will be forwarded to this Headquarters, (Attn: AFOOP-AL) by 15 April 1955 to insure that procurement action is in harmony with the RC-121 requirements and capability.

BY ORDER OF THE CHIEF OF STAFF:

1 Incl
RC-121C

/s/t/ R. E. KOON
Brig. General, USAF
Acting Director of Operations
Deputy Chief of Staff, Operations

SECRET

RC-121-C

	1/55	2/55	3/55	4/55
ADC Estimated Rate (PF-56-1)	199	268	355	396
PF-56-1 Rate	199	268	335	396
ADC Estimated Rate (PF-57-1)			180	270
PF-57-1 Rate			180	270

	1/56	2/56	3/56	4/56
ADC Estimated Rate (PF-57-1)	270	225	225	270
PF-57-1 Rate	270	225	225	270

RC-121-D

	1/55	2/55	3/55	4/55
ADC Estimated Rate (PF-56-1)	199	268	335	396
PF-56-1 Rate	199	268	335	396
ADC Estimated Rate (PF-57-1)			228	243
PF-57-1 Rate			228	270

	1/56	2/56	3/56	4/56
ADC Estimated Rate (PF-57-1)	243	227	227	243
PF-57-1 Rate	270	225	225	270

Peacetime Planning Factors Manual, Page 0-7-4, contains 516 Hours per quarters. per aircraft.

Proposed Operational Plan, Seaward Extension, of Radar RC-121 C/D, dated 10 Mar 54, contains 516 Hours per quarter, per aircraft.

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Hq USAF AFOOP-AL Subject: Flying Hour Requirement for RC-121 C/D

ADOOT-B2 1st Ind 8 Apr 1955

Hq ADC, Ent Air Force Base, Colorado Springs, Colorado

TO: Commander, 8th Air Division (AEW&Con), Hq (WADF), McClellan Air Force Base, McClellan, California

1. Attached correspondence is forwarded to your headquarters for your comments and recommendations.

2. Request your indorsement reach this headquarters not later than 14 April 1955.

BY ORDER OF THE COMMANDER:

1 Incl
n/c

/s/t/ C. F. HUMPHREYS
Major, USAF
Asst Command Adj

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73

ADOOT-B2

SUBJECT: (Uncl) RCS: AF-F13 (OT)

TO: Director of Operations
Headquarters USAF
Washington 25, D. C.

1. The attached ADC revised program requirement for flying hours includes the 1st, 2nd, 3rd and 4th Quarters FY '56.

2. The quarterly flying hour rate is an accurate reflection of ADC's requirement and capabilities predicted on past, current and predicted performance for each type aircraft. Quarterly average aircraft figures include all gains and losses of aircraft going into and out of programmed modifications such as Pull Out, Hop Up, and IRAN maintenance schedules.

3. The estimated number of rated officers to be assigned to ADC for whom operational support Code CS aircraft and flying hours will be provided, is as follows:

a. All quarters FY '56 1916

4. Included in this report is ADC's requirement to support the AFROTC rated instructors' additional 25 hours for cadet orientation for FY '56.

FOR THE COMMANDER:

MEMO FOR RECORD: The major change in this program is in the field of RC-121 aircraft. Previously the RC-121C & D's were programmed to receive approximately 90 hours per month per aircraft. These hours were still in excess of their capability as shown by past utilization. Headquarters 8th Air Division objected to the present program because it was not in consonance with their operational plans for the RC-121 mission. They stated their predicted capability as shown in this document.

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REVISED ADC FLYING HOUR REQUIREMENTS

E MODEL ERIES	CODE	1ST QTR FY 56 QTR AVG A/C	QTR RATE	TOTAL TIME THIS QTR	2ND QTR FY 56 QTR AVG A/C	QTR RATE	TOTAL TIME THIS QTR
6D	CC	1114	78	86,892	1114	75	83,550
D	CC	226	58	13,108	246	60	14,760
H	CC				4	51	204
4C	CC	231	99	22,869	244	90	21,960
121C	CC	9	335	3,015	9	423	3,807
121D	CC	28	396	11,088	38	423	16,074
5J	CC	8	157	1,256	8	138	1,104
2A	CC	19	147	2,793	18	123	2,214
B	CC	12	177	2,124	11	138	1,518
5A	CC	3	60	180	4	63	252
45A	CC	7	60	420	7	63	441
3	CP	191	147	28,077	193	129	24,897
7D	CP	8	180	1,440	6	162	972
1C	CP	66	108	7,128	70	117	8,190
G	CM	5	42	210	5	42	210
3G	CM	11	57	627	11	54	594
9	CM	14	57	798	14	54	756
0	CM	35	90	3,150	35	90	3,150
5M	CM	9	117	1,053	9	108	972
7	CM	1	60	60	1	51	51
6D	CM	18	84	1,512	24	84	2,016
25M	CS	26	147	3,822	26	129	3,354
3	CS	68	150	10,200	80	147	11,760
5F	CS	25	132	3,300	25	120	3,000
5G	CS	25	147	3,675	29	132	3,828
5H	CS	23	159	3,657	24	150	3,600
7D	CS	65	210	13,650	65	171	11,115
47D	CS	8	234	1,872	8	180	1,440
17B	CS	1	240	240	1	210	210
17C	CS	2	240	480	2	210	420
54	AD	1	150	150	1	150	150
31	AD	4	150	600	4	150	600
TAL TIME R QUARTER				229,446			227,169

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REVISED ADC FLYING HOUR REQUIREMENTS

E MODEL RIES	CODE	1ST QTR FY 56 QTR AVG A/C	1ST QTR FY 56 QTR RATE	1ST QTR FY 56 TOTAL TIME THIS QTR	2ND QTR FY 56 QTR AVG A/C	2ND QTR FY 56 QTR RATE	2ND QTR FY 56 TOTAL TIME THIS QTR
6D	CC	1114	78	86,802	1114	75	83,550
9D	CC	226	58	13,108	246	60	14,760
H	CC				4	51	204
4C	CC	231	99	22,869	244	90	21,960
121C	CC	9	335	3,015	9	423	3,807
121D	CC	28	396	11,088	38	423	16,074
5J	CC	8	157	1,256	8	138	1,104
29A	CC	19	147	2,793	18	123	2,214
B	CC	12	177	2,124	11	138	1,518
5A	CC	3	60	180	4	63	252
45A	CC	7	60	420	7	63	441
3	CP	191	147	28,077	193	129	24,897
7D	CP	8	180	1,440	6	162	972
1?C	CP	66	108	7,128	70	117	8,190
G	CM	5	42	210	5	42	210
3G	CM	11	57	627	11	54	594
[illegible]	CM	14	57	798	14	54	756
0	CM	35	90	3,150	35	90	3,150
5M	CM	9	117	1,053	9	108	972
7	CM	1	60	60	1	51	51
6D	CM	18	84	1,512	24	84	2,016
25N	CS	26	147	3,822	26	129	3,354
3	CS	68	150	10,200	80	147	11,760
5F	CS	25	132	3,300	25	120	3,000
5G	CS	25	147	3,675	29	132	3,828
5H	CS	23	159	3,657	24	150	3,600
7D	CS	65	210	13,650	65	171	11,115
47D	CS	8	234	1,872	8	180	1,440
17B	CS	1	240	240	1	210	210
17C	CS	2	240	480	2	210	420
54	AD	1	150	150	1	150	150
31	AD	4	150	600	4	150	600
TAL TIME R QUARTER				229,446			227,169

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REVISED ADC FLYING HOUR REQUIREMENTS

E MODEL ERIES	CODE	3RD QTR FY 56 QTR AVG A/C	QTR RATE	TOTAL TIME THIS QTR	4TH QTR FY 56 QTR AVG A/C	QTR RATE	TOTAL TIME THIS QTR
6D	CC	1169	75	87,675	1234	84	103,656
D	CC	262	72	18,864	254	78	19,812
H	CC	38	51	1,938	93	60	7,518
4C	CC	253	90	22,770	247	99	24,453
02A	CC				2	54	108
102A	CC				2	57	114
121C	CC	9	505	4,545	9	516	4,644
121D	CC	48	505	40,314	57	516	29,412
5J	CCm	8	138	1,104	8	157	1,256
20A	CC	18	123	2,214	18	147	2,646
B	CC	11	154	1,694	11	183	2,013
5A	CC	5	63	315	5	66	330
45A	CC	7	63	441	7	66	462
3	CP	203	129	26,187	218	147	32,046
7D	CP	4	162	648	3	180	540
19C	CP	70	117	8,190	62	153	9,486
19?	CP				10	108	1,080
G	CM	5	42	210	5	57	285
G	CM	11	54	594	11	57	627
[illegible]	CM	14	54	756	14	57	798
0	CM	35	90	3,150	34	90	3,060
5M	CM	9	108	972	9	117	1,053
7	CM	1	60	60	1	60	60
6D	CM	27	84	2,268	27	84	2,268
25N	CS	26	129	3,354	25	147	3,675
3	CS	86	147	12,642	78	150	11,700
5F	CS	24	120	2,880	24	132	3,168
5G	CS	29	132	3,828	28	147	3,675
5H	CS	24	150	3,600	24	159	3,816
7D.	CS	64	171	10,944	64	210	13,440
47D	CS	8	180	1,440	8	234	1,872
17B	CS	1	210	210	1	240	240
17C	CS	2	210	420	2	240	480
54	AD	1	150	150	1	150	150
31	AD	4	150	600	4	150	600
AL TIME R QUARTER				264,977			290,543

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HOURS REQUIRED TO SUPPORT AFROTC ORIENTATION FLIGHTS FOR FY 56

Number of Instructors to be Assigned During this Period: 163

BREAKDOWN

TYPE MODEL SERIES	1ST QTR FY 56	2ND QTR FY 56	3RD QTR FY 56	4TH QTR FY 56
C-47D	300	300	300	300
C-54H	719	719	719	719
TOTAL HOURS	1,019	1,019	1,019	1,019

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74

Subject: Flying Hour Requirements
To: DCS/O From: O&T Date: 29 Mar 55

1. Recent discussions with DCS/M and 8th Air Division (AEW&Con) staff officers have indicated various flying hour requirements for the RC-121 which were not provisioned for in the allocation of thirty UE aircraft per wing. To clarify the flying hour requirement, it is necessary to show the utilization within the various categories and the flying hours per aircraft per month to meet these requirements.

2. By actual experience, modifications must be made in the operational hours required to perform the stated mission. In publishing the Operational Plan for AEW&Con, the average mission time was computed as being 12 hours, with the aircraft performing an eight hour shift on station. This figure has now been established as 13:15 for an average mission on the West Coast. Utilizing this figure, the summary of flight data for 24-hour operation must be changed as follows:

a. Airplanes.................... 30

b. Missions per day.............. 12

c. Airplanes required per day.... 15

d. Actual flight hours........... 159 (13:15x4x3)

e. 20% allowance for abort....... 12.6 (20% of en route time only; i.e., 5:15x4x3)

f. Total flight hours per day.... 171.6

3. As will be noted above, the 172 hours per month per aircraft utilization currently stated in the Operations Plan barely cover the operational mission requirement. There is no factor for maintenance, test pilot training, transition, instrument checks, etc--all of which must be accomplished by the AEW&Con Wing. To bring the flying hour requirement in consonance with these additional training and maintenance factors, the following additions should be made:

a. 6% allowance for maintenance test....... 10.2

b. 10% allowance, Training, Transition...... 17.2

c. Total flight hours per day.............. 199.0

4. Based upon an authorization of 30 aircraft, the monthly flying hour requirement per aircraft has reached 199 hours. This is considered an impossible task, especially with such an aircraft as complex as the RC_121D.

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Subject: Flying Hour Requirements (Continued)

5. The 8th Air Division (AEW&Con is preparing a detailed study of this problem in terms of maintenance capability and an acceptable flying hour requirement per aircraft per month to perform their mission. It is anticipated that the results will indicate a requirement for 13 to 15 UE aircraft per squadron, with the resultant aircraft utilization rate of 133 to 153 hours per month. To keep the overhead to a minimum, it is recommended that the UE aircraft authorizations in the 3 AEW&Con squadrons be increased rather than authorize an additional tactical squadron within the Wing organizational structure.

/s/t/ BEN I. MAYO, JR Colonel, USAF Ch. Opnl Plans Div Ext 2661 - 3	JOHN C. MEYER Colonel, USAF Director, O&T Ext 2212 - 3

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
DCS/Development

GOR No. AD-3c

GENERAL OPERATIONAL REQUIREMENT
FOR AN
AIRBORNE EARLY WARNING AND CONTROL SUPPORT SYSTEM

I. PURPOSE

This GOR is in support of that portion of Development Planning Objective - Air Defense Weapon Systems for the Period 1957 - 1963, which establishes the need for improved airborne early warning and control aircraft and equipment.

II. OPERATIONAL MISSION

There is a continuing requirement to provide an airborne seaward extension of early warning and control contiguous to the ground radar system of the United States. This augmentation to the continental aircraft control and warning system is required to extend the unequivocal warning, and improve the kill capabilities of the air defense system and it should perform or provide facilities for the following functions:

A. Detection and tracking of aircraft.

B. Identification of air targets.

C. Evaluation and processing of data.

D. Two-way automatic relaying of data between the GCI station and interceptors.

III. ENEMY EFFECTIVENESS ESTIMATES

A. GOR Intelligence Annex.

IV. FRIENDLY ENVIRONMENT

A. General.

These aircraft will operate from bases in the United States and normally will land at the base from which deployment of these units to overseas areas.

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B. Runway Limitations.

These aircraft must be capable of operating from runways normally required for C-118 and C-121 type aircraft.

C. Maintenance.

It is imperative that this aircraft and the equipment it contains be designed with maximum emphasis placed on maintainability. All electronics gear will be designed for in-flight maintenance. Consideration should be given to alternate installation with "switchover" control for those components of relatively low operational reliability. Carrying of spare components for plug-in substitution, and simple test equipment and procedures for cirtical circuitry are also recommended. An extremely high order of operational reliability throughout the normal 24-hour operating endurance of the aircraft is mandatory. Specified performance may be degraded slightly to obtain significant increases in reliability/

V. OPERATIONAL EMPLOYMENT

The airborne early warning and control aircraft aircraft will be used to extend the ZI AC&W system early warning and interceptor control coverage off the East and West Coasts of the United States. This barrier must be effective 24 hours a day in all types of weather.

VI. LIMITATIONS OF PRESENT SYSTEMS

A. Lack of Airborne Moving Target Indicator (AMTI) equipment:

Without this equipment the elimination of sea and ground clutter from the radar scopes is impossible. In over-water operation at present, airborne early warning and controlaircraft must be operated at 4,000 - 6,000 altitude to minimize the extent of the sea clutter. This limitation in the airborne early warning and control aircraft operating altitude limits the range of low altitude radar coverage and hinders the use of line-of-sight type point-to-point communication equipment.

B. Large operating crews and limited space prohibits carrying the double crews required to utilize the full endurance capability of the aircraft.

C. Inadequate air/ground communication facilities.

D. Manual data processing.

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E. Manual navigation.

F. Insufficient radar range.

VII. OPERATIONAL PERFORMANCE

A. Airframe.

(1) The airborne early warning and control mission is one that requires an aircraft which has at least a 20 to 24-hour endurance capability without refueling. The speed of the present piston engine four-engine transports is adequate. The aircraft must have all-weather capabilities and should be able to perform its patrol mission at an altitude of at least 25,000'. Emphasis must be placed on crew efficiency, e.g., suppression of noise and vibration to a higher degree than exists today. There must be facilities aboard for two complete crews. Although airborne aircraft control and warning aircraft are normally thought of as heavier-than-air aircraft, the possibilities of lighter-than-air aircraft should be investigated as a possible solution.

(2) Heavier than air aircraft must be capable of air refueling.

B. Electronics Equipment.

(1) Radar-The radar should have a search range of 200 nautical miles on a target of 1 square meter. Altitude coverage should extend from the surface to 80,000' throughout as much of the 200 mile range as is possible. The radar must be equipped with AMTI equipment which should reduce sea clutter sufficiently to permit detection and tracking of aircraft through clutter areas at all times. The radar should also provide height data out to the maximum search range at an accuracy of plus or minus 1000'. Range and azimuth resolution should be on the order of plus or minus 2% of range and plus or minus 1° azimuth.

(2) Data transmission - It is desired that all data collected by this system be relayed automatically to ground stations for processing and use. The aircraft crew would then consist of flight and electronics maintenance personnel only, with all CIC or operations personnel located at the ground stations. It can be assumed the aircraft will be within line of sight of the ground station at all times and will act as a data gathering system as well as a relay point for data link equipped Interceptors. This, therefore,

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requires long range (200-300 miles) automatic relay equipment for search, IFF and height data relay to a ground station and air-to-air data link to receive and relay command control intercept data to interceptor aircraft.

(3) Identification - The airborne early warning and control aircraft must have the same electronic identification capability as the ground aircraft control and warning system.

(4) Automatic Navigation - Due to the need for constant correct position data the aircraft must be equipped with automatic navigation equipment. It should be self-contained and not be designed around the existence of ground beacons, Loran, etc.

(5) A passive detection capability covering S and X band energy is desired. This system should be equipped with auto-alarm devices, and data from it need not be relayed automatically to ground stations as maintenance personnel aboard can transmit the data by radio after having been alerted by the auto-alarm system.

(6) Semi-automatic Ground Environment System Compatibility - The entire system should be designed to feed its data directly into the Semi-Automatic Ground Environment System.

VIII. AVAILABILITY

This weapon system must be available to operational units in the 1958 - 1960 period.

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76

HEADQUARTERS
AIR DEFENSE COMMAND
Ent Air Force Base
Colorado Springs, Colorado

ADMIS-CA

15 July 1955

SUBJECT: Status of Texas Tower No. 2. Construction and Establishment of Beneficial Occupancy Inspection Procedure.

TO: Director of Installations, Headquarters ADC, Ent Air Force Base, Colorado Springs, Colorado

1. DURATION, PLACE AND PURPOSE OF CONFERENCE:

a. Duration: 8 July 1955

b. Place: AFIR office, New England Region, Boston, Mass.

c. Purpose: To discuss personnel requirements, obtain latest data on construction status and establish acceptance and transfer procedure for subject facility, when completed.

2. PERSONS PRESENT AT CONFERENCE:

Mr. T. L. Johnston, Const. Div, Hq ADC
Mr. K. Lord, Installations, Hq EADF
Lt Col Yavorski, Operations, Hq EADF
Mr. G. B. Buffington, Hq MAAMA
Capt P. Knight, AFIRO NER
Comdr J. J. Albers, USN, 1st Naval Dist.
Major R. A. Kallman, USAF, Commander, 762nd AC&W Sqn.
Capt C. R. Nicholson, USAF, 762nd AC&W Sqn.
WOJG C. P. Hardy, Jr. USAF, Utilities Officer, Texas Tower #2.

3. Construction of Texas Tower No. 2 is proceeding slightly behind schedule due to reasons stated in paragraph 5a. The tower is currently being fitted out for sea at Bethlehem Yards, Boston, Mass. The tower was visited by the undersigned during the afternoon following conference on 8 July 1955.

4. Texas Tower No. 2 Statistical Data:

a. Fresh water storage - 166,000 gallons. Additionally, tow evaporators will be provided to reduce sea water to potable supply for day to day use based on criteria of 50-gallon/man/daily.

(1) Capacity of evaporators at 80% loading:

Ionic evaporator............	2,3000 gpd
Steam evaporator............	2,400 gpd
TOTAL	4,700 gpd

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Population requirements (AF):

76 men x 50 gpd...................3,800-gallons/day

b. Fuel Oil capacity: 200,000 gallons

c. Aviation Gas capacity: 3,000 gallons (boats & helicopters)

(1) Resupply is based on 6 months requirements. A contract with ESSO has been recommended for both fuel and water. (The 166,000 gallons storage is intended for reserve and fire purposes)

(2) Method of unloading: Stern lines fastened to tower through anchor to piers. Unloading lines extend from stern to tower in accordance with established sea refueling procedure.

5. FINDINGS AND DECISIONS OF CONFERENCE:

a. BOD for installation was originally 15 Oct 55. Commander Albers requested moving BOD to 15 Nov 55 due to slippage of construction schedule caused by trouble in launching.

b. On 13 July 1955 the tower, with structure essentially complete, and installed equipment in place, will be towed to permanent location at Georges Sand and jacked to position 80-ft above sea-level. Permanent caissons will be placed; radar towers and communication masts erected.

c. BOD minus 30 days - 15 Oct 55:

(1) Utilities personnel comprising 15 men will come aboard for indoctrination in equipment operations: 2 utilities men, 1 construction equipment operator, 2 plumbers, 2 boilermen, 4 powermen, 1 marine engineerman, 1 supply sergeant and 1 detachment commander. TOTAL of 14 men. (Electrical man, enlisted, will come aboard in August.)

(2) These men will stand watches and will actually operate equipment as installation is completed. This will be considered part of training.

d. BOD minus 15 days - 1 Nov 55:

(1) Although contractor will operate galley until BOD, one AF mess sergeant will come aboard for indoctrination in operating equipment.

(2) Personnel arriving at this time will comprise the following: 14 utilities personnel (listed in paragraph 5c(1) above), 1 mess sergeant, 1 AMC Project Engineer, 1 seaman, 7 AMC Installation personnel - Total of 24 Air Force personnel. 76 Contractor personnel. 100 TOTAL personnel on board tower (will exceed maximum capacity temporarily)

e. BOD - 15 November 1955:

(1) On BOD contractor personnel will be reduced to 20. These personnel will complete installation and correct deficiencies. Air Force will commence full operation of all equipment and galley.

(2) Personnel aboard will comprise the following:

24 Air Force Personnel (listed above)
3 Cooks
1 Medical Supervisor
2 Communications repairmen
25 Radar Installationmen, AMC
20 Contractor personnel
2 Naval Inspectors
2 E G Paige manufacturers installationmen
13 Cambridge Research Center installationmen

96 Total personnel on board tower.

(3) Contractor and electronic equipment installation personnel will be reduced to optimum of 76, three to four months after BOD.

6. ACCEPTANCE AND TRANSFER OF FACILITIES OF BOD:

a. The inspecting party on BOD, 15 November 1955, will be comprised of representatives of the following headquarters:

ADC...............1 Structural (Installations)
1 Mechanical (Installations)
1 Electrical (Installations)
1 Communications & Electronics

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EADF	1	Installations Representative
Otis AFB	1	AIO (who will sign transfer forms)
(Supp Base)	1	Property man (who will come aboard ahead of inspecting party to conduct inventory)
762nd AC&W	1	Commander of Installation
MAAMA	1	AMC Representative
AFIRO	1	Representative (Project Officer)
BuDocks, USN	As required	(inspectors will be aboard)
Hq USAF	As required	
Contractor	As required	
TOTAL	13 to 15	

b. It is essential that the inspection party be held to the minimum number of personnel described in paragraph 6a above due to limited transportation facilities, and accommodations available on the tower.

c. On the BOD inspection date all installed mechanical equipment will be operational and ready for testing. Air conditioning equipment will be installed and operational; however, full load tests will be deferred until such time as the major components of electronics equipment is installed. All structural components included in the contract will be inspected and accepted on the BOD.

d. Final acceptance tests of installed equipment will be made by BUDOCS approximately 6 months after BOD in accordance with terms of the contract.

e. It is essential that all members of the inspecting party be fully informed on the specialized nature of this particular part of the inspection in order that the acceptance mission be expeditiously and efficiently accomplished. All findings will be reviewed and evaluated at the conclusion of the inspection, made a matter of record, and classified either as (minimum) punch list construction deficiencies of major deficiencies, (including incompleted work) which will be listed on the transferforms.

f. It will be noted that inspection of the installation will be conducted for the purpose of ascertaining compliance with contract plans and specifications. Design deficiencies will not be considered in this inspection due to limitations referred to in paragraph 6b above.

g. The acceptance will be conducted in accordance with provisions of ADC message ADMIS-CA 27773, 8 July 55, which supercedes ADC message ADMIS-CA 11779, 24 Mar 55.

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Hq ADC, ADMIS-CA, Subj: Status of Texas Tower No. 2. Construction and Establishment of Beneficial Occupancy Inspection Procedure. 15 July 1955. (Contd)

7. ACTION TO BE TAKEN BY THIS HEADQUARTERS:

a. Alert members of ADC and EADF and 762nd AC&W Squadron inspection team to be in full readiness for their participation in the acceptance in accordance with provisions of paragraph 6 above.

b. Notify all other headquarters and agencies who will participate in inspection on receipt of confirmation of BOD from BUDOCKS through AFIR NER, in accordance with procedure established in message ADMIS-CA 27773, 8 July 55. Such confirmation should be obtained 14 days prior to acceptance date.

THOMAS L. JOHNSTON
Cons. Mgmt. Engr.
Hq ADC

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77

ADOCS-AR 1 April 1955

SUBJECT: (Unclassified) Operating Date for Texas Tower No. 2

TO: Commander
Middletown Air Materiel Area
Olmsted Air Force Base
Middletown, Pa.

1. This headquarters is taking action to change the PC operating date on Texas Tower No. 2, Georges Shoal, to the 2nd quarter FY56.

2. The above action is required for the following reasons:

a. Information available to this headquarters indicates that all CE equipment will be available for storage on the tower in May 1955, and it appears that some of the technical installation, such as cables and racks, can be accomplished prior to departure of the tower for the site in July 1955.

b. The Navy project officer has assured this headquarters that the tower will be ready for beneficial occupancy on site by 1 September 1955. Installation of CE equipment can begin at this time and should be completed by 2nd quarter FY 56.

c. It is desirable that the ADC contiguous early warning and control capability be extended as soon as possible. Early operation and testing of the first Texas Tower is essential for proper planning.

d. Lincoln Laboratory has scheduled the ID-1 installation for operation in September 1955. It is very desirable that the first Texas Tower be tied in to ID-1 at the earliest possible date for systems evaluation and testing.

3. In view of the above, this headquarters believes that it is technically and logistically feasible to complete the installation of this Texas Tower in 2nd quarter FY56.

4. It is requested you forward your comments on the proposed change through Rome Air Force Depot to this headquarters by 15 April 1955. It is necessary to receive this information by 15 April 1955, in order to meet the next scheduled PC revision for this command.

RECTOR C. DACUS

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MEMORANDUM FOR RECORD: Col Carey stated in this ltr of 24 Feb 55 to Maj Gen Smith that the Navy project officer assured him that the first Texas Tower would be ready to move into position by July 1955. At present we are programming for an operational date of June 56 which would be approximately 11 months from the time that the tower would be ready to go into position. Further information indicates that the tower will be in position by September which would provide approximately four months for installation of the equipment. Therefore, we feel that a more realistic operational date would be in Nov or Dec of 1955. If this change can be accomplished, the FC operating date will be changed to Feb 56.

GORDON P. PALMER
Capt. USAF

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78

From: Comdr, ADC

24 May 1955

To: Comdr, EADF, Stewart AFB, N.Y.

(CONFIDENTIAL) ADOCE-AL 3148. The fol tentative phasing SKED for TEX TWR two is FWD for planning purposes: A. 20 May 55 - Launching. B. 20 May to 4 Jun 55 - W/B at the Quincy Yard, BSN, MASS. C. 5 Jun 55 - W/B towed to East BSN for trial INSTL and to CK leg jack. D. 1 JUL 55 - towed to Georges Shoal. E. 10 AUG 55 - secured to ocean floor. F. 10 AUG 55 - CONTR WILL COMPL INSTL. G. 15 Oct 55 - Beneficial occupancy. H. The CONTR desires, if possible, USAF HSKPG PERS be aboard by 1 OCT 55 in order to PROV checkout on EQP. I. The CONTR will OPR the mess until 15 OCT 55 but a few CONTR PERS will remain on board for a short time after 15 OCT 55 and CONTR desires we PROV mess FACS. I. ADC responsibility commences with beneficial occupancy date.

MEMO FOR RECORD: Above info was received from ADMEL-3 as stated by the Navy Project Officer at the AF-OCE construction conference. Diary item required.

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79

From: Comdr ADC, Ent AFB, Colo. 14 Jul 55

To: Comdr EADF, Stewart AFB, N.Y.

Info: C/S, USAF, Washington D.C. (AFOAC, AFOOP & AFCIE)
Comdr AMC, Wright Patterson AFB, Ohio
Comdr, Rome AF Depot, Griffiss AFB, N.Y.
Comdr, MAAMA, Olmsted AFB, Pa.
Chief, USAF, AMC ADES, Proj Office 220 Church St NY

(SECRET) ADOCE-4 3408 . MAAMA has advised this hq that all programmed C&E EQP for TEX TWR NR 2 can be made OPRL by 31 Jan 56. This hq revising desired OPRL date for this TWR to 1 Feb 56. Revision of OPRL dates for remaining TEX TWRS under consideration this hq. Original operating date for TEX TWR NR 2 was JUN 56.

MEMORANDUM FOR RECORD: Present operational date for Texas Tower #2 is June 56. Since completion of all installation work appears possible by 1 Feb 56 oprl date is being changed to this date. No diary item required.

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80

17 June 1955

SUBJECT: (U) Operational Plan for Texas Tower

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. References:

a. Your letter dated 31 March 1955, subject as above.

b. Our message AFOOP-OP-D 53594, dated 13 May 1955.

c. Your message ADOPR 3110, dated 20 May 1955.

2. Reference 1. a. requested that this Headquarters approve subject plan in order that early dissemination could be effected. While subject plan was being reviewed by the Air Staff it became apparent that an overall Operational Plan with Communication Annexes was required for the Seaward Extension of Contiguous Radar Cover. Such a plan was requested in reference 1.b. and is to replace the three individual plans now in existence covering Texas Towers, Picket Vessels and Airborne Early Warning and Control. Reference 1.c. advised this Headquarters that an overall plan would be developed on or about 20 June 1955.

3. In view of above this Headquarters recommends that any further actions to disseminate subject plan be discontinued pending approval of your overall plan. To assist you in preparing the Texas Tower portion the following comments, changes and/or recommendations are forwarded:

a. Reference paragraph III.B.2. This Headquarters does not concur with your proposed Phase II operation for the following reasons:

(1) During this period, with the presently assigned parent stations, P-10 will be required to control all intercepts in the coverage area of P-10, TT-1 and TT-2. This centralization tends to decrease the total capability of the system. Consideration should be given to retaining the control capability in the towers by taking full advantage of the AN/GPA-37's, until SAGE is implemented.

0979

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Ltr to ADC, subj: ADC Opnl Plan for Texas Towers (Cont)

(2) To provide remoting equipment prior to the installation of FGD for SAGE will necessitate the re-engineering of a video transmission system such as RAFAX and installing it as an interim system. The developmental effort and re-engineering required will be expensive in both money and manpower.

(3) The time period involved in Phase II operation in relation to SAGE implementation does not justify the engineering and installation of interim point-to-point data transmission equipment.

(4) The inherent inaccuracies of the SDV equipment which necessitated the development of the FGD System raises the question whether or not a satisfactory control capability could be accomplished.

It is therefore recommended that all the towers be manually operated until FGD is installed and operating.

b. Reference paragraph IV.C.1. This Headquarters considers your requirement for two (2) detachments to man each Tower to be excessive for the following reasons:

(1) Placing an authorization of a complete detachment at the parent AC&W Squadron as rotation resource for the detachment on the tower is not only a luxury, but will adversely affect the morale of those personnel due to a lack of any constructive duty assignment until they return to duty on the Tower.

(2) Operationally, it is considered mandatory to rotate Texas Tower duty among all personnel of the parent AC&W Squadron who possess the skill required on the Tower.

(3) Those individuals required on the Tower, but not common to AC&W Squadrons should be drawn from resources of other units within your Command. Specifically, the Utilities Superintendent, AFSC 56000; Construction Equipment Operator, AFSC 55151; Seaman, AFSC 59150; and Marine Engineman, AFSC 59151.

c. As concerns composition of a detachment is reflected in paragraph IV.C.:

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(1) AFSC 30470 - Ground Radio Maintenance Technician. The grade of T/Sgt is considered adequate.

(2) AFSC 5640 - Plumber. It is recommended that this be deleted and an Air Condition Technician be substituted. This skill offers a good opportunity for civilianization, which along with other skills should be investigated by your Headquarters.

(3) AFSC 36271 - Wire Maintenance Technician (Inside Plant). Assignment on a full time basis is questioned. This position and grade should be further evaluated to determine its essentiality on a full time basis.

(4) AFSC 56570 - Electrical Power Production Operator. The grade spread from A/1c through M/Sgt is basically unsound from the standpoint of running for one position 24 hours a day. Recommended grade spread is one (1) T/Sgt and three (3) A/1c.

(5) AFSC 62250 - Cook - Four (4) cooks for forty-six (46) people is a ratio of 8.6:1, which is approximately 2½ times the ratio for your Command as a whole. Recommend one (1) A/1c be deleted.

(6) AFSC 64173 - Organizational Supply Supervisor. A M/Sgt for this position is too high, recommend it be reduced to A/1c.

d. Reference paragraph 1.B. of Communications Annex. The initial scatter equipment to be installed on the Texas Towers will meet the full circuit requirements (60) of SAGE. The installation of the submarine cable is being delayed pending evaluation of Tropospheric Scatter by ARDC. It is expected that this evaluation will be completed by 15 June 1955 at which time a decision on whether to delete or install the submarine cable will be made.

4. Since your Command has changed the function of radar site M-102 Barrington, Nova Scotia from that of surveillance to a direction center, and reprogrammed heavy radar equipment for this site, the requirement for installing TT-5 on Browns Bank is questioned.

5. Desire your Headquarters review your coverage requirements in the Browns Bank area and if it is determined that TT-5 is an operational

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Ltr to ADC, subj: ADC Opnl Plan for Texas Towers (Cont)

requirement submit complete justification showing actual radar coverages being obtained from existing P sites, theoretical coverages of augmentation radars and Texas Towers in the Atlantic Coast area.

BY ORDER OF THE CHIEF OF STAFF:

[illegible]
Brig. General, USAF
Deputy Director of Operations
Deputy Chief of Staff, Operations

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Hq USAF AFOOP-OP-D 53564, Subj: (U) Operational Plan for Texas Tower

ADCPR (17 Jun 55) 1st Ind 23 Jul 1955

Hq AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colorado

TO: Chief of Staff, Headquarters USAF, Washington 25, D. C.

1. The CONAD Operational Plan for Seaward Extension of the Air Defense Combat Zone, with communications annexes, was forwarded to your Headquarters on 24 June 1955. It was the purpose of this plan to provide a general operational concept in sufficient detail to facilitate planning and coordination. It was not intended to include complete detail in this plan for the operation of each element of the seaward extension. It is the intention of this Headquarters to publish separate and detailed plans for each of the three elements, following the guide lines of the overall plan. The following comments relative to your basic letter are forwarded for review and consideration:

a. Reference paragraph 3a (1).

Phase II operation is not mandatory, but will be dependent upon equipment and system development. This Headquarters does not plan to redeploy the GPS-37s from the Towers after installation, but desires to decrease support requirements and personnel manning to the minimum consistent with operational requirements.

b. Reference paragraphs 3a (2), (3) and (4).

If a feasible and practicable remoting system is not available Phase I operation will be continued.

c. Reference paragraph 3b.

(1) Authorization for a complete detachment at the parent ACW Squadron as rotation resource for the detachment on the tower was given thorough consideration and study by this Headquarters prior to our making this recommendation. Several determining factors entered into our consideration of this subject, including the requirement for manning of these units on an austere basis. Limited manning of these units while on tower is a requirement, based upon the space limitations on the tower and the number of persons that can be accommodated thereon. Our planning and estimate of requirements have included the consideration that in order to

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DCPTT (17 Jun 55), Subj: (U) Operational Plan for Texas Tower (Cont'd)

fill a majority of positions on tower, the assigned personnel must be cross-trained into related career fields which will permit accomplishment of several jobs by each person. There are a large number of functions on tower which are not required to be manned on a full time basis and for which no full time manning is provided. Cross-training of assigned personnel is necessary in order to fill these positions on a part time basis. Consequently, it can be expected that the personnel concerned will be required to work long hours while they are on the tower. It can also be expected that these personnel will require some time off when they return ashore prior to being assigned to duties with the parent ACW Squadron.

(2) For reasons outlined above, personnel returning from duty on tower should not be subject to immediate assignment to duty at the parent ACW Squadron. If personnel are drawn from the parent ACW Squadron and rotated to the tower there will be positions in the parent ACW Squadron which will not be manned continuously. This is considered to be an unsatisfactory arrangement, because of the air defense mission requirements (other than Texas Tower support) of the parent squadron.

(3) If, as you suggest, tower duty is rotated among all personnel of the parent ACW Squadron a major cross-training problem will be created. For example, the primary equipment to be used on tower is AN/FPS-3A, while parent squadron's (except P-15's) primary equipment is AN/CPS-6B. This will require training on two primary equipments. Instead of cross-training only those personnel required to man the tower, practically the entire squadron complement will require cross-training into related career fields in order to qualify them to perform the several jobs on tower which they must perform and for which no full time manning is provided. This training workload and the reduced maintenance capability will degrade parent squadron operation.

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(4) Paragraph 3b(3) of your letter states that "those individuals required on tower, but not common to ACW Squadrons should be drawn from resources of other units within your command". The personnel which you refer to as an example are authorized in limited numbers within this command, e.g. Seaman, AFSC 57150, and Marine Engineman, AFSC 57151. For this reason, it can be expected that if no resource is specifically provided for tower replacement manning a considerable assignment and rotation problem will be created. Personnel will have to be assigned to temporary duty on the tower from stations a considerable distance from the parent ACW Squadron. Therefore, much time will be consumed in travel. If these persons are drawn from their normal duty assignments and placed on TDY on tower for two (2) weeks, this will mean that in some cases the personnel concerned will be away from their normal duty assignments as much as three (3) weeks or more, including travel time. No doubt, this practice will work a hardship upon the units from which the TDY personnel are drawn, and an additional training workload will be created. Staff work to keep such a system in operation will also be sizeable.

(5) It was not intended that the personnel while ashore would be adversely affected due to the lack of any constructive duty assignment until they return to duty on the tower. Instead, it was intended that the parent ACW Squadron should conduct a training program to train replacements, and that the personnel should be utilized as necessary on constructive duty assignments within the squadron. The detachments will not be rotated as units. Rather, because of transportation difficulties and the plan to rotate personnel by helicopter, replacements will be provided from the shore detachment on an individual basis rather than on a unit basis. Since the parent squadron will have functions to perform which are peculiar only to ACW squadrons supporting Texas Towers, e.g. plotting and telling data received from the towers,

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ADOTR (17 Jun 55), Subj: (U) Operational Plan for Texas Tower (Cont'd)

is intended that the detachment personnel on shore will perform these functions. The parent squadron is not manned to do these functions, and unless this action is taken, additional augmentation personnel will be required for the parent squadron.

(6) This Headquarters, as indicated above, considered the many factors involved in this problem before making the recommendation that two (2) detachments be provided to man each tower. The placing of an authorization of a detachment at the parent ACW Squadron as rotation resources for the detachment on the tower is considered to be a necessity.

i. Reference paragraph 3e.

(1) AFSC 30470 - Ground Radio Maintenance Technician. The requirement will exist for certain technical personnel on tower, including the Ground Radio Maintenance Technician, to be well qualified in their specialty. This is particularly important in this case, since the tower is not authorized a communications officer. The Ground Radio Maintenance Technician will be required to assist the Ground Electronics Officer, AFSC 3044, in performing communications responsibilities. In this connection, it is pointed out that the Operational Plan calls for communications facilities between the towers and the shore to be provided by submarine cable and tropospheric scatter radio. Initial communications, in phase with the Beneficial Occupancy date for the towers, must be provided by the best means available. Each tower is programmed to have ten ground-to-air radio channels during manual operation and twenty-two when integrated into the SAGE System. The importance of, and reliance upon, communications between the towers and the shore based parent ACW Squadron and ground-to-air indicates to us that this position should be authorized a master sergeant.

(2) AFSC 56450 - Plumber. It is believed that the manning authorization for plumber should be retained and that the substitution of an air conditioning technician should not be made. Failure of the air conditioning

0936

equipment should not induce any particular hazard, as parts and mechanics will be available by airlift from support bases as required. Food storage equipment is installed with spare apparatus, allowing continued operation by switch-over until such time as maintenance personnel and spare parts are dispatched from the support base. Our planning has been based upon the performance of preventive maintenance, minor repair, and unit replacement by the tower detachment within its capabilities. Preventive maintenance and minor adjustment of air conditioning equipment is only one function which must be accomplished by cross-training, and for which no full time manning is provided. There are other installations type personnel included in our proposed manning who are to be cross-trained and qualified to perform minor maintenance of this equipment. As pointed out above, the fact that manning authorizations are not provided for certain functions, as in the case of maintenance and operation of air conditioning equipment, is not an oversight on the part of this Headquarters. When SAGE equipment is installed, however, it is visualized that an air conditioning technician will be required on tower on a full time basis. At the present time, it is considered that a plumber is required. As for the civilianization of these jobs, it is felt that the air conditioning position offers no particular advantage over the plumber position; either position could be manned accordingly.

(3) AFSC 36271 - Wire Maintenance Technician (Inside Plant). The requirement for this position on a full time basis has been re-examined and it is considered to be required, based upon the maintenance of the internal communications systems, including sound powered equipment, 60-line unattended dial system, GTA-6 Radar plotting communications system, public address system, and the tower termination of the tower-to-shore communications equipment.

(4) AFSC 56750 - Electrical Power Production Operator. The grade spread of A/1C through M/Sgt as included in the proposed Texas Tower manning encompasses two functions, i.e., Electrical Power Production Operators

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AFSC 54750, and Electrical Power Production Technician, AFSC 54770. As in the several other functional areas, it is intended that related functions be grouped for performance in order to reduce the number of personnel required on tower; each person under this concept would be cross-trained into related career fields in order that several jobs can be performed. Therefore, it is not intended that the grade spread of A/1c through M/Sgt be provided solely on the basis of manning one generating plant position 24 hours a day. Instead, two operator positions are included (1 A/1C; 1 S/Sgt) to operate and perform operator maintenance on the generating equipment as necessary. The Technicians were provided primarily for maintenance of the equipment rather than for supervision of the equipment operation function, although they will be required to assist in, as well as supervise the equipment operating functions. A review of the specialty descriptions reveals that the five (5) level airman is skilled in operation of the equipment and can perform operator maintenance only. The Technician seven (7) level airman is qualified to perform difficult repair of the components. If the technician(s) is to be utilized primarily in a supervisory capacity over the operator personnel and in the manning of one operator position on a 24 hour a day basis, as suggested in your letter, then the grade spread proposed would be adequate. However, for the reasons stated above, it is recommended that the two (2) technicians now included in the proposed manning be retained.

(5) AFSC 62250 - Cook. Your letter recommended that one (1) A/1c cook be deleted based on the fact that the ratio of four (4) cooks for forty-six (46) people is approximately 2½ times the ratio for the Command as a whole. Although there are only forty-six persons authorized in the proposed manning document, food service manning must be based upon known workload. There will be additional persons stationed on the tower who will have to be fed, and who are not included in the manning table. For example, there will be naval personnel, civilian contract

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DCTR (17 Jun 55), Subj: (U) Operational Plan for Texas Tower (Cont'd)

personnel, civilian technician representatives, and certain other periodic maintenance personnel who are assigned on a periodic basis. It is expected that approximately 70 persons will be present on tower at all times. In addition, during rotation of crews additional rations will probably be served. Helicopter crews, resupply crews, and emergency maintenance personnel from the support bases will also increase the food service workload. Assuming that an average of 75 rations are served daily, this would represent a ratio of 5.3. This ratio compares favorably with the ratio which is being utilized by our Aircraft Control and Warning [illegible] sites. This Command is now conducting a further study of our food service authorizations, the results of which will be forwarded to your Headquarters. In view of the attention which will be given Texas Towers during their first year of operations, it is suggested that the food service manning as proposed by this Headquarters be retained. It is to be expected that the detachment will be required to furnish food service to a number of transients, as well as the additional personnel who are to be stationed on tower and who are not included in our manning authorizations.

(6) AFSC 64173 - Organizational Supply Supervisor. Your letter recommends that the requested grade of M/Sgt be reduced to A/1C. It is pointed out that this one space is the only authorization included in the supply career field. Approximately 3,000 line items of general supply and tech supply will be stocked on tower. Secondly, this one individual must be more than a storekeeper. He must act as supply officer, warehouseman, issue clerk, storekeeper, organizational supply clerk, etc., all combined. An important part of his job is the timely requisition of supplies and equipment. It is our opinion that the authorization of A/1C for this position is entirely inadequate. For the above reasons it is recommended that the grade of M/Sgt be retained for this position.

(7) Manning authorizations were given very thorough study and consideration by this Headquarters during

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ADOPR (17 Jun 55), Subj: (U) Operational Plan for Texas Tower (Cont'd)

their development, however, it appears that the concepts used differed to a considerable extent from those used in your review. It is impossible to provide a satisfactory manning document if we are not aware of the restrictions to be imposed in this area. In addition much staff time is wasted in the initial preparation of the document and in subsequent reviews of changes effected. It therefore is suggested that some system be developed to assure dissemination of the necessary basic manpower policies to this Command concurrently with, or prior to, dispatch of the operational concept so that a complete manning document can be provided your Headquarters. It also is recommended that, based upon the justification previously provided in this indorsement, our recommended manning for Texas Towers be approved and that authorizations be granted on a subsequent MAV.

e. Reference paragraph 3l.

Concur.

f. Reference paragraphs 4 and 5.

A study is being made at this Headquarters to determine whether or not Texas Tower No. 5 is needed. Appropriate recommendations will be submitted to your Headquarters when his study is completed.

FOR THE COMMANDER:

C. R. BOND, JR.
Colonel, USAF
Acting DCS/O

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Subject: Texas Towers
To: [illegible] From: [illegible] Date: 21 Feb 55 Comment No. 2

1. The basic differences in concept between the attached EADF plan for Texas Towers and the Operational Plan for Texas Towers dated 20 July 1954 (referred to herein as the ADC plan) are as follows:

a. EADF proposes an authorization for Texas Tower operation based on a manning factor of 1.6. ADC proposes a minimum manning factor of 2.0 in all AFSCs and slightly higher in some AFSCs that are critical to Texas Towers.

b. EADF proposes basing all personnel eligible for Texas Tower duty at one location (a group headquarters) and providing a training facility for on shore use. The ADC plan proposed placing personnel eligible for Texas Tower duty at the parent AC&W station and integrating these on shore personnel into the parent site operation.

c. EADF proposes a supply operation at the group headquarters rather than augmenting the parent AC&W squadron. ADC proposes a minimum supply augmentation of the squadron and a small port supply facility.

2. Discussion of the basic differences.

a. Paragraph 1a. EADF's manning proposals are based on the concept of 2 periods (months, weeks, etc.) on the tower and 1 period at the parent station. EADF has specifically recommended a period of 60 days on the tower and 30 days at the group training area. This proposal is obviously cheaper than the ADC proposal from a manpower approach. The office of the Command Surgeon (Col Myers) has taken the position that any tower duty in excess of 15 consecutive days will have an extremely deleterious effect on efficiency and morale of personnel involved. He further recommends that at least 2 weeks between tours would be an acceptable minimum. Based on this requirement EADF's proposed manning figure must be increased to conform to the 2.0 manning factor used in the ADC plan.

b. Paragraph 1b. The basing of all personnel eligible for Texas Tower duty at one location will require a facility for training these personnel while on shore. EADF has proposed construction of a training radar installation costing more than a million dollars. If these personnel were dispersed at the Texas Towers' parent AC&W site, they could be integrated into the station complement and their talents utilized in the established site. If these personnel were based in a group organization at an established AC&W site it is possible that the established radar could be used for training or it is possible that the squadron at the AC&W site could be substantially reduced in strength and on shore Texas Tower personnel could assume certain portions of the

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Subject: Texas Towers (Contd)

operational commitment of the station. Housing information indicates that varying amounts of dormitory facilities will have to be built at all of the proposed locations. We understand you feel the construction of a radar training facility at Otis will not be favorably considered.

e. Paragraph 1e. Augmentations for supply support seem to be approximately the same for either type of operation. The actual assembly of supplies for the towers will necessarily have to be done in a port facility. A supply operation for Texas Towers whether accomplished at a group headquarters or at a parent AC&W site will be primarily a requisitioning rather than warehousing activity.

3. Having considered the basic differences between the EADF plan and the Operational Plan for Texas Towers, I have arrived at the following conclusions:

a. The EADF proposed plan to form a Texas Tower group, construct a training facility and construct barracks, etc., is not considered feasible due to expense of the training facility.

b. The EADF proposed Texas Tower Group has considerable merit, specifically:

(1) More efficient utilization of critical Texas Tower required AFSCs.

(2) Better morale due to the assignment of all Texas Tower personnel to a unit having a consistent, if unprecedented, mission.

(3) A consolidated supply effort. All Texas Tower supply actions would be initiated by one agency.

However, several drawbacks are also present, specifically:

(4) It will be difficult to properly utilize all on shore Texas Tower personnel (approximately 250 at all times) at any facility.

(5) Since the requirement for manning at a factor of 2.0 has been established, the overhead involved in a Texas Tower group makes it more expensive than the dispersed operation.

c. The ADC plan of augmenting the parent AC&W site has considerable merit, specifically:

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Subject: Texas Towers (Contd)

(1) Personnel would be under the command and operational control of the same man, the AC&W squadron commander.

(2) The man having operational control of the Texas Tower would also have the maintenance and supply responsibility.

(3) Due to the small numbers of Texas Tower personnel on shore (1 Texas Tower crew) more efficient and productive utilization of their time and talents could be realized.

Again certain drawbacks are present, specifically:

(4) Unexpected illnesses, etc., in Texas Tower crews could cause an undermanned tower for a period of time in certain AFSCs.

(5) Personnel arriving in North Truro or Montauk Air Force Stations after a tour on a tower may not feel they are in the garden spot of the world.

(6) It may be necessary to transport personnel an excessive distance from the AC&W site to a suitable port for transportation to the tower.

4. Recommendations:

a. That a detachment of the 762nd AC&W Squadron (North Truro) be formed to provide the operating personnel for the tower at George's Shoal.

b. That this unit be used as a test case to determine the type of organization most desirable for the four remaining towers. From present information, and assuming that the training facility at Otis will not be built, it appears the ADC proposal to augment the several shore based AC&W squadrons would be more desirable than formation of a holding group. The proposed augmentation for these units has been included in the latest ADC program, therefore little or no problem should exist in the procuring of spaces for either plan (unless an increase over the present program is required).

c. That the manning provided by our D/F subject: "Change to Detachment Manning for Texas Towers", dated 27 Jan 55 (which received concurrence by C&E, O&T, Electronics (DCS/M, DCS/P, and your directorate) be used for the first tower to go into operation. After observing the tower's operation, appropriate changes in manning will undoubtedly be required.

JAMES R. WERGIN
Colonel, USAF
Director, M&O

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Subject: Change to Detachment Manning Table for Texas Towers
To: C&E From: M&O Date: 27 Jan 55
CAT
P&R
Elect
M&O
(In Turn)

1. At a meeting convened at 1300 hours 24 January 1955 in the office of Systems Division, P&R, the following revised manning table for Texas Tower operation was formulated.

a. Detachment manning table.

AFSC	TITLE	TOTAL	GRADE
[illegible]	Commander	1	Capt
[illegible]	Controller	3	Lt
[illegible]	Ground Electronics Officer	1	Capt
[illegible]	Utilities [illegible]	1	[illegible]
27330	Apprentice AC&W Operator	1	A/2c
27350	AC&W Operator	6	A/1c
27350	AC&W Operator	3	S/Sgt
27370	AC&W Supervisor	1	M/Sgt
29150	Comm Center Specialist	2	A/1c
27370	Traffic Oper Supervisor	1	T/Sgt
30350	AC&W Radar Repairman	3	A/1c
30350	AC&W Radar Repairman	3	S/Sgt
30372	AC&W Radar Maint Tech	2	T/Sgt
30372	AC&W Radar Maint Tech	1	M/Sgt
30450	Ground Radio Repairman	1	S/Sgt
30470	Ground Radio Maint Tech	1	M/Sgt
36151	Carrier Repeater Mech	1	A/1c
36271	Wire Maint Tech (Inside Plant)	1	T/Sgt
47151	Construction Equip Opr	1	S/Sgt
54370	Electrical Supervisor	1	T/Sgt
55250	Plumber	1	A/1c
55250	Plumber	1	S/Sgt
56750	Elect Power Production Operator	1	A/1c
56750	Elect Power Production Operator	1	S/Sgt
56770	Elect Power Production Tech	1	T/Sgt
56770	Elect Power Production Tech	1	M/Sgt
62250	Cook	3	A/1c
62250	Cook	1	S/Sgt
64170	Organizational Supply Supv	1	M/Sgt
90770	Medical Service Supv	1	M/Sgt
[illegible]	Coxswain	1	S/Sgt
[illegible]	Marine Engineman	1	A/1c
	TOTAL	[illegible]	- 6 officers and 50 airmen

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ADC Operations Plan [illegible]-55, "Extension to Seaward of Contiguous Radar Coverage and Control (Texas Towers)"

Specific comments and recommendations regarding subject plan are as follows:

1. Reference Basic Plan, paragraph 3x(2). To increase the operational effectiveness of the Texas Towers and provide for compatibility with the SAGE system, the general locations of the five (5) towers and the associated shore direction center will be as follows:

Tower No. and Name	Location		Shore Direction Center
TT-1 Cashes Lodge	42° 54'N	68° 57'W	P-10 North Truro, Mass.
TT-2 Georges Shoal	41° 44'N	67° 45'W	P-10 North Truro, Mass.
TT-3 Nantucket Shoal	40° 45'N	69° 19'W	P-45 Montauk, N. Y.
TT-4 Unnamed Shoal	39° 48'N	72° 40'W	P-[illegible] Highlands, N. J.
TT-5 Brown's Bank	42° 47'N	65° 37'W	P-13 Brunswick NAS, Me.

2. Reference Annex A, app 1. The recommended manning table for one (1) Texas Tower.

AFSC	TITLE	TOTAL	GRADE
1644	Commander	1	Capt
1644	Controller	3	Lt
3044	Ground Electronics Officer	1	Capt
56000	Utilities Superintendent	1	WO
27330	Apprentice AC&W Operator	4	A/2C
27350	AC&W Operator	2	A/1C
27350	AC&W Operator	2	S Sgt
27370	AC&W Supervisor	1	M Sgt
29150	Comm Center Specialist	2	A/1C
29270	Crypto Oper Supervisor	1	T Sgt
30352	AC&W Radar Repairman	3	A/1C
30352	AC&W Radar Repairman	2	S Sgt
30372	AC&W Radar Maint Tech	1	T Sgt
30372	AC&W Radar Maint Tech	1	M Sgt
30450	Ground Radio Repairman	1	S Sgt
30470	Ground Radio Maint Tech	1	M Sgt
36251	Carrier Repeater Mech	1	A/1C
36271	Wire Maint Tech (Inside Plant)	1	T Sgt
55151	Construction Equip Opr	1	S Sgt
56170	Electrical Supervisor	1	T Sgt
56450	Plumber	1	A/1C
56450	Plumber	1	S Sgt
56750	Elect Power Production Operator	1	A/1C

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AFSC	TITLE	TOTAL	GRADE (cont'd)
56750	Elect Power Production Operator	1	S Sgt
56770	Elect Power Production Tech	1	T Sgt
56770	Elect Power Production Tech	1	M Sgt
62250	Cook	3	A/1C
62250	Cook	1	S Sgt
64173	Organizational Supply Supv	1	M Sgt
90270	Medical Service Supv	1	M Sgt
59150	Seaman	1	S Sgt
59151	Marine Engineman	1	A/1C
	TOTAL	46 - 6 Officers and 40 Airmen	

3. Reference Annex B, app 1, para 12a(5): A 75-line switch board is too large for the limited requirements for telephones on the towers. A requirement for a 40-line unattended board has been included in ADC PC revisions.

4. Reference para 12a(6): A public address system is being installed by the contractor. Its tie-in to the telephone system is unknown.

5. Reference para 12a(8): Operational communications cannot be decided in detail until a firm organization is established to support the towers.

6. Reference para 12b (1) (b): No multi-channel UHF equipment is programed. ADC has programed the single channel equipment AN/GRT-3 and AN/GRR-7 for Texas Tower use.

7. Reference para 12b (2) (d): The frequency band to be used and the assignment of frequencies in this band cannot be decided until equipment type is known. It is possible that frequencies in the 900 MC range may be used in addition to those listed in the EADF plan.

8. Reference para 12c (2): The initial installation provides for only two (2) UPR-35's, the balance will be the scopes provided with the prime equipment. All UPA-35 scopes used in the Texas Tower program must come from those now allocated to the ADC.

9. Reference para 12f (2): There is no approved USAF plan for Navy or Coast Guard equipment and personnel for the Texas Towers. Approximately 500 square feet of floor space has been set aside for this purpose if and when the requirement is established.

10. Reference para 9f, page 5: The Texas Towers with their associated parent directions center are outlined in para 1.

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Subject: Change to Detachment Manning to be for Texas Towers
To: C&E From: M&O Date: 27 Jan 55
O&T (Contd)
P&R
Elect
M&O
(In Turn)

2. The differences and reasons for differences from the 20 July 1954 Operations Plan for Texas Towers are as follows:

a. Three controllers and two radar maintenance personnel added due to change in concept from remote to on station operation and the resulting addition of equipment to the towers.

b. Boiler Technician - plumber type personnel added to maintain the steam pressure and steam heat equipment. This capability was not included in the original table.

c. Utilities Superintendent added to provide technical supervisory capability for tower maintenance.

d. Winch Operator added to provide boat launching and recovery, cargo loading and unloading capability.

e. One carrier repeater mechanic added to provide additional wire maintenance capability.

f. Three ECM maintenance personnel deleted since the requirement was deleted.

g. Building crafts supervisor deleted due to lack of need for woodworking capability.

h. One ground radio repairman deleted due to lack of requirement for more than two radio mechanics.

3. Request your comments and/or concurrence. After consolidation of these comments, the manning table for Texas Towers detachment contained herein will be included in the Operational Plan for Texas Towers which is presently being revised.

JAMES R. WERGIN
Colonel, USAF
Director, M&O
Ext 2237/2238

0947

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Subject: Texas Tower Program
To: P&R   From: C&E-A   Date: 21 Feb 55

1. The EADF Communications-Electronics Annex to the Texas Tower Operational Plan has been reviewed and found adequate except as noted in the following paragraphs.

2. Reference paragraph 12A(3), page 6. This is an adequate number of circuits, providing that control channels can be derived from the voice circuits.

3. Reference paragraph 12a(5), page 6: A 75-line switchboard is too big for the limited requirement for telephone on the towers. A requirement for a 40-line unattended board has been included in ADC FC revisions.

4. Reference paragraph 12a(6), page 6: A public address system is being installed by the U.S. Navy. Its tie-in to the tower telephone system is unknown.

5. Reference paragraph 12a(8), page 7: Operational communications needed will depend on the type of organization authorized to support the Texas Towers. These circuit requirements should be established by O&T.

6. Reference paragraph 12b(1)(b), page 7: No multi-channel UHF is programmed. ADC plans call for single channel equipment AN/GRT-3 and AN/GRR-7.

7. Reference paragraph 12b(2)(d), page 8: The frequency band to be used and assignment of frequencies in this band cannot be decided until equipment type is known. It is possible that frequencies in the 900 mc range may be used in addition to those listed in the EADF plan.

8. Reference paragraph 12c(2), page 8: The initial installation will require only two AN/UPA-35's, to be used in control positions. This requirement may be deleted when the AN/GPA-23 is available. Any AN/UPA-35 scopes used in the Texas Tower Program must come from those now allocated to ADC. Scopes in excess of the two AN/UPA-35's will be furnished as a part of the radars.

9. Reference paragraph 12f(2), page 9: There is no USAF approved plan for Coast Guard personnel or equipment on Texas Towers. It is a possibility, however, for the tower on Nantucket Shoal.

10. Reference Appendix 2, Wire Requirements:

a. The decision on circuit adequacy should be made by O&T.

b. NAVFORCONAD has been told by Chief of Naval Operations that Navy personnel and equipment will not be assigned to Texas Towers before 1958.

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Subject: Texas Tower Program
To: P&R From: C&E-A Date: 21 Feb 55
(Contd)

11. Reference paragraph 9f, page 5: It is considered advisable to have Texas Towers under operational control of shore AC&W sites within the same subsector. Therefore

a. TT-1, Cashes Lodge, should be under operational control of the 762nd AC&W Squadron, North Truro AFS, Mass.

b. TT-5, Browns Bank, should be under operational control of the 672nd AC&W Squadron, Barrington, N.S., Canada.

12. Although the type of organization for support of Texas Towers is not the responsibility of this office, it is believed that an AC&W Group to operate Texas Towers is not desirable because:

a. Assigning Texas Tower operating personnel to shore-based AC&W sites will give more efficient operation since both tower and shore personnel are from the same organization and controlled by the same commander.

b. A Texas Tower AC&W Group with all personnel not actually on duty on the towers assembled in one location provides nothing constructive for these men to do during their time on shore. Such a plan will result in poor morale, excessive disciplinary problems, and is not good military management. If a training AC&W site is built as recommended by EADF, it cannot be operational before 1958. Even though such a site were built, a continued training mission for those not then on a Texas Tower will not accomplish desired result.

WILLIAM A. LAFRENZ
Lt Colonel, USAF
Chief, Plans & Proj Div
Ext 2411/2643

HASKELL E. NEAL
Colonel, USAF
Dir of Comm & Elect
Ext 2228/2229

1 Attchmt
n/c

[illegible]RET

Subject: Texas Towers
From: F&R   To: [illegible]   Date: 1[illegible] Feb 55 Comment No. 1

1. Generally, this directorate concurs with the attached plan from an operational viewpoint. Target direction centers for the Texas Towers have been changed to a degree, but the change is not expected to affect the overall plan. This change will be discussed separately with [illegible] and [illegible].

2. The [illegible] portions of this plan has been withdrawn and forwarded to [illegible] for comments.

3. Request your comments or concurrence with the proposed manpower and organizational structure to support the Texas Towers program. Is [illegible] your comments be available for discussion during the meeting, referenced in paragraph 4 below.

4. A meeting will be held in Systems Division, [illegible], 1330 [illegible] to consolidate comments for preparation of a reply to [illegible]. Representatives of [illegible], [illegible], OST, [illegible] and D/M will be invited.

/s/s/ [illegible]
Lt Col, USAF
Chief, Systems Div.
Ext 2521

/s/s/ [illegible]
Colonel, USAF
Director, F&R
Ext 2215-2217

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23 Feb 1955

82

From: Hq USAF, Washington D. C.

To: Comdr, ADC, Ent AFB, Colo.

/CONFIDENTIAL/ From: AFMSP-PL Attn: DCS/M 58233 ref logistic support for Texas Towers. This Rad in 4 parts: Part I. This answers your letter ADMME, subj: Cross-Servicing Agreement for Texas Towers, 3 Jan 55. Since available information of detailed requirements was considered inadequate to arrange meeting with Navy on receipt this letter, Lt Col Bradley, this office, visited your hq 14 January and requested your D/M Texas Tower Project Officer to forward a detailed logistic support plan. This not yet received. However, your 1st indorsement, 8 Feb 55, "Supply Ships for Texas Towers" ADMSV-2A, in answer to a request for transportation requirements. Provides most of the information needed. Initial reaction here tentatively opposed your concept of major housekeeping support by Navy. Believe it probably best AF provide maximum support to towers using MSTS for cargo and probably helcopters for personnel. Part II. Anticipate decision on helicopters early this week. Believe approximately 6 or 7 H21B's can be authorized for routine rotation of personnel and for emergency use. Part III. Informal information from Navy indicates that submarine detection gear for towers does not exist and must be developed. They do not anticipate the Naval detachment of personnel aboard towers before 1958. Part IV. Request representatives of your command visit this hq

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Msg from Hq USAF to Comdr. ADC, (Continued)

0900 Wednesday. 2 Mar 55, prepared to stay thursday and friday, if necessary. Contact Lt Col Bradley, Room 4D-266, Ext 78435. Purpose: To discuss logistic support of Texas Towers; to conduct as much detailed logistic planning as practicable; to determine the specific type and capability of surface and air transportation required; port or ports of operation, base or bases of helicopter operation and/or logistic support; areas of support required by other services; etc.

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83

DEPARTMENT OF THE AIR FORCE
Headquarters United States Air Force
Washington 25, D. C.

25 March 1955

AFMLP

SUBJECT: (Unclassified) Logistic Support for Texas Towers

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. References:

a. ADC letters ADMSS, "Cross-Servicing Agreement for Texas Towers," 3 Jan 1955 and 16 Feb 1955, to Director of Supply and Services, Hq USAF.

b. TWX AFMLP-PL 58233, 28 Feb 1955, from Asst for Logistics Plans, Hq USAF, to DCS/M, ADC, subj: "Logistic Support for Texas Towers.

c. ADC 1st indorsement, subj: "Supply Ships for Texas Towers," dated 8 Feb 1955.

2. a. The references in par 1a contained your concept of rather extensive cross-servicing support of Texas Towers by the Navy.

b. Reference b indicated our tentative position regarding this concept, and requested an ADC-USAF conference to resolve Texas Tower logistic support problems.

c. Reference c stated your personnel and cargo transportation requirements for a Texas Tower of 80 personnel (55 Air Force and 25 Navy) with 45-day supply levels, 15-day resupply and 30-day rotation of personnel.

3. The ADC-USAF conference was held in the Pentagon, 3-4 March 1955, and considered primarily the support for the first Tower (BOD 1 Sept 1955), with general consideration to the ultimate requirements in support of five Towers. Incl 1 contains a discussion of this conference.

4. As indicated in incl 1, this headquarters recommends the use of H21B helicopters for transportation of personnel and of cargo other than diesel fuel and water to the first Tower. Water will be distilled on site, and diesel fuel storage will be increased by approximately 110,000 gallons, permitting occasional resupply by standard tankers.

5. You will be advised of the results of further investigation by this headquarters into the method of discharging cargo from standard vessels.

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Ltr to ADC, subj: Logistic Support for Texas Towers (contd)

6. Two H21B's with adequate support can be made available for the first Tower. We anticipate manning requirements of 3 pilots and 3 ground crew personnel per helicopter, assuming you would base them at Otis AFB.

7. If you agree with this concept, the date the helicopters are required and your helicopter personnel requirements should be submitted as soon as possible. A revised logistic plan should also be prepared.

BY ORDER OF THE CHIEF OF STAFF:

1 Incl
Logistic Support for
Texas Towers

EDWARD M. MOORE
Colonel, USAF
Deputy Ass't for Log. Plans
Office, DCS/Materiel

JAMES P. [illegible]
Brigadier General, USAF
Assistant for Logistics Plans
Office, Deputy Chief of Staff, Materiel

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LOGISTIC SUPPORT FOR TEXAS TOWERS

1. This inclosure contains the results of discussions in an ADC-USAF conference, 3-4 March 55 on Texas Tower logistic support. Some information obtained after the conference is also included.

a. Naval Detachment: Latest information available from the Navy indicates that provision of their detachments aboard the Towers depends on the development of technical equipment. The Navy estimates no naval personnel aboard before CY 1958.

b. AF Strength: Present programming calls for augmenting the parent radar site by 46 men -- the anticipated strength of the Tower detachment. It was understood ADC planned rotating the men for 30-day tours on the Tower from similar jobs at the parent site.

c. Surface Movement of Personnel: ADC's "Plan for Logistic Support of Texas Towers," July 1954, calls for normal movement of personnel and supplies by surface transportation, and emergency transportation by helicopter. Investigation into this revealed a requirement for trips to each tower at least once a week to avoid the turnover of too many personnel at one time. This would mean the full-time commitment of more (specially equipped) ships than would be required for resupply only. Otherwise, if we used only one ship (of adequate size for resupply operations), the in-transit loss in manhours would require more manpower to sustain operations at the parent site and the tower. In addition, surface transportation costs of moving personnel from their home sites to and from the port would be incurred.

d. Air Movement of Personnel: Because of the disadvantages of surface personnel movement, the conferees agreed that personnel should normally move by helicopter between the parent sites and the Towers. Weather factors were discussed and, since the rotation schedule can be varied somewhat, the expected delays awaiting suitable weather appear acceptable. The representative of Hq Air Weather Service felt sure that the longest period during which visibilities and the winds might prevent routine H21B operations to a Tower would be one week. The H21B is considered the best aircraft available for this purpose because of:

(1) Capacity -- Carry approximately 10 men or 2000# cargo without refueling at Tower, and with adequate survival gear on board.

(2) Ease of handling in cross-wind landings.

(3) Flexibility -- because of the capacity, bad weather delays can be rapidly overcome.

(4) Fewer personnel required for the H21B operation than for a larger number of smaller helicopters.

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Based on a planning figure of 75 men rotating monthly from five towers, we considered 6 H21B's, probably based at Otis AFB, Suffolk County Apt and Brunswick NAS and/or Halifax N.S., to be adequate for personnel movement. To assure the availability of one helicopter in commission for emergencies, and to provide additional lift while the initial operation is being tested, 2 H21B's will be authorized for the first tower, if acceptable to ADC. This will also provide additional training and cadre personnel forexpansion next year.

e. Cargo Ship for Resupply: The conferees were advised that a suitable ship which could supply the Towers with the various cargoes required does not exist -- either in the Naval or Commercial fleets. To obtain one would require modification and contracting for it on a full-time basis (through MSTS). The smallest size considered appropriate would be large enough to supply all five Towers every 15-30 days. Therefore, it could be utilized only 20% of the time during the first year for the first Tower. The cost has been estimated at $1000-1200/day for such a ship.

f. Helicopters for Resupply: To avoid obtaining a special ship for the first Tower, airlift of cargo was considered with the following results:

(1) The 2 H21B's at 50 hrs/mo each and 3 hrs/round trip should provide about 33 sorties per month, carrying 10 passengers or 2000# cargo. Using ADC's latest strength figure of 55, 5.5 sorties would transport the personnel on rotation. This leaves 27.5 sorties available -- a potential 55,000# of airlift (less emergency runs of less than full load).

(2) We scaled down ADC's tonnages listed in reference 1c basic letter (80 men) to those for 55 men, excluding water and Diesel fuel. These dry cargo requirements were approximately 31,000#/month -- or 15.5 H21B sorties. A margin of 12 sorties remained for unscheduled flights.

(3) A decision a) to move the personnel by air; b) to use the vehicle now considered best for this -- the H21B; and c) to authorize 2 of these for the reasons stated above, results in enough capacity to airlift dry cargo without an increase in helicopters or helicopter personnel -- for the first Tower.

(4) After five Towers are operating, helicopter utilization for personnel movement could be improved, and the five Towers supported with 6 H21B's as indicated above. Prior to that time, the cost of operating 4

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more helicopters to continue air resupply at all five sites should be compared with surface transportation costs. ADC should have about six months experience with the first Tower before a decision on a ship for the second year sites is required.

g. Water: Latest information from the AF Installations representative in Boston indicates that apparatus for normal distillation of water will be installed in the first Tower.

h. Diesel Fuel: Diesel oil storage can be increased by 100-120,000 gallons to 1[illegible]-16[illegible],000 gallons, or about 5 months supply. Installation of a constant tension towing engine on the Tower to assist in receiving cargo from standard ships is being considered. With only 2-3 trips a year, it is felt that diesel resupply can be scheduled in favorable weather, using standard vessels with little modification (high-pumping capacity to lift fuel to the Tower), and using Harbor pilots previously briefed on a [illegible].

2. Further conversations during the second day of the conference reaffirmed the desirability of using a maximum of airlift for the first Tower, provided that fuel oil and water can be provided without obtaining a full-time ship. These items were further investigated by Hq USAF. As indicated above, water supply can be obtained by distillation and a constant tension towing device can be installed on the Tower, if necessary, limiting surface resupply to diesel fuel from standard tankers, if ADC decides to use the H21's as suggested above (and assuming they prove to be as suitable as expected). Representatives of this headquarters will visit Boston soon to discuss the method of discharging fuel (and other cargo if required -- e.g. heavy equipment) to the first Tower.

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Hq USAF, Subj: Logistic Support for Texas Towers

ADMSL-3 (25 Mar 55) 1st Ind 30 Apr 1955

Hq AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colo.

TO: Director of Air Force Materiel for Logistic Plans, United States Air Force, Attn: AFMSP-PL-US, Washington 25, D. C.

1. Air Defense Command concurs in general with the proposed logistic support plan for Texas Towers.

2. Reference is made to inclosure No. 1, Logistic Support for Texas Towers:

a. Paragraph 1a, Naval Detachment: Noted.

b. Paragraph 1b, AF Strength: This paragraph indicates that parent radar stations will be augmented by "46 men--the anticipated strength of the tower detachment". The ADC plan is to augment all parent radar stations by 70 men, the anticipated strength of the "on tower" detachment plus the strength of the "off tower" detachment.

c. Paragraph 1c, Surface movement of Personnel: Concur

d. Paragraph 1d, Air Movement of Personnel: Concur in the requirement for two helicopters to rotate the personnel of Texas Tower No. 2 by airlift. However, it is recommended that decisions regarding the 4 additional Texas Towers be held in abeyance until "in commission rates" of the H-21 are determined. Prior to Beneficial Occupancy of the four additional towers, sufficient data should be available for a determination of feasibility and the number of helicopters required for the support of five towers.

e. Paragraph 1e, Cargo Ship for Resupply: Concur in that the cost for a suitable ship to support the first tower would be excessive. However, when the five towers are in operation and with a constant tension tending device mounted on the Texas Tower many types of ships could be handled at the tower for on and off-loading operations. This possibility was discussed at the conference.

f. Paragraph 1f, Helicopter for Resupply: Concur, however, in commission rates will need be considered also.

g. Paragraph 1g, Water: In addition to the normal distillation of sea water it is possible that the fuel tanker will be able to pump water aboard while delivering fuel. The quantity delivered would be governed by the "fresh water bunker capacity" aboard the tower and the tanker

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Ltr to USAF, Subj: Logistic Support for Texas Towers (contd)

capability. This augmentation would reduce the fuel required to distill water.

h. Paragraph 1h, Diesel fuel: Concur.

3. Request the following action be taken to insure ample time for organization and training of the helicopter support element:

a. Two each H-21B helicopters, with flotation gear modification be furnished Air Defense Command and assigned to the 564th Air Defense Group, Otis AFB, Mass. on or about 1 July 55.

b. Concurrent with the assignment of 2 H-21B helicopters to Otis Air Force Base, it is requested that our Non-T/O authorizations be increased by 6 officers and 6 airmen o/a July 55 as indicated below:

Job Title	Rank	AFSC	Total Required
Pilot	Capt	1024	2
Pilot	Lt	1024	4
Crew Chief	T/Sgt	43170	2
Helicopter Mech	A/1C	43150	2
A/C Recp Eng Mech	S/Sgt	43251	2
		Total	6 officers 6 airmen

c. In view of the AOCP and ECC conditions being encountered with H-21 type aircraft, a supply precedence of II within a mission category of 2 will be required. It is recommended that USAF instruct AMC to render all possible supply assistance to support this project. This headquarters is prepared to provide liaison with the prime AMC Depot for the preparation or adjustment of Table II or the institution of [illegible] action. It is desired to have spares and equipment in place 30 days prior to delivery of aircraft.

4. Back-Up Surface Transportation: Your proposal implies that helicopter service will meet all personnel and dry supply transportation requirements, with a recognition of a possible week's delay due to weather. This command foresees other situations that would induce a transport problem and reduce the Texas Tower operational capability unless back-up surface transportation is immediately available. For example:

a. Helicopter goes "out of commission" after landing on the Tower. Sufficient space would not be available to land a second helicopter, thus the landing area would be closed with a resultant lack of support until the helicopter was returned to service and the landing area cleared.

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Ltr to USAF, Subj: Logistic Support for Texas Towers (cont)

4. Curtailment of flight schedule due to [illegible] and other "out of commission" factors would result in inadequate resupply of replacement spare parts, rations and supplies. Shortages in these areas of supply, and personnel fatigue generated by extended periods of duty would seriously impair the operational capability of the tower.

5. Considering these factors, this command considers it mandatory that a procedure be in being for back-up surface transport at all times. All interested agencies must be informed of the procedure and that the commander, 762nd AC&W Sq, North Truro, is authorized to implement this plan as required. It is recommended that a cross-servicing agreement between the USAF and the U.S. Navy, MSTS, or the U.S. Coast Guard be accomplished to provide such back-up surface transportation. Request advisement on this point.

6. A revised logistics annex to the Texas Towers operational plan is being prepared and will be published o/a 1 May 55, copies of which will be forwarded your headquarters.

FOR THE COMMANDER:

/s/ W. J. [illegible]
Lt Col, USAF
Asst Comd Adj

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84

From: COMDR ADC

To: COFS HQ USAF
ATTN: AFMLP
WASHINGTON 25, D. C.

Info: COMDR EADF

(UNCLASSIFIED) ADMEL-3 15634 . This is an interim reply to your ltr 25 Mar 55, AFMLP, Subj: (UNCLASSIFIED) Log Supp for Tex Towers and incl thereto. This comd concurs in the H-21 B air logistics supp concept. Req heptrs and pers be in place o/a 1 Jul 55 at Otis AFB. Further req nec act to ins adequate sup priorities and H-21 B flotation gear modn.

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85

From: Hq USAF, Washington 25, D. C. 28 April 1955

To: Comdr ADC

From AFOOP-OC-S 46504 Attn: MCS and MCCR. This msg in 2 Parts. Part I to all: ADC msg ADMEL-3 15634, dtd 19 Apr 55. Action w/b taken to asg six H-21 hcptrs to ADC for logistic supp of Texas Towers. Two hcptrs w/b assigned initially with remainder phased with tower const. since acft w/b engaged in extensive over-water operation, they must be equipped with floats. Part II to ADC: Two H-21B acft w/b asgd your comd from June pdn under proj ADC 5H-619. Otis AFB should immed initiate action under para 11, section 21, volume 3, AFB 67-1 to obtain sufficient spares to supp fifty flying hrs per month per acft, desire you rqn plts and mechanics to supp this operation IAW normal rqng pros. These pers cannot be made avel until approx sep 55. However, if you can prov well qualified pers from curr resources to satisfy immed rqrs, this hq will arrange for H-21 plt and mechanic tng at early date. Advise your desires ASAP. FYI, 5 hcptr plts were asgd your comd from plt course 55-H-H graduating 15 Jun 55. AF Form 449 nos. 4-1467, 68, 69, 70, 71 effected this asgmt. Desire you sbm rqr for installation of flotation gear on H-21B acft to AMC at EPD IAW AFR 57-4.

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86

Subject: Logistic Support for Texas Towers
To: DCS/P From: ADMEL Date: 20 Apr 55

1. Reference is made to Headquarters USAF letter, subject as above, dated 25 March 55 and R&R, your office, dated 13 Apr 55.

2. It has been decided to assign two H-21B helicopters to Otis Air Force Base for transportation of personnel and supplies between the 762nd AC&W Sqdn N. Truro, Mass., and Texas Tower #2.

3. Request the personnel to maintain and operate the two H-21B's be programmed and if possible, to be on statin at Otis AFB in July 55. Personnel requirements are as follows:

Job Title	Rank	AFSC	Total Required
Pilot	Capt	1024	2
Pilot	Lt	1024	4
Crew Chief	T/Sgt	43170	2
Helicopter Mech.	A/1C	43150	2
A/C Recp Eng Mech	S/Sgt	43251	2
		Total	6 officers 6 airmen

RITCHIE A. TURNBULL
Lt Colonel, USAF
Dir Elec S&M

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87

Hq USAF, AFMTP-PD, Subj: Supply Ships for Texas Towers

ADMEL-3 (10 Jan 55) 3rd Ind 29 Apr 55

Hq AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colo.

TO: Director of Transportation, Headquarters United States Air Force, Washington 25, D. C.

1. Reference is made to Hq USAF letter AFMTP-PL-US dated 25 March 55 and 1st Ind thereto. The concept of resupply by helicopter has been accepted by ADC; therefore the requirement for a special vessel, reference attached correspondence, is no longer valid.

2. Your proposals imply that helicopter service will meet all personnel and dry cargo transportation requirements, with recognition of a possible one week delay due to weather. This command forecasts other situations that would induce a transport problem and reduce the Texas Tower operational capability unless back-up surface transportation is immediately available. For example:

a. Helicopter goes "out of commission" after landing on the tower. Sufficient landing space would not be available to land a second helicopter, thus the landing area would be closed with a resultant lack of support until the helicopter was returned to service and the landing area cleared.

b. Curtailment of flight schedule due to TOC and other "out of commission" factors would result in inadequate resupply of replacement spare parts, rations and supplies. Shortages in these areas of supply and personnel fatigue generated by extended periods of duty would seriously impair the operational capability of the tower.

c. Some replacement units or parts for major repairs may exceed the weight or dimension factors of the helicopter.

3. Considering these factors, this command considers it mandatory that a procedure be in being for back-up surface transport at all times. All interested agencies must be informed of the procedure and that the Commander, 762nd AC&W Sq, North Truro, is authorized to implement this plan as required. It is recommended that a cross-servicing agreement between the USAF and the U.S. Navy, MSTS, or the U.S. Coast Guard be accomplished to provide such back-up surface transportation. Request advisement on this point.

4. This headquarters is coordinating the required tower changes with AFTRO-MED and the revised logistics annex to the Texas towers

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operational plan is being prepared and will be published o/a 1 May 55, copies of which will be forwarded your headquarters.

5. The Area Petroleum Control Office Olmstead AFB, had been informed of the fuel requirements and the requirement for a docking pilot.

FOR THE COMMANDER:

1 Incl
a/s

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COPY 88

3 February 1955

Capt. Burris:

Here is the first installment on the information I have been able to find which is applicable to the Texas Tower problem. I think this information is sufficient to determine the operational criteria for the operation and on its basis have included a tentative list of weather criteria. You can look this stuff over and check with the requesters and see if they agree. If so then all that remains is to grind out the data.

Incidentally, I talked to a Marine copter pilot yesterday and his opinions were in line with the two pilots mentioned in the write up. He felt though that visibility restrictions were somewhat more critical than the AF or Army pilots did. Major Mclean felt that if the copter pilot lost his horizon line (actual and not an instrument line) that the pilot was definitely handicapped. The marines have also had considerabl experience with copters operating off of carriers etc and he said that the maintainence problem with copters is about twice as bad as with fixed wing aircraft. There is also a real problem with the H-17 on salt air corrosion also and the marines find that copters on carriers are in the shops more than in the air. He seriously doubts the feasibility of stationing copters on the towers just from the maintainence standpoint. He thought it would take 3 copter specialists on the platform working full time to keep it in commission and plenty of spare parts available in addition. So I would suggest that the ADC people who are thinking about stationing copters on the platforms get in tough with the naval people who have had maritime experience with copters and discuss it with them first. While the idea is fine, its feasibility is seriously in doubt based on the talk yesterday. He felt that if you could station the copters at land bases with lots of parts and maintaince equipment available, then you could keep the operation going from the repair standpoint without too much time lost due to the copters not being in flying shape.

I have also requested a NIS summary for our area be sent out to you which will have a lot of the required weather data all summarized for you. When you get it note section 3, page 168, "human survival in water". This is good information to give ADC for this operation also. In addition I have some special navy tabulations coming next week which will have other data summarized for this operation. I'll compile and send it out to you as it is worked up. I'm sorry I don't have the list of the tabulations available at present, but I'll call you next week and tell you what I will have for you along this line.

From this end, I think we have this pretty well lined up now and if ADC goes along with the weather criteria, then we shouldn't have too much trouble working up the data for them.

I'll call you next week.

Church

0365

TENTATIVE WEATHER CRITERIA FOR HELICOPTER OPERATIONS

In solving the weather feasibility problem for helicopters in support of the Texas Towers it is suggested that the following weather criteria be used:

1. Daylight operations only.
2. Winds enroute and during landings be less than 35 knots with little or no gustiness (- 10 knots).
3. Flight conditions enroute and at terminals be:
   a. Ceiling equal to or greater than 500 feet.
   b. Visibility equal to or greater than 1 mile.
   c. No heavy weather involvement which should include
      1. No icing.
      2. No hail.
      3. Moderate or greater turbulence.
      4. No frontal penetrations.
      5. No thunderstorms.
   d. Flight above or below cloud decks, but not through or in clouds.

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28 January 1955

HELICOPTER WEATHER CAPABILITIES

This information is the result of interviews with Lt. Col. Ferdinand L. Svore, OIC of MATS Air Transport Section, Wing B, Room 214, phone 3144, on the capabilities of H-19 and H-21 helicopters and their weather limitations. His opinion was cross checked by talking to Major George and Capt. Gill of the Army Transportation Corps, Fort Belvoir, Virginia, in an effort to eliminate personal prejudice from the comments. All pilots have had considerable copter experience in both types.

I asked these gentlemen the following questions which I thought would outline the weather capabilities of the two copters and help to establish reasonable weather criteria for helicopter operations. Their consolidated comments in answer to the questions follows.

Q. 1. Can helicopters fly instrument?

A. At present there is only one helicopter in the AF which is authorized to fly instrument. This is an experimental model at Wright-Patterson, which is helping to develop suitable instrument flying equipment that would be usable on helicopters. However, copters do have a limited instrument capability in that they can cut their forward speed way down and "feel" their way along in extremely bad flight conditions which would be impossible with the conventional-type aircraft. (Other limitations will be brought out in later questions which bear also on this problem.)

Q. 2. Can helicopters fly at night?

A. Yes, but their pilots prefer daylight operations due to the lack of what they feel is necessary instrument equipment. However, if the pilot is familiar with the route, has a moon, or lights from cities, or is not in complete darkness, then he can fly visually at night without too much trouble, providing his landing area is known clear of landing obstructions, etc., and/or lighting is available.

Q. 3. How strong head winds can they handle?

A. Both types cruise at approximately 85 to 90 knots. They are not bothered by turbulence enroute like conventional craft since they literally "ride with the wind" due to their slower ground speed. Also, during landings there is what is called "ground cushion" which is the result of the downward rush of air from the rotor blades not diverging fast enough laterally. This develops the "cushion" and even during gusty surface conditions makes copter operations easier than conventional craft. (However, this depends somewhat upon the orientation of the tail boom and its rotor to the prevailing winds during landings. They like to land copters into the wind, as is customary of other types of aircraft, to minimize this tail ossilation problem.) This cushion effect is even beneficial on rolling or pitching ship landings since the cushion allows the copter to roll and pitch in phase with the underlying ship, so it is no problem to set one down on shipboard under these conditions.

From the cruise speed and range characteristics of the particular type copter, the maximum head wind they can make progress against can be computed. When they encounter strong winds they like to fly close (50 to 100 feet) to the ground and minimize the wind's effect.

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Q. 4. How sensitive are they to turbulence?

A. (See comments in question 3 also.) Their design factor is about 2.5 G's. The most sensitive part of the craft is their rotor blades. They can take a lot, but the rotors cannot take any icing or hail, and with the older-type blades even heavy precipitation of the shower type without partial or total destruction and it's attendant rotor vibrations. In heavy thunderstorms, they don't like to fly near them due to possible downdraft fluctuations, hail possibilities and visibility restrictions. Also frontal penetrations are unwise due to the instrument conditions involved and the possibility of icing of rotor blades.

Q. 5. Can they take any icing?

A. Emphatically no! This is the most important weather criteria according to copter pilots. There is no anti-icing means available on present rotors for these two types of copters and icing of the blades is sure death as far as they are concerned. However, the engines do have carburetor heaters, etc., and can handle engine icing problems.

Q. 6. Can they land under gusty surface conditions?

A. (See question 3 also.) They should be landed into the wind and an experienced pilot can handle gusty conditions up to about 40 knots. This is qualified to mean with no structural obstacles in the area of the landing platform which could produce eddy turbulence, or venturi effect problems. If there are landing obstacles around the area, it is very trucky since the tail boom and its vertical rotor can ossilate and be damaged as can the main rotor blades by gustiness. Also, landings under gusty conditions on shipboard are nasty in that unless both wheels or floats of the landing gear are tied down simultaneously, and the copter gets caught in a gust she is a gone goose. If they are both free and a gust hits, the pilot just lifts it clear and hovers back down when the gust decreases.

q. 7. What is their operational ceilings?

a. They like to fly as low as possible usually as the winds are less, but generally their ceilings are about 10,000 feet. However, under strictly test conditions they have been flown as high as 18,000 ft.

For most field operations the pilots feel that ceilings of about 500 feet and 1 mile are reasonable minimums although they admit that they have flown under much worse conditions without too much trouble and it is possible, but as a steady diet it is not practical. Lt Col Svore claims that 100 feet and ½ mile are feasible lower limits based on his copter experience in Korea and Japan. However, the Army pilots didn't concur in this and thought the higher limits especially over water would be better as they would allow some margin for forecast errors enroute and the patchiness of fog and stratus over water.

q. 8. Is there any temperature restrictions on their use?

a. No. They have winterization kits available to -65° F. at present and covers for canopies, engines, and rotor blades for frost, etc., are available. They expect winterization kits to even lower temperatures to be available shortly.

q. 9. What landing visibility restrictions are reasonable?

a. Lt Col Svore claimed ½ mile is plenty if the landing area is known, but the Army pilots thought that they should 1 mile as a minimum if any appreciable winds were involved and particularly if gusty winds.

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Q. 10. What is their range capability?

A. About 4 hours without floats and about $3\frac{1}{2}$ hours with floats with normal loads.

Q. 11. What communications equipment is available on helicopters?

A. Either VHF or UHF, radio compass and occasionally other sets are available. Since copters like to fly rather low and UHF and VHF equipment is line of sight gear, there may be a communication problem unless they climb up a few thousand feet prior to using the equipment. For the areas of this country it is possible that ducting phenomena may extend the range of their micro wave sets considerably as well as radar search equipment located at landing sites who might be looking for them also.

Q. 12. Does flying upward or downward through inversions affect copter operation?

A. No problem usually. However, if they are flying in real cold air and climb up through an inversion into warm tropical air, the plastic bubble around the cockpit usually fogs up and restricts the pilots visibility until it heats up. Only other effect possible is the ducting problem on their communications gear.

Q. 13. Would sea spray affect their usability?

A. Yes to varying degrees. The H19 is about 90% magnesium construction which is subject to rather rapid salt corrosion pitting unless appropriate protective varnishes are covering the metal. The H21 has only about 10% magnesium construction and the remainder is aluminum

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so its corrosion problem is less.

Q. 14. Would icing of the landing site bother them?

A. It could be tricky if there is much wind (see question 6), but in the absence of wind, ground handlers could do the job alright. If there is much wind, and icing is present, then the tie down problem is great and it is better not to plan a flight under such conditions unless the ice can be sanded, salted, or chopped clear of the landing area.

Q. 15. In a small landing area near buildings or other obstructions, such as on ships, are eddies due to these obstructions much of a problem in landing?

A. This is a definite problem. The platform for landing should be orientated such that the copters can land into the wind. Also, with eddies there should be room for the swing of the tail boom as it fish tails in response to the eddy currents. Gustiness caused by a venturi effect between buildings can also make it a rather tricky proposition on a small landing area.

Q. 16. Is snow a problem in flight or landing?

A. Only inso far as the icing hazard due to snow is concerned. The visibility problem causes them to slow down forward speed unless the route is known. At the usual heights they fly they have vertical visibility to the ground in the snow providing there isn't much snow cover on the ground. The engines are OK as far as snow is concerned in flight.

Q. 17. Are copters capable of hovering and supplying by cable

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if landing is impossible for some reason?

A. Yes, but it depends upon the length of the flight. To hover it takes 100% power, while flying they use only 60% to 65% power. So if the copter must hover for any extended period for loading, etc., its range is cut down considerably. For this kind of supplying at distances of 100 to 150 miles flight distance it would be risky on the fuel consumption basis alone. Actually if a copter can get close enough to hover, it can usually land and supply in the normal manner.

Q. 18. If copters had to RON after landing on a ship, for example, would this present any special problems?

A. Not usually, with preplanning the copter can carry rotor covers, canopy cover, etc. By proper planning, the RON problem shouldn't be necessary.

Q. 19. Can copters be refueled with the rotors going?

A. Yes. This is sometimes necessary during high winds. If the winds are above 30 to 35 knots you can't get the rotors started again once they are stopped. The reason is that as the rotor blade comes around into the wind it gets lots of lift and being flexible its tip rises considerably (that is, the starting speed is too small to hold the rotor blades straight out by centrifugal force as yet). Then as the blade swings around into the downwind leg it loses this lift and drops way down below the straight position and starts chopping the tail off the copter. So if there is much wind, they leave the rotors going and unload and/or load, or refuel with the blades idling just fast enought to hold the blades straight.

James F. Church
Captain, USAF

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COPY 89

Subject: Special Clothing for Texas Tower Personnel
From: ADMEL To: ADMSV ADMET ADMEG ADHFS Date: 13 May 55 Comment No. 1

1. A requirement exists for survival equipment and special clothing for personnel stationed aboard Texas Towers. This requirement may be divided into three general areas:

a. Texas Tower personnel will rotate from shore to tower via H-21 helicopter. Equipment and clothing for helicopter crews and passengers for overwater flight are required. Survival time in the Atlantic during winter months is very limited without special clothing.

b. During helicopter operation and transfer of cargo, surf boats must be launched and will stand by until completion of these activities. In addition to the boat crews, personnel will be required on the open deck portions of the tower during these operations and while accomplishing maintenance functions.

c. Total evacuation of the tower by lifeboat imposes a requirement for special clothing for all personnel.

2. Additional information:

a. Normally each of the 2 helicopters will transport 10 passengers plus crew of three.

b. Normally not more than 60 personnel will be aboard the tower at a given time.

c. Normally not more than 20 people will be engaged in open deck activities at one time.

d. Attached is a weather study for this area prepared by 3rd Weather Wing.

3. Request the necessary action be taken to determine and authorize the proper survival equipment and special clothing required.

4. Request this directorate be kept advised of action progress.

1 Incl
a/s

RITCHIE A. TURNBULL
Lt Colonel, USAF
Dir Elect S&M

An individuals chances of survival while immersed in water of temperatures below 50°F are greatly reduced because the human body does not keep pace with the heat loss; for this reason the individual has a reasonably good chance of surviving only if rescue is effected within 3 hours. There is very little change in survival times north of the 40th parallel between Feb and May as much of the water remains below 50° F. However, by May warmer water areas south of the 40th parallel are much larger, so that an individual immersed can survive longer. During August the survival time increases. By November the colder water makes it appearance and hence the survival time again becomes less than 3 hours.

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90

From: Comdr ADC
Comdr TTAF Gulfport, Miss.

11 Aug 1955

To: CofS, Hq USAF, Wash 25, D.C.
Comdr ATC, Scott AFB, Ill.
Comdr EADF, Stewart AFB, Newburgh, N.Y.

(CONFIDENTIAL) ADMNT-T-3B 3672. This msg in II Parts.

PART I. This comd has a rqr for Life Boat Usage and Sea Survl Tng for all pers sked for asgmt to Texas Towers. The fol info fwd IAW AFM 50-[illegible]. (a). Does not apply. (b). A short crse of tng teaching Survl at Sea and Life Boat Usage. (c) Prior to asgmt to Texas Towers, pers will compl above cited crse. (d) Rqr exist for tng of approx twelve (12) officer and eighty-four (84) amn. A continued rqr will be nec when add Texas Towers become opr as outlined in Part II. A finalized and compl tng rqr will be furn your Hq upon rec of Unit Manning Document now in Hq USAF for review and approval. (e) Req tng rqmt for Texas Tower [illegible] II for cited crse be furn on fol time-wise sked:

Sep 55: Two (2) Officers - Twelve (12) amn

Oct 55: Two (2) Officers - Twelve (12) amn

Dec 55: One (1) Officer - Twelve (12) amn

Jan 56: Four (4) Officers - Thirty (30) amn

Feb 56: Three (3) Officers - Eighteen (18) amn

TOTAL: Ninety-six (96) spaces.

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(CONFIDENTIAL) ADFGT-T-3B 3602.

PART II. The approx tng rqmt and sked for Texas Towers NRS 1, 3, 4, and 5 will be as fols:

Sep 56: Eight (8) Officers - Forty-eight (48) amn

Oct 56: Eight (8) Officers - Forty-eight (48) amn

Dec 56: Four (4) Officers - Forty-eight (48) amn

Jan 57: Sixteen (16) Officers - One Hundred Twenty (120) amn

Feb 57: Twelve (12) Officers - Seventy-two (72) amn

TOTAL: Three hundred eight-four (384) spaces. A continued rqr will be nec as pers rotate, discharge etc and replacements are reasgnd.

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COPY

91

ADMEL-3 25 May 1955

SUBJECT: (Uncl) Logistic Support Plan for Texas Tower #2

TO: See Distribution

1. The attached General plan for logistic support of Texas Tower #2 is provided for guidance in the preparation of a detailed support plan by Eastern Air Defense Force.

2. All agencies will coordinate actions deemed necessary with Commander, Eastern Air Defense Force for inclusion in the detailed plan.

3. Upon preparation of a detailed logistic support plan for Texas Tower #2, Eastern Air Defense Force will coordinate subject plan with Headquarters, Air Defense Command, prior to implementation.

FOR THE COMMANDER:

1 Incl
a/s

C. F. HUMPHREYS
Major, USAF
Asst Command Adj

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LOGISTIC SUPPORT PLAN FOR TEXAS TOWER #2

16 May 1955

PURPOSE:

The purpose of this plan is to provide guidance and direction for the preparation of the detailed logistical plan for the support of Texas Tower No. 2, Georges Shoal. The detailed logistics plan will be the responsibility of the Commanding EADF.

SCOPE:

This document contains the basic planning factors required for the formulation of a detailed logistical annex to the operational plan for Texas Tower No. 2. Items included are: supply, maintenance, transportation, evacuation, medical, and personnel services.

GENERAL:

The requirement for this plan is generated by the proposal to establish an Air Defense radar station on a modified, off shore, marine drilling platform on Georges Shoal. Texas Tower #2 will support radar, communications equipment, living quarters and storage space as required. The station will be manned and operated 24 hours per day. Construction is the responsibility of the Bureau of Yards and Docks, U.S. Navy. Normal transportation of personnel and dry cargo will be by helicopter. Liquid cargo is to be delivered by a standard tanker. Emergency supply will be by air or sea, dependent upon the transport vehicle capability and the nature of the emergency. Emergency evacuation of sick and injured shall be primarily by the assigned helicopters and augmented by appropriate rescue agencies, trained and equipped for such missions. Texas Tower #2 will be operated as a detachment of the 762nd AC&W Sq., North Truro, Mass.

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c. Supply.

1. Rations will be the responsibility of the Commander, 762nd AC&W Squadron through Otis AFB. Normal levels will be: 15 days of perishables, 30 days dry, and 15 days emergency rations, based on an average strength of 60 men. Periodic turnover of emergency rations will be required in accordance with current directives.

2. POL

(a) Requirements:

(1) Fuel, oil, diesel MIL-F-[illegible] (NSFO)
Initial supply - 150,000 gal.
30 day estimated consumption - [illegible] gal.

(2) Mogas
Initial supply - 3,000 gal.
30 day estimated consumption - 500 gal.

(3) [illegible] High detergent lube oil MIL-L-[illegible]
Type NAVY 9170
Initial supply - 1,650 gal.
30 day estimated consumption - [illegible] gal

(b) Method of Supply:

(1) POL will be delivered by commercial tanker as required. The commercial contract is the responsibility of the Area Petroleum Control Office, Olmsted AFB, Middletown, Pa. To protect the U.S. Government and the vendor, the contract should include a harbor pilot for docking operations at the tower.

(c) Procedure: Not less than 30 days of fuel, based on consumption, will be maintained on the tower. The Commander, 762nd AC&W Sq through Otis AFB will be

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responsible for effecting delivery of POL in sufficient amounts to fill the tower bunkers. The vendor will deliver as soon after receipt of request as is practicable considering the weather and sea conditions.

(d) __Schedule:__ Due to the many variable factors, a definite delivery schedule cannot be maintained. The Commander, 762nd AC&W Sq, the Commander, Otis AFB, and the vendor are thus required to maintain sufficient liaison to insure that POL shortages do not develop.

3. The 762nd AC&W Sq will be responsible for office and housekeeping supplies.

4. The 762nd AC&W Sq will be responsible for maintaining the UAL equipment. The 762nd AC&W Sq UAL will be augmented to include equipment authorized for Texas Tower No. 2.

5. The appropriate AMC agency is responsible for furnishing and installing the radar and communications equipment.

6. Electronic supply support will be the responsibility of the 762nd AC&W Sq through the designated electronic support base.

7. Unit, electronic, and R&U supply activities will be consolidated as a single function and minimum stock levels are as follows:

(a) Unit: As required by UAL

(b) Electronics: 45 day level of spare parts augmented by an appropriate level of replaceable assemblies and sub-assemblies of electronics components.

(c) R&U: 45 day level of R&U supplies, to include power generating equipment spares.

3. Exchange support will be the responsibility of Otis AFB, Mass.

B. Maintenance:

1. Electronics - to be performed by the Texas Tower detachment, 762nd AC&W Sq, contractor support, and AMA in accordance with current directives.

2. Installations - preventive maintenance and minor repairs by the Texas Tower detachment. Major repairs will be the responsibility of Otis AFB.

3. Lifeboats -- Organizational maintenance and minor repairs to be performed by the 762nd AC&W Sq. Major repairs and overhaul by the appropriate agency, Otis AFB.

C. Transportation:

1. Air: The prime mode of transportation for personnel and dry cargo will be by helicopter based at and maintained by the appropriate agency, Otis AFB, Mass.

2. Surface:

(a) Normal: Liquid cargo will be delivered by standard commercial tanker under contract.

(b) Emergency: It is mandatory that a procedure be in being for back-up surface transportation at all times. All interested agencies must be informed of the procedure and that the Commander, 762nd AC&W Sq, North Truro, is authorized to implement this plan as required. It has been recommended to Hq. USAF that a cross-service agree-

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ment with U.S. Navy be made to fulfill this requirement. Upon receipt of firm information from Hq, USAF this paragraph will be amended accordingly.

(c) Vehicles: The vehicles assigned to 762nd AC&W Sq will be augmented as required.

3. Air Lift Control: The helicopters will be under the operational control of the Commander, 762nd AC&W Sq. All agencies will coordinate the delivery of supplies for Texas Tower #2 with the Commander, 762nd AC&W Sq.

4. Air Lift Personnel: The Non-T/O authorizations are to be increased as follows:

Job Title	Rank	AFSC	Total Required
Pilot	Capt	1024	2
Pilot	Lt	1024	4
Crew Chief	T/Sgt	43170	2
Helicopter Mech	A/1C	43150	2
A/C Recp Eng Mech	S/Sgt	43251	2
		Totals	6 Officers
			6 Airmen

D. Evacuation:

1. Appropriate lifeboats as recommended in Feasibility Report on Texas Towers, Part 2, and in sufficient quantities consistent with personnel assigned will be provided for emergency evacuation. They will be equipped with Mae Wests and other seagoing survival gear, as required.

2. Additional life preservers and life rafts to be provided on the tower proper, as required.

3. Emergency medical evacuation will be performed by the assigned helicopters and augmented by appropriate agencies trained

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and equipped for such missions. Negotiations with such agencies for the performance of this service will be conducted by the Commander, 762nd AC&W Sq.

4. Mortuary assistance will be provided by Otis AFB, Mass.

E. Medical:

1. The 762nd AC&W Sq will be responsible for appropriate medical supplies and equipment.

2. The assigned Medical Service Supervisor will operate the medical facility aboard the Texas Tower.

F. Power Requirements:

Power will be generated on station to fulfill the total requirements. Loads to be determined and sufficient power generating equipment to be installed by the appropriate agency. Static type electronic voltage regulators (Sorenson or equivalent) to meet qualitative power requirements are to be provided by AMC and installed by contractor.

G. Other:

1. Refrigeration and heating systems will be installed as part of the construction contract.

2. Air conditioning equipment for the electronics equipment and mechanical cooling for the balance of the facility will be contractor installed.

3. Hot water heaters and hot water storage will be contractor installed.

4. Clothes washer and drier will be contractor furnished and

installed.

5. Fire fighting equipment consisting of pumps, stand pipes and hoses, will be contractor furnished and installed, where required.

6. Galley equipment will be shipboard type equipment and contractor installed.

7. Fresh Water:

(a) Initial Supply: Sufficient for 15 days.

(b) Resupply:

(1) Ionic demineralization equipment will be used for fresh water make-up.

(2) The fuel tanker may be requested to pump fresh water aboard the tower during re-fueling operations, commensurate with the tanker capability and the capacity of fresh water bunkers aboard the tower.

H. Personnel Services:

Recreational equipment and facilities will be the responsibility of the 702nd ACW Sq.

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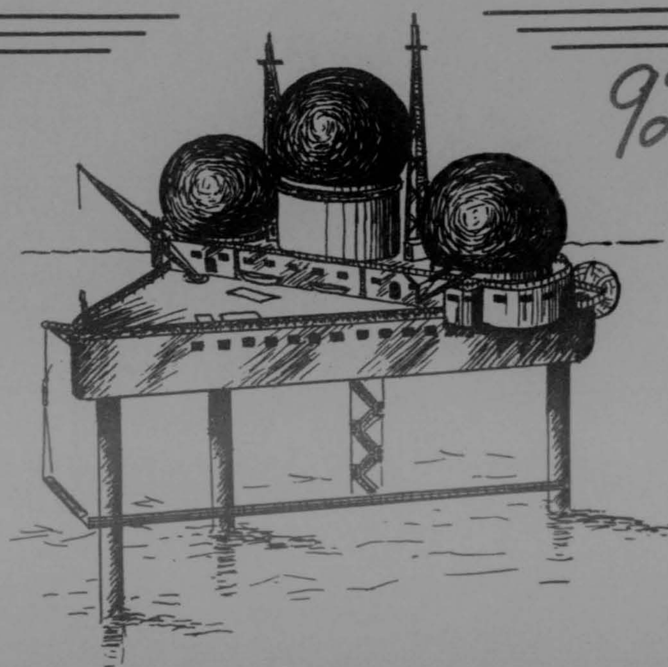
92



LOGISTICS PLAN

TEXAS TOWER NO 2

HEADQUARTERS
EASTERN AIR DEFENSE FORCE

0987

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17

location. Spare parts lists may be obtained from USAFIR, New England Region. Recurring supply requirements necessary to maintain levels will be submitted by the tower detachment to the parent unit for further submission to the support base.

(e) Medical. The assigned medical service supervisor will determine, periodically, those supplies and equipment required to maintain authorized levels. Requirements will be submitted to the parent unit, who, in turn, will submit consolidated unit requirements in accordance with current directives.

(f) Rations. The parent unit is responsible for requesting authority to stock operational rations in accordance with the provisions of AFR 145-26. Subsistent requirements for the detachment will be submitted to the support base by the parent unit.

(g) Fuels, Lubricants, and Water. Fiscal year requirements and requests for allocation of funds for diesel fuel will be the responsibility of the parent unit, through the support base. Submission of monthly requirements for 100/130 avgas will be the responsibility of the support base in accordance with Chapter 8, AFM 67-4. Submission of requirements for SAE #20 lube oil will be the responsibility of the support base through normal supply channels. It is estimated that installed equipment available at the tower

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location is capable of preparing sufficient quantities of fresh water to provide necessary replenishment requirements.

b. Maintenance.

(1) Policies.

(a) Unit Equipment. Organizational maintenance of UAL equipment will be provided by detachment personnel to the extent of capabilities; detachment capabilities will be augmented by the parent unit when required. Field maintenance will be provided in accordance with current directives.

(b) Communications and Electronics. Maintenance of communications and electronics equipment by detachment personnel will normally be limited to organizational and field maintenance, consistent with the nature of the repair; availability of spare parts, tools, and test equipment; and the capabilities of personnel. Performance of depot level maintenance is authorized as required by operational necessity.

(c) Aircraft. No aircraft maintenance will be performed by detachment personnel. When aircraft maintenance is required at the tower location, the support base will be notified.

(d) Installations. Preventive maintenance and minor repairs will be accomplished by the detachment within its capabilities. Detachment capabilities will be augmented by the parent unit and the support base, as required. Requirements for major repairs will be made known to the support base through the parent unit. The parent unit will arrange for airlift of the required spare parts, supplies, and personnel.

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c. Transportation.

(1) Policies. The prime mode of transportation for personnel and dry cargo will be by mission support aircraft (Helicopters) based, operated, and maintained by the support base. The Commander, 762d ACWRON, will be responsible for establishing priorities and requirements for the utilization of these aircraft. Liquid cargo will be transported by surface vessel, military, or commercial, as determined by ASPPA, Fuels Transportation Division, Washington, D.C. Back-up surface transportation arrangements, as determined by joint ADC-USAF-Navy agreement, will be established to satisfy emergency requirements.

(2) Requirements. (Estimated)

(a) Air.

Initial 30 days supply of operational rations	13,680 lbs
Subsistence each 15 days	9,120
PX Supplies each 15 days	8,000
Electronics supplies each 30 days	800
Housekeeping supplies each 15 days	1,000
R&U supplies each 30 days	1,000
Rotation of personnel each 30 days	19,000

(b) Surface.

Initial supply of diesel fuel	180,000 gal
Initial supply of avgas	3,000
Initial supply of lube oil	1,650
Resupply of diesel fuel each 90 days	111,900
Resupply of avgas each 90 days	18,000
Resupply of lube oil each 90 days	1,980

(c) Emergency. Upon determination by joint action of ADC-USAF-Navy as to the source and mode of emergency back-up surface transportation, the development of a standard operating procedure will be required.

(3) Operations. Transportation of diesel fuel by surface vessel,

0990

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civilian or military will be the responsibility of ASPPA Fuels Transportation Division, Washington, D.C. Transportation of 100/130 avgas, in drum lots, by surface transportation, will be the responsibility of ASPPA, Fuels Transportation Division, Washington, D.C. Transportation of SAE #20 lube oil, in drum lots, by surface vessel will be the responsibility of ASPPA, Fuels Transportation Division, Washington, D.C. Additional vehicle transportation required will be provided the parent unit by the support base. Additional vehicles required will be obtained by the support base initiating appropriate action in accordance with the provisions of AFE 67-83. Upon notification of source and mode of emergency back-up surface transportation, standard operating procedures will be developed and disseminated by the parent unit to all interested agencies.

i. Installations Engineering.

(1) Policies. Texas Tower #2 will be considered an auxiliary station at North Truro Air Force Station, and the Commander, 762d ACWRON (parent unit) considered the Commander of the tower. Custody of the tower will be assigned to the commander of the parent unit. The accountability will be assigned to the support base, i.e., as if the tower were another building at North Truro Air Force Station. Installation support will be the responsibility of the support base.

(2) Requirements. The maintenance of installations functions, such as water preparation, electricity, heating, refrigeration, real property, etc.

0931

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(3) Operations. Installations functions will be performed in accordance with the provisions of paragraph 4, AFR 85-5 and pertinent regulations specified therein. Real property maintenance of installations projects will be prepared classified and processed for approval by the support base in accordance with AFR 93-3.

e. Evacuation and Hospitalization.

(1) Policies. The assigned medical service supervisor will provide medical treatment, sanitary inspections, supervision of medical evacuation, and medical administration at the tower location.

(2) Requirements. Medical treatment of assigned personnel, sanitary inspections, and medical administration, as required. Maintenance of authorized levels of medical supplies and equipment.

(3) Operations. The medical service supervisor will administer medical treatment to the extent of his capabilities; conduct inspections as required by AFR 91-10, 160-91, and AFM 160-4; provide information for medical reporting as required by AFR 160-78, 160-80, 160-106, and AFM 160-20; maintain authorized supply levels obtaining requirements through the parent unit; determine advisability of patient evacuation and supervise such evacuation to the support base hospital by the most expedient transportation facility available.

f. Miscellaneous Services.

(1) Food Services. Field ration type subsistence including bread and pastries will be provided for the detachment by assigned food service personnel under the supervision of the commander

0932

of the parent unit or his designated representative, in accordance with applicable directives governing field ration dining hall operations.

(2) Laundry. Laundry services will be provided by the individual utilizing equipment located at the tower for that purpose.

(3) Mortuary. Mortuary services will be provided by the support base upon request of the parent unit.

(4) Exchange. Exchange services will be provided by A & AFES through the support base in accordance with current directives.

6. PERSONNEL ACTIVITIES. (See Appendix 1 - to be furnished later).

7. MISCELLANEOUS.

a. Comptroller. Personnel will be paid on the regular payroll of the parent unit. Reports of survey will be prepared and processed by the parent unit. The support base will be responsible for the application of budget and accounting policies in accordance with current directives. Funding requirements, will be included in the appropriation request of the support base. All required RCS reports will be prepared and controlled by the parent unit in accordance with current directives.

b. Information Services. All matters pertaining to OIS will be controlled by the support base in accordance with current directives. All legal queries (public information) will be processed through normal PI channels for final action by OSAF/OIS. There will be a requirement for a detachment newspaper, commander's call, and related internal information of activities, in addition to public information activities. In accordance with the policies and procedures established by the OIS at the support base, detachment commander will submit requirements and activities through the parent unit to the support

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6

HEADQUARTERS, EASTERN AIR DEFENSE FORCE
Stewart Air Force Base, Newburgh, New York

LOGISTICS PLAN
TEXAS TOWER #2

22 July 1955

TASK ORGANIZATION

Headquarters Eastern Air Defense Force

32d Air Division (Defense)

4707th Air Defense Wing

564th Air Defense Group

762 ACW Squadron

TEXAS TOWER #2 Detachment of 762 ACW Squadron

1. MISSION.

To provide complete logistics support for Texas Tower #2, located on George's Shoal. This plan outlines logistic policies for the guidance of affected units.

2. GENERAL SITUATION.

The establishment of an air defense radar station on a modified marine drilling platform located on George's Shoal has generated the requirement for the development of logistic arrangements for the support thereof. Due to the remote location of this station, normal support arrangements necessarily require modification. Texas Tower #2 will operate 24 hours per day and will support radar, communications equipment, living quarters and storage space as required.

3. LOGISTICS ORGANIZATION.

Texas Tower #2 will be operated as a detachment of the 762 ACWRON, North Truro, Massachusetts. Command jurisdiction for logistics support is assigned to Headquarters 4707th Air Defense Wing, Otis Air Force Base, in accordance with EADFM 23-1. The support base for the 762d ACWRON, the 564th ADG, Otis Air Force Base is designated the support base of all supplies, equipment and services, except communications and electronics. In accordance with the provisions of ADCR 67-13, the 4700th Air Defense Group, Stewart Air Force Base, is designated the electronic support base for Texas Tower #2. The depot support system, as presently constituted will be utilized in accordance with current directives.

4. LOGISTIC POLICIES.

Logistic support requirements for Texas Tower #2 will normally be submitted by the 762d ACWRON to the support base or in the case of electronics items, to the 4700th Air Defense Group, Stewart Air Force Base. The support base will obtain required support items or services through normal channels in accordance with current directives. Headquarters, 4707th Air Defense Wing will maintain such surveillance and control as will insure complete and adequate logistic support for the tower operation. Continuing evaluation of logistic requirements, support system and operational procedures will be accomplished by the 4707th ADW. At the request of this headquarters, the wing will be prepared to submit comprehensive evaluation of support operation and make recommendations applicable to the support of additional Texas Tower as presently contemplated.

5. MATERIEL ACTIVITIES.

a. Supply.

(1) Policies.

(a) Unit Supply Records. All unit supply records will be maintained in accordance with provisions of Volume 4, AFM 67-1.

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17

All AF Forms 1120, Unit Property Record, and allied documents will be maintained at the parent unit.

(b) General Supplies and Equipment. Required office, housekeeping supplies and UAL equipment will be provided by the parent unit. The parent unit will obtain tower detachment requirements by normal requisition actions to the support base.

(c) Communications and Electronics. The communication and electronics support base designated to support the 762d ACWRON will provide C&E support for the Texas Tower detachment. The General Electric Company and the Bendix Radio Corporation will provide contractor support in accordance with TO 31P-1-19 and TO 31P-1-20 respectively.

(d) Aircraft supply support of the Texas Tower mission support aircraft (Helicopters) will be provided by the support base. Supplies and equipment required will be obtained by the base through normal supply channels in accordance with current directives. The supply precedence of the support base (XI) will apply.

(e) Installations Supply. Supply support for installations requirments will be provided by the support base upon request of the parent unit. Maintenance of authorized levels will be the responsibility of the parent unit.

(f) Medical. Medical supplies and equipment will be provided by the parent unit. Required items will be obtained from the support base hospital in accordance with current directives.

0936

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(g) Rations. Rations required to support the food service function will be provided by the parent unit. Rations will be obtained from the support base in accordance with current directives.

(h) Fuels, Lubricants, and Water. Procurement of diesel fuel will be by "open end" contract, and will be the responsibility of AMC Field Petroleum Supply Officer at Middletown AMA. Procurement of 100/130 avgas will be in accordance with AFM 67-4 from the aviation stock fund by Middletown AMA. Procurement of SAE #20 lub oil will be by normal requisitioning action. Initial requirement of 166,000 gallons of fresh water will be supplied by construction contractor, replenishment as required will be provided for in the Middletown AMA's fuels contract.

(2) Requirements.

(a) General Supplies and Equipment. 45-day level of office and housekeeping supplies will be maintained. 15-day resupply cycle is applicable. Unit equipment levels as required by UAL.

(b) Communications and Electronics. 45-day level of C&E spares and supplies augmented by authorized assemblies and sub-assemblies of electronic components will be maintained.

(c) Aircraft. Aircraft support levels at the support base will be established in accordance with AFM 67-1 and other directives applicable to the mission support aircraft. No levels of aircraft support items will be maintained at the Tower location.

(d) R&U Supplies. 45-day level of R&U supplies to include spares for installed equipment will be maintained.

18

(e) Medical. 120-day level of medical supplies will be maintained. Resupply will be as required.

(f) Rations. 30-day level of operational "B" type rations and a 15-day level of field rations will be maintained. Resupply of field rations will be made every 15-days. Rotation of operational rations will be accomplished in accordance with current directives.

(g) Fuels, Lubricants, and Water. Not less than 30-day level of fuels, lubricants, and water, based on consumption experience will be maintained. Resupply will be accomplished as required.

Initial Requirements:

Fuel Oil, Diesel. MIL-F-16888B-180,000 gallons.

Grade 100/130 Avgas - 3000 gallons.

SAE #2, high detergent lube oil, MIL-L-9000A, Type Navy, 9170 - 1650 gallons.

Fresh Water - 166,000 gallons.

Estimated Monthly Requirements:

Fuel Oil, Diesel - 37,300 gallons.

Lube Oil - 660 gallons.

Avgas - 600 gallons.

Water - See para 5a(3) (g) below.

(3) Operations.

(a) General Supplies and Equipment. All requirements for office and housekeeping supplies will be submitted by the detachment to the parent unit in accordance with current directives.

0938

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(b) Communications and Electronics. All requirements for C&E supplies will be submitted by the detachment to the parent unit who, in turn, will submit routine requests to the designated electronics support base. Emergency requests will normally be processed through channels outlined above; however, when item is not available at the C&E support base, the parent unit will submit requests direct to appropriate contractor. The parent unit will be responsible for arranging airlift of priority items direct to the Texas Tower detachment. The parent unit will provide electronic support base with requirements information in sufficient detail to permit adjustment of levels.

(c) Aircraft. The support base will adjust levels of peculiar and common spare parts and supplies in accordance with the provisions of AFM 67-1. By requisitioning action, establish and maintain authorized levels required for support of mission support aircraft (helicopters). Procure and maintain the special equipment and tools required and authorized. Initiate action in accordance with AFR 67-83, as appropriate.

(d) Installations Supply. The support base will, in accordance with the provisions of letter, Headquarters United States Air Force, AFCIE-CO, 9 Nov 54, subj: Spare parts for Installed Equipment at Remote ZI and Overseas Installations, initiate procurement action which will assure the establishment and maintenance of a 45-day level of spare parts at the tower

0939

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52

base, utilizing voice communications where PI is involved.

c. Security. Matters pertaining to Provost Marshal activities will be controlled by commander of the parent unit in accordance with existing directives. There will be a requirement for visitor control and internal security. Visitor control, internal security, and other Provost Marshal activities will be carried out in accordance with specific instructions contained in directives of the 125 and 205 series.

d. Legal Services. Legal support in the fields of militaryjustice, civil law and legal assistance will be provided by the Commander, 4707th ADW. Jurisdiction under the Uniform Code of Military Justice over personnel of the detachment will be exercised by the Commander, 4707th ADW in accordance with Attachment No. 1, EADFR 111-3. Administration of civil law for detachment personnel will be provided by the Commander, 4707th ADW. Administration of legal assistance will be provided by the Commander, 4707th ADW. Administration of claims under the 112 series of Air Force Regulations will be provided by the commander of the support base.

DONALD B. SMITH
Brigadier General, USAF
Commander

OFFICIAL:

Glenn C. Thompson
GLENN C. THOMPSON
Colonel, USAF
Deputy for Materiel

Appendixes: Personnel Activities (To be furnished later)
Distribution: See Distribution List

1900

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22

DISTRIBUTION LIST

TO: Commander
Continental Air Defense Command - 20
Ent Air Force Base
Colorado Springs, Colorado

Air Force Installation Representative - 2
New England Region
857 Commonwealth Ave.
Boston 15, Mass.

Officer In Charge, Construction - 2
Texas Tower
NOy Contracts
Navy Bldg.
495 Summer St.
Boston 10, Mass

Area Petroleum Office - 2
Olmstead Air Force Base
Middletown, Pa.

Commander
4707th Air Defense Wing - 5
Otis Air Force Base
Massachusetts

Commander
565th Air Defense Group - 5
Otis Air Force Base
Massachusetts

Commander
762d AC&W Squadron - 5
North Truro, Mass.

Commander
32d Air Division - 5
Syracuse Air Force Station
Syracuse, New York

Commander
Eastern Air Defense Force - 20
Attn: EAMDM -- 1
EAMEL -- 3
EAMSS -- 3
EAMIS -- 1
EAMAC -- 3
EAMLP -- 1
EAPPL -- 1
EACBA -- 1
EAOMO -- 1
EAOCE -- 1
EAOPR -- 1
EAIIG -- 1
EADVC -- 1
EAODO -- 1
Stewart Air Force Base
Newburgh, N.Y.

Commander
Rome Air Force Depot - 10
Griffiss Air Force Base
Rome, N.Y.

Commander
Middletown Air Materiel Area - 10
Olmstead Air Force Base
Middletown, Pa.

Commander
Air Materiel Command
Attn: Dir, Special Projects - 5
Col. F. Shannon
Wright Patterson Air Force Base
Dayton, Ohio

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93

Middletown Air Materiel Area
Olmsted Air Force Base
Middletown, Pennsylvania

MMEEI 24 August 1954

SUBJECT: (S) Tropospheric Scatter Radio for Texas Towers

TO: Commander
Air Defense Command
Attn: Lt Col Worden, ADOOC
Ent Air Force Base
Colorado Springs, Colorado

1. It is requested that appropriate action be initiated by your command for the assignment of operating frequencies for the tropospheric scatter radio systems to be used in the Texas Towers project.

2. The commercially available radio equipment for this application is designed to operate on frequencies from 571 to 601 megacycles and 701 to 731 megacycles. The following specific frequencies are requested.

a. 576, 586 and 596 megacycles.

b. 706, 716 and 726 megacycles.

3. The tentative circuit assignments are as follows:

a.

Simplex Radio Circuit	Transmitting Frequency
P-13 to Browns Bank	576 mc
Browns Bank to P-13	706 mc
P-13 to Cashes Ledge	726 mc
Cashes Ledge to P-13	596 mc
P-10 to Georges Shoal	576 mc
Georges Shoal to P-10	706 mc
P-45 to Nantucket Shoal	586 mc
Nantucket Shoal to P-45	716 mc

1002

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93

Middletown Air Materiel Area
Olmsted Air Force Base
Middletown, Pennsylvania

MCMEE 26 August 1954

SUBJECT: (S) Tropospheric Scatter Radio for Texas Towers

TO: Commander
Air Defense Command
Attn: Lt Col Worden, ADOOD
Ent Air Force Base
Colorado Springs, Colorado

1. It is requested that appropriate action be initiated by your command for the assignment of operating frequencies for the tropospheric scatter radio systems to be used in the Texas Towers project.

2. As commercially available radio equipment for this application is designed to operate on frequencies from 571 to 601 megacycles and 701 to 731 megacycles, the following specific frequencies are requested:

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P-10 to Georges Shoal	576 mc
Georges Shoal to P-10	706 mc
P-45 to Nantucket Shoal	586 mc
Nantucket Shoal to P-45	716 mc

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Hq [illegible], Subj: (C) Tropospheric Scatter Radio for Texas Towers (Cont'd)

T-[illegible] to Unnamed Shoal [illegible] mc

Unnamed Shoal to T-[illegible] [illegible] mc

b. In the event of conflict of these specific frequency assignments with other radio services in the geographic locations involved, circuit frequency reassignments can be made. However, reassignment must be made using only these specific frequencies.

FOR THE COMMANDER:

JOSEPH C. [illegible]
Captain, USAF
Chief, Ground [illegible] Division
Directorate of [illegible] Engineering

1004

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Hq [illegible] Subj: (S) Tropospheric Scatter Radio for Texas Towers

[illegible] (24 Aug 54) 1st Ind 21 Sep 1954

HQ AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colorado

TO: Commander, Eastern Air Defense Force, Stewart AFB, Newburgh, N.Y.

1. Request your headquarters submit application for assignment of frequencies noted in basic correspondence in accordance with [illegible] 2106.A.

2. Peak power for 5 [illegible] with type [illegible] emission will be indicated.

BY ORDER OF THE COMMANDER:

[illegible]
Captain, USAF
Asst Command Adj

1005

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Hq [illegible] Subj: (S) Tropospheric Scatter Radio for Texas Towers

ADOCE-C (24 Aug 54) 1st Ind 21 Sep 1954

TO: Commander, Eastern Air Defense Force, Stewart AFB, Newburgh N.Y.

1. Request your headquarters submit application for assignment of frequencies noted in basic correspondence in accordance with CEI 2106.4.

2. Peak power for 5 KW with type F9 emission will be indicated.

BY ORDER OF THE COMMANDER:

C. W. HUMPHREYS
Captain, USAF
Asst Command Adj

EADCE-CR (24 Aug 54) 2d Ind 5 Oct 1954

HQ EASTERN AIR DEFENSE FORCE, Stewart Air Force Base, Newburgh, N.Y.

TO: Commander, Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado

Attached are applications for frequency assignments in compliance with Paragraph 1, 1st Indorsement.

FOR THE COMMANDER:

JAMES R. [illegible]
Captain, USAF
Asst Adjutant

1006

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Hq [illegible] Subj: (S) Tropospheric Scatter Radio for Texas Towers

[illegible] (2[illegible] Aug 54) 3rd Ind 1[illegible] Oct 1954

Hq AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colorado

TO: Director of Communications, Headquarters USAF, Washington 25, D. C.

Attached as inclosures to 2nd indorsement, in accordance with [illegible] 2106.[illegible], are tentative frequency requirements to provide tropospheric scatter communications to Texas Towers.

FOR THE COMMANDER:

[illegible] D. [illegible]
Lt Col, USAF
Asst Command Adj

1007

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Bsc ltr fr [illegible] to ADC, 24 Aug 54, subj: (S) "Tropospheric Scatter Radio for Texas Towers"

[illegible] 4th Ind 2 Jun 1955

Department of the Air Force, Headquarters USAF, Washington 25, D. C.

TO: Commander, Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado

1. The basic request for frequencies in the [illegible] Mc/s region has been superseded by subsequent tropospheric scatter planning. (U)

2. Due to the difficulty expected in clearing non-government frequencies for military tropospheric circuits, the decision has been made to procure equipment in the band 1700-2400 Mc/s. The early on site date of the first Texas Tower did not, however, allow sufficient time to get more than [illegible] Mc/s tropospheric equipment for the first Texas Tower circuit. We have obtained concurrence from the Federal Communications Commission to use frequencies [illegible] and [illegible] Mc/s for the first Texas Tower tropospheric circuit on a temporary basis with the understanding that this equipment will be replaced with [illegible] Mc/s tropospheric equipment when available. (SECRET for paragraph 2) [illegible]

3. It is necessary that information regarding the appropriate frequency authorizations be forwarded to this headquarters before frequencies [illegible] and [illegible] Mc/s are assigned. In this connection, Air Defense Command should inform Headquarters USAF whether a new radio frequency authorization is desired for the land portion of the first Texas Tower circuit, or if an existing radio frequency authorization amendment is possible. (U)

BY ORDER OF THE CHIEF OF STAFF:

CHARLES [illegible]. GORDON
Colonel, USAF
Chief, Plans & Policies Division
Directorate of Communications-Electronics

1008

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[illegible] SECRET Subj: (U) Tropospheric Scatter Radio for Texas Towers

[illegible] ([illegible] 55) [illegible] [illegible] Jun 1955

[illegible] AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colorado

TO: Director of Communications, Headquarters USAF, Washington 25, D. C.

1. Reference paragraph 2, 4th indorsement. The shore terminal of the [illegible] circuit to the First Texas Tower will be located physically at the [illegible] Station, North Truro AFS, Mass.

2. USAF Radio Frequency Authorization [illegible], North Truro AFS, should be amended to include the [illegible] transmitting frequency.

[illegible] THE COMMANDER:

/s/ [illegible]
Captain, USAF
Asst Command [illegible]

Memo for record: [illegible] USAF has determined frequencies for Comm. for the First Texas Tower to shore. However, before they will issue Frequency Authorizations, they want to know whether there is any existing frequency authorization which may be modified to include frequencies for the shore terminal.

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Bas Ltr fr [illegible] to ADC, 24 May 54, subj: (S) Tropospheric Scatter Radio for Texas Towers

[illegible] 6th Ind 18 Jul 1955

Department of the Air Force, Headquarters USAF, Washington 25, D. C.

TO: Commander, Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado

1. Inclosed is revised USAF Radio Frequency Authorization No. AF-163 for the Commander, 762d AC&W Squadron, North Truro, Massachusetts. Included in this revision is the assignment of [illegible] and 752 Mc/s for tropospheric scatter circuitry between North Truro and Texas Tower number 2.

2. The above assignment is in a non-government portion of the spectrum and is approved by the Federal Communications Commission on a temporary basis. These frequencies are to be replaced by tropospheric scatter frequencies in the 1700-2[illegible] Mc/s band as soon as equipment is available.

3. This indorsement is classified Secret in accordance with paragraph 23c, AFR 205-1.

BY ORDER OF THE CHIEF OF STAFF:

CHARLES W. GONDER
Colonel, USAF
Chief, Plans & Policies Division
Directorate of Communications-Electronics

1010

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SECRET

[illegible] Subj: (S) Tropospheric Scatter Radio For Texas Towers

ADOTE-OR (24 Aug 54) 7th Ind 28 Jul 1955

HQ AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colorado

TO: Commander, Eastern Air Defense Force, Stewart AFB, Newburgh, N. Y.

Forwarded is USAF Radio Frequency Authorization No. AF-163 in duplicate.

BY ORDER OF THE COMMANDER:

[illegible]
Major, USAF
Asst Comd [illegible]

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94

From: Comdr ADC — 2? Apr 1955

To: Comdr AMC, Wright-Patterson AFB, Ohio

Info: CofS USAF, Wash D. C.
Comdr EADF, Stewart AFB, Newburgh, N.Y.

(CONFIDENTIAL) ADOCE-AL 2071 . REF USAF MSG AFOAC-S/E 5222?, 1? Apr 55. This msg in two parts. Part I. In regard to siting shore termination for cable and tropo-scatter from TEX TWRS the fol rqrs are estb: (1) For TEX TWR NR 2, site should be on [illegible] North Truro AFS, Mass. or as close thereto as possible. (2) Primary consideration w/b given to siting of tropo-scatter. It isunderstood that cable landing w/b determined by contractor and that FACS RQD for cable landline connection w/b prov by TP CO. (3) Furn this hq ASAP space rqrs for tropo-scatter EQP to include switching device rqrd for AUTO switchover from cable to tropo-scatter. Part II. You w/b advised when firm rqrs are estb for TEX TWRS 1, 3, 4 and 5.

MEMO FOR RECORD: Hq USAF has given AMC responsibility for siting shore termination for communications from Texas Towers. Therefore, we are establishing our requirement as to siting and request for equipment space requirements in order to come up with a building definitive and land requirements.

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95

From: Comdr AMC, Wright-Patterson AFB

7 Apr 1955

To: CofS, Hq USAF, Washington D. C.

Info: Comdrs, Rome AFD, Griffiss AFB, Rome N.Y.
ARDC, Balto, Md., MAAMA Middleton, Pa.
ADC, Ent AFB, Colo. Springs, Colo.

(CONFIDENTIAL) For AFOME-CR USAF. (Re AFOAC-Sierra/Echo 3'132, dtd 21 Mar 55. Specifications for commercial type tropospheric scatter furnished RAFD by ARDC. A package type contract is being written to include equip and engineering installation for Texas Tower No. 2. Expected operational date for tropospheric scatter on tower no is Oct 55. Specification for submarine cable will be furnished to RAFD by ARDC on or before 15 April. A package type contract is anticipated for submarine cable on Texas Tower No. 2. This msg is classified due to the fact that it contains classified operational dates. Sgd Directorate of Maintenance Engineering.

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1313

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96

From: USAF 5 Jul 53

To: AMC, ARDC

Info: ADC, EADF, MAAMA, Chief, Proj Office, 220 Church St, N.Y.
Cambridge Research Center, Rome AF Depot, RADC

(CONFIDENTIAL) Ref msg APOAC-Sugar/Easy 53310 10 May curr. This msg in two parts. Part I. For AMC. Based on evaluation of tropospheric scatter reliability by ARDC, defer action in instln of submarine cable for Texas Towers until after actual operating tests of tropospheric scatter estb the reliability. Funds to provide for the submarine cable should be incl in the FY 57 Budget Program. Part II. For ARDC. Specifications for submarine cable should be avail in the event reliability of tropospheric scatter does not approach expectations.

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97

HEADQUARTERS
AIR DEFENSE COMMAND
Ent Air Force Base
Colorado Springs, Colorado

12 Jan 1955

ADOPR

SUBJECT: (Uncl) Radar Video Remoting

TO: Commander
Air Research and Development Command
P. O. Box 1395
Baltimore 3, Maryland

1. The primary operational principle in the Texas Tower concept is the seaward extension of the contiguous ground radar coverage for ground control of interceptors in the Northeastern United States. The operational plan calls for remoting the surveillance radar video from the Texas Towers to their respective shore-based direction centers. The interceptors are to be controlled from these direction centers. The remoting distance involved is approximately 150 NM over water. Relay points are not planned. At the time the project was initiated, slowed down video (SDV) was believed operationally sound as a remoting means. In the interim, SDV has proven unsatisfactory because of multiple returns on single aircraft and considerabl azimuth inaccuracies.

2. Satisfactory equipment for remoting the radar video from the Texas Towers, for presentation on AN/UPA-35 and/or AN/GPA-23 consoles in the shore direction centers, would increase the ground control effectiveness. This would in turn increase, proportionately, the effectiveness of the manned and unmanned interceptors.

3. A general description of the required equipment is as follows:

a. Performance -- The desired equipment must provide a means for remoting radar video at least 150 NM by wire, cable or radio, over water and/or land, while retaining sufficient comparative values to permit proper commitment of forces and accurate ground radar control of manned or unmanned interceptors. The planned overwater transmission paths will exceed line-of-sight distances and relay points are not planned.

b. Desired design features --

(1) As small and simple as possible.

(2) Operational by the fall of CY 1955.

(3) As resistant to enemy jamming and sabotage as possible.

Hq ADC ADCPR Subject: (Uncl) Radar Video Remoting

(4) A trouble-free service life of at least ten (10) years.

(5) As resistant to outside interference as possible.

(6) As inexpensive as possible.

4. Suggested equipments or methods for meeting the requirement are as follows:

a. Improved SDV equipment and techniques.

b. Fine Grain Data (FGD) equipment.

c. UHF transmission technique developed by the Bell Telephone Company.

d. Tropospheric Scatter.

5. The first Texas Tower is scheduled into the air defense system in the fall of CY 1955. It is imperative that remoting equipment, satisfactorily tested, be available to meet this requirement when the first Texas Tower is installed. Texas Towers will be used without the remoting equipment if it is not available. Control will be performed from the tower although it will be less effective.

FOR THE COMMANDER:

/s/t/ JOSEPH D. HORNSBY
Lt Col, USAF
Asst Command Adj

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Hq ADC ADOPR, Subject: (Uncl) Radar Video Remoting

RDTDRR-7 R&D 4-25 (12 Jan 55) 1st Ind 12 Apr 1955

HQ AIR RESEARCH AND DEVELOPMENT COMMAND, P. O. Box 1395, Baltimore 3, Md.

TO: Commander, Air Defense Command, Ent Air Force Base, Colorado

1. It is the understanding of this Headquarters that the program for integrating the Texas Towers into the SAGE System calls for operation of the AN/GPA-37 manually at the tower until the appropriate AN/FST-7 Direction Central is prepared to receive remoted video data. (S)

2. Equipments relating to the program outlined in paragraph 1 above are currently in production. The SAGE implementation schedule as outlined in the SAGE Status and Progress Report No. 15 dated 8 March 1955, indicates that the AN/FST-2 will be available for installation on TT-2 in early CY-1956. (S)

3. Due to the absence of a previous requirement for Video Remoting to a shore based manual direction center, no effort has been directed toward developing the terminal equipment which would be required to accomplish this function. At this date, it appears unlikely that such equipment could be developed -- even on a crash basis -- in sufficiently short time to provide a material time advantage over the programmed date of the AN/FST-2 - AN/FSQ-7. (S)

4. In view of the above, it is requested that the requirements outlined in the basic letter be reconsidered. (U)

FOR THE COMMANDER:

/s/t/ EDWARD A. FRIEDLANDER
Colonel, USAF
Chief, Radar Branch
Radar and Communications Division
Deputy Commander/Technical Operations

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98

From: Comdr ADC 15 Apr 1955

To: Comdr Hq ARDC Baltimore Md

(CONFIDENTIAL) ADOCE-EG 1152. ATTN: RDTSD. Presentation on RAFAX was made at Haller, Raymond and Brown CORP, 22 MAR 55, to PERS from this HQ and we desire now to reevaluate use this EQP within AD system. We are particularly interested in its use to transmit video data from Texas Tower to shore. REQ INFO be provided ASAP which can be used to EVAL OPR CHAR and capability of RAFAX and any specific data AVAL which shows relative value BTWN RAFAX and FGD/SDV.

MEMO FOR RECORD: Personnel of the P&R Directorate this HQ attended the cited presentation on RAFAX and were favorably impressed with the data they obtained. There appears to be a possible use for RAFAX equipment within Air Defense, principally to transmit video data from Texas Towers to shore. Information on hand within this Hq outlining the characteristics of RAFAX is extremely limited. Comeback copy req'd for COMM file.

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[illegible] 21 Feb 1955

SUBJECT: (Unclassified) Use of AN/GPA-37 with Texas Towers

TO: Commander
Air Defense Command
ATTN: ADOPR
Ent Air Force Base
Colorado Springs, Colorado

1. Reference is made to your teletypes ADOPR-[illegible] and ADOPR [illegible] concerning the use of the AN/GPA-37 on the shore from video data gathered on the Texas Towers.

2. This Center has recommended Transmitter Coordinate Group [illegible], commonly known as [illegible], to be used to furnish Texas Tower video data to an AN/GPA-37 installed at a shore GCI station. This equipment is currently in production and could be made available through appropriate Hq USAF action, in the same time period as the initial Texas Tower.

3. The problem of integrating the AN/GPA-37 with the Texas Towers has been forwarded to the Air Force Cambridge Research Center as a result of a decision to assign Systems responsibility for the Texas Towers to AFCRC.

FOR THE COMMANDER:

1 Incl
Cy RADC ltr to AFCRC,
Subj: Use of AN/GPA-37
w/Texas Towers

JOHN R. HOOVER
Colonel, USAF
DCS/Operations

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[illegible]

SUBJECT: (Unclassified) Use of AN/GPA-37 with Texas Towers

TO: Commander
Air Force Cambridge Research Center
ATTN: [illegible]
224 Albany Street
Cambridge 39, Massachusetts

1. The Air Defense Command in a teletype dated [illegible] November 195[illegible] has expressed a need to operate the Texas Towers as a manual system prior to the implementation of SAGE and to use the AN/GPA-37 as a backup device after SAGE becomes operational. In a later teletype dated 13 January 1955, ADC indicated their immediate concern is for a radar data transmission means and video switching device which will be operationally available for use from the first operational Texas Towers; that FGD is not scheduled for operation until 1957 and provides no means for reconstituting video for PPI or AN/GPA-37 presentation.

2. This center recommends Transmitter Coordinate Group [illegible]/GPA-[illegible], commonly known as RAFAX, be used to furnish Texas Tower video data to an AN/GPA-37 installed at a shore GCI station. This equipment is currently in production and could be made available, thru appropriate Headquarters USAF action, in the same time period as the initial Texas Tower.

3. It is envisioned that the RAFAX signal would be sent over one of the forward scatter channels this center understands is scheduled for early installation thru the use of 12/24 channel commercial UHF transmitting equipment. A second channel would be required for voice commands for an interception if it is desired to transmit UHF commands from the Texas Towers. A third channel from the Tower to the shore GCI operator would be required for voice telling of height and IFF information. When the 60-channel submarine cable and/or eventual forward scatter equipment becomes available the RAFAX equipment would use these facilities.

4. At a later time period, estimated as 1957, when the Lincoln Fine Grain Data (FGD) Systems becomes operationally available on the Towers, it will be possible to use these signals to convey the video data to the AN/GPA-37 provided a video regenerator unit is made available.

SECRET

Hq RADC RCOS Subject: (Unclassified) Use of AN/GPA-37 with Texas Towers

5. It is recommended that a firm requirement be established for a device to reconstitute the FGD signal from the Texas Towers to a video signal suitable for application to the AN/GPA-37. It is suggested that the details be worked out concurrently with the FGD system.

6. A video switching device needed at the AN/GPA-37 in order to switch the computer from local to remote video, on a console basis, is somewhat more complicated than a simple switching unit. This is due to the use of central equipment for sweep generation. The problem is easily solvable by installing additional central equipment associated with the remote video and a switching unit that will enable each console to be connected to the local or remote central equipment.

7. This Center recommends that a firm requirement be established to have Hq USAF direct the Air Materiel Command to procure the additional central equipment and a switching unit directly from the current development production contract for the AN/GPA-37. This Center will supply the required specifications and engineering support to the Rome Air Force Depot.

8. In the event the initial commercial forward scatter equipment does not have sufficient channel capacity, it is recommended that consideration be given to the temporary use of ground wave transmission using available low frequency transmitters to furnish a voice band width channel for the RAFAX signal. A low power transmitter with some antenna directivity on the tower and a highly directive receiving antenna could be employed in order to minimize interference.

FOR THE COMMANDER:

JOHN R. HOOVER
Colonel, USAF
DCS/Operations

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27 June 1955

From: MAAMA Olmsted AFB
To: ADC, Ent AFB
Info: RAFD, Griffiss AFB

(SECRET) URMSG ADOCE-ALFA 3362 dtd 21 Jun 55. This msg in two parts: Part I: Earliest date Texas Tower Number two can become operational is 31 Jan 56. Part Two: It is anticipated that towers one, 3, and 4 will follow same schedule as tower number 2 with Coca Echo installation beginning approximately 15 Oct 56 and becoming operational 31 Jan 57, provided no changes in programmed equip (Papa Coca Document) or architechtural design occurs.

1372

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101

30 June 1955

From: Hq USAF, Washington, D. C.

To: Comdr ADC, Ent AFB, Colo.

(SECRET) From: AFOOP OP D 55901 in of the Radar Improvement Program which will improve the seaward coverage of both P-10 and P-13 the rqmt for installing TT-1 on Cashes Ledge is questioned. Desire your hq conduct a similar rev of your coverage rqmts in this area as reqd for Browns Bank in par 5 ltr this hq dtd 17 Jun 55, subj: (U) Opnl Plan for Texas Tower. Advise this hq NLT than 20 July 55.

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102

From: Hq USAF, Wash. D. C.

~~25~~ 24 Jun ~~38~~ 1955

To: Comdr ADC, Ent AFB, Colo.

(SECRET) From: AFOOP-OP-D 55624. This message in three parts: Part I. Regarding paragraph 5 letter this hq dtd 17 June 1955 subject: (U) Operational Plan for Texas Tower. Part II. Discussions at Governmental level regarding the legality of the U.S. exercising its territorial rights are scheduled in the very near future. Part III Desire you advise this hq NLT 28 June 1955 whether or not TT-5 is required. Withdrawal of this requirement prior to scheduled discussions would be most advantageous.

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SECRET

From: Comdr ADC, Ent AFB, Colo. Springs, Colo 28 Jun 55

To: CofS, Hq USAF, Washington 25, D. C.

(SECRET) ADOPR 3413. Reference your msg AFOOP-OP-D 55624 dated 24 Jun 55 and fone con 28 Jun 55, btwn Major H. M. Farmer, this Hq and nbr of AFOOP-OP-D, your Hq. This Comdr has initiated a study to re-eval the Air Def Sys rqr for Texas Tower nr five. Due to the complexity of the rqr and its intricate brg upon other related programs, it is expected that the eval will not be compl until aprx 30 Jul 55. At the epd, your Hq will be advised of the results of the eval.

MEMO FOR RECORD: The Directorates of ADOPR, ADOOT, ADOCE, (DCS/O and ADMEL (DCS/M) are now evaluating the need for Texas Tower #5. The study is expected to be finished by 30 July 1955.

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103

2 Aug 1955

From: Comdr ADC

To: CofS USAF Wash D. C.

(SECRET) ADOPR 3645. For DIR of OPR. URMSG AFOOP-OP-d, 30 Jul 55. The ADC RQR for TT-1 (Cashes Ledge) and TT-5 (Browns Bank) still exists. A study SUPP this POSIT will FOL.

MEMO FOR RECORD: The study on the need for TT-1 and TT-5 was made at the direction of USAF. The study has been coordinated through the interested agencies in Hq ADC. All agencies concurred on the continued need for TT-1 and TT-5.

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104

5 April 1955

PICKET VESSEL PERFORMANCE

The following figures were compiled by Commander Escort Squadron SIXTEEN and represent the average performance for the ships of the squadron while on picket station during the period December 1954 through March 1955.

PERFORMANCE FACTORS	AVERAGES
Number of contacts passed to ADDC per tour on station	112.4
Number of flight plans received per tour	[illegible]5.7
Number of flight plans correlated and reported per tour	41.7
Maximum radar detection range	157.1 miles
Average radar detection range	90.0 miles
Air Force interceptors made available	163 (total)
Number active intercepts conducted by P.V.	15 (total)
Number training intercepts conducted by P.V.	131 (total)
Average error in Picket Vessel plots	5.4 miles
Percent effective voice communications with ADDC (HF)	77%

ENCLOSURE (1)

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COPY 105

USS SKYWATCHER (YAGR 3)
Care of Fleet Post Office
New York, New York

YAGR-3/RDP:rd
A4-3
Ser: 0237
27 July 1955

From: Commanding Officer, USS SKYWATCHER (YAGR 3)
To: COMNAVEASTCONAD
25th Air Division Commander
Via: Commander Escort Squadron SIXTEEN

Subj: Picket Vessel Final Summary Report for period 8 through 25 July 1955

Ref: (a) COMEASTSEAFRON MOVORD 4-55
(b) COMNAVEASTCONAD OP PLAN 1-55

Incl: (1) Daily Summary Report
(2) Comparative Graph SRA, SPS 8A, and SK Antenna Beam Pattern

1. In accordance with reference (a) USS SKYWATCHER (YAGR 3) assumed station THREE at 2105Z 8 July 1955. At 0330Z 25 July 1955 the USS KIRKPATRICK (DER 318) relieved the SKYWATCHER. Primary and secondary EADF reporting stations were the 773rd AC&W squadron at Montauk, New York and the 646th. AC&W squadron at Highlands, New York respectively. In addition, continuous voice communications were maintained with the Naval relay and monitor station, Beavertail Point, Rhode Island and the vessels manning station FIVE.

2. While on station, a straight line patrol was used while steaming on forty mile legs within the station boundaries. Plotting and reporting procedures were in accordance with ADC Regulation 20-55. The maximum difference between the ships plot and the AC&W plot was 41 miles and is attributed to a bearing error that was incurred in the SPS-8A. The average difference between the plots of SKYWATCHER and AC&W Squadron was 7 miles.

3. Brief summary of Air Surveillance:

(a) 196	(g) 10
(b) 196	(h) 297
(c) 247	(i) 50,000
(d) 110	(j) 1000
(e) 0	(k) -450 ft.
(f) 196	(l) 127

4. Brief summary of weather conditions:

(a) Eighty-five percent of the time, temperature inversion with fog was experienced with a varying amount of trapping. The SPS-8A was effected most by these weather conditions in that 5° antenna

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elevation was necessary to eliminate surface contacts at 50 miles in the cases of severe trapping. The trapping of the SRA was not severe enough to impair operation at any time.

(b) Communications were seriously impaired at dawn and dusk. In the vew cases that communications were lost with Beavertail and Montauk satisfactory communication could be conducted via picket station FIVE.

(c) Average sea state was TWO. Average wind velocity was 5 knots. Long low swells were encountered 90% of the time on station.

5. Summary of Communications:

(a) Equipment used:

Channel	Frequency	Transmitter	Receiver
H	2478 kc	SRT-16	SRR-13
L	2940 kc	SRT-16/TDE	SRR-13
VHF guard	121.5 mc	TDQ	AN/URR-27
UHF guard	243 mc	TED	AN/URR-13
#10	364.2 mc	AN/GRC-27	
#9	238.7 mc	AN/GRC-27	
	351.0 mc	AN/GRC-27	
U	3102 kc	TDE/SRT-16	SRR-13
	2772 kc	TDE/SRT-16	SRR-13

(b) Major equipment failures:

(1) Two AN/GRC-27 units were inoperative for 12 hours. Failures in the bias section of both units were encountered. No onboard spares were suitable for repairs. A temporary field change of removing a shunting resistor and replacing it with a difference type relay returned operation to normal. The modulator high voltage transformer in one AN/GRC-27 unit shorted to ground and no spare was available. This unit was inoperative from 0800Z 17 July for the remainder of the tour on station.

(c) Analysis of methods used:

(1) Voice communications were established 8 July on channel U and then shifted to channel H for primary telling net and channel S for secondary telling net. On 13 July the secondary telling net was shifted to channel F. On 15 July the secondary telling net was shifted to channel L. Channel H and L were used for the remainder of time on station. Communications were considered approximately 95 percent effective with the AC&W squadron and Beavertail.

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(2) RATT - No Transmissions Made While on Station.

(3) CW - No transmission to Beavertail or the AC&W Squadron. Channel A was used approximately 6 days for communications between Picket Stations.

D. Amount and Type of Interference.

(1) Heavy atmospheric interference was encountered approximately eighty percent of the time on ataion. CW interference was encountered approximately forty percent of the time on station. Communications were most difficult during sunrise and sunset periods. Periods of propagation skip effect were encountered. The SRA radar when properly tuned caused saturation interference on 121.5 MCS, 133.2 MCS and on a band from 200 to 375 MCS. This restricted the effective use for communications on these bands to receiving only strong signals. This interference which is of the direct radiation type comes from the receiving antenna and could be eliminated by the use of an absorption filter placed in the receiving antenna coaxial line.

(2) Interference was experienced by the SRa radar.

6. The maximum range at which reliable UHF communications were established with Air Force interceptors was 90 miles.

7. Brief Summary of Radar Equipment Failures:

A. The AN/SPS-8A was inoperative for five hours. Contamination of the oil in the magnetron housing caused the high voltage to arc to ground. The oil was drained, the housing cleaned, and new oil put in and the arcing condition was corrected. Failure of the local oscillator type 2K28 caused loss of receiver signal. The oscillator was replaced and adjusted and the equipment was returned to normal operation.

B. The SRa radar was inoperative for a period of one hour due to failure of the modulator tupe type 5022. The tube was replaced and the equipment was returned to normal operation.

8. EADF Exercises conducted and aircraft controlled:

A. All intercepts made with Air Force planes were training intercepts. Seven (7) intercepts were attempted and five (5) completed.

(1) On 11 July the 75th F.I.S. provided two (2) aircraft. This vessel assumed control of Ligament Nan "1" and Ligament Nan "2" at 1843Z. Communications were established on channel #10 then shifted to channel #9. Two (2) intercepts were accomplished. At 1933Z this vessel relinquished control of both aircraft to the 773rd AC&W Squadron for aircrafts return to base with ship controlling time 50 minutes

(2) On 12 July the 75th F.I.S. provided three (3) aircraft. Ligament How "1", Ligament How "2", and Ligament How "3" at 1330Z.

Communications were established on channel #10 then shifted to channel #9. No intercepts were accomplished due to inoperative IFF and lack of sufficient picture on the repeaters to permit positive control of aircraft. At 1420Z this vessel relinquished control of aircraft to 773rd AC&W Squadron for aircrafts' return to base with ship controlling time 40 minutes.

(3) On 13 July the 75th F.I.S. provided two (2) aircraft. This vessel assumed control of Ligament How "1" and Ligament How "2" at 1530Z. Communications were established on channel #10 then shifted to channel #9. Five training intercepts were accomplished. At 1610Z this vessel relinquished control of both aircraft to the 773rd AC&W Squadron for aircrafts' return to base with ship controlling time 40 minutes.

(4) On 18 July the 75th F.I.S. provided two (2) aircraft. This vessel assumed control of Ligament George "1" and Ligament George "2" at 1305Z. Communications were established on channel #10 then shifted to various Air Control channels. No intercepts were conducted due to lack of communications on any channel other than channel #10. At 1340Z this vessel relinquished control to the 773rd AC&W Squadron for aircrafts' return to base with ship controlling time 35 minutes.

(5) This ship participated in exercise "DEEP ROCK" from 180001Z until departure from station 260350Z. The ship relayed "FAKER' contact reports and ECM information to the primary AC&W Squadron. At 191400Z a series of nine (9) radar reflectors were dropped in a straight line bearing 000° T at intervals of ten (10) miles, altitude 12,000 feet. At 210445Z four (4) raids of "FAKER" aircraft detected from 174 to 221 miles and reported to the primary AC&W Squadron. At 230659Z six (6) raids of "FAKER" aircraft were detected from 130 to 187 miles and reported to the primary AC&W Squadron. Fifty (50) radar signals were intercepted and analyzed with 10 signals reported as ECM contacts to the primary AC&W Squadron.

9. On 17 July the Communications Officer suffered head injury from fall, was transferred by airlift to Doctor's care aboard the USS ANTIETAM. The excellent and timely assistance rendered was greatly appreciated.

10. Comments:

A. During this tour on station the SRa radar proved to be a reliable air search radar with some surprising results. Initial contacts for aircraft flying below 20,000 feet varied with the size and altitude; 70 miles for single low flying aircraft, and 180 miles for multi-engine craft, with an average range of 125 miles. Initial contacts for aircraft above 20,000 feet ranged between 160 miles and 221 miles for single craft, with an average range of 188 miles.

B. A group of four aircraft taking part in Exercise Minimum Warning on 21 July at 0432: was initially picked up at 206 miles, altitude 50,000 feet, by the SRa, trakced to the coast and over land to a distance of 305 miles, the maximum range on the AN/SPA-8A re-eapter, with received signals classed in the E4 to E5 signal strength

1331

greater, had the operator, on the SRa, not been using the 200 mile range for search at the time.

C. From the foregoing performance over a 17 day period it is felt that the SRa is a good basic long range, air search radar for high flying craft, when kept in a high state of readiness and in tune.

D. Some of the advantages and disadvantages of the SRa are as follows:

1. Advantages of the SRa over the AN/SPS-8A when used as an air search radar.

   a. Land mass has little or no effect beyond 60 miles when tracking high flying aircraft.
   b. Weather, which completely blanked out sectors of the AN/SPS-8A had little or no effect on ability to track aircraft through these areas.
   c. The SRa had very low component failure rate and extremely stable operation when correctly tuned.
   d. Little or no interference from surface contacts beyond twelve miles.

2. Disadvantages of the SRa vs. the AN/SPS-8A:

   a. Poor target resolution.
   b. Large fade areas from 65 to 90 miles in range exclude its use as a fighter detector radar.

2. Disadvantages Continued:
   c. Antenna sector scan is not provided, delaying confirmation of initial contacts.

E. Recommendations: As a result of recent experience with the SRa the following field changes and operating procedures are recommended to further the effectiveness of the equipment as a long range, air search radar.

1. The present antenna should be replaced with one having a higher gain. The SK-3 antenna is such and would materially improve the antenna gain. The following comparative information is listed for further study. Ref: Catalog of Electronics Equipment, NavShips 900,116 Supplement No. 1, Pages S-13 and S-30.

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Antenna Specifications:

	SK-3	SRa	Difference
Gain in DB	18.6	15	+3.6 DB
Frequency Range in megacycles/sec.	215 to 220	215 to 225	-5 mc.
Horizontal Beam Width	17°	20°	-3°
Vertical Beam Width	22°	50°	-28°
Size	17'diameter	5.5'by 13.5'	Considerable
Weight	1,650 lbs.	67[illegible] lbs.	+[illegible]71 lbs.
Polarization	Horizontal	Horizontal	none

The addition of 3.6 DB gain would in effect double the relative power output of the transmitter, and double the reflected energy returned from a target to the receiver. This would not double the range of the radar, but would minimize fade areas, and increase the probability of detection within the present range of the radar which is believed to be in excess of 200 miles. For graphic comparison of antennas see Enclosure Two.

E. Recommendations Continued:

2. The slow rate of rotation of the antenna is highly desirable for maximum detection but, due to this low rate, weak targets often appear and are lost before the antenna rescans the sector. If a field change were incorporated for sector scan (as in the AN/SPS-8A) the suspected area could be rescanned before the weak contact reaches a fade area, thus allowing confirmation of initial contact at 30% increase in range and considerably less time. With the use of two operators on the SRa sector scan has been accomplished, with one on the PPI and another on the antenna control. This, although operable, is a time consuming and arduous task which results in lost time in reporting initial contacts.

3. SRa antenna on the YAGR-3 has shown poor target response on a relative bearing of 150° to 170°. This is believed to be due to the location of the stack, king posts, and the superstructure at this bearing in relation to the SRa antenna. It is recommended that the antenna be raised to clear this area.

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4. The SRa tuning procedure as outlined in January 1946 Electron Magazine, NavShips 900,100, has been found very satisfactory with few minor differences inherent to the individual shipboard installation.

5. It is considered mandatory for optimum performance that a Voltage Standing Wave Ratio vs. Frequency study be made and from this an operating frequency may be determined for the most efficient equipment operation.

10B Communications are considered the weakest phase of the Early Warning System. The present communication organization is considered inadequate due to lack of personnel and equipment. It is recommended that personnel and equipment be made available for a CW "backup net" and for low and high frequency parallel telling nets. It is believed the communication organization outlined in COMNAVEASTCONAD Op-Plan 1-55 would be adequate if personnel and equipment were available for carrying it out

JOHN ANTO

1334

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SHIP REPORTING USS SKYWATCHER

STATION MANNED #3 DATE SUBMITTED 26 July 1955

KEY

A. -Total air contacts observed (penetrating).

B. -Total tracks reported to AC&W Squadrons.

C. -Total flight plans received.

D. -Total flight plans correlated and reported.

E. -Total tracks reported as believed to be friendly by picket vessel.

F. -Total tracks reported as unknown by picket vessel.

G. -Total tracks reported to AC&W Squadron which could not be correlated with existing tracks in the air defense system.

H. -Maximum radar range

I. -Maximum altitude

J. -Minimum altitude

K. -Average estimated altitude error for height finder radar (in hundreds of feet).

L. -Average radar rnage.

DATE	A	B	C	D	E	F	G	H	I	J	K	L
7/8/55	0	0	0	0	0	0	0	160	00	0	0	0
7/9/55	1	1	17	1	0	1	0	162	19K	5K	-400	127
7/10/55	7	7	21	5	0	7	0	171	30K	2K	-600	122
7/11/55	18	18	23	9	0	18	0	168	26K	3K	-500	121
7/12/55	16	16	32	11	0	16	0	151	29K	5K	-500	133
7/13/55	8	8	28	3	0	8	0	158	18K	4K	-500	122
7/14/55	15	15	28	8	0	15	2	152	33K	2K	-500	122
7/15/55	11	11	15	8	0	11	1	169	20K	1K	-400	108
7/16/55	13	13	22	5	0	13	0	169	21K	2K	-500	139
TOTAL												

(Report is CONFIDENTIAL when filled in) Enclosure 1 to COMCORTRON 16 Instruction 03320.1A

1335

SHIP REPORTING USS SKYWATCHER

STATION MANNED #3 DATE SUBMITTED 26 July 1955

KEY

A. -Total air contacts observed (penetrating).

B. -Total tracks reported to AC&W Squadrons.

C. -Total flight plans received.

D. -Total flight plans correlated and reported.

E. -Total tracks reported as believed to be friendly by picket vessel.

F. -Total tracks reported as unknown by picket vessel.

G. -Total tracks reported to AC&W Squadron which could not be correlated with existing tracks in the air defense system.

H. -Maximum radar range.

I. -Maximum altitude.

J. -Minimum altitude.

K. -Average estimated altitude error for height finder radar (in hundreds of feet).

L. -Average radar range.

DATE	A	B	C	D	E	F	G	H	I	J	K	L
7/17/55	13	13	16	8	0	13	0	156	25K	4K	-500	134
7/18/55	10	10	16	8	0	10	1	182	30K	5K	-500	129
7/19/55	10	10	24	4	0	10	0	172	40K	2K	-500	109
7/20/55	11	11	14	8	0	11	0	157	40K	5K	-800	158
7/21/55	9	9	15	3	0	9	4	297	50K	5K	-500	152
7/22/55	14	1	13	0	0	1	1	257	18K	5K	-500	152
7/23/55	18	18	21	8	0	18	0	187	38K	1.8K	-300	125
7/24/55	16	16	14	11	0	16	10	161	20K	5K	-400	118
7/25/55	18	18	14	10	0	18	1	155	20K	2K	-300	126
TOTAL	196	196	247	110	0	196	10	297	50K	1K	-450	127

Report is CONFIDENTIAL when filled in)

Enclosure 1 to COMCORTRON 16
Instruction 03320.1A

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The enclosed graphs that compare the SK-3 with the SRa antenna as to the minimum range that the radar will detect high flying aircraft and from this it may be seen that the SRa antenna has a better minimum range than the SK-3, i.e., a bomber flying at 40,000 feet, the minimum detectable range for the SRa is seventeen miles while, for the SK-3, it is fifty miles. This is due to the decrease of vertical beam width. This would present no problem as the AN/SPS-6A should easily maintain the target's track through this area. The increased reliability of maximum detectable range is believed to far offset the disadvantages.

(Enclosure 2)

1337

Coordination indicated by Gen Smith's signature of letter C S Glenn

COOPR

SUBJECT: (U) Operational Plan for Distant Early Warning System

405 B

21 pp

TO: Chief of Staff
Headquarters USAF
Washington 25, D. C.

1. Reference your letter (TS) dated 24 January 1955, subject as above, file AFODC, Control Number 550084. This letter directed Continental Air Defense Command to prepare, in accordance with its mission, the operational plan for the DEW System. We recognize that a complete and detailed plan was desirable as soon as possible, however, as you know, information and decisions necessary to develop a complete plan are not available at this time.

2. In view of the above, immediate action was taken to develop those portions of the plan required to enable the contractor and system designers to complete equipment specifications and general design of the system. Attached is the preliminary planning for the philosophy of operation, communication requirements and command responsibilities for the DEW System. These portions of the plan, although not fully completed, are being submitted now in order for your headquarters to provide guidance to the contractor. Our target date for the complete operational plan is between 1 April and 1 May 1955.

3. It should be noted that our initial planning for operational functions within the DEW System is restricted to early warning. We are not incorporating additional requirements for growth potential. We do acknowledge the need to bear in mind that the DEW System may eventually be expanded to perform additional functions, and accommodate more people for defense purposes. For example, passive detection and control of weapons functions may be added.

4. Our discussions with Alaskan Air Command and Northeast Air Command reveal that two sections of the line need immediate consideration. First, Alaska is not programming for the air surveillance and communication equipment between Kodiak Island and Cape Lisburne required in the coastal perimeter for the DEW Line. Second, the Line is presently only under contract to be constructed as far as Cape Dyer. We know that the Line is approved only to this point. However, time is passing so rapidly that we now fear that the DEW Line east of Cape Dyer will not be completed in phase with the segments now under construction. Since the NEAC radar system does

Glenn

Glenn, Gen
14 Mar 55

This correspondence is classified SECRET in accordance with Par 23 c, AFR 205-1, 15 Dec 53, or for the reason (s) stated. E a Harbes, Col not extend to Cape Dyer, it means that the shortest avenue of attack route to our most critical target areas is not to be covered by the DEW System by July 1957.

5. In view of the above, the following is recommended:

a. That the Western Electric Corporation's present contract for constructing the Cape Lisburne to Cape Dyer segment of the DEW Line be extended to include the design and construction of the Kodiak-Cape Lisburne Section of the DEW Line.

b. That approval of the Line location from Cape Dyer to Cape Farewell, Greenland be obtained.

c. That the Western Electric Corporation DEW construction contract also be extended to include the design and construction of the Cape Dyer-Cape Farewell segment.

d. In the event that approval of the line location east of Cape Dyer is not obtained in the immediate future, it is essential that gap fillers and Early Warning radar stations be installed from Hopedale, Labrador northward to Cape Dyer. This program would be strictly on a lash-up basis. The operational requirement is only to temporarily close the DEW Line.

6. The emphasis and support that the Air Staff is giving the DEW Program is indeed gratifying. You may be assured that the other participating services and representatives from Canada are extremely interested and are participating in every way possible to complete this essential program for defense of North America.

1 Incl:
Prelim "Oper Plan for the DEW System"

[illegible], JR.

Info cys to:
AOC-RCAF-ADC
CINCLANT
CINCPAC
CINCNE
CINCAL
AAC

1039

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TITLE PAGE

PRELIMINARY
OPERATIONAL PLAN FOR THE
DISTANT EARLY WARNING SYSTEM

14 MARCH 1955

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6-223
6-224
6-225
6-226
6-227
6-228
6-~~1-228~~

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627-3

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TABLE OF CONTENTS

SECRET

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127-4

1041

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FOREWORD

1. The complete and detailed operational plan for the DEW System cannot be published at the present time. The delay in the complete plan is due to the inherent time consuming details that must be agreed upon even though agreement in principle for the DEW System between the countries and services is consummated.

2. The preliminary sections of the operational plan outlined herein are not organized exactly like the suggested outline in AFR 5-47. A few of the sections contain information that would normally be classified into one or more subjects in a normal plan. However, it is contemplated that revisions and additions to the plan will eventually conform to this regulation. It should be noted that the operational sections are separated by geographical names only. The exact areas of command jurisdiction are made by station number and name for clarity.

3. For planning purposes, the location of the Line is assumed to proceed east from Cape Dyer to Holt Steinborg, Greenland; then on to the Azores via Cape Farewell on the southern tip of Greenland.

4. Forces and operations of the Seaward Extensions of the early warning systems will be commanded by appropriate Navy Command of JCS directive. Therefore, the operational requirements for CONAD are the only items of the operational plan included for the sea extensions.

- - -

This correspondence is classified ___________ in accordance with

1342

SECTION I

MISSION OF THE DEW SYSTEM

1. A requirement exists to provide for early warning of an air attack against the North American Continent in ample time to:

   a. Satisfy the warning needs of the Strategic Air Command.

   b. Bring all defense forces to a maximum state of alert.

   c. Provide for the timely implementation of other military and civil defense measures.

2. Air Defense data on unidentified aircraft crossing the DEW Line is the primary requirement of this system. It is essential that this information be transmitted to the Continental Air Defense Command and RCAF-ADC Combat Operations Centers for coordination with strategic intelligence and evaluation to derive early warning of an enemy air attack. Dissemination of early warning information and unidentified penetrations to appropriate user agencies is a CONAD responsibility.

3. The DEW System is designed to intercept the three most probable air attack routes on the North American Continent --

   a. Over the Arctic land mass.

   b. Seaward approach over the Atlantic Ocean.

   c. Seaward approach over the Pacific Ocean.

(See figure No. 1)

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127-6

1043

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AVENUES of APPROACH

Figure 1

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1344

SECTION II

ORGANIZATION AND MANNING

A. COMMAND RESPONSIBILITIES.

1. The purpose of this section is to recommend Command responsibilities for operation and logistic support of segments of the DEW system. For planning purposes, alternate courses of action are submitted for consideration.

2. The recommendations outlined herein are based upon the following factors.

   a. JCS Directives.

   b. The desires of the several operating commands.

   c. The natural lines of communication to the Canadian Archipelago, for logistical purposes.

   d. The most probable position of the governments of Canada and the United States regarding the operation and support of that portion of the DEW System located on Canadian territory.

3. It is recommended that command responsibility for both operational and logistical support of segments of the DEW System be assigned as follows:

   a. Commander-in-Chief, Pacific... Hawaii to Kodiak Island.

   b. Commander, Alaskan Air Command... The land based segment extending from Kodiak Island via the coastal perimeter of Alaska to station BAR 3 (Tuk Tuk, Northwest Territory, Canada) inclusive.

      (1) Representatives of the Alaskan Command and the Alaskan Air Command pointed out that no action has been taken to supplement and improve the air surveillance capability for that part of the DEW Line extending from Kodiak Island to Cape Lisburne, Alaska. To correct this deficiency, a contract should be awarded to the Western Electric company authorizing them to take

-627-8

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whatever action is necessary to meet the requirements set forth in the Military Characteristics Report for the DEW System. This should be accomplished in coordination with the Alaskan Air Command.

c. Commander, USAF Air Defense Command...Station BAR D (Eskimo Lakes, Northwest Territory, Canada) to Station CAM 3 (Shepherd Bay, Northwest Territory, Canada) inclusive.

d. Royal Canadian Air Force.... Station CAM D (Simpson Lake, Northwest Territory, Canada) to Station FOX C (Ekalugad, Northwest Territory, Canada) inclusive.

e. Commander, Northeast Air Command...Station HKH (Henry Kater, Northwest Territory, Canada) to Cape Farewell, Greenland inclusive.

(1) It is essential that a decision to locate the DEW Line from Padloping Island, Northwest Territory, Canada to Cape Farewell, Greenland be rendered without further delay and that a contract be awarded to the Western Electric Company to construct this portion of the line.

f. Commander-in-Chief, Atlantic... Cape Farewell, Greenland to the Azores.

4. In the event the recommendations listed in paragraph 3 above are unacceptable, the following alternate courses of action are recommended:

a. Alternate course of action No. 1. Royal Canadian Air Force, to be responsible for both operational and logistical support of the segment of the DEW Line extending from Station BAR D (Eskimo Lakes, Northwest Territory, Canada) to station FOX C (Ekalugad, Northwest Territory, Canada) inclusive.

b. As Alternate course of action No. 2. Commander, USAF Air Defense Command is to be responsible for both operational and logistical support of the segment of the DEW Line extending from station BAR D(Eskimo Lakes, Northwest Territory, Canada) to station FOX C (Ekalugad, Northwest Territory, Canada) inclusive.

1046

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B. MANPOWER POLICIES

1. The operation of the DEW System is a military responsibility. Preliminary planning indicates that a small compliment of military personnel must be stationed at each main and auxiliary station to make military decisions and provide positive military control. While the total number of military personnel at each main and auxiliary station has not been determined, it appears that the following functions must be performed by military personnel.

a. Station Commander.

b. Pilots for aircraft stationed along the line.

c. Aircraft Maintenance Technicians.

d. Medical Technicians.

2. In this connection, the commanders having operational and support responsibility for a segment of the DEW line must determine the military personnel requirements for stations under his jurisdiction.

3. It is recognized that many of the functions within the main and auxiliary stations, and all of the functions in the intermediate station, can best be accomplished by civilian personnel. Therefore, civilian personnel should be used to the maximum extent possible to perform all functions within the main, auxiliary and intermediate stations, consistent with the requirement for military control.

1347

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SECTION III

DEW LINE SYSTEM PERTAINING TO ALASKAN
AIR DEFENSE COMMAND

1. Concept of Operations

a. Kodiak to Tuk Tuk. Air surveillance data from this segment of the DEW Line will pass directly into the Alaskan Air Defense system for filtering and identification under existing procedures. Track data on aircraft that cannot establish their identity is reported to CONCOMAD and RCAF-ADC for threat evaluation. Unidentified penetrations from the entire DEW System will be reported to AAC, Combat Operations Center.

2. Method of Operation

a. The method of operation in integrating DEW line information into the AAC system is the same as presently employed in the AAC AC&W system. Challenges for identification are accomplished by the DEW line operator. The operators pass this surveillance information by voice in rectangular coordinates (GEO REF) of the target on his scope direct to the station responsible for the sub sector. From this point the data is passed on the normal voice channels to the appropriate Air Division. At the Air Division all unidentified traffic is transmitted direct to Continental Air Defense Command, Colorado Springs and RCAF-ADC, by the teletype telling technique. A drop-off will be provided to the AAC, and NEAC Combat Operation Centers.

3. Line Composition

a. Kodiak to Lisburne. This segment of the line requires improvements and addition of radars to provide the reliability and operational characteristics dictated by the military characteristics for the DEW System. The DEW equipment proposed by the Western Electric Company will satisfy these requirements.

b. Lisburne to Tuk Tuk.

(1) The Western Electric proposal for equipment for this segment meets the requirement for AAC Early Warning and extension of their radar coverage northward.

(2) The AAC desires to operate and support a small segment of the DEW Line in Canadian territory -(Alaska border to Tuk Tuk). The basis for this is to control the radar coverage that the DEW radar extends the programmed Alaskan AC&W System. Thus, the Alaskan Air Command will be provided

-627-11

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the capability of using their weapons to the greatest possible range for air defense purposes.

SECTION IV

DEW SYSTEM PHILOSOPHY OF OPERATION FROM THE TUK TO CAPE HENRY KATER PENINSULA

I. Concept of Operations.

1. Air Surveillance data from this segment of the DEW Line will be filtered and identified at each rotating radar. The CAA and Department of Transport of Canada will be responsible to provide the flight plan data for identification to the appropriate Air Movements Identification Section. The Air Movements Identification Section will forward the flight plan data to a Base Station for relay to the appropriate Main and Auxiliary Stations.

2. Track data pertaining to aircraft that do not establish their identity is reported to COC's of CINCONAD and RCAF-ADC. This information may be routed through the Mid-Canada Line and Air Defense Divisions, provided the accumulative delay is not greater than twelve (12) minutes from time of initial detection.

II. Method of Operation.

3. At each rotating radar station, radar detection information will be reported to the military movements-identification operator who will perform the identification function for all tracks in his area of responsibility. This area will normally be to the mid-point of the adjacent radar.

4. The discreet information of any one target may appear at more than one radar, however, the adjacent identification sections will filter this information by direct voice communications. The identification section will correlate friendly aircraft tracks with alarms from FLUTTAR.

5. Identification of all friendly aircraft will be made by electronic, procedural, visual, or other means, regardless of the direction of flight. The identification section must perform the identification function within seven (7) minutes from reporting time of initial detection. Unidentified inbound aircraft will be reported in rectangular coordinates (GEO REF) to COC's of CINCONAD and RCAF-ADC within an additional five (5) minutes by teletype telling technique. A drop-off

1949

of this information to the NEAC, and the appropriate RCAF or USAF Air Defense Divisions will be provided.

5. Reliability of information into and from the line is assured by having alternate routes of communications. Thus each radar station on the line is capable of communicating rearward through either of the adjacent main stations.

SECTION V

DEW SYSTEM PHILOSOPHY OF OPERATION FROM CAPE HENRY KATER PENINSULA TO CAPE DYER AND ON TO CAPE FAREWELL, GREENLAND

I. Concept of Operations.

1. Air surveillance data from this segment of the DEW line will pass directly into the northeast air defense system for filtering, and identification under existing procedures. Track data on aircraft that cannot establish their identity is reported to RCAF-ADC and to CONAD for threat evaluation. Unidentified penetrations from the entire DEW System will be reported to NEAC, Combat Operations Center.

II. Method of Operations.

1. The identification function is planned to be accomplished at the Goose Bay direction center. Details of operation are not available at this time.

127-13

1950

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SECTION VI

DEW LINE COMMUNICATIONS ELECTRONICS REQUIREMENTS

PART I

1. REFERENCE:

a. Outline Plan for Distant Early Warning System, 22 November 1954 (Prepared by Western Electric Company, Inc., Defense Projects Division) (Secret).

b. Final Report of the Systems Engineering Group for the Mid-Canada Early Warning Line, 27 August 1954, RCAF Headquarters, Ottawa, Canada (Secret).

c. Preliminary Systems Engineering Plan for the Continental Section of the Distant Early Warning (DEW) Line, 15 January 1955 (prepared by Bell Telephone Labs., Inc), for The Western Electric Company Inc., under Contract AF 18(600)-578 (Secret).

d. Letter Headquarters USAF, Subject: (UNCL) Implementation of the DEW Line, w/2 inclosures. Inclosure No. 1 - Implementation Plan for the DEW Line, (Secret), Inclosure No. 2 - List of DEW Stations (Secret).

e. Letter Headquarters USAF, Subject: (Uncl) Letter of Transmittal with two Inclosures. Inclosure No. 1 - Map, Alaskan AC&W System; Inclosure No. 2 - Phase I List (White Alice Recompilation of Requirements by Trunk Routes as of 20 January 1955).

f. Tropospheric Scatter Communications System, Operations Plan - 1-55, Headquarters Northeast Air Command, 14 February 1955 (Uncl)("Pole Vault" Communications System).

PART II

1. <u>INTRODUCTION:</u>

a. The Communications and Electronics requirements outlined in this document are limited to that land portion of the DEW System extending from Cape Lisburne, Alaska along the North Alaskan coast through the Northwest Territory of Canada and terminating near Cape Dyer on Baffin Island. Extension of the line on both the Eastern and Western Termini are being studied by Headquarters USAF and the Communications and Electronics requirements for these extensions are not covered in this document.

-627-14-

1051

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b. The Communications and Electronics responsibility and facility requirements outlined in this document were discussed with representatives from CINCAL, AAC, NEAC, CHD, USAF and RCAF-ADC at a conference held at Headquarters CONAD during the week of 7 March 1955.

(1) At this conference, DEW System, Communications and Electronics facility requirements and responsibility assignments as outlined in this document were agreed upon in principle by the CINCAL, AAC and NEAC representatives.

(2) It was the personal opinion of the RCAF-ADC representatives that the approach taken for design and operation of the C&E facilities for the Mid-Canada segment of the line was sound. Firm C&E requirements and assignments of responsibilities will be delayed pending finalization of agreements between the Canadian and United States Governments.

c. Wherever possible, maximum use is to be made of existing C&E networks and facilities to satisfy new requirements imposed by the DEW System. This action is necessary to insure economy of operation and to prevent unnecessary duplication.

2. <u>SYSTEMS ENGINEERING PLAN:</u>

a. In general the C&E requirements, design objectives and implementation of the DEW System (as proposed in references a and c, paragraph 1) are considered sound.

(1) Adequate communications, circuits and facilities have been programmed for use on the line and along the line. C&E station equipments appear adequate to handle the DEW system mission.

(2) A change in the concept of operation has necessitated reprogramming of communications facilities to the rearward areas. These changes are outlined in this document.(See attached chart).

b. While adequate C&E facilities were programmed to support the DEW System mission, other operating agencies and

1052

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Headquarters USAF may impose additional C&E requirements which do not contribute directly to the accomplishment of this mission. These requirements will be presented to Headquarters USAF for approval prior to incorporation into the DEW program. Basic DEW Communications Systems design must possess the capability of expanding to include these added requirements.

PART III

1. RESPONSIBILITIES. Because of geography, political and military boundaries and the proximity to existing air defense systems, the DEW System is divided into three areas of operating responsibility. These are: (a) Alaskan Air Command, (b) Combined Canadian-United States, and (c) Northeast Air Command. By necessity, the communications system must be designed to support these sub-divisions of the DEW System.

a. Alaskan Air Command

(1) The requirement is established for two voice communications facilities as the primary means of communications between the DEW Line and the Alaskan Air Defense Communications System. They are:

(a) Indian Mountain ADDC and Point Barrow Main Station.

(b) Fort Yukon ADDC and Barter Island Main Station.

(2) The VHF Scatter facilities proposed between Anchorage and Point Barrow and between Anchorage and Cape Lisburne will be deleted from the DEW program.

(a) Headquarters USAF is responsible for including these changes in the DEW communications system.

(b) The VHF Scatter facility now installed between Barter Island and Anchorage will remain in the program for use as an alternate means of communications with the DEW Line.

(3) When necessary to satisfy DEW requirements, AAC will be responsible for providing the added communications circuits and facilities in existing or programmed Alaskan ACSW Communications Systems. Wherever possible, these requirements should be incorporated

1053

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(?) the "White Alice" Communications Plan.

(?) Detailed communications channel requirements along the DEW Line and in the Communications facilities between the DEW Line and Indian Mountain and Fort Yukon will be established by Alaskan Air Command. These requirements will be forwarded to Headquarters USAF for approval and incorporation into the DEW Line program.

(4) It is expected that extension of the DEW Line from Cape Lisburne to Trinity Island (Kodiak) will utilize gap filler radars for low altitude coverage. These radars will be remotely operated by the Adjacent ADDC operating as a part of the Alaskan Air Defense System. The communications circuits and facilities necessary to support this program from the ADDC to the rear is expected to be incorporated in the Alaskan "White Alice" Plan and has been excluded from this document.

(a) This extension of the DEW Line is pending USAF decision as to how it will be implemented and the equipment to be employed.

b. Northeast Air Command.

(1) The requirement is established for a voice communications facility as the primary means of communications between the DEW Line main Station at Henry Kater, Northwest Territory, Canada, and Frobisher Bay, Baffin Island (GCI Station N-31 and Northern most terminal of the NEAC "Pole Vault" Communications System).

(2) The VHF Scatter facility proposed for use between Henry Kater and Goose Bay, Labrador is not required and should be deleted from the DEW program.

(3) The requirement is established for a voice communications facility between Goose Bay (GCI Station N-26) and RCAF-ADC, St. Hubert, Canada.

(4) When necessary to satisfy DEW requirements, NEAC will be responsible for providing the added communications circuits and facilities

1954

to the existing or programmed ACAN Communications System. Wherever possible, these requirements should be incorporated into the "Pole Vault" Communications System.

(3) Detailed communications channel requirements along the DEW Line and in the communications facility between Henry Kater and Frobisher Bay will be established by NEAC. These requirements will be forwarded to Headquarters USAF for approval and incorporation in the DEW System program.

(a) Detailed communications channel requirements for the voice communications facility between Goose Bay and St. Hubert will be determined by NEAC and RCAF-ADC. These requirements will be forwarded to Headquarters USAF for approval and incorporation in the DEW System program.

c. COMAD-RCAF-ADC.

(1) The requirement is established for elimination of the programmed Churchill VHF Scatter relay station. Two VHF Scatter facilities are required between the IGLOOLIK DEW Main Station to a base station located at the Mid-Canada Line Early Warning Station at Amery, Manitoba and between the PEARCE DEW Main Station to Amery.

(2) The requirement no longer exists for the programmed Hay River VHF Scatter relay station. VHF Scatter facilities are required between the Cambridge Bay DEW Main Station to a Base Station located at the Mid-Canada Early Warning Station at Dawson Creek, British Columbia and between the Barter Island DEW Main Station to Dawson Creek. Headquarters USAF is responsible for programming these changes to this rearward communications link for the DEW System.

(3) COMAD-RCAF-ADC will be responsible for determining the detailed communications channel requirements along the DEW Line and in the VHF Scatter facilities between the DEW Line and Dawson Creek and Amery. These requirements will be submitted by COMAD to Headquarters USAF for approval and incorporation into the DEW Line program.

(4) CONAD-RCAF-ADC will be responsible for providing the added communications circuits and facilities to existing or programmed Canadian RCAF communications systems required to satisfy DEW requirements.

d. CONAD.

(1) CONAD, in coordination with RCAF-ADC, AAC and NEAC, will:

(a) Establish circuit and facility requirements necessary for exchange of DEW Line information among the Combat Operations Centers of CONAD, RCAF-ADC, NEAC, and AAC.

(b) Establish operation procedures for reporting of DEW line tactical and surveillance information.

e. HEADQUARTERS USAF.

(1) Headquarters USAF will be responsible for:

(a) Review and approval of all DEW System Communications circuits and facility requirements.

(b) Obtaining necessary frequencies as requested by the DEW System engineering agency.

f. GENERAL.

(1) Requests for call signs, security and authentications systems will be handled in accordance with existing USAF, RCAF-ADC directives.

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SECTION VII

CONAD OPERATIONAL REQUIREMENTS FOR THE ATLANTIC AND PACIFIC SEGMENTS OF THE DEW SYSTEM

1. The operational requirements are as follows:

a. Identification of all friendly aircraft will be made by electronic, procedural, visual, or other means, regardless of the direction of flight.

b. The identification function must be accomplished as soon as possible after the time of the initial detection.

c. The CAA and Department of Transport of Canada will be responsible for providing flight plan data to the appropriate Air Movements Identification Section. The flight plan data will then be forwarded to the appropriate land terminus of the seaward segment.

d. The track data pertaining to the aircraft that are determined to be unknown or hostile at the DEW Line will be introduced into the Air Defense System with the least possible delay. Tentative agreements propose that the following responsibilities for communication routing:

(1) Pacific Sea Extension. The Navy accepts the responsibility for assembling the information on unknown and hostiles from this segment of the line at two points. For CONAD all unknowns and hostiles are assembled at the Navy radio station, San Francisco. CONAD will install the communication lines from the Navy radio station to JEADF. For AAC the Navy will assemble only information on unknown and hostiles from the DEW segment that includes the three picket vessel stations nearest Kodiak.

(2) Atlantic Sea Flanks. The Navy accepts the responsibility to assemble all the unknowns and hostiles from this segment of the DEW Line to two (2) points, namely, Headquarters JEADF, Stewart Air Force Base and Headquarters NEAC. This agreement applies when the Atlantic segment provides air surveillance from St. Johns, Newfoundland to the Azores, and also when the line is from Cape Farewell to the Azores.

1957

1058

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107

OFFICE OF THE CHIEF OF STAFF
UNITED STATES AIR FORCE
Washington, D. C.

30 Jul 1955

SUBJECT: (Uncl) Decisions Relative to Operation of the DEW Line

TO: (SEE DISTRIBUTION)

1. Several proposals concerning the operation of the DEW Line have been under study by this Headquarters and other agencies for some time. While all questions concerning the project are not resolved the following information and instructions are provided as guidance for further planning and action.

2. Command Responsibility. The Canadian Government has been queried as to the extent of their participation in the military control and supervision of the line and a formal reply is expected by 1 August 1955. However, advance information has been received concerning the Canadian views which permits the USAF to proceed as follows:

a. The DEW Line will be divided for command and operational purposes into a western and an eastern sector. The dividing line will be between the Cambridge Bay (CAM) and Hall Lake (FOX) main stations at a point agreed to by the operating commands. It is suggested that Shepard Bay Auxiliary Station be the eastern-most station in the Western Sector.

b. The Alaskan Air Command will be responsible for the operation of the Western Sector which extends from Cape Lisburne to the dividing line stated in paragraph a. above. The Northeast Air Command will be responsible for the operation of the Eastern Sector which currently extends from the dividing line to Cape Dyer. Assignment of responsibility to NEAC for the operation of a land-based extension east of Cape Dyer will be considered following the JCS decision on location of such an extension. The above applies to the operational responsibility as is amplified below. Guidance concerning responsibility for logistic support of the line will be forthcoming in the near future.

c. The RCAF will provide one RCAF Officer at each Main Station on Canadian Territory. This officer will serve as an RCAF Liaison Officer and in addition participate in the operation of the station.

3. Manning. The Canadian Government has been queried as to their views on manning the line. While a formal reply is expected by 1 August 1955, informal information indicates that the following instructions can be used:

a. The line will be manned on a civilian contract basis. Such contracts will include but will not be limited to such functions as

1959

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communication and electronic maintenance and operator, all housekeeping, provision of medical attention, operation and maintenance of aircraft and other means of transportation, certain resupply activities (to be specified later), personnel recruiting and training.

b. Military officer personnel will be assigned to Main Stations only to provide military control and supervision and to perform the identification function. Each Main Station will be provided one commander and from three to five assistants for the above functions. The RCAF Officer assigned to Main Stations in Canada will replace one USAF Officer. Some additional military personnel may be required for logistic support purposes. Decision as to such a requirement has not been made at this time, but instructions will be given when the logistic support plan is firm.

4. Sector Organization and Operation. The Western and Eastern Sectors of the line will be divided into subsectors. Each Main Station will serve as the command post for a subsector and will have two to four Auxiliary Stations on each side reporting to it.

a. Surveillance. Each Main Station and its Auxiliary Stations serve as surveillance stations on a 24-hour a day basis. Track information from surveillance operators at Auxiliary stations will be composed by automatic message composers and transmitted to the associated Main Station by teletype. Messages will be handled by automatic equipment so as to be presented sequentially on teletype-writers at the main station. Track data may be told in GEOREF grid or in azimuth and range coordinates from Auxiliarys to Mains. Main Stations will plot, filter and tell directly to the command posts of the operating commands and to ADC by teletype in GEOREF grid. When required, drops on rearward telling circuits may be established for subordinate organizations of AAC, NEAC, and the RCAF. Voice telling circuits to selected direction centers in Alaska and NEAC may be used where provided for by the currently approved communication system. Surveillance procedures in both Sectors will be identical. Procedures for handling doppler detections (Intermediate stations) will be as agreed to by the two operating commands and the Air Defense Command. The frequency of plot telling will be established by the operating commands provided the needs of the Air Defense Command are met. The maximum time delay from time of detection at any station to receipt of filtered and identified track information at CONAD Combat Operation Center is currently established as twelve minutes. This may be reduced as operational experience indicates such a capability.

b. Identification. Decisions as to identification will be made at Main Stations only and by military personnel. Identification may be performed by the following methods:

Ltr, subj: "(U) Decisions Relative to Operation of the DEW Line" (Cont)

(1) Flight plan correlation

(2) Electronic identification (When the required equipment is available)

(3) Identification maneuvers and voice challenge and reply systems.

Procedures used for identification in both sectors will be identical and will be established to meet the qualitative requirements of the Air Defense Command within the limitations prescribed above. The operating commands and the Air Defense Command will take action to establish a single statement of requirements for United States and Canadian Governmental regulations of air traffic to facilitate identification at the DEW Line.

c. Operational Equipment. The Main Stations and auxiliary stations will be provided identical control rooms. The control rooms will contain consoles on which displays and communications equipment will be available. Each Main Station will include a plotting room containing equipment for pre-plotting flight plans, track plotting and filtering, identification, and telling to the rear. Voice communications equipment will be provided to permit the handling of supplemental surveillance information, identification queries and other operational instructions directly with the surveillance operations at the associated auxiliary stations. Crypto equipment will be available at Main Stations to permit the handling of classified flight plan data and other classified information.

d. Weather Reporting. Limited weather observations will be made and reported over presently planned communications by operating personnel at selected stations along the line. Such observations will be confined to data which can be collected by civilian personnel with limited training. The information provided will normally include barometric pressure, temperature, dew point, wind velocity, precipitation and visability data. The Air Weather Service will designate up to twelve Auxiliary or Main Stations from which such information is desired and will provide concerned headquarters and agencies with specific information as to the equipment, training and routing required.

5. Proposals for the segment of the DEW Line between Cape Lisburne and Kodiak Island area are under study at this Headquarters at the present time. Detailed information concerning the composition of that segment will be forthcoming in the immediate future. Guidance concerning operations is as follows. The line will be considered as a part of the Alaskan Air Command AC&W system. Surveillance and identification procedures will be prescribed by the Alaskan Air Command. Communications between the new DEW stations and the existing and programmed Alaskan AC&W system will be provided by the DEW contractor. Communications from the AC&W stations to rear echelons will be over the AC&W communication system. No changes in procedures for relaying surveillance or other air defense information to other commands are contemplated as the Cape Lisburne - Kodiak segment is but an augmentation to

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Ltr, subj: "(U) Decisions Relative to Operation of the DEW Line" (Cont)

the existing AAC system. The Auxiliary Stations will be constructed and equipped in the same manner as are the Auxiliary Stations along the Artic coast. Any minor changes in function which may require changes in equipment should be submitted immediately to this Headquarters for review.

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THOMAS D. WHITE
General, U.S. Air Force
Vice Chief of Staff

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DOCUMENT NO. 108

THIS DOCUMENT MAY BE FOUND

IN VOLUME 9 OF THE SUPPORTING

DOCUMENTS TO THIS HISTORY.

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D. C.

21 JAN 1955

SUBJECT: (Unclassified) Implementation of the DEW Line

TO: **Commander**
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. The following developments concerning the distant early warning system are summarized for your information and necessary action.

a. On 24 February 1954, the President approved the National Security Council's recommendations that a distant early warning system be implemented as soon as proven feasible by the development and testing program. The President directed the implementation of the line by all appropriate executive departments and agencies of the United States Government.

b. On 11 March 1954, the Secretary of Defense directed the Army, Navy and Air Force to implement such elements of the distant early warning program as fall within their responsibilities.

c. On 1 December 1954, the Secretary of the Air Force approved the plan for implementing the land-based segment of the DEW Line and a contract was awarded the Western Electric Company. A copy of the implementation plan is attached for your information and guidance. Revisions and modifications to the Plan will be forwarded to concerned agencies as they occur.

d. On 2 December 1954, the Joint Chiefs of Staff approved the military characteristics for the DEW system subject to approval by the Canadian Chiefs of Staff Committee.

e. On 14 January 1955, the Joint Chiefs of Staff approved amended recommendations for the location of a portion of the DEW system. Attached is a partial list of stations along the route which has been approved. Additional stations will be identified in the future.

1064

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2. A Joint Distant Early Warning Project Office (DEWPO) has been established under the provisions of AFR 20-10. Offices are located in Room 728, 220 Church Street, New York 13, N. Y.. Executive responsibility has been assigned to Headquarters, Air Research and Development Command. A shift in executive responsibility to Headquarters, Air Materiel Command will be accomplished in the future. You will be advised at the time of change.

a. The responsibilities of the DEWPO are stated in the attached Implementation Plan. They include:

(1) Serving as the contractors point of contact within the Air Force.

(2) Management of the DEW Line Program.

(3) Developing working policies and details of coordination in conjunction with the contractor.

(4) Providing decisions and guidance to the contractor.

(5) Coordinating contractor requirements with military agencies as may be needed.

b. This Headquarters expects the contractor to submit his requirements for military support to the DEWPO. That office will coordinate such requirements with the Command concerned. Specific requirements in support of the DEW project which are beyond the capability of the command concerned will be submitted to this Headquarters for resolution.

3. Our target date for completing the land-based segment is mid-1957. The short time available for implementation of this project dictates the necessity for extraordinary action in procurement, transportation, construction, installation and activation of the facilities. This Headquarters has assigned an OPU precedence rating of I-3 to this project and Air Materiel Command has authorized an ANS-1 supply priority. The timely and successful completion of the line is considered to be of paramount importance to the effective defense of Canada and the United States. Your full cooperation and support in furthering this objective is desired.

2 Inclosures
1. Implementation Plan for the DEW System
2. List of DEW Stations

James E. Briggs
JAMES E. BRIGGS
Major General, USAF
Assistant Deputy Chief of Staff, Operations

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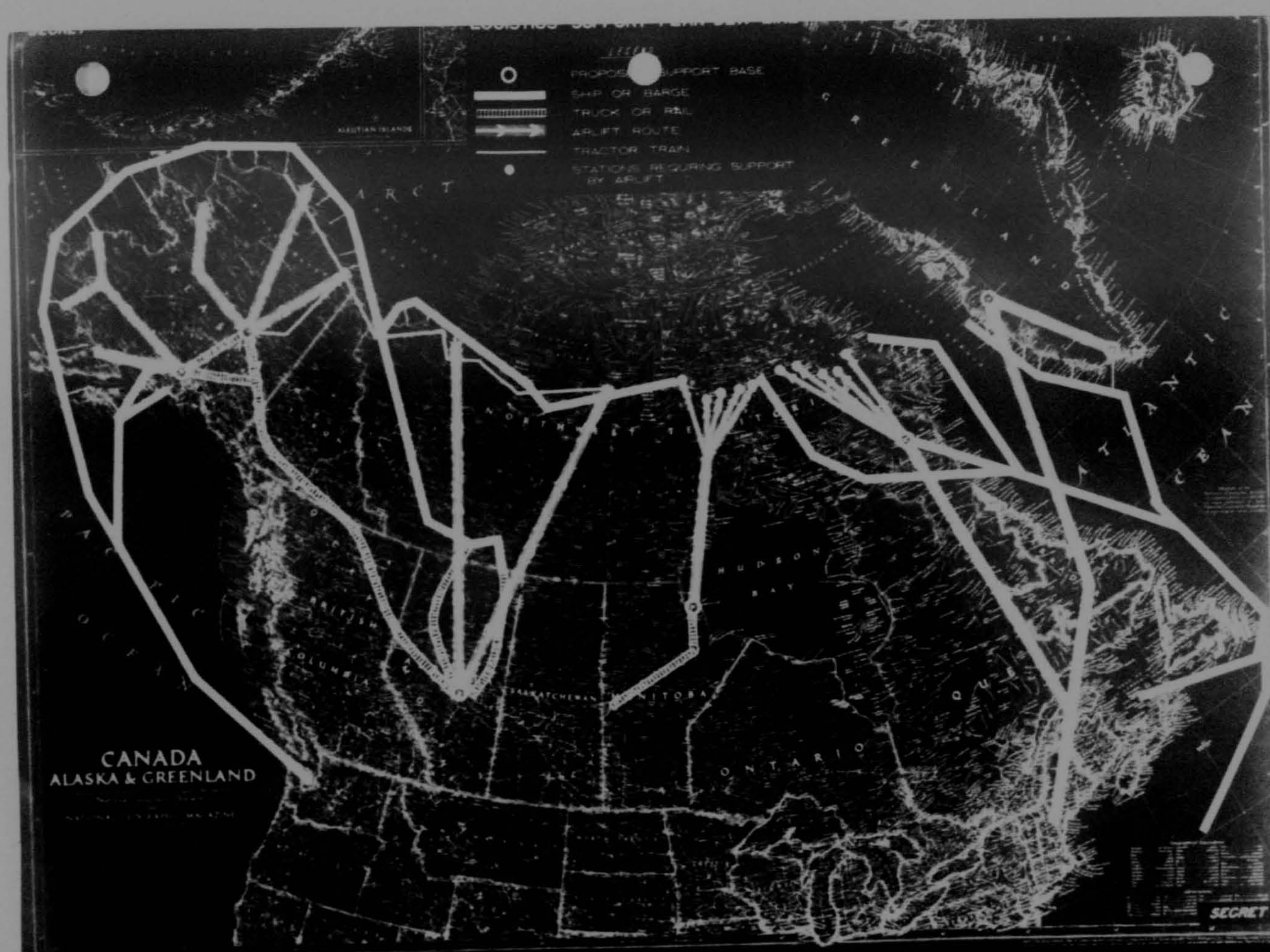

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TAB A

IMPLEMENTATION OF THE PROGRAM

1. In order to effectively manage Project "DEW", it is contemplated that a "package" contract, or family of contracts will be awarded to Western Electric under which they will provide for certain managerial and consultant services; however, the contract will be written to retain for the Air Force the authority to exercise decision regarding price, to procure certain equipments if advantageous, to use Air Force inventory and procurement stocks, and to establish procedures for approval of sub-contracts. It will retain sufficient authority to assure that the system is correct from a maintenance, supply, training, and operational stand-point. The Air Materiel Command will administer the prime contract.

2. From the Air Force side a "DEW" Joint Project Office (JPO) has been established under the initial executive responsibility of ARDC. Transfer of executive responsibility to AMC will take place upon execution of the contract with Western Electric, estimated to be 10 January 1955. The JPO, as finally constituted, will consist of personnel from AMC and ARDC. Invitation for representation will also be extended to ADC, AAC, NEAC, North Atlantic (AFIR), and the Canadian Government. The JPO's functions and responsibilities are as follows:

a. It will be the contractor's point of contact within the Air Force.

b. It will have overall Air Force responsibility for managing the program.

c. It will develop in conjunction with the contractor working policies and details of coordination consistent with the control required by law which will assure that the responsibilities of each party will be executed rapidly and to the best interest of the contractor and the Air Force.

d. It will arrange to have the contractor develop logistic techniques which may be phased into Air Force operation at a time considered appropriate by the JPO.

3. The procurement philosophy contemplated for the program is as follows:

a. Contracting for Equipment, Supplies and Services

(1) The United States Air Force will give equal consideration to Canadian and United States qualified sources in the procurement of equipments, supplies and services. Availability and price are important factors which will be taken into consideration when making awards.

(2) Implementing procurement procedures to carry out the above will be prepared by the JPO and will be applicable to contracts awarded by both the USAF and Western Electric.

b. Construction Contracting

(1) In the awarding of contracts for actual construction, Canadian contractors will be extended equal consideration with United States contractors, and Canadian contractors shall have equal consideration in the procurement, for use on this project, of materials, equipment and supplies in either Canada or the United States.

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(2) Any contractors awarded a contract for construction in Canada will be required to give preference to qualified Canadian Labor for such construction. The rates of pay and working conditions for this labor will be set after consultation with the Canadian Federal Department of Labour and will be set in accordance with the Canadian Fair Wages and Hours of Labour Act of 1935.

(3) Canadian Law (e.g. tax laws, labor laws, workmen's compensation, unemployment insurance, etc.) will apply.

4. Detailed transportation planning including the determination of requirements, development of procedures and operational methods will be accomplished jointly by the contractor and USAF through the JPO.

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TAB B

THE ROLE OF THE WESTERN ELECTRIC IN AIR DEFENSE

1. Western Electric has been associated with the air defense problem for several years. During WW II and ensuing years, the Bell System provided the basic communications for continental air defense operations. In recent years, Western Electric has occupied a more comprehensive role in providing technical assistance to the USAF in all phases of air defense aircraft control and warning operations.

2. In 1950 the Bell Telephone Laboratories were employed to provide technical services and assistance for the implementation of the ZI air defense system. Under their contract, Bell was required to study the technical, operational, and logistical aspects of the existing continental radar network and make recommendations for improvement in our air defense capability. A unit known as the Continental Air Defense Systems (CADS) Group was organized to complete this very comprehensive study covering all aspects of air defense radar operations. On completion of this work, the contract was terminated in 1953.

3. The Bell System, in the form of Bell Laboratories and Western Electric Company, is employed by the Air Force to provide an experimental early warning system on the arctic coast. This project was covered by an all-inclusive contract between Western Electric Company and ARDC. It calls for the engineering, construction, installation, and operational testing of an early warning network to determine the feasibility of constructing such a system across the arctic. This is a current project.

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4. Bell Laboratories are under contract to the Air Force to make a detailed technical review of the Lincoln program and all other Air Force projects relating to air defense activities. A first report has been submitted covering their analysis of the Lincoln program. This contract has been further expanded to encompass the planning, construction, and implementation of the Semi-Automatic Ground Environment.

5. In view of the experience and potential capability of the combined effort embodied in the Bell System, it is concluded that this organization possesses optimum capability within the U.S. to pursue the implementation of the DEW system.

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TAB C

PROGRAM FOR DESIGN AND CONSTRUCTION

1. Western Electric will engage and supervise a competent A/E* firm to prepare the design and inspect the construction of the specialized facilities. The Air Force will be consulted in the selction of the A/E and the construction contractor and will review and approve preliminary plans and outline specifications and final plans and detailed specifications.

2. The contractor will construct or enter into sub-contracts for the construction of the sites and will supervise inspection activities of the A/E.

3. In order to implement this plan, appropriate documents will be processed to:

a. Inform OSD, Army and Navy that this construction will be accomplished under direct Air Force control.

b. Secure the necessary Finding and Determination for the A/E services and approval to proceed with a CPFF type contract.

c. Secure clearances and releases from Congress, BOB and OSD for funds.

4. The North Atlantic Region, AFIR (Air Force Installation Representative), will provide guidance to the JPO on construction matters.

* Architect-Engineer

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TAB D

9 November 1954

PROPOSED WORK STATEMENT - DISTANT EARLY WARNING LINE CONTRACT

I. General.

The contractor shall furnish, with the assistance of the Air Force, a plan providing for the installation and operation of a complete Distant Early Warning System for North American Continental Air Defense by July 1957. This plan shall be subject to the approval and acceptance by the USAF. The contractor shall prepare a proposed schedule for the accomplishment of the approved plan. The contractor will be required, upon the approval of both the plan and the schedule for the accomplishment of the plan, to provide when authorized by the Distant Early Warning Project Office (USAF) engineering, procurement and administrative services for the implementation of the Distant Early Warning System. In putting the plan into effect, maximum utilization will be made of Government facilities to perform all work within the time limits of the approved schedule. General supervision of the contractor in the performance of this contract shall be exercised by the Air Force through the medium of a Project Office.

II. DEFINITION.

The Distant Early Warning System as defined in this work statement includes the following:

A. Those facilities required to gather air surveillance data for the planned distant early warning system to be located along the northernmost practicable line extending along the North American continent.

B. Those facilities required to transmit the information from the data gathering facilities to the appropriate control facilities, intermediate stations, relay points, and terminal facilities.

III. SPECIFIC DUTIES OF THE CONTRACTOR.

A. System Planning and Engineering

1. The Contractor shall be required to:

a. Prepare, with the assistance of the USAF, a system plan covering all necessary functions, i.e. development, siting, construction, installation, testing, etc., leading to the orderly evolution of an operational Distant Early Warning Line as defined, at the earliest practicable date.

b. Prepare, with the assistance of the USAF, a time-phased logistic plan covering those support aspects necessary to the initial and continued successful operation of the DEW Line, as defined.

c. Assist the USAF in evolving a practical plan for the optimum operational employment of the DEW Line in association with other air defense systems.

d. Assist the USAF in programming and budgeting for the necessary equipment, sites, construction, communications, installation, training, spare parts, and test equipment required to implement the above technical, logistic and operational plans.

e. Prepare such other special related studies as are required.

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B. Continuation of Present Work*

1. The objective of the continuation of present work is to continue the research and development of equipment for installation in a DEW line which will adequately meet the requirements of an early warning system. The present work is defined as that work called for by Contract AF 18(600)-572 and the amendments thereto which includes but is not limited to:

a. The construction, preparation and maintenance of two land-based installations, one in the continental United States and the other in the far north.

b. The preparation of engineering plans for the establishment of the ground base portion of a far north operational early warning line.

c. The system's engineering, research and development required for the establishment of a distant early warning system covering both the over-water and over-land approaches to this continent and facing the most probable threats.

This does not include the current propagation tests in the NEAC area.

C. Research and Development

1. The contractor shall be required to:

a. Perform research and development on those equipments necessary for the functional operation of the DEW line,

* Pertains to continuation of current Project 572.

for which satisfactory commercial or military items cannot be found.

b. Perform research and development leading to necessary modifications to existing items of equipment in order to overcome functional deficiencies in the performance of the DEW Line.

c. Perform appropriate background investigations and testing as required to obtain otherwise unavailable data necessary for the successful employment of equipment and/or techniques directly applicable to the performance of the DEW Line.

D. Construction

1. The contractor shall accomplish the design of all facilities in the Distant Early Warning sites subject to the following:

a. Prior to subcontracting for any portion of the Architectural and Engineering work, the contractor shall submit to the JPO for approval a list of recommended Architectural and Engineering firms, together with adequate preliminary specifications and design data to serve as a basis for design.

b. Upon contractor's receipt of the approved preliminary specifications, design data, etc., and approved A/E list, the contractor shall arrange for completion of design and furnish to the Government the final drawings, data, specifications, bill of materials, etc., necessary for construction of the complete Distant Early Warning System.

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2. The contractor shall, upon receipt of Distant Early Warning Project Office approval of the drawings, data, specifications, bill of materials, etc., furnished under D 1.b. above, construct the facilities in the Distant Early Warning System subject to the following:

a. Prior to subcontracting for any portion of construction work under part D 2, the contractor shall submit to the Project Office for approval a list of recommended construction firms.

b. Upon contractor's receipt of approved list of construction subcontractors, the contractor shall solicit bids or enter into negotiation with the construction firms for specified work and submit recommendations to the JPO for approval.

3. Construction

a. In the awarding of contracts for actual construction, Canadian contractors will be extended equal consideration with United States contractors, and Canadian contractors shall have equal consideration in the procurement, for use on this project, of materials, equipment and supplies in either Canada or the United States.

b. Any contractors awarded a contract for construction in Canada will be required to give preference to qualified Canadian labor for such construction. The

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rates of pay and working conditions for this labor will be set after consultation with the Canadian Federal Department of Labour and will be set in accordance with the Canadian Fair Wages and Hours of Labour Act of 1935.

c. Canadian law (e.g. tax laws, labor laws, workmen's compensation, unemployment insurance, etc.) will apply.

E. Procurement

1. The contractor will purchase equipment, materials, and services to complete the DEW System to the extent that the Project Office determines that GFE or services are not available. In effecting such procurement, the contractor will follow such procedures as are prescribed by the JPO. Consideration will be given to Canadian sources in accordance with the international agreement.

2. The contractor will procure necessary support items that cannot be government furnished.

3. The contractor will procure necessary services such as telephone and telegraph circuits to make the DEW Line operational.

F. Installation and Maintenance

1. Provide complete equipment engineering services for installation peculiar for Distant Early Warning facilities, including the development of the floor plan layouts, equipment installation specifications, and the preparation of complete bills of materials therefor.

2. Install the equipment, including detection and communication, in accordance with the approved plan.

3. Prepare or arrange for preparation of instruction and maintenance manuals for each type of station and its equipment.

4. Prepare and recommend operational procedure and instructions for complete Distant Early Warning System and appropriate section thereof.

5. Prior to turning the Distant Early Warning Line (or any portion thereof as agreed upon by the contractor and the USAF) over to the USAF, the operating equipment and facilities will be thoroughly tested by the contractor. The tests to be conducted will be in accordance with the standards and procedures approved by the USAF.

G. Training Programs

The contractor will analyze the manpower requirements for installing, operating, and maintaining the Distant Early Warning Line in order to establish training program requirements. Such requirements should be expressed in terms of the specialties involved, the nature and duration of required training courses, and the time schedule for conducting this training. As deemed appropriate by the JPO, the contractor will organize, conduct, or arrange for the conduct of the necessary training programs for personnel to install, operate and maintain the Distant Early Warning Line.

IV. TIME OF PERFORMANCE

A. It is mutually understood that the evolution of the Distant Early Warning System is of a continuing nature. The contractor will undertake the work outlined above for a period of two years. Prior to the end of this period, a review will be undertaken between the contractor and the Air Force to determine the extent and the scope of the work to be performed beyond the agreed period.

B. The contractor will adhere to the approved plan schedules and will be responsible for alerting the Distant Early Warning Project Office in adequate time when it is determined that expeditious action will be required by the Air Force in order to maintain time schedule of the plan.

V. RELATIONS OF THE CONTRACTOR AND THE CONTRACTING AGENCY.

The USAF will assume the full responsibility for complete internal coordination in the Department of Defense and other departments of the U.S. and Canadian Governments. The contractor will work directly with the Project Office and look to it for decisions, guidance and required coordination including but not limited to matters concerning material implementation.

VI. REPORTS

The contractor will prepare and distribute periodic progress reports as required by the Joint Project Office.

CONFIDENTIAL

EXPLANATION OF BREVITY CODE

1. A code name of three letters only indicates a main station.

2. A code name of three letters followed by a number suffix indicates an auxiliary station.

3. A code name of three letters followed by a letter suffix indicates an intermediate station.

4. A code name of three letters followed by a letter and a number suffix indicates a combined auxiliary and intermediate station. This situation exists only at some of the original test sites.

5. The auxiliary and intermediate stations take the three letter code name assigned to the main station lying to the west of the auxiliary or intermediate station concerned. An exception is the auxiliary station at Cape Lisburne which provides the code name for the stations lying between Cape Lisburne and Point Barrow.

6. The auxiliary and intermediate stations are numbered and lettered consecutively from the main station which provides the three letter code name.

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NAME			LOCATION	CODE	FUNCTION
Cape Lisburne, DEW Station			Cape Lisburne, Alaska	LIZ-1	Auxiliary St
Unnamed Point,	"	"	Approx 50 mi East of Cape Lisburne, Ala.	LIZ-A	Intermediate
Point Lay	"	"	Point Lay, Alaska	LIZ-2	Auxiliary
Icy Cape	"	"	Icy Cape, Alaska	LIZ-B	Intermediate
Wainwright	"	"	Wainwright, Alaska	LIZ-3	Auxiliary
Peard Bay, Alaska		"	Peard Bay, Alaska	LIZ-C	Intermediate
Point Barrow	"	"	Point Barrow, Alaska	POW	Main Station
Cape Simpson	"	"	Cape Simpson, Alaska	POW A	Intermediate
Lonely	"	"	Lonely, Alaska	POW 1	Auxiliary St
Kogru River	"	"	Kogru, Alaska	POW B	Intermediate
Oliktok	"	"	Oliktak, Alaska	POW 2	Auxiliary
McIntyre	"	"	McIntyre, Alaska	POW-C	Intermediate
Bu[illegible]n Point	"	"	Bullen Point, Alas(NAW)	POW 3	Auxiliary
Brownlow Point	"	"	Brownlow Point, Alas(NATW)	POW D-1	Combined Auxiliary & Int
Simpson Cove	"	"	Simpson Cove, Alas (NMIW)	POW D-2	Combined Auxiliary & Int
Barter Island	"	"	Barter Island, Alas (NMS)	BAR	Main Station
Aschoff Cape	"	"	Aschoff Cape, Alas (NMIE)	BAR A-1	Combined Auxiliary & Int
Demarcation Bay	"	"	Demarcation Bay, Alas(NAIE)	BAR A-2	Combined Auxiliary & Int
Bagnall Beach	"	"	Bagnall Beach, Yukon Territory, Canada (NAZ)	BAR-1	Auxiliary
Kay Point	"	"	Kay Point, Yukon Territory Canada	BAR B	Intermediate
Shingle Point	"	"	Shingle Point, Yukon Territory, Canada	BAR-2	Auxiliary

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1082

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NAME	LOCATION	CODE	FUNCTION
Tununuk DEW Station	Tununuk, Northwest Territory, Canada	BAR C	Intermediate
Tuk Tuk DEW Station	Tuk Tuk, Northwest Territory, Canada	BAR 3	Auxiliary
Eskimo Lakes DEW Station	Eskimo Lakes, Northwest Territory, Canada	BAR D	Intermediate
Nicholson Peninsula DEW Sta	Nicholson Peninsula, Northwest Territory, Can	BAR 4	Auxiliary
Horton River, DEW Station	Horton River, Northwest Territory, Canada	BAR E	Intermediate
Cape Parry " "	Cape Parry, Northwest Territory, Canada	BAR 5	Auxiliary
Pearce Point " "	Pearce Point, Northwest Territory, Canada	PIN	MAIN
Clinton Point " "	Clinton Point, Northwest Territory, Canada	PIN 1	Auxiliary
Cl[illegible]ton Point " "	Clifton Point, Northwest Territory, Canada	PIN A	Intermediate
Young Point " "	Young Point, Northwest Territory, Canada	PIN 2	Auxiliary
Bernard Harbor " "	Bernard Harbor, Northwest Territory, Canada	PIN B	Intermediate
Lady Franklin Point DEW Station	Lady Franklin Point, North-West Territory, Canada	PIN 3	Auxiliary
Ross Point DEW Station	Ross Point, Northwest Territory, Canada	PIN C	Intermediate
Unnamed Point, DEW Station	Approx 50 miles East of Ross Point, Northwest Territory, Canada	PIN 4	Auxiliary
Cape Peel DEW Station	Cape Peel, Northwest Territory, Canada	PIN D	Intermediate
Cambridge Bay DEW Station	Cambridge Bay, North-west Territory, Can	CAM	MAIN

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1083

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NAME	LOCATION	CODE	FUNCTION
Sturt Point DEW Station	Sturt Point, Northwest Territory, Canada	CAM A	Intermediate
Jenny Lind Island DEW Sta	Jenny Lind Island, Northwest Territory, Canada	CAM 1	Auxiliary
Hat Island DEW Station	Hat Island, Northwest Territory, Canada	CAM B	Intermediate
King William Island, DEW Station	King William Island, Northwest Territory, Can	CAM 2	Auxiliary
Matheson Point DEW Station	Matheson Point, Northwest Territory, Canada	CAM C	Intermediat
Shepherd Bay DEW Station	Shepherd Bay, Northwest Territory, Canada	CAM 3	Auxiliary
Simpson Lake DEW Station	Simpson Lake, Northwest Territory, Canada	CAM D	Intermediat
W. Simpson Peninsula DEW Station	W. Simpson Peninsula, Northwest Territory, Can	CAM 4	Auxiliary
E. Simpson Peninsula DEW Station	E. Simpson Peninsula, Northwest Territory, Can	CAM E	Intermediat
W. Melville Peninsula DEW Station	W. Melville Peninsula, Northwest Territory, Can	CAM 5	Auxiliary
Mid Melville Peninsula, DEW Station	Mid Melville Peninsula, Northwest Territory, Can	CAM F	Intermediat
Igloolik DEW Station	Igloolik, Northwest Territory, Canada	FOX	MAIN
Rowley Island DEW Station	Rowley Island, Northwest Territory, Canada	FOX 1	Auxiliary
Bray Island DEW Station	Bray Island, Northwest Territory, Canada	FOX A	Intermediat
Foley Island DEW Station	Foley Island, Northwest Territory, Canada	FOX 2	Auxiliary
W. Baffin Island DEW Station	W. Baffin Island, Northwest Territory, Canada	FOX B	Intermediat
Mid Baffin Island DEW Station	Mid Baffin Island, Northwest Territory, Canada	FOX 3	Auxiliary

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1084

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NAME	LOCATION	CODE	FUNCTION
Ek[illegible]gad DEW Station	Ekalugad, Northwest Territory, Canada	FOX C	Intermediate
Henry Kater DEW station	Henry Kater, Northwest Territory, Canada	HEN	MAIN
Cape Hooper DEW Station	Cape Hooper, Northwest Territory, Canada	HEN A	Intermediate
Kivitoo DEW Station	Kivitoo, Northwest Territory, Canada	HEN 1	Auxiliary
Broughton Island, DEW Station	Broughton Island, Northwest Territory, Canada	HEN B	Intermediate
Padloping Island, DEW Station	Padloping Island, Northwest Territory, Canada	HEN 2	Auxiliary

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Register Number 65227-6

MEETING ON ALASKAN EXTENSION OF DEW LINE CAPE LISBURNE TO KODIAK ISLAND
220 Church St. - April 19, 1955

Colonel Williamson opened the meeting by stating that W.E. has a request from the Air Force to prepare siting proposals and a cost estimate for funding purposes covering (1) the Extension of the DEW Line from Cape Lisburne to Kodiak Island utilizing the existing Alaskan radar Stations and (2) the povision of certain protection circuits to supplement the Alaskan communication network being installed on Project 717. This information is required in Washington by May 15.

After the people in attendance at the meeting were introduced, Mr. Bowman pointed out that in order for W.E. to submit proposals for the implementation of these 2 features which will coincide with the needs of the Air Force, it is desirable that there be an understanding of the basic philosophy underlying the requirement for these facilities. The purpose of this meeting is to obtain the views of Headquarters USAF, ADC and AAC concerning the over-all operational plans of which the DEW Extension will be a part, so as to rationalise any proposal made by W.E. to fit in with them.

Mr. Aschoff pointed out on the map the routes of Project 717 communications circuits and the locations of existing and proposed radar stations. He then briefly outlined 2 possible alternative routes that might be followed in establishing a detection line from Cape Lisburne to Kodiak Island.

One of these would, in general, follow the convolutions of the coast line, incorporating in it the existing AAC radar installations at Lisburne, Wales, [redacted] Romanzof, Newenham and Naknek. The other route which would be shorter and would materially reduce the total number of stations goes overland across the base of the Seward Peninsula and across the Delta Region of the Yukon and Kuskokwim Rivers and integrates into it the proposed radar stations at Kotzebue, Unalakleet and Bethel.

Lt. Col. Jones indicated that the DEW Line Extension in Alaska is basically intended to serve a dual purpose -- act as a distant early warning facility for the continental U.S. and assist AAC in the task of defending Alaska against air attack. Consideration of the latter feature causes AAC to favor a route following the coast line in order to buy as much warning time as possible.

In the general discussion which followed, several items of information developed:

The existing radar stations are early warning radars.

In a number of instances the radar equipment is located on high elevations.

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with remote indication provided for operations purposes at sea level; only maintenance personnel being required on the mountain tops. The communications controls are also remotely located at sea level.

The proposed radar installations are to be GCI stations and their integration into the DEW Line Extension does not need to be planned for, since they will have a different purpose.

Possibilities of jamming need to be taken into consideration in the orientation of both detection and communication facilities, particularly at those points where they are to be located closest to foreign territory and therefore are most susceptible to jamming.

Heavy traffic of bush pilots flying in the area of the Line (particularly the Seward Peninsula) will certainly pose a problem in attaining effective performance of the fluttar system.

Interference between radars in the Line and the GCI radars where they will be in generally close proximity, can presumably be taken care of by frequency adjustments.

It will not be necessary to include in the W.E. proposal any modifying of the radar equipment at existing stations integrated into the Line, but merely to figure on adding fluttar receivers and lateral communications equipment at these points. Presumably, remote indication and remote controls can be employed for the additional equipment at those installations where this method of operation is already established.

SUMMARY

At the conclusion of the general discussion it was agreed that:

1. W. E. proposal should be submitted to USAF for approval on the basis of providing a detection line generally following the coast line southward from Cape Lisburne and ending at Sitkinak at the south end of Kodiak Island.

2. Any action toward relocating the proposed GCI stations because of the DEW Line Extension being in the picture, is the responsibility of AAC.

3. The information obtained along the Line will be fed to the existing warning radar stations, whence existing or proposed communications circuits can convey it wherever required. Consequently, no provision will be made as far as this proposal is concerned, for any so-called "rearward" communications other than the protection circuits mentioned hereafter in Item 5.

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4. The effect on the fluttar detection systems of heavy commercial air traffic in the vicinity of portions of the Line is an operational problem to be resolved by the Air Force.

5. The method of providing the protection circuits to serve as back-up for the Project 717 network routes will be studied in each of the segments involved. The W.E. proposal will be made on the basis of the most economical and reliable procedure in each instance. This involves determination as to whether the lateral communications of the DEW Line should be planned with sufficient capacities to take care of the additional circuits required or whether provision of independent circuits is indicated by a consideration of the circumstances.

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JCS PRESENTATION -- MAJ GEN F. H. SMITH, JR.

22 JUNE 1955

LOCATION EASTERN FLANK - DEW LINE

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1089

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LOCATION EASTERN FLANK - DEW LINE

ADMIRAL RADFORD AND MEMBERS OF THE JOINT CHIEFS OF STAFF:

1. THE PURPOSE OF THIS CONAD PRESENTATION IS TO RECOMMEND THE LOCATION FOR THE EASTERN FLANK OF THE DEW LINE AND TO EXPLAIN CONAD'S VIEWS AS TO WHY THE LINE MUST BE LOCATED IN THIS MANNER IN ORDER TO BE TACTICALLY SUITABLE FOR CONTINENTAL AIR DEFENSE PURPOSES. THESE VIEWS ARE THOSE OF GENERAL CHIDLAW, RECENTLY RETIRED COMMANDER-IN-CHIEF OF THE CONTINENTAL AIR DEFENSE COMMAND, AND ARE CONCURRED IN BY GENERAL MICKELSEN, THE INTERIM COMMANDER-IN-CHIEF.

2. THE ENTIRE DEW LINE AS PROPOSED IS INTENDED TO SATISFY THREE CRITICAL AND MAJOR REQUIREMENTS FOR CONTINENTAL AIR DEFENSE PURPOSES. THESE ARE:

a. SATISFY THE NEEDS FOR WARNING FOR THE STRATEGIC STRIKING FORCES.

B. BRING ALL DEFENSE FORCES TO A MAXIMUM STATE OF ALERT CONSISTENT WITH THE WARNING PROCURED.

c. PROVIDE FOR THE TIMELY IMPLEMENTATION OF OTHER MILITARY AND CIVIL DEFENSE MEASURES.

THE SYSTEM MUST BE SO DESIGNED THAT IT FULFILLS THESE OBJECTIVES OVER THE THREE MOST LIKELY ROUTES OF APPROACH, NAMELY:

a. THE ARCTIC LAND MASS

b. THE SEAWARD APPROACH OVER THE PACIFIC OCEAN

c. AND THE SEAWARD APPROACH OVER THE ATLANTIC OCEAN.

3. THE WESTERN FLANK OF THE DEW LINE AND THE LAND BASED NORTHERN FLANK WHICH HAS BEEN APPROVED WILL PROVIDE THREE HOURS OR BETTER OF

1930

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WARNING AGAINST RUSSIAN AIRCRAFT OF THE T-37 AND T-3[illegible] TYPES. THE LOCATION OF THE EASTERN FLANK SHOULD BE COMPATIBLE WITH THESE TWO SEGMENTS IN ORDER TO PROVIDE ONE EARLY WARNING SYSTEM WITH A HIGH DEGREE OF WARNING RELIABILITY.

4. THE GENERAL CONAD POSITION AS TO THE LOCATION OF THE EASTERN FLANK OF THE DEW LINE IS THAT THE LINE SHOULD BE LOCATED SO THAT IT HAS POSITIVE TACTICAL VALUE FOR CONTINENTAL AIR DEFENSE PURPOSES. WHILE THE FUNCTION OF A DISTANT EARLY WARNING LINE IS TO PROVIDE A LONG TERM WARNING, IF THIS WARNING IS TO BE PROCURED FROM A SINGLE LINE IT MUST ALSO PROVIDE A REASONABLY RELIABLE INDICATION OF ENEMY INTENTIONS. I SHOULD LIKE TO MAKE IT CLEAR THAT CONAD WELCOMES ANY INFORMATION-GATHERING CAPABILITY WHICH CAN BE PRODUCED, COVERTLY OR OVERTLY. ALL AIRCRAFT MOVEMENTS IN FORCE ARE OF DIRECT INTEREST TO CONAD AND THIS INFORMATION, COUPLED WITH STRATEGIC INTELLIGENCE, HELPS FORM THE BASIS FOR DECISION BY COMMANDER CONAD. THIS INTELLIGENCE INFORMATION MUST THEN BE BACKED UP BY A SYSTEM OR A LINE SUCH AS THE DEW LINE, THE CROSSING OF WHICH, IN FORCE, WILL REQUIRE THAT THE COMMANDER TAKE POSITIVE ACTION TO FULFILL HIS RESPONSIBILITIES.

5. THERE ARE TWO PROPOSALS FOR THE LOCATION OF THIS EASTERN FLANK OF THE DEW LINE.

CHART

ONE PROPOSAL WOULD LOCATE THE LINE FROM CAPE DYER TO ICELAND AND THENCE TO THE FAEROES AND ENGLAND. THE OTHER LINE WOULD PROCEED FROM CAPE DYER TO CAPE FAREWELL AND THEN TO THE AZORES. THE ICELAND LINE IS APPROXIMATELY 1230 MILES FROM THE NEAREST SOVIET BASE ON THE KOLA PENINSULA AND THE AZORES LINE IS ABOUT 21[illegible]0 NAUTICAL MILES FROM THE NEAREST SOVIET BASE.

THE GREENLAND-ICELAND LINE IS ABOUT 6 HOURS FLYING TIME WITH SOVIET JET BOMBERS FROM THE EAST COAST AND THE AZORES LINE IS ABOUT 4-1/2 HOURS FLYING TIME. THIS 4-1/2 HOURS WARNING LINE PRODUCES MORE WARNING THAT IS PROCURED FROM THE DEW LINE ON THE NORTHERN OR WESTERN FLANKS. CONAD WOULD LIKE TO SEE THE LINE ESTABLISHED FROM GREENLAND TO THE AZORES FOR THE FOLLOWING REASONS:

a. THE CLOSER POSITIVE WARNING LINES ARE ESTABLISHED TO RUSSIAN CONTROLLED TERRITORY THE EASIER THE LINES ARE TO SPOOF. CONSTANT SPOOFING WITH RELATIVE EASE NEGATES THE POSITIVE VALUE OF A WARNING LINE. WE FEEL THAT THE GREENLAND, ICELAND, FAEROES LINE IS PARTICULARLY VULNERABLE TO SPOOFING. THIS LINE IS APPROXIMATELY 1200 MILES FROM THE KOLA PENINSULA AND RUSSIAN LONG-RANGE AIR FORCES OPERATING ACROSS THIS LINE WOULD BE OPERATING IN AN AREA OF THE NORTH ATLANTIC WHICH IS CLOSER TO RUSSIAN TERRITORY THAN TO THE UNITED STATES. WE MUST ASSUME THAT AS THE RUSSIAN LONG-RANGE AIR FORCES GAIN IN CAPABILITY AND EXPERIENCE THAT THEY WILL CONDUCT LARGE SCALE BOMBER TRAINING MISSIONS OVER THE OCEAN AREAS. IT IS FELT THAT RUSSIAN BOMBERS CROSSING THE ICELAND-ENGLAND LINE WOULD NOT HAVE INDICATED PROBABLE <u>HOSTILE INTENT</u> TOWARD NORTH AMERICA EVEN IF OPERATING IN SIGNIFICANT NUMBERS. THE UNITED STATES WOULD HAVE DIFFICULTY IN MOLDING WORLD OPINION TO THE EXTENT THAT ANY CROSSING OF THIS LINE WOULD BE CONSIDERED A DIRECT THREAT TO THE

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UNITED STATES. CONAD WOULD BE IN AN EXTREMELY DIFFICULT POSITION IF THE ICELAND-ENGLAND LINE WERE INSTALLED ALONE. WE WOULD KNOW THE LINE HAD BEEN PENETRATED AND OUR NEXT POSITIVE INFORMATION WOULD BE RECEIVED WHEN THE AIRCRAFT ENTERED THE OFF-SHORE CONTIGUOUS COVERAGE UNLESS THE ARGENTIA-AZORES LINE WERE ALSO INSTALLED. THIS OBVIOUSLY WOULD BE TOO LATE TO TAKE ALL THE REQUIRED ACTIONS FOR AIR DEFENSE PURPOSES. THEREFORE, WE WOULD BE FORCED TO TAKE ACTION ON CROSSING OF THE OUTER-LINE. THE POSITIVE VALUE OF THE WARNING LINE IS NEGATED DUE TO ITS VULNERABILITY TO SPOOFING AND THE RESULTANT FALSE ALARMS.

b. THE GREENLAND - AZORES LINE DOES NOT SUFFER FROM THE SAME DISADVANTAGES. THIS LINE BEING LOCATED MUCH CLOSER TO NORTH AMERICA, ANY PENETRATION OF THIS LINE BY LARGE NUMBERS OF UNKNOWN AIRCRAFT WOULD JUSTIFY AND REQUIRE POSITIVE ACTION BY CONAD. THIS LINE IS LOCATED IN APPROXIMATELY THE AREA WHERE THE COMMANDER, CONAD, IN ASSESSING THE THREAT, WOULD BE FORCED TO SAY, "THIS IS AS CLOSE AS I CAN LET THEM GET WITHOUT TAKING ACTION." AT THIS POINT, THE RAID MUST BE DESIGNATED AS PROBABLY HOSTILE IN INTENT, BEING ONLY 4-1/2 HOURS FROM OUR EAST COAST. ITS LOCATION IS MORE COMPATIBLE WITH THE REST OF THE DEW LINE FROM A TIME-DISTANCE STANDPOINT AND IT DOES ALLOW ADEQUATE TIME TO PERFORM THE BASIC ACTIONS FOR WHICH THE DEW LINE IS BEING DESIGNED. IT IS TRUE THAT THE RUSSIAN CAN SPOOF EITHER OF THESE LINES. HOWEVER,

1333

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THIS COUNTRY WOULD BE ON MUCH FIRMER GROUND IN CHALLENGING THE RUSSIAN RIGHT TO PENETRATE THIS LINE THAN THEY WOULD THE ICELAND-FAEROES LINE. WE MUST, CONCURRENT WITH THE DEVELOPMENT AND INSTALLATION OF SUCH A LINE, MAKE KNOWN TO THE WORLD THE PURPOSE OF THIS LINE, THE FACT IT IS WITHIN THE WESTERN HEMISPHERE, AND THAT WE VIEW PENETRATION OF THE LINE AS A THREAT TO THE SECURITY OF NORTH AMERICA AND THAT IT IS WAR PROVOCATION IF PENETRATED IN LARGE NUMBERS FOR SPOOFING PURPOSES. (THESE FEW SUGGESTIONS ARE NOT IN ACCORDANCE WITH EXISTING INTERNATIONAL LAW. HOWEVER, THIS IS A PROBLEM WHICH MUST BE FACED IN THE AGE OF THE JET BOMBER). THE MAIN POINT TO ESTABLISH HERE IS THAT CONAD CONSIDERS THIS LINE AN ACTION LINE REQUIRING TACTICAL DECISION.

c. NEITHER THE GREENLAND-ICELAND-FAEROES LINE OR THE ARGENTIA-AZORES LINE, STANDING BY THEMSELVES OR TOGETHER, FULFILL THE REQUIREMENT FOR A TACTICALLY SUITABLE LINE AS WELL AS DOES THE GREENLAND-AZORES LINE. THEREFORE, WE AT CONAD FEEL THAT WE COULD BETTER ACHIEVE THE RELIABLE WARNING INFORMATION FROM THE GREENLAND-AZORES LINE AND DUE TO THE FORCES REQUIRED OVER THE LAND AND WATER AREAS WE WOULD EXPEND LESS RESOURCES.

6. THERE ARE OTHER FACTORS WHICH BEAR ON THE LINE LOCATION, SOME OF THESE ARE:

a. DIFFICULTY OF GETTING ADDITIONAL MILITARY RIGHTS AND STATIONING ADDITIONAL FORCES IN ICELAND VS NEGOTIATING WITH DENMARK AND PORTUGAL ON THIS SAME PROBLEM.

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DESIRABLE THAT THE DISTANT EARLY WARNING LINE BE SO LOCATED THAT NORMAL PEACETIME INTERNATIONAL FLIGHTS PENETRATED AS NEARLY AT RIGHT ANGLES AS IS PRACTICABLE. THE LOCATION OF THE LINE FROM THE TIP OF GREENLAND TO THE AZORES SATISFIES THIS REQUIREMENT AND GIVES US A CROSS CHECK ON FRIENDLY TRAFFIC APPROXIMATELY IN MID-OCEAN, THUS REDUCING THE IDENTIFICATION PROBLEM WITHIN THE CONTIGUOUS RADAR COVER. THE GREENLAND-ICELAND-FAEROES LINE PARALLELS THE ROUTES FOLLOWED BY NORMAL TRAFFIC, AND THUS WOULD FURNISH LITTLE OR NO IDENTIFICATION ON SUCH TRAFFIC.

c. THE TERMINATION OF THE LINE AT THE AZORES PROVIDES A FLEXIBLE LINE USING MAINLY PROGRAMMED FORCES WHICH INITIALLY WOULD STRETCH FROM NEWFOUNDLAND TO THE AZORES AND BE AN EXTENSION OF THE MID-CANADA LINE, THEN IN A LATER TIME PERIOD THE NORTHERN END WOULD BE SWUNG TO SOUTHERN GREENLAND. SHOULD IT BE DESIRABLE DURING A LATER TIME PERIOD, THE FORCES COULD BE RE-DEPLOYED TO AUGMENT AND EXTEND THE OFF-SHORE CONTIGUOUS COVERAGE. THIS FLEXIBILITY WOULD ENABLE THE U.S. TO REACT TO THE VARYING DEGREES OF INTERNATIONAL TENSION AND TO DEPLOY ITS FORCES ACCORDINGLY.

d. IT IS CONSIDERED THAT BOTH LINES ARE FEASIBLE AND CAN BE LOGISTICALLY SUPPORTED.

e. THE GREENLAND-AZORES LINE CAN BE EXTENDED AT A FUTURE DATE, IF DESIRABLE, AND BE COMPATIBLE WITH THE REST OF THE LINE.

7. RECOMMENDATION: IT IS RECOMMENDED THAT THE JOINT CHIEFS OF STAFF APPROVE THE CONAD LINE AT AN EARLY DATE SO THAT ITS DEVELOPMENT MAY PROCEED IN PHASE WITH THE REST OF THE DEW LINE AND PRODUCE AN EFFECTIVE

1995

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112

5 Aug 1955

From: CINCONAD

To: CofS, AS Executive Agent to JCS
Hq USAF, Washington 25, D. C.

(SECRET) COOPR 30251 . Personal to Twining fr Partridge.

In your Secret Msg AFOOP-OP-D 57360, dated 27 Jul 55, you indicated that a Study Group has been convened to re-evaluate the approved Western Sea Flank of the Distant Early Warning Line for a possible relocation between Midway and the Aleutian Islands. This is the first official notification received by my headquarters that a re-study of this segment of the Dew Line was being considered. In view of prior JCS approval of the location of the line between the Hawaiian Islands and Kodiak, I had felt the only major point at issue would be the location of the Eastern Sea Flank. I was also surprised at the decision to refer the question of relocation to a Joint Group in Washing with participation by this headquarters limited to one or two representatives.

While I appreciate the necessity for initial study by the Air Force and the Navy and other agencies prior to the establishment of CONAD, the terms of reference which established my headquarters clearly designated it as an important planning agency for early warning systems and procedures. In the terms of reference and mission, I am directed, in coordination with appropriate United States and Allied commanders, to plan for early warning systems and procedures which will provide early warning of air attack for the defense of the continental United States to insure that their systems are designed and operated in a

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COOPR 30251 . manner responsive to continental air defense requirements and in consonance with national policy.

In view of this directive, I suggest that it would be better for the JCS TO request the views of CINCONAD on any alternate proposals for the location of the Dew Line. I could then consider such proposals in coordination with appropriate commanders.

I am sure that you share my concern over the fact that delay and indecision on the location and programming of the sea flanks will probably result in the establishment of an operational land-based segment of the Dew Line without the concurrent establishment of compatible sea flanks.

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113

27 July 1955

From: Hq USAF, Washington, D. C.

To: CINCONAD, Ent AFB, Colorado

(SECRET) From AFOOP-CP-D 57360. USN and USAF have been charged with reconvening Joint USN/USAF Feasibility Study Group to study and report to JCS on feasibility of future relocation of Kodiak-HAWAII extension of Dew Line to a location between Midway and Aleutians. Study group has examined Shemya, Adak and Dutch Harbor as possible Aleutian terminals. Adak appears most desirable from standpoint of costs, manpower and operational feasibility. Study will now concentrate on Midway-Adak with Dew type land-based stations to Alaskan mainland. It is requested you provide one or more representatives to participate in study with objective of providing JCS with recommendations as to whether or not Kodiak-Hawaii extension should be relocated and if so when. CINCAL and CINCPAC Fleet also being invited to send representatives. Personnel should contact Col Robbins, Room 4D 1084, 1 Aug. Estimated TDY not to exceed 2 weeks.

1098

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114

From: Hq USAF, Washington, D. C. 15 Aug 1955
To: CINCONAD, Ent AFB, Colorado

(SECRET) From AFCCS 58119 REUR COOPR 30251. By memo, 27 May 55, CNO proposed that Joint USN/USAF Feasibility Study Group be reconvened to "examine and report to the JCS on feasibility and desirability of re-locating Pacific extension of DEW Line by utilizing a system of fixed raders along Aleutians plus over water line to Midway." JCS comments on recommendation this regard by Killian Committee pointed out certain undesirable aspects of ultimately relocating Pacific segment of DEW Line by agreed that early study should be given the recommendation without holding up present program. On basis JCS comments it was agreed that Joint Study should be under taken to provide essential data upon which to base future consideration of any relocation but it is emphasized that no action should be taken which might interfere with present Pacific Programs for DEW Line. However, trend of joint study clearly indicates CNO desire for early decision regarding relocation due to obvious savings which would accrue to Navy. On basis this trend, USAF representatives indicated appropriateness for your hq to study matter and Navy. On basis this trend, USAF representatives indicated appropriateness for your hq to study matter and necessity for your views prior to JCS consideration of any proposed relocation of Pacific segments of DEW Line. In light of this trend and your terms of reference, it is intended to propose to CNO that your hq assume responsibility for conducting the study and pre-paring in coordination with appropriate U.S. commands a report on this matter. Request you initiate study concurrent with efforts being taken

1939

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here to obtain whole study responsibility for your hqs. Since current study was not directed by JCS but was initiated by mutual agreement, it is considered inadvisable to make this a matter for JCS consideration at this time as suggested. Request your comments as soon as possible regarding intent as expressed above.

1100

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115

8 FEB 1955

AFOOP-OP-D

SUBJECT: (Uncl) Redesignation of Air Defense Identification Zones

TO: Commander
AirDefense Command
Ent Air Force Base
Colorado Springs, Colorado

1. Reference is made to your letter, ADOOT-B 1, dated 18 December 1954, subject "(U) Redesignation of ADIZs and Incorporation of ADIZ-Vertical Plane Concept in Identification."

2. This Headquarters concurs in the need for changes in the ADIZ System in the United States which will be commensurate with the revised radar detection capability. After thorough study of your recommendations submitted in correspondence cited in paragraph 1 above, this Headquarters has incorporated certain changes which will:

a. Provide more stringent controls and identification.

b. Simplify the system for participants.

c. Make the program more acceptable to the Civilian components of aviation.

3. The operational procedures for the program as finalized by this Headquarters is attached as Inclosure #1. The proposed regulation, AFR 60-22, which incorporates changes to your suggested system is attached as Inclosure #2. The system differs from that submitted to this Headquarters in the following:

a. Abolishment of the Vertical Plane along the Eastern and Western ADIZs. It is felt that a single line from the ground to infinity does not provide sufficient control of aircraft penetrating Defense Zones. Aircraft flying at any speed, below two thousand feet might reasonably slip across the line unnoticed and be assumed to have originiated the flight within the Defense Zone.

1101

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b. <u>Establishing the Domestic ADIZ from the Ground to Infinity.</u> This accomplishes the control desired from the Vertical Plane concept except, that aircraft penetrating the Defense Zone must penetrate an area of between 40 to 90 miles under radar surveillance.

c. <u>Abolishment of the Voluntary Reporting System to Ground Observer Posts.</u> This system was replaced by mandatory calls, collect, to Civil Aeronautics Administration thereby insuring proper flight plans entering the Air Defense System through already established, responsible channels.

d. <u>Exempting aircraft Flying below 1,000 feet and 120 MPH TAS or Lower from Filing Flight Plans in Domestic ADIZs.</u> This involves 36-40 thousand aircraft which, to qualify for exemption, must fly slower than any hostile aircraft which is considered a potential threat to the United States. The control of these aircraft as established in your proposed system was not considered postive yet would necessarily have been enforced by Federal law. Direct control of these low flying, slow, small aircraft would also adversely overload those portions of your identification system so necessary to deal with aircraft which could impose a major threat to the United States.

4. The ADIZ System, as shown in Inclosure #1, has the informal concurrence of the Civil Aeronautics Administration. In order to expedite the final approval of the Program and publication of necessary directives, desire your comments be forwarded to this Headquarters, ATTN: AFOOP-OP-D, to arrive not later than 21 February 1955.

BY ORDER OF THE CHIEF OF STAFF:

2 Inclosures
1. Operational Procedures finalized by Hq USAF
2. Proposed Draft of AFR 60-22

OPERATIONAL PROCEDURES

I. GENERAL

a. Pilots of aircraft will file flight plans, prior to take-off, in writing or by telephone with an appropriate aeronautical facility when the flight:

(1) Penetrates a Domestic ADIZ toward a defense zone or originates or operates within subject ADIZ. (Flights originating in the defense zone flying into or through the Domestic ADIZ outbound are not required to file.)

(2) Penetrates or operates within the Albuquerque ADIZ or the Northern ADIZ.

(3) Penetrates or operates within a coastal ADIZ.

(4) Penetrates a Vertical Plane toward the U. S.

(NOTE: Aircraft flying TAS of 120 mph or less at an altitude of 1000 feet or less above terrain are exempt from subparagraphs (1) and (2) above).

II. PROCEDURES

a. Pilots departing locations at which an appropriate aeronautical facility is available will file either a DVFR or IFR flight plan in writing and conduct the flight in accordance with AFR 60-22 and AFR 60-16 (CAR 620 for civilians).

b. Pilots departing locations at which an appropriate aeronautical facility is not available will:

(1) File either a DVFR or IFR flight plan with the nearest CAA facility by telephone, collect, and will conduct the flight in accordance with AFR 60-22 and AFR 60-16 (CAR 620 for civilians), or

(2) Effect prior coordination with the Air Division (Defense) Commander.

DRAFT OF PROPOSED REGULATION

Air Force Regulation
No. 60-22

Departments of the Army, the
Air Force, and the Navy

FLYING

IDENTIFICATION AND SECURITY CONTROL OF MILITARY AIRCRAFT

SECTION I - GENERAL

SECTION I - GENERAL

1. Purpose and Scope: To prescribe the rules and procedures which are considered necessary in the interest of national security to identify, locate and control military air traffic in designated air defense identification zones and Vertical Planes.

2. Responsibility: Commanders of all echelons will insure that military pilots are cognizant of the provisions of this Regulation.

3. Definitions: For the purpose of this Regulation, the following definitions apply:

1104

a. Air Defense Identification Zone (ADIZ): - Airspace of defined dimensions designated by the Administrator of Civil Aeronautics within which the ready identification, location and control of aircraft is required in the interest of national security. (These zones are delineated in Radio Facility Charts or other appropriate military regulations.)

(1) Domestic Air Defense Identification Zone - An air defense identification zone within the United States and extending from the surface of the earth upwards to infinity.

(2) Coastal Air Defense Identification Zone - An air defense identification zone over the coastal waters of the United States and extending from the surface upwards to infinity.

b. Vertical Plane: - A flat surface perpendicular to the ground and extending from the terrain upwards to infinity designated by the Administrator of Civil Aeronautics through which a flight towards the United States requires ready recognition in the interest of National Security (See Attachment 1).

c. Defense Zone: - That airspace into which all aircraft above specified altitude and air speed must file a flight plan to enter. The airspace is along the west coast and in the eastern part of the United States delineated by Air Defense Identification Zones.

d. Security Identification Zone: - Designated by the Department of Transport, Canada, as an airspace of defined dimensions extending upwards from the surface of the earth to an altitude of 4,000 feet, within which southbound flights must be conducted in accordance with certain rules

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designed to facilitate ready identification of the aircraft.

e. United States: - The several States, the District of Columbia, and the several Territories and Possessions of the United States, including the Territorial waters and the overlying airspace thereof.

f. Local Flying: - Flights within established local flying areas and between parent bases and auxiliary bases of the parent base, and between such auxiliary bases, provided that no landings are to be made at other than the parent or auxiliary bases. (The term "bases" includes airfields, seadromes, and aircraft carriers or other vessels tending aircraft.)

g. Defense Visual Flight Rules (DVFR): - Visual flight rules (VFR) applicable to flights which originate within, operate within, or penetrate an air defense identification zone toward defense zones or penetrate a Vertical Plane towards the United States.

h. Flight Plan: - Specified information which is filed either verbally or in writing with an appropriate clearing agency relative to the intended flight of aircraft.

i. Appropriate Aeronautical Facility: - The normal communications facility with which flight plans or position reports are filed.

j. Reporting Point: - A geographical location in relation to which the position of an aircraft is reported.

k. Position Report: - Information transmitted to an appropriate aeronautical facility in accordance with the information and procedure specified in the latest Radio Facility Charts.

1106

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4. Violations: Reports of Violations of Air Defense Identification zones will be processed in accordance with the provisions of AFR 62-5/SR 95-145-1/OPNAV Instruction 3760.1.

5. Communications: Direct communications between all agencies and/or units is authorized for the purpose of coordinating the procedures outlined herein.

SECTION II - OPERATION OF MILITARY AIRCRAFT IN DESIGNATED AIR DEFENSE IDENTIFICATION ZONES AND THROUGH VERTICAL PLANES

6. General:

a. Pilots of aircraft will file flight plans, either DVFR or IFR, prior to take-off, in writing or by telephone with an appropriate aeronautical facility when the flight:

(1) Penetrates a Domestic ADIZ toward a defense zone or originates or operates within subject ADIZ. (Flights originating in the defense zone flying into or through a Domestic ADIZ outbound are not required to file DVFR or IFR.)

(2) Penetrates, originates or operates within the Albuquerque ADIZ, or the Northern ADIZ.

(3) Penetrates, originates or operates within a coastal ADIZ.

(4) Penetrates a Vertical Plane toward the U. S. (NOTE: Aircraft flying TAS or 120 mph or less at an altitude of 1000 feet or less above the terrain are exempt from subparagraphs (1) and (2) above.)

7. Flight Plans:

a. Flight plans will not be submitted in flight to provide for flights listed in paragraphs 6a(1) through (4) above.

1107

b. DVFR Flight plans will include the route and altitude for penetration and/or operation while within an ADIZ and/or the penetration of a Vertical Plane.

c. IFR Flights: - Flights conducted under instrument flight rules (IFR) conditions will be as follows:

(1) Within Air Traffic Control Areas. Present IFR procedures will apply.

(2) Outside Air Traffic Control Areas. The reporting procedures specified for DVFR flights in 7d(1) and (2) below will apply.

d. VFR Flights: - Flight plans filed for this category of flights will be preceded by the letter "D" (DVFR) and the following procedures will apply:

(1) DVFR Flights without two-way radio communication. These flights may operate within the Northern ADIZ, Presque Isle ADIZ, Albuquerque ADIZ or the Eastern or Western ADIZ or enter such an ADIZ towards a Defense Zone provided that the aircraft commander adheres to a filed flight plan which will include the point of penetration and estimated elapsed time to the point of penetration.

(2) DVFR Flights with two-way radio communication. The pilot in command of an aircraft with functioning two-way radio communications will not enter or operate within an ADIZ or penetrate a Vertical Plane towards the U. S. at any altitude, until:

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(a) He has reported to an appropriate aeronautical facility the time, position and altitude at which the aircraft passed the last reporting point along the flight path of the aircraft prior to penetration of an ADIZ or Vertical Plane, and his estimated time over the next reporting point along the intended flight path of the aircraft. This position report will be made while over the last reporting point or as soon thereafter as possible.

(b) A report has been made to an appropriate aeronautical facility which contains the estimated time, position and altitude at which he will penetrate the ADIZ or Vertical Plane, if compliance with 7d(2)(a)(b) above is impractical. This position report will be made no sooner than 30 minutes and not later than 15 minutes prior to penetration. Position reports will be made at least once an hour while within an ADIZ as required by AFR 60-16, AR 95-10, or appropriate OPNAV Instructions, (every 300 miles for jet aircraft) or more frequently as may be required. When practicable established reporting points will be used.

e. Local Flying:

(1) Local IFR Flights: Normal IFR procedures, including present reporting and emergency procedures will apply.

(2) Local VFR Flights: Local VFR flights conducted wholly

1109

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or partially within an ADIZ will be performed in a manner conducive to ready identification. Procedures relative to identification of flights of this nature will be prescribed by the local commander, or commanding officers as appropriate after coordination with the Air Division (Defense) commander concerned.

f. Mass Flights:

(1) The flight plan of mass flights will contain in the remarks section of the DD Form 175, "Aircraft Clearance," the identification or serial number of each aircraft in flight.

(2) When mass flights are flown in other than close formation, each aircraft individually will make position reports as required in this paragraph.

(3) Aircraft in mass flights will comply with the provisions of paragraph 8.

8. Adherence to Flight Plans or Air Traffic Clearance:

a. IFR Flights:

(1) Within Control Zones and Areas. No deviation will be made from an air traffic clearance unless an amended clearance is obtained from CAA air traffic control.

(2) Outside Control Zones and Areas. When a flight is conducted in accordance with IFR within or into an ADIZ where an air traffic clearance is not required by the Civil Air Regulations or appropriate military regulations, no deviation from the flight plan, as filed, will be made unless prior notification is given to an appropriate

58-11

1110

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aeronautical facility.

b. DVFR Flights: - No deviation will be made from a DVFR flight plan unless prior notification is given to an appropriate aeronautical facility.

c. Time, Distance, and Altitude Tolerances: - To adhere to a flight plan, or an air traffic clearance, a pilot in command of an aircraft will not exceed the following tolerances:

(1) Time. Five minutes from an estimate over a reporting point or point of penetration; or, in the case of a flight originating within an ADIZ, ten minutes from the proposed time of departure specified in the flight plan, unless the flight is conducted in accordance with IFR in a control area.

(2) Distance. Ten miles from the center line of the route of flight if the flight is entering or operating within a domestic ADIZ or penetrating a Vertical Plane towards the U. S. or 20 miles from the center-line of the route of flight if the flight is entering or operating within a coastal ADIZ.

(3) Altitude Deviation. A pilot in command of an aircraft when on a DVFR flight plan or an IFR flight plan for which air traffic clearance is not required will not deviate from the cruising altitude specified in the flight plan unless prior notification is given to an appropriate aeronautical facility, except that he may begin descent from the altitude specified in the flight plan within reasonable distance of destination without

658-12

reporting change of altitude.

d. Revision of Flight Plan: - The pilot in command of an aircraft will immediately transmit corrected information to an appropriate aeronautical facility when it becomes evident that a previously filed estimated time over a reporting point or point of penetration of an ADIZ or Vertical Plane is in error in excess of the time and distance tolerances indicated in c(1) and (2) above.

e. Change of Flight Plan, IFR to DVFR-Aircraft commanders of IFR flights subject to the provisions of this Regulation who desire to change to a VFR flight plan in the air before the ADIZ or Vertical Plane portion of the flight is completed, will request the change to be made as DVFR instead of VFR.

9. Coastal Air Operations: In coastal ADIZ's, when compliance with the provisions of this section is impracticable, identification and reporting procedures will be as prescribed and mutually agreed to by the appropriate Air Defense Force commander(s), Sea Frontier commander(s), Coast Guard commander(s), and/or other military and civil agencies concerned.

10. Emergency procedures: In emergency situations which require immediate decisions and action for the safety of the flight, the pilot in command of the aircraft may deviate from the provisions of this Regulation to the extent required for such emergency. When a deviation is exercised the pilot in command will report such deviation, and the reasons therefore, as soon as practicable to an appropriate aeronautical facility.

11. Radio Failure:

a. IFR Flights - In case of the failure of two-way radio communications, the pilot in command of the aircraft will proceed as prescribed by appropriate regulations for such situations.

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b. DVFR Flights: - In case of failure of two-way radio communications, the flight may proceed in accordance with the original DVFR flight plan and the pilot in command of the aircraft will make a report of such failure, as soon as possible, to an appropriate aeronautical facility.

12. Air Defense Security Instructions: Under emergency air defense conditions which may involve the national security, aircraft will be operated in accordance with such additional special security instructions as may be issued. These instructions will be consistent with the provisions of the "Plan for the Security Control of Air Traffic During a Military Emergency (SCAT," 15 July 1952, as approved.

BY ORDER OF THE SECRETARIES OF THE ARMY, AIR FORCE AND THE NAVY:

Attachment
Chart - ADIZ's
w/d

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-TV

Hq USAF, AFOOP-OP-D, Subj: (Uncl) Redesignation of Air Defense Identification Zones

ADOOT-Ml (8 Feb 55) 1st Ind

HQ AIR DEFENSE COMMAND, Ent AFB, Colorado Springs, Colorado

TO: Director of Operations, Headquarters USAF, Washington 25, D. C.

1. Reference is made to paragraph 4 of the basic letter. This headquarters concurs with the proposed changes contained in paragraph 3 of the basic letter with the following exceptions:

a. Reference is made to paragraph I.a. Inclosure 1 to the basic letter. We believe that pilots penetrating an international boundary, coastal ADIZ or the Florida ADIZ toward the United States should file a flight plan in writing with an appropriate aeronautical facility prior to take-off. In the interest of security, we do not believe that in such instances telephone calls should be accepted in lieu of flight plans filed in writing.

b. Reference is made to the footnote contained in paragraph I of Inclosure 1. Since ADC radar scopes are calibrated in nautical miles and airspeed information has been converted into knots prior to receipt at direction centers, recommend the use of 110 knots instead of 120 mph as an airspeed identification criterion. Further believe that the 1,000 feet above the terrain altitude limitation as used in conjunction with the 110 knot TAS will flood the air defense system with unnecessary data and perhaps in such a volume as to preclude proper usage by Direction Centers concerned. This headquarters believes that the 1,000 foot altitude limitation should be tested when the plan is implemented; however, we will recommend necessary changes regarding the altitude limitation as actual performance of the air defense system dictates.

2. In the interest of expediting our reply as requested in the basic letter, we are withholding comments regarding your draft proposal of AFR 60-22. Our recommendations regarding the regulation will be forwarded to your headquarters not later than 15 March 1955.

FOR THE COMMANDER:

2 Incl
n/c

GEORGE F. SMITH
~~[illegible]~~
Major General, USAF
DCS/~~[illegible]~~X
Chief of Staff

no
Capt LaS le/ht-wdg
2602-3-4
C-17 Feb 54

MEMO FOR RECORD:
AFR 60-22 is not essential as regards coordinating our identification concept with CAA. The proposed reg requires many changes and must be coordinated by various staff agencies within this hq. We will forward our comments regarding AFR 60-22 to USAF ASAP.

This correspondence is classified ______ in accordance with Par 24 b, AFR 205-1, 15 Dec 53, or for the reason (s) stated.

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[illegible] B/75
[illegible] TYC337 [illegible] 40152 [illegible]
[illegible]
DE [illegible] 1133
P 2521 42Z
FM HED USAF WASH DC

TO COM AIR DEF COM ENT AFB COLO
BT

FROM [illegible] AFOOP-OC-E/2 45954 The new ADIZ system proposed by your headquarters 1[illegible] Dec 54 and as modified by Headquarters [illegible] and the SCAT Board with your concurrence has been concurred in by the Army and Navy with one exception. The CNO does not concur with the designation of a gulf coast ADIZ. It is felt that when the phase three radar program is near completion during FY 1956 the probability of getting Navy concurrence in a gulf coast ADIZ will be very good. This headquarters therefore feels that in order to obtain an identification program commensurate with your radar capability, the ADIZ Program, without a gulf coast ADIZ, should be implemented with a target date of 15 November 55. Concurrently, this headquarters will endeavor to obtain, in the immediate future, concurrence from the CNO in the designation of a gulf coast ADIZ on or about 1 July 56. Request your comments and/or concurrence not later than 29 Aug 55.

BT
25/2153Z Aug [illegible]

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[illegible], ADC

[illegible] DC

AFOOP-OC-F/2

(UNCLASSIFIED) ADOOT-B1 35394 . Your message AFOOP-OCOF/2 43954, 25 August 55. Subject to stipulations entered in reference message, this headquarters concurs in the ADIZ program as modified by Headquarters USAF and the SCAT Board and concurred in by Army and Navy. We realize CNO coordination is achieved only by elimination of the Gulf Coast ADIZ. Request you keep this headquarters informed of the status of action relative to obtaining CNO concurrence regarding the designation of a Gulf Coast ADIZ when the Phase 3 radar program is near completion.

M/R: We are concurring as stated above in order that our ADIZ program will get moving. The domestic ADIZ's are of more importance than a Gulf ADIZ, since vital target areas will be encircled by ADIZ's which are superimposed over good radar coverage. Present radars along the Gulf are rather obsolete and of short range capability. The 3d Phase radars will increase immeasurably our capability in that area and that is when we must have a Gulf Coast ADIZ.

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FILE NUMBER 252

SECRET

CONADC

PRIORITY

COFS USAF WASH DC

X

2 9 JUN 1955

AFOOP-OP-D 42369 UNCLASSIFIED

(SECRET) ADOOP-XL 7611. UNCLASNEG AFOOP-OP-D 42369, 17 Jun 55. This msg in 4 parts: PART I: Do not concur with Navy proposed change of Pacific ADIZ in LOSA-SDIEGO. Deletion as proposed by Navy would allow low flying acft to penetrate and fly through the ADIZ toward LOSA AND SDIEGO without being detected until in the def zone. Since there would be no means to ident, acft would proceed unmolested to target. PART II: Do not concur with Navy proposed change of western bdry of Pacific Coastal ADIZ and eastern bdry of Atlantic Coastal ADIZ. The loc of these bdry as proposed by this hq is consistent with our rqr for detection and ident at farthest point from the CONUS and is predicated upon land based radar cover and programmed picket vessel and AEW&C acft deployment. Future programmed picket vessels and AEW&C acft will rqr add ext of ADIZ's to the seaward. Reduction of coastal ADIZ bdry at this time is only delaying the problem until future programs are impl. PART III. Do not concur with Navy's proposed deletion of Gulf Coast ADIZ. Appr by your hq and higher auth indc agreement that threat of attack in this area is possible. Navy tng rqr can be met thru development of lopro with appropriate naval

1 2

Lt Col Assmann/bc

ADOOP-XL 2722

SECRET

C. F. HUMPHREYS
Major, USAF
Dep Command Adj

U526-1

1 1 1 7

SECRET

(SECRET) ADCCF-MR 3411.

and air defense. PART IV: Concur with 2 changes proposed by the Navy for deletions to the western edge of the WADF Domestic ADIZ.

B-9-37 292120Z

C. F. HUMPHREYS
Major, USAF
Asst Command Adj

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COMADC

AIR OFFICER COMMANDING CANADIAN AIR DEF COMD
ST HUBERT PQ CANADA

COMEBACK COPY

.... Not requested, not furnished
x ... Furnished 14 MAY 1955 x ...
(Date) (Initials)

COMADF HAMILTON AFB HAMILTON CALIF ADOOT-B1 1940 SECRET
MR J H TIPPETS, DIR OFFICE OF FEDERAL AIRWAYS CAA DEPT OF COMMERCE WASH DC

(SECRET) ADOOT-B1 3075 14 MAY 1955. CANUSECURITY. MY CLASSIFIED MESSAGE ADOOT-B1 1540, 1 Sep 54, and conference between Squadron Leader W. Quint, your headquarters, and Capt. LaSalle, this headquarters. Traffic survey conducted in Vancouver-Seattle area indicates approximately 350 inbound flights per month via Amber 1 airway and approximately 70 overwater flights per month from Alaska and the Aleutians making landfall at various points on Vancouver Island and at Neah Bay, Washington. Since this traffic originates at air bases in Alaska and the Aleutian Islands, the development of associated procedures and briefing present no outstanding problems. As stated in referenced message, this headquarters considers use of MCDS as a positive means of identifying inbound oceanic air traffic. Establishment of MCDS at Station C-18 will permit earlier identification than if MCDS were established at Neah Bay; further, implementation will place into effect a system which will cope with any increase of air traffic which could be generated as a result of an emergency.

Mr. Tippets ... classified information

LaSalle

1 1

Capt LaSalle/bc

ADOOT-B1

B-15-14 1948152

This correspondence is classified ________ in accordance with Par ____, AFR 205-1, 15 Dec 53, or for the reason (s) stated.

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FILE NUMBER 754 or

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COMADC

ROUTINE

COMMADF HAMILTON AFB HAMILTON CALIF

2 JUN 1955

(SECRET) ADOOT-B1 9606. Ref proposed MCIS at Neah Bay, Wash. RCAF-ADC has recom we reconsider the advisability of reloc ref MCIS at Sta C-18, Holberg, Vancouver, for the fol reasons: 1) The volume of air tfc making landfall along Vancouver Island and at Neah Bay does not warrant MCIS. During an emerg, RCAF-ADC recom routing such air tfc from Alaska and the Aleutian along Amber Red airway; 2) No overlap of radar surveillance exists in proposed corridor area. No back-up radar will be aval at C-18 for considerable time; 3) Deployment of intcp acft precludes satisfactory ident by intcp of normal corridor tfc. Desire your comments relative to the objections listed above; further, desire your theses for estb of MCIS at Neah Bay or C-18 in view of the low volume of air tfc which will participate should ref MCIS be impl.

PARAPHRASE NOT REQUIRED
SEE [illegible] SECTION
BEFORE DECLASSIFYING.

MESSAGE TRANSMITTED
WITH FOLLOWING DATE TIME GROUP
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Capt LaSalle/bc

ADOOT-B1

2722

RECTOR C. DACUS
Captain, USAF
Asst Command Adj

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PARAPHRASE NOT REQUIRED
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BEFORE DECLASSIFYING.

29 MAR 1955

[illegible] 1017 [illegible]

M/R not nec

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(Date) (Initials)

RECTOR C. DACUS
Captain, USAF
[illegible] Command Adj

2722

This correspondence is classified [illegible]
Per 136 , AFR 205-1, [illegible]

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V219-IV

122 55a

EACOP 29 MAR 1955

SUBJECT: (Unclassified) Current Status of SCATER Plan

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. The conduct of an air defense battle will be dependent in a very large measure upon the degree with which positive control of all air traffic can be effected. In order to achieve such control, the SCATER Plan was developed. In its current status and configuration, the SCATER Plan will not provide the extent and measure of control which are attainable and are necessary for full realization of maximum defense capability. The following fundamental discrepancies are evident in the current SCATER Plan:

a. Air movements in fulfillment of the initial war missions of the several military services will be along routes and will employ fixed navigational aids selected by the associated commands. A number of these routes, as indicated in the current SCATER Plan, provides for direct overfly of the most critical target areas in this defense region. In addition, the number and location of navigational aids requested in conjunction with the individual routes serve only to compromise target security. As a result, the air situation over the affected areas will very likely become congested and confused. Defense capability will become correspondingly diluted.

b. Top Secret flight plans for Category II SAC aircraft will remain Confidential after having been filed. The ultimate effect of this procedure will be denial of vital air movement information on a timely basis to air traffic control agencies and to direction centers engaged in conducting the air battle. The effect upon air defense capability is obvious. The possible effect upon deploying SAC forces classified unknown in a battle area might well be taken into consideration.

c. Authority has not been given the air division commanders to direct the control of military navigational aids and aeronautical communications. Such authority now rests with the appropriate base commander under the provisions of Department of Defense CONELRAD Plan. This procedure is not compatible with the air defense requirement.

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d. Much time and effort has been expended trying to determine how to expedite movements of planned deployment flights, but little consideration has been given the required movement of high priority logistical and administrative flights which cannot be planned in advance. Some of these flights will surely move during Warning Red and Yellow. Their departure points or destination, in most cases, will be in critical areas. Therefore, a method must be developed whereby this traffic can move with safety. The 30th Air Division (Defense) is working on such a plan, but its predicted value is limited due to the requirement for nationwide dissemination and application.

e. A standard format for the classified annexes of the SCATER Plan has been under development for approximately four years. It is still not in the field. A standard format is vitally necessary to insure that coordination is completed with all agencies and to insure that instructions and procedures throughout the Continental United States are standard.

2. It is considered vitally important that discrepancies existing in the current SCATER Plan be corrected. Toward this end, the following actions are recommended:

a. Follow up the request made in September 1954 by your headquarters to the major commands and the Navy that they revise their Emergency War Plans in accordance with the list of navigational aids for deployment use which was submitted to them. Further, prescribe a specific date after which only those aids on the approved list will be made available.

b. Re-emphasize to Headquarters SAC the importance of flight plans to ADC units, especially during Warning Red and Yellow. If they cannot be made available when needed, both commands must be prepared to accept the consequences.

c. Request the Department of Defense to amend the CONELRAD Plan so as to authorize the air division (defense) commander to direct the control of military radio aids to air navigation and aeronautical communications.

d. Expedite the designation of Inner Defense Areas and the development of operating procedures pertinent thereto. Distribute both to all military and civilian agencies concerned.

e. Expedite the development of a standard format for the classified annexes to the SCATER Plan.

V-714-57

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EAOOT Subject: (Unclassified) Current Status of SCATER Plan (Contd)

3. This letter is classified Secret in accordance with paragraph 23c, AFR 205-1.

DONALD B. SMITH
Brigadier General, USAF
Vice Commander

1-714-5X

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268
AV

EAOOT Subj: (Unclas) Current Status of SCATER Plan

ADOOT-B1 (9 Mar 55) 1st Ind 24 ... 1955

HQ AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colorado

TO: Commander, Eastern Air Defense Force, Stewart Air Force Base, Newburgh, New York

1. Lettered paragraphs below correspond to those in paragraph 2 of the basic letter:

a. Major commands and Navy have agreed to reaccomplish Emergency War Plans to indicate that EWP routes will be in accordance with the list of navigation aids furnished each command or service in September 1954. Effective date for use of these aids will be prescribed when distribution of revised EWP's containing the aids has been effected.

b. This headquarters has emphasized repeatedly to Headquarters SAC our requirement for adequate flight movements data during air defense warning "yellow" or "red." Recently, Headquarters SAC indicated that during such a warning condition, those portions of Category II flight plans pertaining to flight within the United States will be unclassified and handled as such. We have requested Headquarters SAC to furnish a date for establishing detailed operational procedures.

c. This headquarters interprets Executive Order 10312, 10 December 1951, and the Plan for Security Control of Air Traffic during a Military Emergency, 15 July 1952, as providing authority for the air division (defense) commander to direct control of civil and military air navigation aids and aeronautical communications facilities. If your air division (defense) commanders are unable to complete detailed plans which provide for the control of air navigation aids and aeronautical communications facilities due to the refusal by base commanders to cooperate as directed in Executive Order 10312, desire you notify this headquarters. At that time we will take the necessary action to obtain resolution of operational differences.

d. The IDA concept is undergoing coordination within Headquarters CONAD. When coordination has been effected the Administrator of Civil Aeronautics will be requested to designate such areas. Concurrent with this request, air defense forces will be assigned the responsibility of effecting local procedures for the operation of air traffic within IDA's. The institution of local operating procedures and designation of IDA's will be accomplished simultaneously.

no
Capt LaSalle/adg
2722-2814
15 March 1955
-07781

MEMORANDUM FOR THE RECORD: not necessary

-714-1

This correspondence is classified ______ in accordance with Par B/L, AFR 205-1, 15 Dec 53, or for the reason (s) stated. (Initials)

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[illegible] Subj: (Unclas) Current Status of [illegible] Plan

[illegible] (9 Mar 55) 1st Ind (Cont'd)

e. The standard format for classified [illegible] messages will be published and distributed when procedures for control of orbit data have been finalized with Headquarters SAC. The tentative publication date is 15 April 1955.

BY ORDER OF THE COMMANDER:

KENNETH P. BERGQUIST
Major General, USAF
DCS/Operations

M- 9862/0594
V-78818/0228
A-61282/0305

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FILE NO. 263 dv 2

DOC 123 ADCHR 55a

ADOOP-ML

SUBJECT: SCATER Conference (Unclassified)

Indentical ltrs to CADF & WADF

TO: Commander
Eastern Air Defense Force
Stewart Air Force Base
Newburgh, New York

1. The attached draft of the proposed Classified SCATER Annexes format was developed at the SCATER conference convened at this headquarters 30 November through 3 December 1954. Conferees participating were:

T-14257/0180
V-66698/0094
A-12388/0151

R. H. Assman, Lt. Col, Hq ADC
F. H. Breher, Lt. Col, Hq WADF
C. J. Cain, Major, Hq CADF
C. B. Snider, Major, Hq WADF
R. J. Nordzima, Major, Hq USAF
L. W. Myers, Major, Hq ADC
P. H. Hansen, Captain, Hq EADF
L. W. LaSalle, Captain, Hq ADC
F. L. Smith, CAA, Washington, D. C.
J. V. Tighe, CAA Liaison Officer, ADC
J. R. Dherest, CAA Liaison Officer, Hq EADF
G. W. Kriske, CAA Liaison Officer, Hq CADF
G. L. Simonsen, CAA Liaison Officer, Hq WADF
R. Deane Branstetter, ADC
D. E. Barrow, Hq USAF

2. As a result of the conference, major changes have been recommended in format and content. The draft of the Classified SCATER Annexes contains what were agreed to be the specific instructions and procedures relative to implementation and subsequent actions of military and civil agencies concerned. All non-applicable and superfluous data has been deleted. It will be noted that pre-planned routes of flight and other details of tactical deployment operations, except for the required radio navigation aids, are to be excluded from SCATER plans.

3. Certain information to be included in Appendix 1 of Annex AA is not available at present. Every effort will be made to provide the final list of navigation aids as soon as possible. The currently approved list will be used until the new list is furnished by this headquarters.

Confirmed in ... ication Form ... r 3a, ADCGM
No. ... by LaSalle ... 2722 ... Dec ...
-507-1

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This correspondence is classified ____________ in accordance with Par 23b, AFR 205-1, 24 Jul 51, or for the reason (s) stated.

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ADCOP-SI, Subj: SCATER Conference (Secret) (Unclas)

4. ADC headquarters representatives advised the conference that submission of classified annexes to Headquarters ADC for approval prior to distribution will not be required provided the agreed upon format and content is adhered to by Air Division (Defense).

5. Distribution of classified annexes will not be prescribed by Headquarters ADC. Air Division (Defense) Commanders are authorized to distribute on a need to know basis, subject to the provisions of AFR 205-1, Safeguarding Military Information, 16 December 1953.

6. The problems presented by SAC classified flight plans, reference SAC Manual 55-4, are recognized. This headquarters is attempting to obtain declassification. Pending outcome of negotiations, no attempt is made in the SCATER format to specify details of handling.

7. The inclusion of a listing of non-operational facilities, Appendix 2, Annex EE, which will be notified by CAA facilities was at the request of the CAA Washington representative. During further discussion after the departure of the Washington representative, it was the consensus of the conference that inclusion of the listing in SCATER plans was not appropriate. Since such a listing would be of use only to CAA facilities, it is being recommended that the lists be prepared by the various ADLO's and distributed to ARTC Centers and the Washington Office.

8. It is requested that your comments be forwarded to this headquarters within thirty days of receipt. Such corrections in wording and clarity will be made as necessary and sufficient copies of the final format for the Classified SCATER Annexes will be prepared by this headquarters. The format will be applicable to all Air Divisions (Defense).

9. Upon receipt by the Air Division (Defense) of the Classified SCATER Annexes in final form, previous instructions concerning the preparation of classified SCATER parts will be rescinded.

BY ORDER OF THE COMMANDER:

1 Incl
Draft of Proposed
Format for Class
SCATER Annexes

C. F. HUMPHREYS
Captain, USAF
Asst Command Adj

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V-507-2x

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DOPR 4 Jan 1955

SUBJECT: Identification Requirements

DOC 124 55a

TO: Comdr, CADF

1. This hq requests the establishment of an AMIS at the New Orleans ARTCC and the necessary FPT lines to the 747th AC&W Squadron at Ellington AFB and the 657th AC&W Squadron at Houma NAS in order to complete the most important link in the aircraft identification capability of the 33d Air Div (Def). Justification for this req is outlined in the paragraphs below.

2. The justification for the request outlined above is based on tactical necessity best expressed by the adage, "A chain is equal to its weakest link." Intelligence estimates forwarded to this Div by higher hq indicate the following:

a. The "Intelligence Estimate, COMAD" revised 1 December 1954, outlines the logical routes to be taken by Russian aircraft when attacking the United States. Two of these routes are extracted from paragraph 2c of TAB 5, Annex H for comparison as follows:

(1)

Route	From	To	Turbo Jet Hrs	Conventional Hours
1	Petropavlovsk	San Francisco	7	15
6	Kola	New York	11	25

b. A logical and obvious extension of route number 1 carries Russian bombers to the Texas Gulf Coast Area in less time than it takes Russian bombers to fly to New York via route number 6. Assuming that the Russians have normal intelligence and the minimum amount of information concerning our air defenses, they could follow route 1 far enough out to sea along the Alaska and California Coasts to avoid detection, crossing lower California, crossing northern Mexico, and penetrating Texas via the Gulf of Mexico or the Mexico-Texas Border. Recomputing the times for this extended route in accordance with the conservative principles used originally by ADC we arrive at the following comparison of this modified route 1 and route 6:

(1)

Route	From	To	Turbo Jet Hrs	Conventional Hours
1a	Petropavlovsk	Texas	10	23
6	Kola	New York	11	25

c. A realistic appraisal of the identification capability of this Div indicates that such an attack could penetrate the southern United States undetected. The military advantage of shock, surprise, and confusion created by enemy aircraft bombing targets in this Div just prior or simultaneous to attacks in other areas is obvious and needs no further discussion.

d. The importance of targets in the 33d Air Div (Def) is outlined in Tab 4 of Annex G of the COMAD Intelligence Estimate and confirms the

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tactical advisability of the attack outlined above. The 33d Air Div (Def) is shown to be second highest in number of Category A. targets, third highest in all other category targets, and has the third largest number of cities over 50,000 population. Important SAC bases are included in the above category targets.

3. Further justification for the proposal suggested in paragraph one is the SCATER Plan of this Div. SCATER is implemented immediately upon an attack on the United States. The implementation of SCATER, in effect, requires that all traffic in the 33d Air Division (Def) be identified as friendly, unknown, or hostile. A conservative estimate of pre-scheduled and non-scheduled tactical missions of all forces that may be flying in the Gulf Coast Area during the first day of an attack numbers 300 sorties. Adequate full-scale identification of aircraft during an attack on the United States cannot be created from nothing within hours or even within days for the following reasons:

a. Lines from the appropriate ARTCCs to the ADDCs concerned must be available twenty-four hours a day for the forwarding of flight plans and airborne times in the event of an attack on the United States. Installation of these lines takes time.

b. An AMIS section must be in place and manned by trained personnel at every ARTCC. Personnel cannot be recruited and adequately trained within days or even within weeks.

c. The identification section at each ADDC must also be trained, functioning, and ready to go into action at a moment's notice.

d. Without the above facilities and trained personnel in place our SCATER Plan cannot function properly when it is needed most - the first few hours and days of an attack.

4. The establishment of an AMIS at the New Orleans ARTCC now, will accomplish the following:

a. The required FPT lines will be installed between the New Orleans ARTCC, the 657th AC&W Squadron at Houma NAS, La., and the 747th AC&W Sq at Ellington AFB, Texas.

b. AMIS ersonnel for the New Orleans ARTCC will be recruited, trained, and so available when most needed.

c. The identification section at the ADDCs concerned will also be trained and functioning.

d. The New Orleans ARTCC controls all over-water civilian and military flights VFR and IFR, in the Gulf of Mexico area as outlined in red on Inclosure #1. By creating the New Orleans ARTCC AMIS now, this Div

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will be able to obtain adequate identification of all over-water traffic within the radar coverage of existing AC&W Squadrons.

5. This proposal has been coordinated with Mr. G. W. Kriske, CAA Liaison Officer at CADF, and Mr. Charles C. Wonycott, Chief of Center at New Orleans ARTCC. The details of the AMIS and communication requirements are as follows:

a. It is recommended that five security controllers be authorized at the New Orleans ARTCC in accordance with previous criteria established for these positions at Kansas City, St. Louis, Fort Worth, and San Antonio ARTCCs.

b. It is recommended that a full period talk (FPT) line terminated in 102A key equipment at the New Orleans ARTCC be connected to the 747th AC&W Sq at Ellington AFB and the 657th AC&W Squadron at Houma NAS, Louisiana. The request for these lines is included as Incl 2.

FOR THE COMMANDER:

2 Incl
a/s

W. R. SMITH
2d Lt, USAF
Asst Adj

Info cy:
747th AC&W Sq

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Hq 33d ADiv, DOPR, Subj: Identification Requirements

PO&R-R (4 Jan 55) 1st Ind 29 1955

HQ, CENTRAL AIR DEFENSE FORCE, Grandview Air Force Base, Grandview, Missouri

TO: Commander, Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado

1. This headquarters concurs with the request of the 33d Air Division to establish security control positions at the New Orleans ARTCC and provide for necessary air movement circuits to the 747th AC&W Squadron at Ellington AFB and the 657th AC&W Squadron at Houma Naval Air Station.

2. It is apparent to this headquarters that all ADDC's must have an identification capability after implementation of SCATER. This capability will require adequate air movement circuits to appropriate ARTCC's and at least a trained cadre of identification personnel at each ADDC. In order to insure collection and dissemination of air movements information, it is necessary that each ARTCC be provided with a minimum number of security controllers.

3. Programs in the past have provided necessary communications and manpower for conducting the identification mission only at those ADDC's which are within perimeter ADIZ's. Evaluating the necessity for identification after SCATER, giving full consideration to the great number of high priority military aircraft moving under our IFR plans, requires each ADDC within the continental United States to have a capability of performing the identification function.

4. This headquarters previously established a requirement for AMIS service at Kansas City, Memphis, St. Louis, Jacksonville and Atlanta ARTCC's effective 2nd quarter FY-56. Full AMIS service was requested for these locations to accomplish identification actions associated with the identification system around the northeast perimeter. Additionally, this headquarters desires to establish a requirement for security control type service at the New Orleans and El Paso ARTCC's. Until such time as the ultimate double perimeter is established through the San Antonio and El Paso ARTCC areas, security control type service in lieu of AMIS service will satisfy the requirement for "normal readiness" training of ADDC's and GOC filter center detachments and provide the capability outlined in para 2 above.

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1st Ind (Cont'd)

5. This headquarters further desires to retain security control service at the Fort Worth and San Antonio ARTCC's in order to retain the capability, outlined in para 2 above, and provide daily training in identification by associated AC&W and GOC filter center units. This headquarters sees no requirement for provision of security control service at the Salt Lake City and Denver ARTCC's since there is no radar in these areas, and GOC filter center detachments are on a non-skywatch status. The liaison circuit from the 34th Air Division to the Salt Lake City and Denver ARTCC's is considered adequate to coordinate SCATER activities in these areas.

6. Security control service is desired at both New Orleans and El Paso ARTCC's by 1 June 1955. The New Orleans ARTCC will provide air movements information to the Tyndall - Eglin -Keesler complex in addition to M-126, P-79 and associated GOC filter centers. The El Paso ARTCC will provide air movements information to M-95 and associated GOC filter centers in that area. Upon approval of this request, this headquarters will submit requests for tactical communication facilities for each ARTCC, ADDC and GOC filter center detachment concerned.

7. In view of the requirement to provide the capability, as outlined in para 2 above, this headquarters will retain, on a full period status, those air movement circuits to ADDC's that do not have an active identification function within ADIZ areas.

FOR THE COMMANDER:

2 Incls
n/c

1133

Hq 33d Air Div (Def) DOPR Subj: Identification Requirements

ADOOT-El (4 Jan 55) 2d Ind

HQ AIR DEFENSE COMMAND, Ent AFB, Colorado Springs, Colo.

TO: Commander, Central Air Defense Force, Grandview Air Force Base, Grandview, Missouri

Reference is made to paragraph six of first indorsement to basic letter. Air Movement Information Section (AMIS) funds are not available to provide security control service at the New Orleans and El Paso ARTC Centers during the remainder of Fiscal Year 1955. We have included in our Fiscal Year 1956 budget estimate a fund requirement which, if approved, will meet AMIS, CAA personnel, and communications costs during Fiscal Year 1956. This headquarters has requested CAA to establish security control positions on a 24-hour basis during 1st Quarter Fiscal Year 1956 at the New Orleans and El Paso ARTC Centers, providing our AMIS fund requirement is approved.

BY ORDER OF THE COMMANDER:

251

2 Incl - not nec for Comd Adj's files.
n/c

V-66148/0104

M/R not nec

Capt LaSalle/bs
2602

This correspondence is classified __________ in accordance with Per __________, AFR 205-1, 15 Dec 53, or for the reason (s) stated.

1134

125

CONFIDENTIAL

DOC 125 ADCHR 55a

COMDR ADC

ROUTINE DEFERRED

COMDR EADF, STEWART AFB, NEWBURGH N.Y.
COMDR CADF, GRANDVIEW AFB, GRANDVIEW, MO. X

FILE NUMBER 251

AFG CANAIRDEF, ST HUBERT, P.Q., CANADA

2 MAR 1955

(CONFIDENTIAL) ADCOP-RE 0814. [illegible]. This hq has req RCAF ADC to take nec act to estb an ANIS at Winnipeg ANTC Cen. Hq RCAF ADC is exam the rqr for ANIS svc at Winnipeg, Edmonton, and Moncton ANTC Cen. FYI the proj will req 18 months to 2 yrs for compl due to prob assoc with procuring trained pers. Flt mov data will be fwd to appropriate DC via teletype with selective distr and land lines will prov emerg service. For planning purpose desire fol info: 1. Which ADC DC will be tied into each Canadian ANTC Cen listed above. 2. From which geographical area is flt mov data req by each DC (delineate by coordinates). 3. Avg nr of flt plans handled monthly by each ANIS in your rgn.

PARAPHRASE NOT REQUIRED
SEE CRYPTO SECTION
BEFORE DECLASSIFYING

COMEBACK COPY
____ Not requested, not furnished
Furnished 2/3/55

MESSAGE TRANSMITTED
WITH FOLLOWING DATE TIME GROUP
Ø3ØØ16Z [illegible]

HECTOR C. DACUS
Captain, USAF
Asst Command Adj

[illegible] L.H.LaSalle/[illegible]

ADCOP-[illegible]

CONFIDENTIAL

Edward Slopek

This correspondence is classified [illegible] in accordance with [illegible]

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127

126

SECRET

DOC 126 55a

COMADC

COMCADF GRANDVIEW AFB GRANDVIEW MO
COMWADF HAMILTON AFB HAMILTON CALIF
COMEADF STEWART AFB NEWBURGH NY

ROUTINE DEFERRED

x x x

251

AIR OFFICER COMMANDING CANADIAN AIR
DEFENCE COMMAND ST HUBERT PQ CANADA

14 MAY 1955

(SECRET) ADOOT-B1 3076. Subj: ADC Direction Centers to Receive Flight Movements Data from Canadian ARTC Centers and Associated Communications. Desire you submit to this headquarters as soon as possible confirmation or comments and recommendations regarding the following: 1) When AMIS's are established in Canadian ARTC Centers, the following ADC direction centers will receive flight movements data from the appropriate AMIS: P-80; P-65; P-16; P-66; C-14; SM 132; SM 133; C-15; C-16; P-69; C-17; P-29; P-28; P-27; P-26; P-25; P-24; SM-151; P-60; P-40; P-46; and P-44. 2) Teletype telling with voice back-up will be used to forward movements data from the AMIS to direction centers. ADCC's concerned will be tied into this system. 3) CADC Recommendation 117 generally will be followed for flight plan distribution. This headquarters is taking action to assign an identification function to the U. S. manned radar sites in Canada. When this action is consummated, a re-evaluation will be made of the identification function assigned ADC direction centers listed above.

1 1

Capt LaSalle/bc

ADOOT-B1 2722

HECTOR C. DACUS
Captain, USAF
Asst Command Adj

DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
WASHINGTON 25

127

General Benjamin W. Chidlaw
Headquarters, Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

259

Dear General Chidlaw:

Reference is made to the necessity, from a national defense standpoint, of developing an over-all plan to:

1. Eliminate the vulnerability of Civil Aeronautics Administration Air Route Traffic Control Centers to sabotage and enemy attack.

2. Eliminate the vulnerability to sabotage, enemy attack, and jamming of the communications circuits used by air traffic control in conjunction with air defense or required for the control of aircraft during a military emergency.

The foregoing has been the subject of previous correspondence between the CAA and Headquarters, United States Air Force, as well as discussions which included personnel from Headquarters, Air Defense Command. It is our understanding that copies of the correspondence have been furnished your office by Headquarters, USAF.

We have been advised that the approach outlined, in our letter dated August 12, 1954, to General Pachynski is agreeable to Headquarters, ADC and USAF. In his reply, General Pachynski recommended that development of the over-all plan be undertaken by the CAA in conjunction with the ADC, stating further that your Headquarters is prepared to furnish whatever assistance and information may be required.

We are prepared to proceed accordingly, and shall appreciate being advised relative to where and when you desire that the initial preparation of the plan take place.

In this connection, Messrs. Benson, Ditzler and Manhardt of this office have been assigned to the project and will be available beginning April 4, 1955, to meet with representatives of ADC at whatever location you may select.

A copy of this letter is being forwarded to Headquarters, USAF for their information.

Very truly yours,

Joseph H. Tippets
Director
Office of Federal Airways

11

128

AD00T-131

Mr. Joseph D. Tippets, Director
Office of Federal Airways
Civil Aeronautics Administration
Department of Commerce
Washington 25, D. C.

Dear Mr. Tippets:

I have delayed replying to your letter of March [illegible], 1955, pending the resolution of dates when a briefing on the SAGE System might be given to CAA representatives.

I believe it advisable to delay detailed discussions on the problem of ARTC Center relocation until after the CAA personnel concerned with planning have had a complete briefing in our future plans—in particular the operational plan for the SAGE System. It appears to my staff that this system will influence any plans for relocation of your centers.

We are beginning a series of two-week courses for the purpose of familiarizing air defense force and air division personnel with the SAGE operational plans and the various components of the system. One day of each course will be devoted to a detailed briefing on the operational plan. The dates selected are 22 April, 20 May, and 17 June 1955.

If you agree with the above recommendation, please let me know which briefing you would prefer your representatives to attend, together with names and degree of security clearance. Unless you would require time to assimilate the information gained in the briefing, preliminary discussions could be undertaken at this time with your representatives.

It is anticipated that a team from this headquarters will conduct a briefing within the next six weeks on the SAGE System at Headquarters USAF. I am certain you can arrange for attendance at this briefing if you prefer.

Sincerely,

MEMORANDUM FOR THE RECORD: Not necessary

Capt LaSalle/afg
2[illegible]-2614
[illegible] April 1955

JOHN C. MEYER
Colonel, USAF
Director, Operations & Training

1138

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129

*ADCR 55-12

ADC REGULATION)
55-12)

HEADQUARTERS AIR DEFENSE COMMAND
Ent AFB, Colorado Springs, Colo.
29 March 1955

OPERATIONS

Standard Identification of Air Movements

1. Purpose. This Regulation establishes standard procedures for processing air movements information and the criteria to be applied for the classification of tracks.

2. Scope. The instructions herein are applicable to all units of this command assigned an identification function, including Ground Observer Corps filter centers.

3. General. This Regulation covers the procedures and criteria to be employed in those areas and at those times when identification is required.

4. Definitions.

a. Air Route Traffic Control Center (ARTCC): A CAA facility established by competent authority to provide adequate supervision of air traffic within a specified control area.

b. Aircraft Movements Information Section (AMIS): A facility established by the Civil Aeronautics Administration (CAA) to provide for collection, processing, and dissemination of flight movement information for use by air defense facilities.

c. Security Control Position: A position established within an ARTCC or Flight Service Center (FSC) to pass unprocessed flight movements information to designated air defense facilities not served by an AMIS.

d. Air Defense Identification Zone (ADIZ): Airspace of defined dimensions designated by the Administrator of Civil Aeronautics within which the ready identification, location, and control of aircraft is required in the interest of national security.

(1) Domestic ADIZ: An ADIZ within the United States.

(2) Coastal ADIZ: An ADIZ over the coastal waters of the United States.

(3) International Boundary ADIZ: An ADIZ adjacent to an international boundary line of the United States.

*This supersedes ADCR 55-12, 6 July 1954.

1139

120

e. Free Area: A designated portion of an ADIZ within which originating tracks may be classified friendly.

f. Correlation Line or Point: A reference line or point(s) established by air division (defense) commander(s) from which "penetration" or "time-over" for a flight is computed for the purpose of Flight Plan Correlation. A correlation point is any point used as a reference for Flight Plan Correlation purposes. It is normally, but not necessarily, on the Correlation Line.

5. Responsibilities. a. Air defense force commanders are responsible for coordinating with the appropriate CAA regional administrators on the basis of mutually approved agreements providing for the identification and security control of air traffic and control of air navigational aids.

b. Air division (defense) commanders are responsible for identification of aircraft within their assigned area of responsibility and for coordinating with the CAA Regional Administrator(s) concerned or his designated representatives, to facilitate establishment of AMIS or Security Control positions, where appropriate, supplying air movements information, as follows:

(1) Prescribe the Correlation Line or Correlation Points to which air movements information will be referenced for each subsector within their sectors of responsibility.

(2) Establish the time prior to arrival at the Correlation Line (or Correlation Point if appropriate) at which air movements information will be transmitted to the ADC facility concerned. Detection capabilities at various altitudes should be considered to insure receipt of information prior to target detection, but not too advanced to require excessive storage.

(3) Establish an alternate plan for the transmittal of air movements information to air defense facilities in the event any station(s) is lost to the system under emergency conditions, and cannot perform its identification responsibilities.

c. Commanders of direction centers assigned an identification function are responsible for:

(1) Operation of a Movements and Identification Section to include continuous manning of communications to all agencies furnishing air movements information.

(2) Insuring that CAA procedures for AMIS operation, Standard Operations Procedures for Security Control

1140

of Air Traffic," and supplements thereto, are available for ready reference.

(3) Insuring that movements identification personnel are completely familiar with procedures used by air movements information furnishing agencies.

(4) Conforming to the operational procedures and criteria established by this Regulation in accordance with approved doctrine.

(5) Accomplishing identification even though the radar equipment is off the air for maintenance, or any other reason, using information cross-told from adjacent units, ground observers, etc.

d. Ground Observer Corps filter centers are responsible to the associated direction center for the identification of established tracks within the capability of the filter center. Final identification of all tracks will be the responsibility of the direction center. The filter center identification section is established to assist in the fulfillment of these responsibilities.

6. Identification Criteria. All tracks originating within or entering an ADIZ indicating movement toward a target complex, require identification. The criteria given in this paragraph have notable exceptions in multiple corridor operations. MCIS criteria are described in paragraph 7. Tracks requiring identification will be classified as:

a. Friendly Tracks: The following methods and criteria are established for the classification of tracks as friendly:

(1) Flight Plan Correlation: Identification obtained by matching the pre-plotted air movements of a ground-filed flight plan with the actual tracks of air movements as obtained from electronic surveillance, GOC, and other sources. The actual track must be within plus or minus 5 minutes of its pre-plotted time and within 10 nautical miles, measured perpendicularly, either side of its pre-plotted flight path in a Domestic or International Boundary ADIZ, or within plus or minus 5 minutes of its pre-plotted time and within 20 nautical miles, measured perpendicularly, either side of its pre-plotted flight path in a Coastal ADIZ. The pre-plotted flight path is computed from the Correlation Point or Line.

(2) Air Speed: Aircraft flying within or entering a domestic ADIZ from the interior of the United States,

1141

4,000 feet or less above the immediate terrain, and having an approximate true airspeed of 110 knots or less, may be classified friendly if the scope on which speed determination is made is set on a radius of no more than 25 miles, and if accurate information is available on wind velocity.

(3) Prior Arrangement: Any track which follows a plan of flight in accordance with a prior arrangement between the air division (defense) commander(s) concerned and the aircraft operator may be classified friendly.

(4) Free Area: Tracks that originate within a free area may be classified as friendly.

(5) Visual Observation: (Applicable only to commercial and all single or twin engine aircraft.)

(a) Intercept Pilot: Information gained visually by an intercept pilot in the course of an interception may be used for identification purposes.

(b) Qualified Observer: Information concerning an airborne object obtained from a qualified observer may be used to classify a track as friendly. Qualified observers are military or civilian personnel whose duties are associated with air operations.

(c) Ground Observer Corps: Any single or twin engine aircraft which has been recognized as friendly by a ground observer may be classified friendly.

(6) Previous Identification: Normally tracks passed by adjacent ACW units as friendly and under continuous surveillance will be accepted as identified friendly unless they create suspicion in accordance with paragraph 6b(4).

(7) Supplemental Identification Methods:

(a) Direction Finding: When a flight plan or prior arrangement exists, air division (defense) commanders are authorized to use simultaneous air-ground radio telephone and direction finding procedures as a supplementary method of identification. A call is made to the

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aircraft concerned to obtain identifying information. (AFSAL 5104 for 4-engine military aircraft.) During the transmission of the identifying information, a line of position is taken on the responding aircraft to insure that the track in question is the same one from which the identifying information is obtained. If the identifying information is correct and the line of position coincides, within plus or minus four degrees of the blip, the aircraft may be classified friendly.

(b) Aldis Lamp: Upon intercepting conventional type bomber aircraft, fighter-interceptor pilots may further challenge the bomber for recognition purposes by flying alongside the bomber on a steady course. Correct aldis lamp response by the bomber aircraft in accordance with ACP 156 may be used to classify the aircraft as friendly. Fighter aircraft will receipt for aldis lamp response by rocking the aircraft wings.

(c) AFSAL 5104: Upon intercepting jet type bomber aircraft, fighter-interceptor pilots may further challenge the bomber for recognition purposes by flying alongside the bomber on a steady course. The fighter-interceptor pilot will then contact the bomber on UHF radio (fighter-bomber liaison frequency), and challenge using AFSAL 5104 procedures. Correct answer to the voice challenge by the bomber may be used to classify the aircraft as friendly. Applicable portions of ACP 158/156 and AFSAL 5104 may be made available to fighter-interceptor pilots in extract form to eliminate the necessity for carrying bulky tables in the fighter-interceptor aircraft.

b. Unknown Tracks: The following criteria are established for the classification of tracks as unknown:

(1) Any track requiring identification that cannot be classified friendly, hostile, or faker within one minute from establishment of track at the unit having the identification responsibility, will be classified unknown and appropriate air defense action will be taken.

(2) Sequence of events for air defense action is:

1143

(a) Two (2) minutes (maximum) for the establishment of a track.

(b) One (1) minute for classification.

(c) Immediately following the classification of a track as unknown, hostile, or faker, appropriate air defense action will be taken and reported. In all cases, a last-minute check will be made with the servicing AMIS to determine if flight plan information is available for identification of the track.

(3) A change of classification of an unknown will be made only on the basis of new or revised information.

(4) Any track, regardless of its origin, creating suspicion as to its friendly intent by reason of course, speed, altitude, radio telephone procedures, maneuvers, size of blip, etc., which indicates abnormality to an extent that further investigation is deemed advisable, will be classified unknown. Unknown is an initial classification subject to change resulting from the inability to classify a track as friendly or hostile using the criteria established in this Regulation. Every means available will be used to reclassify an unknown track as friendly or hostile.

c. Hostile Tracks: Methods and criteria prescribed for classification of tracks as hostile are contained in ADCR 55-10.

d. Outbound Tracks: Tracks outbound from a domestic or coastal ADIZ, and not indicating movement toward a target complex in the sector of responsibility, need not be identified and may be designated "Outbound" at the discretion of air division (defense) commanders.

e. During conditions of air defense Warning Red and Yellow and subsequent to implementation of SCATER, all tracks will be classified either friendly or hostile.

7. Multiple Corridor Identification System (MCIS). Overwater approach to the United States has dictated a separate procedure for the identification of air movements. Aircraft participating in the MCIS program, and within MCIS correlation limits, will not be violated under the provisions of ADCR 55-24, and the criteria for classification of friendly will be as outlined in this program.

1144

Upon making the system regulatory, procedures will be established for violating aircraft.

a. Each fan of the MCIS will consist of a series of corridors radiating from a point marked by a navigational aid. Each fan will be given a place name, such as the San Francisco fan, the Azores-Nantucket fan, etc., and the corridors of each fan will be designated with numbers. The corridors will be numbered consecutively starting with number 1 as the most northerly corridor in a fan oriented east-west, and number 1 as the most easterly in a fan oriented north-south. For example, the most northerly corridor of the Santa Barbara fan would be designated SB-1; the second most northerly corridor of the San Francisco fan as SF-2.

b. The following lines are established across the corridors of each fan:

(1) Outer Reporting Line: A line (or in the case of the Yarmouth fan, a point) about 250 nautical miles from the apex of the fan over which the penetrating aircraft will make a position report and an estimated time of crossing the inner reporting line.

(2) Inner Reporting Line: A line approximately 150 nautical miles from the apex of the fan over which the pilot will make a position report and an estimated time of arrival over the Release Line. This line is used by the radar identification section for correlation purposes and is the equivalent of the Correlation Line defined in paragraph 4f.

(3) Release Line: A line about 60 nautical miles from the apex of the fan (or in certain instances, as in the Bermuda-Nantucket and Azores-Nantucket fans, the apex of the fan) over which participating aircraft are automatically released from their corridor assignments, if this release has not been previously granted on completion of identification.

c. Because of the additional security gained from selective corridor system, normal correlation criteria may be relaxed. The following criteria will apply to aircraft participating in the MCIS program:

(1) If the actual track is within plus or minus 10 minutes of its dead reckoned time, and within the assigned corridor, and if the aircraft properly executes the assigned check turn or answers with the assigned code word, whichever has been assigned at the briefing station, the aircraft may be classified friendly.

1145

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(2) If the actual track is within plus or minus 10 minutes of its dead reckoned time, and in a corridor adjacent to that assigned, the track may be classified friendly provided the aircraft performs the assigned maneuver when requested to do so by the director involved. (The assigned maneuver is given to the pilot in a sealed envelope at his last briefing station prior to entering a multiple corridor fan.)

(3) If the check turn mentioned in paragraph 7c(1) above is performed incorrectly; or in the case of the code word, if the identification by code word cannot be made because the code word cannot be transmitted by the aircraft, because the code word is garbled in transmission, or because the blip in question falls outside of plus or minus four degrees of the DF line of position, the track can be classified friendly provided the aircraft performs the assigned maneuver when requested to do so by the director involved.

(4) The track will be classified unknown if the following conditions prevail:

(a) If the actual track is outside of plus or minus 10 minutes of its dead reckoned time, or outside of the corridors adjacent to that assigned.

(b) If the actual track is within plus or minus 10 minutes of its dead reckoned time, in a corridor adjacent to that assigned and performs the maneuver incorrectly.

(c) In the case of the use of the check turn, if the actual track is within plus or minus 10 minutes of its dead reckoned time, in the assigned corridor, and incorrectly performs both the check turn and the maneuver.

(d) In the case of the use of a code word, if the aircraft is within plus or minus 10 minutes of its dead-reckoned time, in the assigned corridor and gives the wrong code word, the blip being within the prescribed DF tolerance limits.

(5) Any fan with a different time tolerance than that of plus or minus 10 minutes, or when a different time tolerance is adopted, in the future, the time tolerance listed above will be changed as appropriat

1146

(6) Tracks undergoing MCIS procedures necessitating a selective maneuver, check turn, or code word at the direction of the director will be reported as "No Scramble NR" (maximum time 10 minutes).

8. Free Areas. Air division (defense) commanders will submit requests, through channels, for the establishment of Free Areas to Headquarters ADC for approval, and will include the following:

a. Boundary of proposed Free Area.

b. Current and expected identification capabilities.

c. Radar and Ground Observer Corps coverage of surrounding area.

d. Length of time Free Area will be required.

e. Any other pertinent data which would help justify the establishment of a Free Area.

9. Procedures. The procedures contained in this Regulation are prescribed to standardize and aid the handling of air movements information and identification operations within air defense units assigned identification responsibility.

a. Identification Plotting Tables: Plotting tables of the PT-104/CPS-6B type are suitable for identification operations.

b. Movements Identification Plotting Table Maps: MI maps should be of a 1:1,000,000 scale.

c. Flight Progress Display: The following standard flight progress system will be established to aid recording, storing, and presenting air movements information and identification results for use and record. Movements identification personnel will:

(1) Record the received air movements information directly on a flight strip installed in a flight strip holder as indicated in ADCR 55-26.

(2) Place the flight strip and holder in the storage tray under the appropriate segregation in a time sequence. (First expected flights nearest the front.)

(3) Record revision(s) as necessary on the flight strip and rearrange the strip and holder to maintain time sequence.

(4) After identification has been performed, complete

1147

the flight strip by the addition of pertinent track and identification data.

d. Air Movements Information: The list of items necessary for flight plan correlation that will be entered on the flight strip are:

(1) Flight identification.

(2) Type of aircraft.

(3) Number of aircraft (where more than one).

(4) Altitude.

(5) Ground speed (knots).

(6) Correlation Point or Line (Inner Reporting Line is the Correlation Line in MCIS operation).

(7) Estimated time over Correlation Point or Line.

(8) Route of flight through area of surveillance within the ADIZ (include destination and/or departure point when appropriate).

(9) Initial flight plan filed in flight (when appropriate).

(10) Date.

(11) Sender's identification.

(12) Time information received.

e. Correlation Aid: A correlation aid will be used to pre-plot and correlate air movements information.

f. Pre-Plot and Correlation of Air Movements Information: Air movements information will be used by air defense facilities to establish a pre-plot for intended flights, penetrating or originating within the area requiring identification, to effect identification, to aid subsequent tracking, and to observe violation of identification zones and air space reservations. Close coordination will be maintained with the various agencies which furnish air movements information to fully implement these procedures.

g. If for any reason detection cannot be effected by the unit first receiving air movements information, the information will be transmitted to the next unit along the expected flight path having identification responsibility in sufficient time for that unit to effect correlation upon target detection.

10. Recording of Identification Data. Flight plan information received will be entered on the ADC Flight Strip, ADC Form 86. Separate flight strips will be maintained on all unknown aircraft detected and complete information filled in upon interception.

11. Supply of Forms. Initial distribution of ADC Form 86 will be made to air defense forces. Resupply will be in accordance with paragraph 5b, ADCR 0-3.
(ADOOT)

BY ORDER OF THE COMMANDER:

OFFICIAL:

GEORGE F. SMITH
Major General, USAF
Chief of Staff

Walter W. Robinson
WALTER W. ROBINSON
Colonel, USAF
Command Adjutant

1 Attachment:
Instructions for
ADC Form 86

DISTRIBUTION:
A

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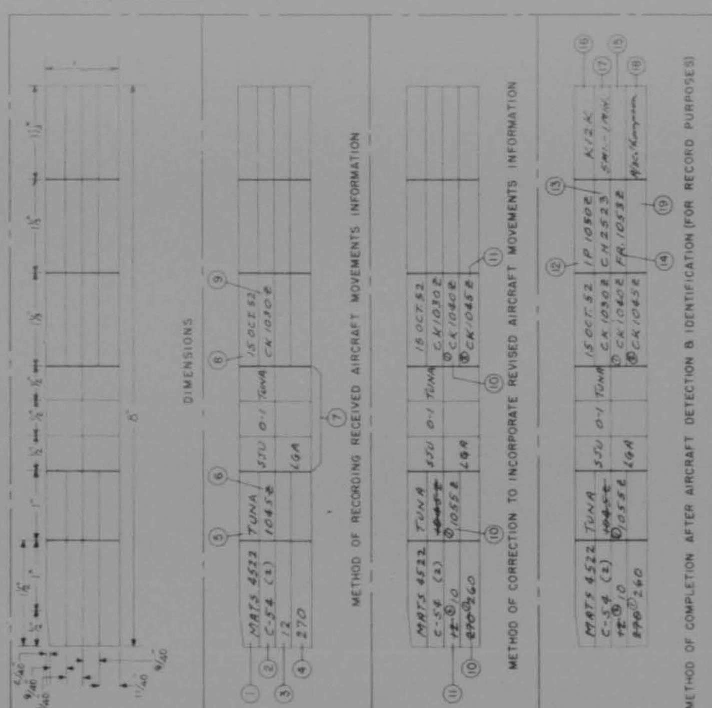
1. Flight identification.
2. Type of aircraft and number of aircraft (if more than one).
3. Altitude (whole thousands of feet).
4. Ground speed (knots).
5. Air Defense Correlation Point (this designation may be by point name, corridor, GEOREF coordinates, etc.).
6. Estimated time over the Correlation Point.
7. Route of flight through the area of radar surveillance within the ADIZ in sufficient detail for preplotting and track following where required. The destination is also recorded in this space.
8. Date.
9. Sender's identification and time flight information received.
10. Revision of ground speed and estimated time over the Correlation Point coded to sender's identification and time revision received.
11. Revision of altitude coded to sender's identification and time revision received.
12. Initial plot time of the radar detected target.
13. Initial plot location (GEOREF) of the radar-detected target.
14. Identification category determined and time of identification.
15. Scramble action and time.
16. Track designator assigned.
17. Navigational error of the aircraft expressed in miles and minutes.
18. Name of Movement-Identification Technician or Officer who performed the correlation and determined the identification category.
19. Final action - Identified intercept, faded prior to intercept, no intercept with abbreviated reason, identified hostile, splash, etc.

NOTES:

1. Time expressed as Greenwich Civil Time (GCT).
2. Additional data, for record purposes, may be noted on the reverse side of the flight information strip when necessary.



Attachment 1, ADCR 55-12, 29 March 1955

Flight information strip dimensions and use.

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Capt USAF

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NAFD

CONTINENTAL AIR DEFENSE COMMAND

AND

AIR DEFENSE COMMAND

History

January - June 1955

Volume III
SUPPORTING DOCUMENTS
Docs. No. 131 - 181

NAFD

Excluded from General Declassification Schedule

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C[illegible]Y 131

COMMANDER, AIR DEFENSE COMMAND

COMMANDER, WESTERN AIR DEFENSE FORCE, [illegible], CALIF
COMMANDER, EASTERN AIR DEFENSE FORCE, [illegible]
COMMANDER, CENTRAL AIR DEFENSE FORCE, [illegible]
COMMANDER, 4750TH AIR DEFENSE WING ([illegible])
YUMA [illegible] ARIZ

COMMANDER, OCAMA, TINKER AFB, OKLAHOMA CITY, OKLA
COMMANDER, SBAMA, NORTON AFB, SAN BERNARDINO, CALIF
COMMANDER, SMAMA, MCCLELLAN AFB, MCCLELLAN, CALIF

(UNCLASSIFIED). ADMAC-2A2 15217. This message is in four parts. Part 1. Subject: Hotwheel No. 1. Information this headquarters from the field indicating a large amount of workload could be reduced if F-86D units in the field were given more leeway as to the minimum time turbine wheels could be removed and returned to the depot for inspection. Part II. This headquarters has contacted depot personnel at Oklahoma City Air Materiel Area and received their concurrence that for scheduling purposes the field can remove and return turbine wheels with the minimum time of 75 hours or at any time between 75 and 100 hours. At no time, repeat at no time, will turbine be operated over 100 hours without inspection. Part III. Since the arrangement was made and concurred in by Oklahoma City Air Materiel Area and this command in an effort to give the units in the field a more flexible scheduling program, every effort should be made to have the turbine wheel inspection performed at/100 hour period. Authority is granted to remove and return turbine wheels at the time of aircraft inspection provided the subject wheels are at or over 75 hours. Part IV. It is recommended this information be brought to attention of all F-86D units within this command.

JOHN J. [illegible]
CWO, USAF
Asst Command Adj

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CONFIDENTIAL

13/6/55

	PRIORITY	ROUTINE
COMDR ADC		
COMDR EADF STEWART AFB NEWBURGH NY	X	
COMDR CADF GRANDVIEW AFB MO		
COMDR WADF HAMILTON AFB CALIF		X
COMDR 4750TH ADW (WPNS) YUMA CTY AFLD ARIZ		

COMDR WRAMA ROBINS AFB MACON GA
AFPR HUGHES ACFT CO CULVER CITY CALIF

(CONFIDENTIAL) ADMAC-5A 2283, For WRMXB, Mr. Davis; WRMFF, Mr. Sprinkle, WRAMA. For WMMD, Mr. Smith, Hughes.

This msg in four (4) parts. PART I. WRAMA has advised that the Depot stocks of the RF unit 5200-628631-75 are insufficient to spt all acft presently equipped with this item. The primary reasons for this cond are: (a) Failure of several AMC agencies to provide a tuneable RF unit for instl in Roll-Out and Mop-Up acft. (b) Failure of WRAMA and the using comds to limit the issues of the RF unit 5200-628631-75 to production acft. This comd estbd the reqmt for tuneability in Dec 53. Hqs USAF provided funds for the F-86D and F-94C in May 54 and for 100 each F-89Ds in May 55. Complete instal has been made in the fol production acft, F-86D, 52-3598 and subs, F-94C, 51-13557 and subs, and F-89D, 52-1829 and subs. Spare 5200-628631-75 RF units has been provided for these acft. No auth exists for instal of this RF unit in acft other than those above. PART II. Provs for the tuneable RF unit have

ADMAC-16

CONFIDENTIAL 1 2

Capt. T.A. Maskela/AIMAC-5A/laj

AIMAC-5A 294

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M553-1

1156

been made in acft undergoing Pullout and Mopup mods. No tuneable RF units have been provided for Pullout or Mopup modified acft. This is due to the failure of several AMC agencies to take positive and expeditious act to modify the fixed RF unit 5200-628631-65. WRAMA and the using comds have not ltd issues of the RF unit 5200-628631-75 to the production acft therefore spare tuneable RF units have been instld in Pullout and Mopup acft. This act has depleted the spares. PART III. Two (2) plans have been proposed to correct this unsatisfactory cond: (a) Plan one. Remove the tuneable RF units from all Pull-Out and Mop-Up acft and limit the issues of tuneable RF units by ser nrs of the proper production type acft. This plan was rejected by this hqs as it is estimated that the program would require at least seven (7) months to accomplish. (b) Plan two. Expedite the procurement and delivery of the subassy 5200-928897 and other small parts required for the repair of the RF unit 5200-628631-75. Expedite the procurement and delivery of the mod kits required to bring the fixed RF unit 5200-628631-65 to a tuneable configuration. Auth WRAMA and OCAMA to substitute the 5200-628631-65 RF unit for the 5200-628631-75 unit when the reqd item is not avail. This plan has been accepted by the major comds and WRAMA as it is estimated that the deliveries of 5200-628631-65 units modified to a tuneable configuration is possible within six (6) months. PART IV. It is realized that the substitution of the fixed RF unit for the tuneable RF unit is not desirable but the savings in overall program should justify this act. Req that the contents of this msg be disseminated to all Base Supplies and Fwd-Echelon Sqdns of your comd.

M553-2X

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FILE NUMBER 314.3

135

ADMAC-4

3 March 1955

SUBJECT: (Unclassified) Air Defense Command Aircraft Scheduling and Assignment Plan for Project "PULL OUT"

TO: Commanders
Air Defense Forces

Commander
4750th Air Defense Wing (Weapons)
Yuma County Airport
Yuma, Arizona

1. Reference is made to letter, this headquarters, subject; as above, November 1954 issue.

2. Inclosures Number 1 through 5 to referenced letter are superseded by the inclosed schedules and will be destroyed immediately. It is desired that these revised schedules be immediately distributed to all affected units within your command.

3. The changes incorporated in the inclosed schedules resulted primarily from the following:

a. Total slippage in the SMAMA output schedules during December 1955.

b. Reduction of the Air Defense Command January 1955 input schedules to SMAMA from 36 aircraft to zero.

c. Changes in the procurement contract with North American Aviation Incorporation which reduced the number of F-86D-55 aircraft and increased the number of F-86D-60 models that will be produced.

4. Inclosure Number 5 also reflects a change-over in certain units from Modified Categories V, VI and VII aircraft to Modified Categories X and XI aircraft. This action is programmed in order to provide the affected units with aircraft having Omni range and Radar equipment installed. It also insures retention of the latest models of F-86D aircraft within the inventories of this command.

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Hq ADC, ADMAC-4 Subject: (Unclassified) Air Defense Command Aircraft Scheduling and Assignment Plan for Project "PULL OUT" (Cont'd)

5. Subject schedules for a three month period beyond July 1955 will be published during the latter part of June 1955.

6. When Inclosure Number 5 is withdrawn or not attached, the classification of this correspondence will be cancelled in the manner prescribed by AFR 205-1.

BY ORDER OF THE COMMANDER:

RECTOR C. DACUS
Captain, US
Comm

5 Incls
1. Overall Scd of Proj Pull Out
2. SMAMA Scd by Maj Comd
3. NAA Scd by Maj Comd
4. Detailed Scd by ADC Sub-Comd
5. Recap of Proj Pull Out Scds

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1159

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Hq ADC, ADMAC-4 Subject: (Unclassified) Air Defense Command Aircraft Scheduling and Assignment Plan for Project "PULL OUT" (Cont'd)

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OVERALL SCHEDULES OF PROJECT "PULL OUT"

		Feb & Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTALS
MAMA	IN	3	10	20	20	30	44	55	64	61	67	36	54	69	57	20				610
	OUT					3	15	30	51	56	3	70	81	85	75	63	58	20		610
AA	IN	9	3	14	22	29	33	28	33	42	49	45	42	41	46	23	9			469
	OUT					6	16	25	39	34	33	51	47	43	42	42	42	30	19	469
OTALS	IN	12	13	34	42	59	77	83	97	103	116	81	96	110	103	43	9			1079
	OUT					9	31	55	90	90	36	121	128	128	117	105	100	50	19	1079

l #1 NOTE: Above schedules do not reflect those aircraft that have been delivered to SMAMA and MAA as "Basket Cases".

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PROJECT "PULL-OUT"

F-86D ACFT - SMAMA INPUT SCHEDULE

Input Schedule	Nr Acft	Command	AF Ser Nr	Category
Mar 3	3	ADC	51-5995 to 6144	VI
Apr 10	10	ADC	51-5995 to 6144	VI
May 20	20	ADC	51-5995 to 6144	VI
Jun 20	20	ADC	51-5995 to 6144	VI
Jul 30	30	ADC	51-5995 to 6144	VI
Aug 44	44	ADC	51-5994 to 6144	VI
Sep 54	10	ADC	51-5995 to 6144	VI
	43	ADC	51-6145 to 8305	VII
	1	ARDC	51-5857 to 5994	V
Oct 64	63	ADC	51-6145 to 8305	VII
	1	FEAF	51-6145 to 8305	VII
Nov 61	11	ADC	51-6145 to 8305	VII
	1	ARDC	61-6145 to 8305	VII
	26	ADC	51-2944 to 3043	III
	2	FEAF	51-8406 to 8505	IX
	11	FEAF	51-6145 to 8305	VII
	10	FEAF	51-8306 to 8405	VIII
Dec 67	20	ADC	51-2944 to 3043	III
	29	ADC	51-3044 to 3131	IV
	2	ADC	52-3598 to 3747	X
	3	FEAF	51-8306 to 8405	VIII
	3	FEAF	51-8406 to 8505	IX
	8	ATRC	51-3044 to 3131	IV
	2	ATRC	51-6145 to 8305	VII

Incl #2

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PROJECT "PULL-OUT"

F-86D ACFT - SMAMA INPUT SCHEDULE

Input Schedule	Nr Acft	Command	AF Ser Nr	Category
	3	ADC	52-3598 to 3747	X
Jan 36	1	ARDC	51-2944 to 3131	III
	15	FEAF	51-8406 to 8505	IX
	2	FEAF	51-6145 to 8305	VII
	3	FEAF	51-8306 to 8405	VIII
	1	ATRC	51-3044 to 3131	IV
	11	ATRC	51-2944 to 3043	III
Feb 54	18	ADC	52-3598 to 3747	X
	1	ADC	51-2944 to 3043	III
	14	ADC	51-3044 to 3131	IV
	11	ATRC	51-3044 to 3131	IV
	4	ATRC	50-518 to 553	I
	6	ATRC	52-3598 to 3747	X
Mar 69	42	ADC	52-3598 to 3747	X
	1	ADC	51-3044 to 3131	IV
	1	ADC	51-2944 to 3043	III
	21	ATRC	50-518 to 553	I
	4	ATRC	52-3598 to 3747	X
Apr 57	52	ADC	52-3598 to 3747	X
	4	ATRC	50-518 to 553	I
	1	ATRC	50-454 to 517	0
May 20	20	ATRC	50-454 to 517	0

Incl #2

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PROJECT "PULL-OUT"

F-86D ACFT - NAA INPUT SCHEDULE

Input Schedule	Nr Acft	Command	AF Ser Nr	Category
Mar 9	9	ADC	51-5857 to 5994	V
Apr 3	3	ADC	51-5857 to 5994	V
May 15	15	ADC	51-5857 to 5994	V
Jun 22	22	ADC	51-5857 to 5994	V
Jul 29	29	ADC	51-5857 to 5994	V
Aug 33	33	ADC	51-5857 to 5994	V
Sep 28	11	ADC	51-5857 to 5994	V
	17	ADC	51-8306 to 8405	VIII
Oct 33	33	ADC	51-8306 to 8405	VIII
Nov 42	19	ADC	51-8306 to 8405	VIII
	10	ADC	51-8406 to 8505	IX
	12	ADC	51-2944 to 3043	III
	1	FEAF	51-8306 to 8405	VIII
Dec 49	28	ADC	51-8406 to 8505	IX
	1	ADC	52-3748 to 3897	XI
	2	ATRC	51-8306 to 8405	VIII
	8	ADC	50-554 to 734	II
	10	ADC	51-2944 to 3043	III
Jan 45	31	ADC	51-8406 to 8505	IX
	7	ADC	52-3748 to 3897	XI
	2	ATRC	51-8306 to 8405	VIII
	5	ATRC	50-554 to 734	II

Incl #9

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PROJECT "PULL-OUT"

F-86D ACFT - NAA INPUT SCHEDULE

Input Schedule	Nr Acft	Command	AF Ser Nr	Category
Feb 42	3	ADC	51-8406 to 8506	IX
	30	ADC	52-3748 to 3897	XI
	9	ATRC	50-554 to 734	II
Mar 41	37	ADC	52-3748 to 3897	XI
	4	ATRC	50-554 to 737	II
Apr 46	30	ADC	52-3748 to 3897	XI
	16	ATRC	50-554 to 737	II
May 23	8	ADC	52-3748 to 3897	XI
	15	ATRC	52-3748 to 3897	XI
Jun 9	9	ATRC	52-3748 to 3897	XI

Incl #3

DETAILED INPUT SCHEDULES TO PROJECT "PULL OUT"

SMAMA - PROJECT NO. A-4-7100-SM									MAA - CONTRACT NO. AF04(606)4080			
UNIT	AMT REQ'D	CATEGORY	SN RANGE			DELIVERY PERIOD	AF	UNIT	AMT REQ'D	CATEGORY	SN RANGE		
[illegible]th	1	III	51-2944	thru	51-3043	Feb 1955	E	432nd	3	XI	52-3748	thru	52-3897
[illegible]th	1	IV	51-3044	thru	51-3131		E	42nd	2	"	"		"
[illegible]nd	1	"	"		"		E	95th	2	"	"		"
[illegible]th	3	"	"		"		E	71st	3	"	"		"
[illegible]th	3	"	"		"		E	63rd	10	"	"		"
[illegible]nd	3	"	"		"		W	323rd	4	"	"		"
[illegible]st	1	"	"		"		C	460th	6	"	"		"
[illegible]nd	1	"	"		"		E	47th	3	IX	51-8406	thru	51-8505
[illegible]th	1	"	"		"		-	-	-	-	-		-
[illegible]th	1	X	52-3598	thru	52-3747		-	-	-	-	-		-
[illegible]th	3	"	"		"		-	-	-	-	-		-
[illegible]th	3	"	"		"		-	-	-	-	-		-
[illegible]rd	1	"	"		"		-	-	-	-	-		-
[illegible]th	4	"	"		"		-	-	-	-	-		-
[illegible]nd	5	"	"		"		-	-	-	-	-		-
[illegible]th	1	"	"		"		-	-	-	-	-		-
[illegible]	1	III	51-2944	thru	51-3043	Mar 1955	E	42nd	2	XI	52-3748	thru	52-3897
[illegible]	1	IV	51-3044	thru	51-3131	Continued on Page 2	E	95th	3	"	"		"

DETAILED INPUT SCHEDULES TO PROJECT "PULL OUT"

SMAMA - PROJECT NO. A-4-7100-SM				NAA - CONTRACT NO. AF04(606)4080				
AMT REQ'D	CATEGORY	SN RANGE	DELIVERY PERIOD	ADF	UNIT	AMT REQ'D	CATEGORY	SN RANGE
1	X	52-3598 thru 52-3747	Mar 1955 (Cont'd)	E	97th	3	XI	52-3748 thru 52-3897
4	"	" "		E	62nd	4	"	" "
1	"	" "		E	331st	2	"	" "
10	"	" "		E	63rd	3	"	" "
1	"	" "		W	94th	1	"	" "
4	"	" "		W	445th	2	"	" "
1	"	" "		W	325th	4	"	" "
3	"	" "		C	15th	2	"	" "
9	"	" "		C	14th	4	"	" "
8	"	" "		C	326th	7	"	" "
6	X	52-3598 thru 52-3747	Apr 1955	E	432nd	4	XI	52-3748 thru 52-3897
6	"	" "		E	13th	3	"	" "
11	"	" "		C	15th	3	"	" "
12	"	" "		C	14th	9	"	" "
13	"	" "		C	326th	11	"	" "
3	"	" "		-	-	-	-	- -
1	"	" "		-	-	-	-	- -

Continued on Page 3

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DETAILED INPUT SCHEDULES TO PROJECT "PULL OUT"

SMAMA - PROJECT NO. A-4-7100-SM					NAA - CONTRACT NO. AF04(606)4080				
IT	AMT REQ'D	CATEGORY	SN RANGE	DELIVERY PERIOD	ADF	UNIT	AMT REQ'D	CATEGORY	SN RANGE
	-	-	- -	May 1955	C	15th	2	XI	52-3748 thru 52-3897
	-	-	- -		C	14th	5	"	" "
	-	-	- -		C	326th	1	"	" "

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S&E
DCS/O
Asst Prog
CCA
Comm & Elect
M&
OCD
Op
O&T
P&R
Wea
S/Nuc
Elect
Gnd
Instl
Log Plans
HQ COMDY

Col SHARP
BLDG S-3 RM B-26
Mr Chandler

COMDR ADC

COMDR CADF GRANDVIEW AFB GRANDVIEW MO
COMDR EADF STEWART AFB NEWBURGH NY

COMDR OCAMA TINKER AFB OKLAHOMA CITY,
OKLAHOMA

10 FEB 1955

(SECRET) ADMAC-2AR 0673. Subject is Project Hotwheel. Due to continued failure rate of J-47 engine turbine wheels not subjected to Pep Zyglo inspection this Hq has arranged with OCAMA to operate inspection line on 24 hour basis, 7 days per week beginning 14 Feb. OCAMA capability is 50 wheels per 24 hours until all ADC reparable wheels are inspected. Prime addressees are hereby directed to begin delivery of twenty five reparable wheels per day, first delivery date NLT 0800 hours 14 Feb., to OCAMA until total affected wheels are delivered. Output quantities and dates will be furnished at later date. No containers are presently available for shipment of reparables therefore it will be necessary your units to locally mfg boxes and/or pads for air transport of these reparables. Suggested method is pad as described to your Project Officers by Maj Berry this Hqs. If better method can be devised this is your perogative. Effect of this action on ADC Combat Capability has been considered. There can be no exceptions to schedule of 25 reparables per day from each defense force if ADC is to gain support needed.

Col MEYERS
O&T

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1 2

Record Evaluation
Permanent ------
Temporary
Until ------
Will Be Confirmed
in Std Publication
Form Under par 3a,
ADCSM 5-3 -- No.

Prepared by Major W H Berry/ADMAC-2A2/ms W Berry
Telephone 2753
Date 10 February 1955

ADMAC-2A2

Not requested, not furnished
Furnished 10/2/55 (Initials)
(Date memo for record not required.)

RECTOR C. DACUS
Captain, ...
Asst C...

ADC Form ...
Revised 15 Aug 53

This correspondence is classified ________ in accordance with Par ________ AFR 205-1, 24 Jul 53, or for the reason (s) stated.

SIGNATURE

M645-1

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1171

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(SECRET) AIMAG-SAM 0673 .

OCAMA world-wide commitments cannot be reconciled with slippages as ADC is getting full production at this time. Sufficient cargo acft are assgd your jurisdiction to accomplish this mission if satisfactory in-commission rates have been maintained. If yr air lift capability is insufficient suggest you initiate action to procure contract charter if possible within your available funds. Your scheduling w/consider maintaining maximum combat capability during the period of this program, i.e., schedule acft out of commission w/b spread as broad as possible across the squadrons affected.

PARAPHRASE NOT REQUIRED
S... TO SECTION
BEFORE DECLASSIFYING.

MESSAGE ... WITH FOLL...
13-16-10 122350Z

SECRET

M645-2X

1172

Comdr | VC | CofS | Comd Adm | Adm | Hist | Pub | Comd Svcs | Comd Stf JA | IG | Insp Svs | PM | Flt Sfty | PIO | DCS/C | Bud | Fin | Mgt Anlys | Stat | DCS/P | Chap | Civ Pers | Mil Pers | Asgmt | Cols & Reds | GS | Pers Sv | PP | WAF | Tng | DCS/I | OI | R&F | S&T | DCS/O | Asst Prog | CCA | Comm & Elect | M&O | OCD | Ops Anlys | P&T | P&R | Inst | Log Plans | HQ Co

FILE NO. 31?.4

CONFIDENTIAL

PRIORITY PRIORITY

COMDR ADC

COMDR OCAMA TINKER AFB OKLAHOMA CITY OKLA

X

COMDR EADF STEWART AFB NEWBURGH NY

COMDR WADF HAMILTON AFB HAMILTON CALIF

COMDR CADF GRANDVIEW AFB GRANDVIEW MO

COMDR 4750TH AIR DEFENSE WING (WEAPONS)
YUMA CO APRT YUMA ARIZ

24 FEB 1955

(CONFIDENTIAL). ADMAC-2A1 0771 . Personal from Major General Roth by Major I. E. Dean to Major General Senter. Subject is Inlet Guide Vane Modification Program J-35A-35 Engines. The 82nd and 318th FIS, Presque Isle AFB Maine, recently discovered cracked inlet guide vanes on 44 J-35A-35 engines while performing inspection in accordance with TO 1F-89-502. Other squadrons operating F-89D aircraft with unmodified inlet guide vanes are also finding many cracked vanes. It is obvious that the present guide vane modification production schedule cannot keep pace with the requirement. Inspection and replacing defective engines is consuming excessive organizational maintenance manhours. The success or failure of Phase III, Project Look On, to be performed by the 318th in July 1955, will depend to a large

ADMAC

ADMAC-1

CONFIDENTIAL 1

Record Evaluation
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Until --------
Will Be Confirmed in Std Publication Form Under par 3a, ADCSM 5-3 --- No.

Ivan E. Dean

Prepared by --- Major Ivan E. Dean/mh
Telephone --- 2023
Date --- 24 Feb 55
ADMAC-2A1

ADC HQ Form 1
Revised 15 Aug 53

M673-1

CONFIDENTIAL

COMEBACK COPY

C. F. HUMPHREYS
Major USAF

Not requested, not furnished
OM Furnished [illegible] (Date) (Initial)

This correspondence is classified __________ in accordance with Par ______ AFR 205-1, 24 Jul 53, or for the reason (s) stated.

SIGNATURE

1173

extent on early availability of modified engines and guide vane assemblies. It is therefore requested that the complete program be reviewed and production increased by whatever methods you find necessary to complete the program at the earliest possible date.

B-4-24

2423037

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93

SECURITY CLASSIFICATION (If any)

DISPOSITION FORM

315

FILE NO.	SUBJECT Operational Plan for F-89D	
TO P&R	FROM O&T	DATE 21 April 1955 COMMENT NO. 1

Major Mayo/2602-3-4/adg

1. Request your office take action to complete those sections as indicated on the attached F-89D Operational Plan outline. We suggest you use the recommended changes as suggested by the attached letter from Hq USAF as a guide.

2. The completed revision pertaining to your section should reach this office no later than 28 April 1955.

Edward Stapelton USAF
for BEN I. MAYO, JR.
Colonel, USAF
Chief, Opnl Plans Div

for JOHN C. MEYER
Colonel, USAF
Director, O&T

1 Incl
a/s

TO

Robert B Hughes

M583-1

1175

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44

FROM HQ USAF

RECOMMENDED CHANGES TO F-89D/H OPERATIONAL PLAN FROM ADC

1. The following comments are recommended changes by the Air Staff on the Operational Plan of the F-89D/H. If you do not concur in these recommended changes, then it will become necessary to recoordinate this plan with Headquarters USAF. If the comments are accepted, the plan will be published, reproduced, and distributed by the initiating command in accordance with AFR 5-47.

SECTION I

a. Reference is made to the first sentence, third paragraph of Section I and to the first sentence under Section II. Since Fighter Interceptor Squadrons are already equipped with F-89D's, it is suggested that these sentences be revised to indicate this fact.

SECTION II

a. In addition to the data contained in paragraph 5, Utilization Rates, Section II, Operational Plan, it is suggested that reference be made to the appropriate USAF Program document for allocated flying hours.

b. Wartime Planning Documents should be referenced for Wartime Planning Factors and it is recommended that this reference be contained in paragraph 5, Utilization Rates. Then, Section III, Tab B, "Standard Wartime Planning Factors for the F-89D" would not be required.

c. Reference paragraph 7, F-89H flight simulators will be furnished ADC. The first will be delivered in the first quarter of FY 1956.

d. Tactics, Training Dates and Operationally Ready Dates, as required by AFR 5-47, are not adequately outlined in the plan.

SECTION III

a. Reference page 7, paragraph 12b(1), the "specialized equipment" cited will process only two (2) GAR-1's per hour rather than 4-5 per hour as stated. For this reason, 500 rather than 336 GAR-1's will be required in the "live" condition. (We understand that this decision has been made and implementing action has been taken).

b. Reference page 9, paragraph 1, two entries for telephone lines appear under this item, "..... cable cir. (UG)" and "..... open circuit." Current directives require that only the supporting structures portion of the outside telephone plant will be programmed as part of installations. The USAF installation facilities and structure catalogue is being changed to reflect proper nomenclature for listing underground cable conduit and aerial cable pole lines required in support of outside telephone plants.

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1176

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c. Reference page 10, paragraphs 1 and n, the item rocket storage appears in both of these paragraphs. In the first, it is "storage, ready rocket," and the second, "rkt storage check-out and assem." It appears that either these are the same facility or have been misnamed. In any case, inclusion of the latter under "Administration Facilities" seems inappropriate.

SECTION IV

a. The F-89D/H operational plan as submitted by Air Defense Command indicates that F-89H aircraft will be deployed in composite squadrons of 12 F-89D and 13 F-89H aircraft. T/O 1-1289 dated 1 March 1954 indicates an increase of 3 officers and 53 airmen is authorized for squadrons equipped with E-9 fire control system and the GAR-1. Recommend that Air Defense Command indicate their manpower requirement for F-89H's when they are deployed in composite squadrons. This it would seem would be about one-half of the 3 officers and 53 airmen authorized for a full squadron.

2. General Information Reference Use of the Atomic Warhead.

a. The F-89D/H operational plan does not mention inclusion of atomic armament. It is expected that an air-to-air rocket with an atomic warhead will be available for operational use by about January 1957. The military characteristics call for this rocket to be compatible with the F-89D/H aircraft if such compatibility will not compromise the primary operational capability with the F-102. Plans for using this rocket in the F-89D/H should be made.

b. For your information the following characteristics of the atomic warhead air-to-air rocket are furnished:

(1) Secondary compatibility consideration will be given to the F-89D/H.

(2) The rocket diameter will be the minimum attainable considering the warhead diameter, probably 15-18 inches.

(3) The maximum allowable length for internal storage is 180 inches. To this may be added the length of a detachable fairing for external carriage, if this is found desirable.

(4) The total weapon weight may not exceed 800 pounds.

(5) The weapon and its support equipment will be compatible with the 15- minute turn-around time specified in the F-89D/H operational plan.

(6) The weapon will be capable of functioning at altitudes up to 60,000 feet.

(7) The weapon is supposed to be capable of being stored on the strike aircraft in a loaded "ready-to-fire" condition for periods up to 24 hours to include repeated flights.

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96

c. In addition the following information concerning the atomic warhead for this rocket is furnished:

(1) Weight - 150 lb maximum

(2) Diameter - 15-18 inches maximum

(3) Length - 21 inches maximum

(4) Yield - 2 KT primary, with ½ and 5 KT also to be investigated.

d. It is recommended that ADC start planning use of this type armament in the F-89D/H immediately and to forward a revised operational plan which includes this capability as soon as possible.

1178

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97

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98

Section II - Operational Plan

2. Availability. The first squadron of F-89D, rocket equipped, interceptors were phased into ADC during the 3d quarter of FY 54. Aircraft availability is published quarterly in the Air Defense Command Program and should be used to determine [illegible]. There will be 156 F-89's equipped with the E-6 Fire Control System. These F-89D's, [illegible], will [illegible] F-89D [illegible] squadrons.

3. Operational [illegible]: [illegible] with 2.75" [illegible] will have [illegible] speed at [illegible] altitude [illegible]. F-89D will have [illegible]. F-89D equipped with [illegible] higher kill potential [illegible].

4. Status of Alert. [illegible], equipped with [illegible], [illegible] conditions of alert.

a. [illegible] - [illegible] (aircraft): Four [illegible], control [illegible] "[illegible]," [illegible] external power [illegible].

b. [illegible] - [illegible] hours, [illegible] for

M583-7

1161

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Fire Contr l System only.

c. Available- Fifteen Mi ute Al rt: [illegible] intercep- tors (estimated to be 10) will be used for normal [illegible] activity and while on the ground will be prepared to meet the [illegible].

D. Re-service Time - The [illegible] and ground handling activities to provi[illegible] 15 [illegible] re-servic[illegible] (four aircraft simultaneously) for int rceptors [illegible] missions. Re-service time will be [illegible] re-servicing [illegible] to time aircraft is/are [illegible] new mission. Re-service will include [illegible]-1's, [illegible], [illegible] fuel.

5. Utilization Rates.

a. The operational [illegible] 1.0 aircraft. Non-operational attrition [illegible] will [illegible] of aircraft inven ory. The [illegible] 53, of as programmed in [illegible]'s current [illegible] per months will be 24. All sorties will carry [illegible] FFAR's or combination GA -1's and 2.75" FFAR's. [illegible] duration. Operational fl[illegible] [illegible], flying hour ti[illegible] is 5 per [illegible].

b. Three sorties [illegible] F-89D interceptor on the first day [illegible] per combat [illegible] F-89D [illegible].

6. Deployment. The F-89D will [illegible] in the same manner as other interceptor [illegible]. [illegible] ment of F-89D [illegible]

M583-8

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7. Training. Air Defense Command personnel will receive the specialized training required for F-89H GAR-1 equipped squadrons from contractor and ATRC schools. Individual ground training for pilots and radar observers on the E-9 fore control system and the GAR-1 will be as required in the Unit Proficiency Directive.

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SECTION [illegible]I-Materiel

5 e. Installations. See Tab A for installation facility requirements for one squadron equipped with F-9D type aircraft.

f. Supply.

a. Fighter Interceptor Squadron responsibilities:

(1) Maintain necessary records in accordance with current directives.

(2) Maintain [illegible] storage and check out facilities. (For detailed information see the current ADC [illegible] Plan for Fighter Interceptor Squadrons [illegible] AM-1.)

b. Support [illegible] responsibilities:

(1) Maintain necessary supply records.

(2) Maintain established level of spares, fuels, munitions, etc.

(c. Air Materiel Command responsibilities:

(1) Provide depot support.

d. Support base stockage objectives:

(1)	Aircraft spares (less engines)		45 days
(2)	Aircraft engines		30 days
(3)	Ammunition	1/	30 days
(4)	Fuel	2/	30 days

1/ Based on ADC estimated sortie and expenditure rates as outlined in Tab B.

M583-10

1184

103.

2/ Based on ADC [illegible]
hours. (See Tab [illegible] for [illegible].)

e. Equipment authorizations.

(1) Each squadron will [illegible] 1 equipment plus [illegible] equipment. (See latest AMC Tentative Table of [illegible] for [illegible].)

10. Maintenance.

a. Fighter interceptor responsibilities:

(L) Organizational maintenance of the [illegible], [illegible], communications and [illegible] control systems and the GAR-1.

(2) Perform minor jet engine repair.

c. Air Materiel Command responsibilities:

(1) Depot maintenance and other maintenance [illegible] squadron and base capabilities.

(2) Maintenance of the GAR-1 not performed at squadron level.

11. Loading.

a/ Equipment required for loading GAR-1 [illegible] 2.75"FAR's will be developed by the aircraft manufacturer and furnished as Table 11 equipment. The first unit is scheduled for service test 1 January 195[illegible]

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12. <u>Specialized Equipment.</u> (See current TTs for the F-89D.)

a. Required test and ground handling equipment must be delivered prior to or concurrent with delivery of the aircraft.

b. Specialized equipment* is required to :

(I) Process 2 GAR-1's and 4 Rockets simultaneously at the rate of 4-5 GAR-1's per hour and 60 Rockets per hour.

(2) Repair, maintain, and store in a "live" condition: 500 GAR-1's and 2016 FFAR's.

c. Refer to T[illegible] for equipment listing.

* [illegible] in the line [illegible] facilities.

M583-12

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SECTION III- TAB A

F-89D OPERATIONAL PLAN

1. Minimum installation facility requirements for one F-89D squadron are as follows:

FACILITY	UNIT	QUANTITY	USAF DWNG
a. Airfield Pavements			
Apron, access, hangar	SY	10,650	
Apron, parking Oper.	SY	39,656	
Apron, T&B Flt.	SY	10,000	
Pad, A/C blast, jet, lt.	SY	945	
A/C runup stand, jet	EA		
Runway, crosswind, lt.	SY	98,400	
Length Std Day Conditions	FT	5,900	
Width	FT	150	
Runway, primary, lt.	SY	98,400	
Length Std Day Conditions	FT	5,900	
Width	FT	150	
Taxiway, alert, new, lt.	SY	15,500	
Width	FT	75 to 150	
Taxiway, crosswind, lt.	SY		
Width	FT	75	
Taxiway, primary, lt.	SY	100,800	
Width	FT	75	
b. Liquid Fuel Storage			
Bulk storage, base, jet	BBL	20,000	
Fill stand, truck	EA	2	
Optg, storage base av gas	GA	16,800	
Optg, storage base av lub	GA	5,000	
Optg, storage base diesel	GA	15,000	
Optg, storage base Mogas	GA	5,000	
c. Communications and Navaids			
Comm, base, general	SF	1824	38-04-11
Comm, base, rec.	SF	1023	38-12-10
Comm, base, trans.	SF	1023	38-12-10
Comm, power, emer.	KW	50	
Lighting, afld, approach(HI)	FT	1500	
Lighting, afld, RW(HI)	FT	5900	

H623-13

1187

	FACILITY	UNIT	QUANTITY	USAF DWNG
d.	Operations Facilities			
	Fire Station, crash (4-stall)	SF	9,165	36-30-01
	Operations, base w/cont twr	SF	4,804	30-07-03M
	Readiness, crew	SF	10,500	30-11-04M
e.	Aircraft Maintenance Facility			
	Hangar, alert	SF	22,450	39-01-40
	Hangar, Maint., base	SF	21,640	39-01-41
	Hangar, organ. (ready)	SF	21,640	39-01-39
	Shop, maint., base	SF	12,580	39-01-41
	Shop, maint. organ. std.	SF	5,160	39-01-41M
	Test stand, jet	EA	1	
f.	Training Facilities			
	Flt simulator, tng, crew	SF	2,840	28-14-03
	Range, facility, sm arms	EA	1	
g.	Troop Housing and Messing			
	Dormitory, airmen	MN	489	21-01-108
	Mess, airmen	SF	10,800	36-05-67
	OS, Men	MN	15	
h.	Family Housing			
	Housing, AM, appr funds	UN	0	
	Housing, off, appr funds	UN	5	
i.	Utilities			
	Drainage, storm water	FT		
	Elec. dist. lines	FT		
	Elec. transmission lines	FT	21,120	
	Elec. sub station	KV	1,500	
	Incinerator, refuse	EA	1	
	Lights, street	EA		
	Parking area, vehicle	SY	9,000	
	Road	MI	6.3	
	Sewage disposal mains	FT		
	Sewage treatment	GD	172,000	
	Tel. lines cable cir. (UG)	FT	1,500	
	Tel. lines open circuit	FT	30,000	
	Walkway	SY	28,000	
	Water mains, potable	FT	10,000	

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101

	FACILITY	UNIT	QUANTITY	USAF DWNG
	Water, plant, file & treat	GPD	172,000	
	Water pumping station	EA	1	
	Water storage	GA	100,000	
	Water well (280 GPM minimum)	EA	1	
j.	Real Estate Facilities			
	Land Easement	AC		
	Land, owned Govt.	AC		
k.	Medical Facilities			
	Infirmary, base (6 bed)	SF	4,440	32-24-18
l.	Storage Facilities			
	Storage, cold	SF	1,588	33-04-06
	Storage, inflam., htld gas	SF	250	
	Storage, paint and dope	SF	238	33-17-07
	Storage, open, AIO	SY	4,000	~~xxxxxxx~~
	Storage, open, bulk supply	SY	2,000	
	Storage, open, motor pool	SY	4,000	
	Storage, expl and ATO igloo	SF	6,440	33-15-11
	Storage, ready rocket	SF	10,702	33-39-01
	Storage, seg., mag.	SF	540	33-13-08
	Supply and issue, organ.	SF	2,050	33-01-09
	Warehouse, base AIO	SF	2,048	33-09-07
	Warehouse, base bulk supply	SF	40,000	33-02-22
	Open salvage yard	SY	1,000	
	Shed storage, salvage	SF	750	
m.	Personnel Facilities			
	Chapel, base	SF	150	38-01-14
	Rec. fac., multi-purpose	SF	7,000	31-06-05
	Club, NCO	SF	4,000	
	PX sales store	SF	4,992	36-06-28
n.	Administration Facilities			
	Rkt Storage Check-Out and Assem.	SF	10,432	
	Administration, AIO	SF	1,000	
	Commissary, clothing sales	SF	2,000	
	Fence, perimeter	FT	22,500	
	Fence, security	FT	12,300	
	Security, gate house	SF	1[illegible]0	27-05-04

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1169

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FACILITY	UNIT	QUANTITY	USAF DWNG
Security, guard house and hq			
Air Police	SF	740	
Hq group air base	SF	6,600	
o. Shop Facilities			
AIO shop, base	SF	2,000	
Auto maintenance shop, base	SF	6,516	35-02-14
Dinghy shop (where needed)	SF	860	36-33-04
Parachute shop, base	SF	6,022	36-33-04
Photo recon. shop, base	SF	1,000	

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109

SECTION III - TAB B

STANDARD WARTIME PLANNING FACTORS FOR THE F-89D

	1st Day	2d Thru 6th	7th Thru 30th
1. Sorties Flown (per A/C in inventory)	3	1 (per day)	1 (per day)
2. Percent of sorties flown expending total ammunition load	80%	25%	10%
3. Percent of sorties flown expending two external fuel tanks	0%	0%	0%
4. AVG. hrs per sortie	2.0 hrs	2.0 Hrs	2.0 Hrs
5. AVG. fuel exp. per hr.	850 gals	850 gals	850 gals

118

SECTION III - TAB C

F-89D OPERATIONAL PLAN

1. The following specialized equipment is required for processing GAR-1's and 2.75" rockets:

GAR-1 Special Equipment

Ready Bench	2 ea.
Check-out Consoles	2 ea.
Battery Charger	2 ea.
Special Storage Rack (spares)	2 ea.
Hydraulic Maintenance Cart	1 ea.
Nitrogen Compressor	1 ea.
Igniter Inserters	2 ea.
Storage Cabinets (Test Equip)	2 ea.
Maintenance Bench (Test Equip)	1 ea.
Special Test Equipment	1 set
Fork Lifts	3 ea.
Pallets (60 for dead storage)	120 ea.

2.75" FFAR Special Equipment

Bench Assembly	1 ea.
Bench Test	1 ea.
Test Cell-Rocket	1 ea.
Racks-Rocket	32 ea.

1132

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SECTION IV - PERSONNEL

13. Squadron Organization. The F-89D is designed as an all -weather fighter-interceptor and will be part of the unit equipment of a fighter-interceptor squadron. These squadrons will be assigned to an Air Defense Group, Defense Wing or Air Division as applicable and will be deployed in units of 25 aircraft. Units will be comprised of the following sections: personnel and administration, operations, maintenance (to include aircraft, armament, and communications and electronics), and supply. The only major change required in the present all-weather fighter-interceptor squadron structure is the addition of an armament section capable of supporting GAR-1 (Falcon) operations when such equipment is authorized.

14. Personnel Capabilities. This unit will be capable of:

a. Performing a continuous air defense alert mission.

b. Performing organizational maintenance on authorized aircraft, electrical, motorized, and fire control equipment.

c. Performing check out, assembly, loading and storage of GAR-1 rockets assigned to this squadron.

52

131

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ADGOR-G

SUBJECT: (UNCL) Qualitative Operational Requirement   2 JUL 1955

TO: Director of Requirements
Headquarters, USAF
Washington, D. C.

1. The following Qualitative Operational Requirement is submitted in accordance with Air Force Regulation 57-3, Subject: Qualitative Operational Requirements dated 28 May 1951.

2. Introduction:

a. The present fire control systems in the F-94C and F-89D will not permit effective utilization of these aircraft at low altitudes, against targets using electronic countermeasures or evasive maneuvers. These aircraft could operate effectively at low altitudes, against electronic countermeasures, and targets employing evasive action if restrictions were not imposed by the fire control systems. The installation of a computing optical sight (NAFFARs) in the F-86D has been approved. (Message AFDRQ-AD/F 52570 dated April 1955). This requirement is being submitted in consonance with the above message which states, "Development status of infrared optical sight combination prohibits consideration for retrofit into current interceptors at this time." Request F-86D, F-89D and F-94C aircraft be considered for retrofit with an infrared optical sight combination when the progress of development permits.

b. Reference our letters ADGPR, Subject: (UNCL) Electronic Configuration of the F-94C dated 30 August 1954, and Subject: (UNCL) Electronic Configuration of the F-89D/H, dated 12 August 1954, of which your headquarters received information copies.

3. Objective: To provide a visual sighting system which is independent of the fire control system that can be used effectively both day and night at low altitudes and in the event the present fire control system becomes inoperative. The sight would be especially effective at night against blacked out targets if an infrared capability were provided.

Will be Confirmed in 3rd Publication Form Under Par 3c, ADCM
No

Prepared by Capt Mitchell/hb
Telephone 2727-2739
Date 16-20-29 June 1955
Refers to Pastold No

This correspondence is classified ____________ in accordance with Par 23b, AFR 205-1, 15 Dec 51, or for the reason (s) stated

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COMDR
VC
C of S
CG AAA
COMNAVFORCOMAD
CAF
SAGE
Asst Prog
Flt Sfty
COMD ADJ
Adm
Rcds Mgt
Class
Hist
Pub
COMD SURG
COMD STF JA
COMD CHAP
COMD IG
Insp Svs
Ptz
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Bud
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Mgt Anlys
Stat
DCS/P
Civ Pers
Mil Pers
Assmts
Spec Act
Bas Adm
Cofs & Rcds
GS
Pers Sr
PR & T
RAF
DCS/I
OI
R & E
IE
DCS/O
CCA
C & E
M & O
OCD
Ops Anlys
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Wea D
DCS/M
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Elect
Gn Sup & Svs
Instl
Log Plans
HQ SQ SEC
PCBA
CAA

Will be Confined in
Ind Publication Fuse
Under Par 3a, ADCM

[illegible] ______
Prepared by ______
Telephone ______
Date ______
Return to Portfolio No. ______

53

Ltr, Subj: (UNCLD) Qualitative Operational Requirement (Contd)

4. Description:

a. Nomenclature: Sight, optical, computing.

b. Purpose:

(1) To provide an effective sighting system in the event of radar fire control system failure.

(2) Low altitude capability where ground clutter renders the automatic tracking radar inoperative.

(3) To provide an effective sighting system against enemy use of ECM and evasive tactics.

(4) Recommend priority 1-A be assigned in accordance with paragraph 4a (1). AFR 80-11, dated 23 March 1951, Subject: Priority for Research Development and Operational Test Projects.

c. Performance: To provide a kill capability at low altitudes, against ECM, and in the event of radar system malfunction.

d. Design Features: Lightweight optical sighting system capable of computing lead etc., in a curve of pursuit type pass firing 2.75" FFARs.

e. Special Features: Optical sighting system that provides infrared detection and angle tracking information to the pilot.

f. Proposed Basis of Issue: Recommend installation in all F-89D and F-94C aircraft equipped with radar computing fire control systems. Two additional systems be issued each fighter interceptor squadron and six additional for each weapons employment center for use as mock-up and spares.

g. Method of Meeting Requirement: Investigate existing systems for their adaptability to the F-94C and F-89D.

FOR THE COMMANDER:

RECTOR C. DACUS
Captain, [illegible]
Asst [illegible] Adj

This correspondence is classified ______ in accordance with
Par ______, AFR 205-1, 15 Dec 53, or for the reason (s) stated.

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[illegible]FDRC-AD/F [illegible] 578. THIS MESSAGE IN TWO [illegible]
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AIRCRAFT.

ADC Hq-O-AG-Form 23
9 April 53

M-14

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SECRET

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
DIRECTORATE OF REQUIREMENTS

391

SKGOR NO. 63-9 (AD-1a-1-52)

DATE 7 June 1955

AMENDMENT TO A
SKELETON GENERAL OPERATIONAL REQUIREMENT

SKGOR No. 63 (AD-1a-1-52), dated 18 November 1954, subject: (U) "Piloted Interceptor Weapon System" is changed as follows:

* * *

IV. Operational Performance:

* * *

E. The F-89H will be equipped at the earliest possible date, with an infrared detecting standby sight having the following characteristics and performance:

(1) Extremely light weight with very high reliability.

(2) Windscreen presentation.

(3) Ninety per cent cumulative probability of detection of a B-47 type target at a range of at least ten (10) nautical miles. A twenty (20) nautical mile range is highly desirable.

(4) Capable of tracking and blind firing of infrared missiles at night in clear air masses with range information furnished by GCI.

(5) Visual lead pursuit firing mode.

* * &

Raymond [illegible] Maj USAF
for GABE P. HAWKINS
Colonel, U. S. Air Force
Chief, Program Control Division
Ass't for Development Programming
Office, DCS/Development

George E. Price
GEORGE E. PRICE
Major General, USAF
Director of Requirements

1137

COPY 140

19 Jan 1955

ADMAC-6A

SUBJECT: Angle of Attack Computer E-4 Fire Control Systems

TO: Commander
Eastern Air Defense Force
Stewart Air Force Base
Newburgh, New York

Identical letter sent to
CADF, WADF, and Yuma

1. The following information relative to the Angle of Attack Computer, E-4 Fire Control System F-86D aircraft has been received from the Armament Laboratory, Wright Air Development Center and is forwarded for your information and possible use:

a. Limits of Operation.
The limits of operation designed into the Angle of
Attack Computer were selected to encompass the combat
region of the F-86D airplane. The lower MACH limit,
.78M, was selected because it was felt that under no
conditions should combat attacks be made at lower
speeds. To select a wider MACH range would have entailed
a loss of accuracy of computation in the combat region. No
action is contemplated to extend this range of operation.
Below MACH .78, elevation aim error increases with decreasing
MACH and increasing altitude. For example: At .65 MACH,
20,000 feet, the rocket centroid will pass about 22 feet below
the target, on the average. With the computer "F" setting at
400 yards, sometimes used at Yuma instead of the production 500
yards, this error reduces to 17 feet. Super imposed on a 14
foot RMS rocket dispersion, and a normal pass-to-pass aim scatter
of 25 feet RMS, this 17 foot angle of attack error results in
about a 10-15 percent reduction in hit probability.

b. Use of External Fuel Tanks.
There is no measurable change in aerodynamic functions due
to adding external fuel tanks. There is, however, no
compensation made in the computer weight circuits for
external fuel.

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External fuel is used first, and tanks would be empty at 21,000 feet in a maximum power climb or 23,000 feet in a military power climb. Retained empty tanks cause less than 1.5 percent error in angle computation which is negligible. No action is contemplated to incorporate provisions for firing with external fuel aboard.

c. Effects of Pull-Out on the Computer.
Modification of the aft sections such as in Project Pull-Out should not effect the angle of zero lift of the airplane. A very small change in zero lift might be expected due to re-rigging of flaps and ailerons. This change is less than 0.15 degrees. However, following airframe modification during project pull-out, the contractor redetermines angle of zero lift by flight test. The high percentage of airplanes requiring a change in setting has justified this action. Consequently, it is recommended that this procedure also be followed by SMAMA.

d. Change in Zero Lift Due to Hard Landings.
It is possible that extremely hard landings or abnormal wingloadings could cause enough structural deformation to change the angle of zero lift. T.O. No. 1F-86D-2KA outlines the procedure for rechecking the zero lift angle if skin wrinkles, etc., indicate the likelihood of overloading.

e. Periodic Checks of Zero Lift Angle.
There is no current requirement for periodic checks of zero lift angle. However, a recheck should be made in accordance with T.O. No. 1F-86D-2KA in the event of loadings in excess of limit load or a major structural component change.

BY ORDER OF THE COMMANDER:

JOHN J. HAYES
CWO, USAF
Asst Command Adj

1139

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CONFIDENTIAL

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HEADQUARTERS
4750TH AIR DEFENSE WING (WEAPONS)
YUMA COUNTY AIRPORT
Yuma, Arizona

7 MAR 1955

DE-DO

SUBJECT: North American Folding Fin Aerial Rocket Sight (NAFFARS)

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. This headquarters has received a copy of the Air Force's Evaluation Team Report on the North American Folding Fin Aerial Rocket Sight (NAFFARS) (Confidential), dated 17 December 1954. Distribution to your headquarters was directed Attn: DCS/Requirements and DCS/Operations.

2. A study of subject report indicates the NAFFARS Fire Control System may be the equipment whereby the tactical effectiveness of interceptors of the Air Defense Command can be greatly increased. At the present time, the all-too-common failure of the lead collision course fire control system dictates an unsuccessful mission. The NAFFARS system, under visual weather conditions, would allow a portion of the aborted sorties to become successful "target destroyed" missions.

3. It is realized a certain amount of difficulty has been encountered in converting interceptor pilots from day fighter tactics thinking to the all-weather lead collision course concept. The NAFFARS system of firing rockets would in no way eliminate the necessity of the lead collision course fire control system but merely serve to provide an additional attack capability in case of primary fire control system failure.

4. This headquarters feels that any system of attack that will provide the Air Defense Command with additional combat capability should not be overlooked and that further study should be conducted towards determining the increased amount of tactical effectiveness the NAFFARS system could provide the F-86D. This headquarters desires

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Will be Confirmed in Std Publication Form Under par 1a, ADCGM 5-1 No

B/L 4750th ADW(W), DM-DO, Subject: North American Folding Fin Aerial Rocket Sight (NAFFARS)

ADCOE-G (7 Mar 55) 1st Ind 6 APR 1955

HEADQUARTERS AIR DEFENSE COMMAND, Ent AFB, Colorado Springs, Colorado

TO: Commander, 4750th Air Defense Wing (Weapons) Yuma County Airport, Yuma, Arizona

1. Projects requested of this headquarters should be accompanied by more specific information than was supplied in basic letter. Approval of this project will be held in abeyance pending arrival of the following information.

a. Project objectives.

b. Proposed rough test outline.

c. Estimated time required to complete the project.

d. Equipment not currently possessed needed to conduct the project.

2. On projects directly assigned by this headquarters, in contra-distinction to those requested, a proposed test outline should be submitted within thirty days of receipt of assignment.

BY ORDER OF THE COMMANDER:

C. F. HUMPHREYS
Major, USAF
Asst Command Adj

M/R: Not necessary

COMEBACK COPY

_____ Not requested, not furnished
Furnished 6 APR 1955 [illegible]
(Date) (Initials)

E-1345

Prepared by Mr. Carvill/gji RWC
Telephone 2727
5 Apr 55

CONFIDENTIAL

ADC HQ Form 11
5 Feb 54 Revised

This correspondence is classified _____ in accordance with Par _____, AFR 205-1, 24 Jul 53, or for the reason (s) stated: _____
SIGNATURE

1202

B/I, 4750th ADW (Wpns), DW-DO, Subject: North American Folding Fin Aerial Rocket Sight (NAFFARS)

DW-DO (7 Mar 55) 2nd Ind

HQ 4750TH AIR DEFENSE WING (WEAPONS), YUMA COUNTY AIRPORT, Yuma, Arizona

TO: Commander, Air Defense Command, Ent AFB, Colorado Springs, Colorado

In accordance with paragraph 1 of the 1st Indorsement, the following is submitted:

1. <u>Project Objectives</u>:

a. To determine the adaptability and feasibility of the NAFFARS Stand-By Fire Control System in F-94C, F-89D and F-86D interceptors.

b. To establish NAFFARS harmonization procedures for all types of interceptors presently employed in the Air Defense Command system.

c. To determine a sound tactical application by the pilot of the NAFFARS Stand-By Fire Control System in the event of an interceptor's fire control system equipment failure in flight.

d. Establish GCI interceptor positioning procedures necessary to insure the successful completion of the attack using the NAFFARS Stand-By Fire Control System.

2. <u>Proposed Test Outline</u>:

a. Ground Phase.

(1) Install a NAFFARS Stand-By Fire Control System in two F-86D-40 project aircraft.

(2) Study and install, if found feasible, the NAFFARS Stand-By Fire Control System in one project F-94C and one F-89D project aircraft.

(3) Harmonize the NAFFARS Stand-By Fire Control System and the wing tip cameras on the project aircraft to be used in the air phase tests.

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b. Aerial Phase.

(1) Aerial Phase I. Non-firing phase for the specific purpose of developing and establishing tactics and techniques in conjunction with GCI. A minimum of twenty missions by each type interceptor at various altitudes using a T-33 aircraft as target. Approximately twenty hours target range time required.

(2) Aerial Phase II. Firing phase to establish the effectiveness of each type interceptor using the NAFFARS Stand-By Fire Control System and a criteria necessary for the indoctrination of pilots in the use of the system. During this phase, a minimum of twenty firing missions per each type interceptor against a 9 x 45 banner target. Missions to be conducted at 20,000 and 30,000 feet altitudes. Approximately twenty hours target range time is required. Wing tip cameras for mission evaluation will be used on all firing missions.

3. Estimated Time Required to Complete Project: Approximately 120 days would be required to conduct the Ground and Aerial Phases of paragraph 2, above.

4. Equipment Not Currently Possessed Needed to Conduct Project:

a. Three NAFFARS Stand-By Fire Control Systems required to conduct this project. Presently, no NAFFARS Stand-By Fire Control Systems are installed in the -60 F-86D's possessed by the 4750th Air Defense Group (Weapons).

b. A sight reticle camera for each NAFFARS system installation to record reticle motion.

FOR THE COMMANDER:

WILLIAM G. SMITH
Major, USAF
Adjutant

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BL: 4750th ADW (Wpns) DW-DO, Subj: North American Folding Fin Aerial Rocket Sight (NAFFARS)

ADOOT-C (7 Mar 55) 3rd Ind

HEADQUARTERS AIR DEFENSE COMMAND, Ent AFB, Colorado Springs, Colorado

TO: Commander, 4750th Air Defense Wing (Weapons), Yuma County Airport
Yuma, Arizona

Because USAF has approved the NAFFARS for the F86D interceptor, it will not be necessary to test this installation. To date, this sight has not been adapted to the F94C or F89D, nor has a requirement for this adaptation been submitted. Therefore, this headquarters will forward a Qualitative Operational Requirement to headquarters USAF, requesting approval of installation of this system in F94C and F89D aircraft. Pending approval of this requirement, and availability of the necessary equipment, action on your request for the subject project is held in abeyance.

BY ORDER OF THE COMMANDER:

Will be Confirmed in Std Publication Form Under par 3a, ADR

Prepared by Mr. Sorvill

Date

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ADC Hq Form 11
5 Feb 54 Revised

This correspondence is classified ______ in accordance with Par ______, AFR 205-1, 24 Jul 53, or for the reason (s) stated. ______
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6 Jun 55

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- Instl
- Log Plans
- Hq Sq Sec
- FCDA
- CAA

Will be Confirmed in Std Publication Form Under par 3a, ADCSM

5-3 No.

Prepared by Capt Gray

Telephone 2816/2615/nkf

Date 1 Jun 55

ADMFS

SUBJECT: (Unclassified) Ejection Seat and Canopy Problems

TO: Commander
Eastern Air Defense Force
Stewart Air Force Base
ATTN: Assistant for Flight Safety
Newburgh, New York

1. Transmitted herewith is Office of The Inspector General, USAF, Publication No. 3-55 entitled, "Ejection Seat and Canopy Problems, Period 1 July 1953 through 30 June 1954.

2. During the period covered by this report, ejection seats were used on 177 occasions during emergencies in the air. Forty-one individuals, representing 23 per cent of all those who attempted to eject, received fatal injuries. It is concluded that some of these fatalities were the result of delay in ejecting occasioned by canopy or ejection difficulties.

3. During the same period, there were 31 known instances wherein escape system failure prevented abandonment of the aircraft. This resulted in fatal injury to the occupant in 50 per cent of the cases.

4. In 79 additional fatal cases emergencies arose at sufficient altitude for ejection, but the crewmembers did not escape. It is probable that a significant number of these individuals could not abandon the aircraft because of failures of the escape system.

5. During the same period, there were 1,430 Unsatisfactory Reports submitted on aircraft canopies and ejection seat systems. This represents an increase of approximately 500 per cent over the previous two and one-half year annual average of Unsatisfactory Reports.

6. The attached study indicates the necessity for improvements in design, expeditious corrective action of known deficiencies, better maintenance and more thorough indoctrination of crewmembers in emergency escape procedures.

BY ORDER OF THE COMMANDER:

JOHN F. SHARP
Colonel, USAF
Assistant for Flight Safety

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Pub 3-55, Cy 131 (Conf)

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HEADQUARTERS
26TH AIR DIVISION (DEFENSE)
Roslyn Air Force Station
Roslyn, New York

FILE NUMBER 315

26ADIDO

2 9 DEC 1954

SUBJECT: Survey of F-86D Operating Procedures

TO: Commander
Eastern Air Defense Force
Stewart Air Force Base
Newburgh, New York

1. As a result of major accidents involving fire in flight, and subsequent fatal low-altitude ejection, a study was made to determine appropriate action to be taken in such critical situations. The board which prepared this study conducted research at the Directorate of Flight Safety Research, Norton Air Force Base, California, and at the North American Aviation Company, Los Angeles, California. The study is attached as Enclosure 1.

2. In formulating its recommendations, the board attempted to establish new procedures for combating emergencies involving fire at low altitude which would provide the greatest safety to the individual and which could be adopted as standard procedures. Inasmuch as many F-86D pilots are of limited experience and their capability to handle a critical emergency is low, the adoption of standard procedures to be followed upon experiencing inflight fire at low altitude is most desirable.

3. The procedures recommended by the board are concurred in with one exception. Upon reaching an altitude at which successful ejection is feasible, the pilot should attempt to analyze his difficulty and determine the most appropriate course of action consistent with his capabilities.

4. The procedures outlined herein are to be adopted by all F-86D units of this command and are recommended for inclusion in the ADC Standardization Program and appropriate revision of TO 1F-86D-1.

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26ADDDO, Subject: Survey of F-86D Operating Procedures

5. When enclosure is withdrawn or not attached, the classification of Confidential on this letter will be canceled in accordance with Paragraph 25 g, AFR 205-1.

1 Encl
Survey of Existing
Operating Procedures

J. W. McCAULEY
Brigadier General, USAF
Commander

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26th Air Div (Def), 26ADDDO Subject: Survey of F-86D Operating Procedures

EAOOT-TW (29 Dec 54) 1st Ind

23 FEB 1955

HQ EASTERN AIR DEFENSE FORCE, Stewart Air Force Base, Newburgh, New York

TO: Commander, Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado

1. Enclosed is a study conducted by a board of officers, 26th Air Division (Defense), concerning F-86D operating procedures. It is recommended that the procedures outlined in the recommendations, as amended below, be incorporated in the ADC Standardization Program and/or made a revision of T.O. 1F-86D-1.

2. Reference enclosure, Survey of Existing Operating Procedures, the following comments are submitted for consideration:

a. Paragraph 24a, concur with paragraph 3 of cover letter, Headquarters 26th Air Division (Defense), 29 December 1954. In addition, depending on surrounding terrain features and intensity of fire, the procedures as outlined in T.O. 1F-86D-1, "Engine failure during take-off leaving ground" should be followed subsequent to closing throttle.

b. Paragraph 24b, your attention is invited to letter this headquarters, APL 3-55, 10 January 1955, recommending that more seat ejection trainers be made available.

c. Paragraph 24c, this procedure should be clarified to indicate that the safety belt not be unfastened if the pilot is being thrown around or negative Gs are experienced.

d. Paragraph 24e, modification of the fire warning system is being accomplished at "Project Pull-Out". By April 1955 this command will have the remaining unmodified aircraft into "Project Pull-Out".

3. It is requested favorable consideration be given to the recommendations submitted. This headquarters is not contemplating any action pending receipt of your considerations and/or actions.

4. This Indorsement is classified Confidential in accordance with paragraph 24a(8), AFR 205-1.

FOR THE COMMANDER:

James R. Worline

JAMES R. WORLINE
Captain, USAF
Asst Adjutant

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Comdr, 26th Air Div

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26th Air Div (Def), 26ADDDO Subject: Survey of F-86D Operating Procedures

EAOOT-TW (29 Dec 54) 1st Ind 23 FEB 1955

HQ EASTERN AIR DEFENSE FORCE, Stewart Air Force Base, Newburgh, New York

TO: Commander, Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado

1. Enclosed is a study conducted by a board of officers, 26th Air Division (Defense), concerning F-86D operating procedures. It is recommended that the procedures outlined in the recommendations, as amended below, be incorporated in the ADC Standardization Program and/or made a revision of T.O. 1F-86D-1.

2. Reference enclosure, Survey of Existing Operating Procedures, the following comments are submitted for consideration:

a. Paragraph 24a, concur with paragraph 3 of cover letter, Headquarters 26th Air Division (Defense), 29 December 1954. In addition, depending on surrounding terrain features and intensity of fire, the procedures as outlined in T.O. 1F-86D-1, "Engine failure during take-off leaving ground" should be followed subsequent to closing throttle.

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d. Paragraph 24e, modification of the fire warning system is being accomplished at "Project Pull-Out". By April 1955 this command will have the remaining unmodified aircraft into "Project Pull-Out".

3. It is requested favorable consideration be given to the recommendations submitted. This headquarters is not contemplating any action pending receipt of your considerations and/or actions.

4. This Indorsement is classified Confidential in accordance with paragraph 24a(8), AFR 205-1.

FOR THE COMMANDER:

James R. Worline

JAMES R. WORLINE
Captain, USAF
Asst Adjutant

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Comdr, 26th Air Div

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Basic, 26th Air Division (Defense) (26ADDDO) Roslyn AF Station-N.Y. 29 Dec 54 to Eastern Air Defense Force, Subject: "Survey of F-86D Operating Procedures"

WCSOH 3rd Ind

HQ WRIGHT AIR DEVELOPMENT CENTER, Wright-Patterson Air Force Base, Ohio
11 May 1955 AIRMAIL

TO: Commander, Air Defense Command, Ent AF Base, Colorado Springs, Colorado

1. A thorough investigation of the previous correspondence and the attached survey has been accomplished by this Center.

2. The survey is generally concurred in and the following action has been taken:

a. F-86D - This Flight Handbook was revised, as of 15 February 1955, to contain basically the same information requested in the survey as well as the modification recommended in paragraph 1a of the 2nd Indorsement.

b. F-94C - This Flight Handbook was revised, by means of a Safety of Flight Supplement T.O. 1F-94C-1CJ, dated 15 April 1955, to include the context of the attached survey. A copy of this supplement is attached for your information. Minor changes were made to the recommended procedure inasmuch as the F-94C was not as critical in this respect as is the F-86D.

3. No action will be taken to revise the F-89D Flight Handbook to include the procedure recommended in the survey because this airplane is considerably different than the F-86D or the F-94C. The two engines and the engine fire extinguishing system alone make the F-89D singular in this respect. However, when coupled with the fact that the greater majority of the fire warning light indications have been false, it can readily be seen that the recommended procedure is not applicable. This Center is of the opinion that the procedure contained in the current F-89D Flight Handbook is the best available for this airplane.

4. Action has been taken to revise the F-84 Series Flight Handbooks similar to that recommended. Action will be taken to revise the F-80, T-33, and F-94 Series Flight Handbooks in a similar fashion.

FOR THE COMMANDER:

A. R. Maleske

A. R. MALESKE
Ass't Chief, Flight Operating Instructions Branch
Operations Office
Directorate of Weapon Systems Operations

2 Incls:
Added 1 Incl
2. T.O. 1F-94C-1CJ
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HEADQUARTERS
26TH AIR DIVISION (DEFENSE)
Roslyn Air Force Station
Roslyn, New York

9 December 1954

STUDY BY: Operating Procedures Survey Board

SUBJECT: Survey of Existing Operating Procedures

PURPOSE:

1. To review present operating procedures for adequacy and consistency, and to develop adequate procedures for the following types of situations:

a. Fire warning light illumination.

b. Low-speed, low-altitude ejections from the F-86D.

ESSENTIAL ELEMENTS OF INFORMATION:

2. The following data has been taken from the records of 263 accidents which includes all F-86D major accidents up to 27 November 1954:

a. Fire, fire warning, and/or explosion - 67.

(1) 19 of the 67 accidents occurred immediately after take-off.

(2) 14 of the 67 accidents were a result of false fire warning indications.

b. Crash landings due to fire warning, and/or explosion - 38, of which 3 were fatal.

3. The following statistics on 202 major accidents occurred during the period from 2 June 1950 to 1 July 1954:

a. Materiel failure - 90. (Of which 50 were due to engine malfunctions)

b. Poor technique in landing pattern - 32.

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c. Accidents involving deficiencies already known to exist - 80.

4. Assumptions:

a. The period from take-off until the aircraft has reached a point at least 2,000 feet above the terrain is highly critical.

b. The present F-86D Flight Handbook is considered adequate except for forward fire warning emergencies occurring within the critical period mentioned in "a" above.

DISCUSSION:

5. Of the 263 F-86D major accidents, 25.5% (67) were caused by fire, explosion, and/or illumination of the fire warning circuit. This figure compares unfavorably with all other jet fighter aircraft which have an 8% incidence of this type. Analysis of all accidents of this type shows that 28.4% (19) occur during the critical period after take-off. Also, this analysis shows that 21% (14) of these accidents are brought about by false indications of the fire warning circuit. False indications mentioned herein are only those that have been the direct cause of major accidents. False indications that have not led to major accidents are not shown in this report.

6. A study of ejections initiated at specific altitudes, which resulted in fatal injuries, shows: (Tab A)

a. That 75% of all attempts below 1,000 feet are fatal.

b. That 26% of all attempts between 1,000 and 1,999 feet are fatal.

c. That 20% of all attempts between 2,000 and 2,999 feet are fatal.

7. The present procedure outlined in the F-86D Flight Handbook calls for the throttle to be moved to the "Closed" position immediately upon illumination of the forward fire warning light. If this procedure is followed during the critical period after take-off, the light must go out; and the pilot must have a suitable place to crash land, or he has, in effect, committed suicide. Three incidents of this nature have happened to pilots within this Air Division. In two of those incidents, which have resulted in fatalities, the pilots have followed the procedures outlined in the Flight Handbook.

8. Of the emergencies caused by fire, 38 resulted in attempted force landings. In 32 of these cases, the pilots have received minor or no injuries. Three received major injuries, and three were fatal. Records do not show in how many of these cases the warning lights

remained illuminated after the decision was made [illegible] the aircraft. Although these figures reflect a high [illegible], it must be remembered that a great number of these [illegible] made on airfields. Seventy-two and two tenths (72.2%) percent of all fatalities in the F-86D were attributed to crashes. These include all cases where the pilot was in the aircraft when it made contact with the ground, whether or not controlled. Of the remaining 27.8% of fatalities, there were 2 cases of inflight explosion, 5 cases of bailing out at too low an altitude, and 2 cases where the pilots failed to pull the rip cord until he was too low.

9. Up to 1 July 1954, 46% of all F-86D major accidents resulted from materiel failure. This compares with a 26% incidence of this type for all types of jet fighter aircraft.

"During the period between recognition and correction of a deficiency, additional F-86D major accidents occurred involving the same deficiencies. Approximately 41% of F-86D major aircraft accidents involved these recurrent deficiencies."

10. Over half of the 90 materiel failure accidents were caused by engine failure. Turbine rotor failure leads all of these, with undetermined causes running a close second.

11. Poor pilot technique, in landing pattern and on the ground, has been the direct cause of 44 major accidents. This figure covers the majority of all personnel error accidents with the following cause factors:

a.	Misjudged distance	- 10.
b.	Stalled	- 7.
c.	Failure to flare out	- 7.
d.	Improper use of brakes	7.
e.	Other	- 13.
	Total	- 44

12. There have been 12,718 unsatisfactory reports submitted on the F-86D as of 1 August 1954. During the calendar year 1953, electrical accessories, relays, micro-switches, voltage regulators, electrical wiring, fuel shut-off valves, and stopcocks were the primary sources of difficulty reported. During the period 1 January 1954 through 1 July 1954, 6,582 unsatisfactory reports were submitted. The majority of these sighted recurrences of previously reported deficiencies. Eighteen of these were on the fire warning system.

13. The fire warning system has been improved on a later model aircraft, and is being modified on all aircraft during Project "Pull Out". There are no plans to modify aircraft in the field prior to entry in Project "Pull Out"; however, kits are available upon request.

14. Discussion with engineers and engineering test pilots at North American Aviation Company revealed that, if on fire, the aircraft would not be more likely to explode if power was left on for a short time during this critical period after take-off. Also, all of the pilots were of the opinion that moving the throttle to the "Closed" position during this critical period was not the best procedure. However, there is a possibility that if the power is left on in an attempt to gain safe altitude for ejection, the fire may become intensified.

15. A study of the low-altitude emergencies caused by fire indicates that pilots seem to be moving the throttle to the "Closed" position from pure instinct rather than from an evaluation of the existing emergency. It seems that the decision is not based on whether a safe ejection or crash landing can be made.

16. As a possible solution to the correct procedure for low-altitude fire, the following alternates were considered:

a. Immediate force landings. This does not allow sufficient time to select a suitable landing area, if available, and closing the throttle does not insure that the fire will be extinguished.

b. Continued flight at reduced power. This would probably not stop fire, and it would increase the time necessary to arrive at a safe ejection altitude.

c. Continue at full power and maximum rate of climb. This may increase the intensity of the fire, but would allow the pilot to gain sufficient altitude for ejection in the shortest possible time.

17. During the period 1 January 1949 through 31 December 1953, there has been 347 emergency bail outs utilizing the ejection seat system. Twenty-three and three tenths percent (23.3%) (81) of these ejections resulted in fatal injuries. Of the 81 men receiving fatal injuries during seat ejection, 42 contacted the ground still strapped to their seats. It has been found that pilots who unfasten their safety belt prior to ejection experience less tumbling, have no difficulty separating from the seat, and have a better chance of deploying their parachutes in time.

18. The time consumed by the seat ejection process from the movement of decision to escapt until the parachute is fully opened averages 10 seconds, provided there is no difficulty. The time of free fall to ground from 1,000 feet for a 300-pound man-seat group ejected from straight and level attitude is approximately 11.5 to 12.95 seconds. (Tab C) Data comparing training relative to injury shows lectures alone to be of very little value, whereas tower rides plus lectures show the highest percentage of successful bail outs versus fatalities. The most important factor affecting the fatality rate from intentional ejection is the inability to separate from the seat and properly deploy the chute at altitudes of less than 3,000 feet. The second most important factor is attempted escapes from high-speed dives and uncontrolled flight at altitudes less than 5,000 feet. (Tab B)

"Ejection through the canopy is hazardous, but desirable as an emergency life-saving measure for extremely low-altitude ejections or when the canopy ejection system fails."

SUMMARY:

19. The F-86D aircraft is peculiar to other types to Jet aircraft in that an extremely high percentage of fires occur during normal operations. A large portion of these fires occur during the critical period after take-off. This brings about a need for a more specific and detailed procedure than that normally required.

20. The fire warning system in the F-86D has been faulty in some cases. This deficiency has been corrected in late model aircraft, and is included as part of Project "Pull Out". The kits have not been sent to the field for modification of the aircraft in which this deficiency still exists.

21. During low-altitude emergencies, there have been ejections at extremely low altitudes. These ejections were fatal because the pilot did not realize the altitude required for a safe ejection, or was unable to reach a safe ejection altitude due to an improper emergency procedure. In a majority of these cases, the pilot was found in his seat, or did not have time to deploy the chute after separation from the seat.

22. The F-86D aircraft has an extremely high percentage of materiel failures in comparision with other types of jet aircraft. This is brought about by continued operation of the aircraft after a deficiency is recognized, but not yet corrected.

23. Accidents resulting from personnel error are the second largest cause factor. Poor technique in the landing pattern accounts for the majority of all accidents in this category.

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ACTION RECOMMENDED:

24. It is recommended that:

a. The following procedure be established as standard for this Division, and that it be forwarded as a recommended revision to the F-86D Flight Handbook:

Forward Fire Warning light immediately after take-off.

(1) Continue at maximum power.

(2) Assume maximum rate of climb.

(3) Unfasten safety belt and prepare to eject.

(4) Abandon aircraft upon reaching minimum safe ejection altitude. (Caution: 75% of all ejections below 1,000 feet result in fatal injuries.)

b. All aircrew members of jet aircraft be required to complete formal ejection seat training and be constantly subjected to refresher programs stressing altitude necessary to effect survivable abandonment of aircraft.

c. Procedure be established within this Command requiring safety belts be unfastened prior to ejection at any altitude.

d. Measures be taken to restrict more closely the operations of F-86D aircraft when known aircraft and/or engine deficiencies exist; and for which corrective action has not been completely tested and found adequate.

e. Modification kits for the original fire warning system be immediately procured for those aircraft not scheduled for Project "Pull Out" in the near future.

4 Encls
Bibliography
Tabs A, B, & C

HUBERT N. SKIDMORE
Captain, USAF
Chairman, Operating Procedure
Survey Board

JAMES O. [illegible], JR.
Captain, USAF
Board Member

M506-11X
54-co-42 80

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SECRET

FILE NUMBER 314

Hq 964th Field Maint Sq FMS Subject: Chaff Dispenser

ADMAC-3 (31 Dec 54) 5th Ind 17 JUN 1955

HQ AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colo.

TO: Commander, Air Materiel Command, Wright Patterson AFB, Ohio
Attn: MCMP

1. This proposal is submitted as a Class 1b modification in accordance with AFR 57-4. The requirement for dispensing highly reflective particles, such as chaff, during or shortly after aircrew emergency ejection is thoroughly justified in the basic letter and indorsements thereto. The design proposal, as submitted, for the F-94C and T-33 aircraft appear adequate for the job and well within the capability of any field maintenance activity to locally accomplish. Request this proposal be given your immediate attention and, if possible, this Command be authorized to perform this modification without delay.

2. Request that a suitable agency conduct an engineering study to provide engineering drawings of a similar device for installation in the F-86D and F-89 type aircraft. Request that the design be as simple as possible so that expeditious modifications can be accomplished by organizations in the field.

3. Reference paragraph 3, 2nd Indorsement. Concur with the recommendation as stated; however, request that action on the proposed modification not be withheld pending outcome of the recommended study. It is extremely urgent that a simple chaff dispensing device be installed and it is obvious that such a device attached to the ejection seat can be more readily obtained than a similar item attached to the parachute or harness.

4. This indorsement contains no classified information.

FOR THE COMMANDER:

[FI]LEBACK COPY

W. J. BIRMELE
LT COL., USAF
Asst Comd Adj

6 Incl
1 Cy W/D

Not [illegible], not [illegible] 17 JUN 1955
(Date) (Initials)

If the attached [illegible] for not [illegible] of [illegible]

Uncl

no

Maj H. L. Swaim/lkw
2115
16 Jun 55
F-09520-B

INCLS NOT REQUIRED FOR AG CLASSIFIED

SECRET

This correspondence is classified [illegible] in accordance with Par ______, AFR 205-1, 15 Dec 51, or for the reason [illegible] stated

SD

DISPOSITION FORM

SECURITY CLASSIFICATION (If any)

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FILE NO.	SUBJECT	
	Survival Equipment in ADC Aircraft	
TO O&T DCS/M (In Turn)	FROM ADHFS	DATE 28 Mar 55 COMMENT NO. 1 ~~Maj Mainolt~~/2816/nkf

1. The subject of the attached Archie Flash ~~was~~ is the difficulty involved in locating aircraft and crews lost over water. Dye marker in a soluable container attached to the aft section inspection panels of the F-86D, F-94C, F-89D and T-33 aircraft would greatly aid in the search for these lost aircraft. When these panels are in place there is ample room for the dye. It would be located aft of the turbine wheel so it can do no damage if it comes loose and it would be attached to the outer skin of the fuselage where the heat would not affect it.

2. Another problem is that of radar surveilance being able to pinpoint the geographical point where the pilot abandons the aircraft. Room is available under the seat of all four type aircraft, even after the seat bottoms for ejection, for a rather large package of chaff to be fastened. It should be attached to the bottom of the seat for normal seat operation but not securely enough that the force of ejection and the slipstream would not burst the package. To prevent the possibility of the package accidently breaking and scattering chaff all over the aircraft we might possibly find it necessary to fasten the chaff securely enough to withstand the "G" forces of ejection. A line could then be fastened to the floor and to the chaff container which would break the package as the seat ejects. The chaff would hang in the air long enough for radar to possibly pin-point the point of ejection.

3. We would like to implement this without the aid of ARDC or WADC. It will require only a little research on our part and we can get it into effect a lot sooner.

John F. Sharp
JOHN F. SHARP
Colonel, USAF
Assistant for Flight Safety

SECRET

DD FORM 1 FEB 50 96 REPLACES NME FORM 96, 1 OCT 48, WHICH MAY BE USED.

1220

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Comdr
VC
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Mgt Anlys
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Mil Pers
Amn Div
Off Div
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S&E
DCS/O
Asst Prog
CCA
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M&O
OCD
Ops Anlys
O&T
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HQ COMDT

FILE NUMBER 317.1

CONFIDENTIAL

COMDR AIR DEFENSE COMMAND
ENT AFB COLO SPRINGS COLO

AIRMAIL

X

COMDR WRAMA ROBINS AFB GA

COMEBACK COPY

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No. ... Furnished 9 JUL 1955
(Abbreviation) (Classification)

9 JUL 1955

(CONFIDENTIAL) ADMDM 3469. Personal Roth to Tibbetts. This msg in four parts. Part I. The average gross number of ADC Ftr intcps (F-86D, F-89D and F-94C) not combat ready because of the lack of E Series Fire Control Systems parts and components decreased during the first nine months of FY-55 from more than 200 to about 70. However, there is no indication of any further reduction; in fact, the number has increased slightly during the past weeks. The WRAMA representative at the Ftr Fire Control Equipment Management Group Meeting held on 14-16 Jun 55 stated that we could not expect any improvement in the supply support of Class 11B until Oct 55 and this is dependent on parts and components being made available after completion of projects "Pull Out" and "Hop Up" and on deliveries from procurement. WRAMA msg WRSMRB-6-212-E dtd 1 Jul also stated that considerable improvement is anticipated from the quantities presently tied up

Record Evaluation
Permanent
Temporary
Until
Will Be Confirmed in Std Publication Form Under par 3a, ADCSM 5-3 No
Prepared by M/Gen M.S.Roth/bld
Telephone 2242
Date 9 Jul 55

M/Gen M. S. Roth

CONFIDENTIAL 1 3

E-267
p1

C. F. HUMPHREYS
Major, USAF
Asst Command Adj

ADC HQ Form 11
Revised 15 A...
This correspondence is classified ... in accordance with Par ... AFR 205...

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(CONFIDENTIAL) ADMDM _________. (Contd)

in banks, pipelines and modification centers on projects "Pull Out" and "Hop Up". The WRAMA msg, however, gave dates into 1956 when the most frequently recurring Class 11B items would be available for limited base stockage. (See inclosure for details).

Part II. A check of the AOCP/ANFE Item Status Reports (RCS AMC S12 13 May through 24 Jun, revealed that more than ninety percent of the 94 Class 11B line items which caused not combat ready condition on our ftr intreps during this 7 week period were not available for base stockage. With the large number of Class 11B requirements which WRAMA will only supply (often with delay of some days or weeks) to replace an item defective or deficient on a specific ftr intrep after it has become ANFE, a considerable number of aircraft must accumulate as not combat ready during the re-supply period. Under present conditions with uninterrupted supply lines involving the use of a large amount of pilot pick up by acft of the consignee base, we have an average gross number of about 75 ftr intep not combat ready for Class 11B items.

We are gravely concerned at the extremely critical situation which could develop on the undeterminable day of attack with no base assets of many Class 11B items to support the immediate air battle and with present supply lines from distant and vulnerable supply points seriously disrupted.

Part III. Class 11B items have adversely affected the ADC combat force ever since the F-86D, F-89D and F-94C were introduced into our inventory. For example, the roll and pitch gyro (8300-221380, 8300-221382 and 8300-221383) has been critical for 82 consecutive

1222

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(CONFIDENTIAL) ANNEX __________ (Contd)

[illegible] and has had many "get well" dates, the latest being 1 Jun 56. In view of the vital importance of Class 11B parts and components in support of our mission acft, request that your headquarters confirm that all possible action is being taken to improve the support of our E Series Fire Control Systems, such as speed up of procurement, increase of repair facilities, reduction of repair turn round time, etc. We recommend that quantities anticipated as being available during the next few months from the banks and pipelines of projects "Pull Out" and "Hop Up" should be definitely confirmed. Further request that your headquarters advise when the more than 90 percent non-available for base stockage conditions, reported in Part I, will be corrected to give our bases sufficient stocks on hand to maintain the maximum number of ADC ftr inteps combat ready.

Part IV. I would appreciate it if we could obtain your personal interest in this matter. For your info, I have not apprized Hq AMC of this situation.

1 Incl
Sup Status of Frequently
Recurring Class 11B ANFE
Items

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10

SUPPLY STATUS OF FREQUENTLY RECURRING CLASS 11B ANFE ITEMS. AMC S123 REPORT AND WRAMA MESSAGE WRSEBS-6-213-E, DATED 1 JULY 1955 REFERS

5200-011490	Antenna	Available for immed shipment against ANFE
5200-011495	Antenna	
5200-221380	Control	
5200-221382	Control	
5200-221383	Control	
5200-970465	Waveguide	
52006628631-65	Receiver Transmitter	Anticipated that limited base stockage available by 1 Jan 56
5200-628631-75	Receiver Transmitter	
5200-000225	Accelerometer	Should be avail for immed shipment against ANFE on 1 Sep 55. Should be available for limited base stockage on 1 Jan 56.
5200-241189-35	Detector	
5200-266289	Filter	
5200-928897	Transmitter	Should be available for ANFE about Nov 55. Base Stockage Mar 56.
5200-203240	Computor	Should be available for ANFE about Oct 55. Target date for Base Stockage is 1 Jan 56.
5200-266289-4	Filter	
5200-928802-665	Transducer	

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146

6

B/ltr 432nd FIS, Subj: Mo Tech Report, E-4 FCS

ADMAC-5A (4 Apr 55) 5th Ind

HEADQUARTERS AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs Colorado

TO: Commander, Warner-Robins Air Materiel Area, ATTN: WRSXB
Robins Air Force Base, Macon, Georgia

1. The message referred to in the 4th Indorsement is quoted for your information:

"(UNCL) ADMAC-5A 07166. WRAMA has requested ADC to waive that portion of AFR 66-27 which precludes the forwarding of a Fire Control System component to higher echelon for repair if the lower echelon has the technical capability for such repair. The proposed waiver is to be in effect for the duration of projects Pull-Out and Hop-Up. This headquarters has advised WRAMA that the proposed waiver was unfavorably considered. ADC has agreed however, to return reparable components when the bits and pieces are not immediately available to repair the components. "Immediately available" for the purpose of this message is defined as "available on the base". This headquarters has requested WRAMA to initiate action to procure spare parts subassemblies and sub-subassemblies in sufficient quantities to permit compliance with AFR 66-27 as it is considered uneconomical to continue to support lengthy pipelines with costly components due to nonavailability of low cost bits and pieces. Request dissemination to appropriate units of your command."

2. The above message was dispatched on 16 February 1955 in accordance with a request contained in letter your headquarters, Subject: Scheduled Slippage of E-Series Components, dated 7 January 1955, signed by Major General Tibbetts. This headquarters was not in complete accord with the waiver of AFR 66-27 requested by General Tibbetts and ADCs objections were expressed by Major General Roth in reply. General Roth at that time requested that action be taken to procure sufficient Fire Control Systems bits and pieces to permit compliance with AFR 66-27. This waiver is to be in effect only for the duration of Hop-Up and Pull-Out. The projects are both to be completed in a matter of six (6) months, however this headquarters is unaware of any action taken to

1225

provide the ADC units adequate bits and pieces for compliance with AFR 66-27.

3. It is therefore, requested that this headquarters be advised as to whether the waiver will have to be extended beyond the completion of Pull-Out and Hop-Up.

FOR THE COMMANDER:

1 Incl:
2 cys w/d

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UNCL

147

13 May 55

[illegible]

SUBJECT: Quality Control of E-4 Fire Control System

TO: Commander
[illegible]

1. [illegible]

2. [illegible]

a. [illegible]

b. [illegible]

c. [illegible]

3. [illegible]

FOR THE COMMANDER

ADMAC-2 NAA Branch

[illegible]

Capt. [illegible]/ADMAC-SA/[illegible] Memo for record not required

1227

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UNCL

3/Ltr Hq ADC, [illegible], Subj: Quality Control of E-4 Fire Control System

8 July 55

[illegible] (23 May 55) 2nd Ind

HEADQUARTERS AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs Colorado

TO: Commander, Air Materiel Command, ATTN: [illegible]
Wright-Patterson Air Force Base, Dayton, Ohio

1. Your attention is invited to the preceding correspondence, specifically inclosure number one. It is apparent that the Inspector did not distinguish between system reliability and system quality control.

2. This Command is aware of the comparatively low reliability of the E-4 Fire Control System and a number of procedures have been adopted to improve the reliability of the system. ADC has long advocated the expeditious installation of modifications to improve the reliability of all Fire Control Systems.

3. This Command has also learned to expect a certain standard of performance from the E-4 Fire Control System. When systems are received which are below this standard, it is assumed that the condition can be attributed to poor quality control.

4. It is the understanding of this headquarters that both RCA and Hughes Aircraft Co. are manufacturing the E-4 Fire Control System to the same design specifications, therefore using activities should be able to expect the same performance from systems manufactured by either company.

5. To assure this Command of comparable performance, it is requested that your headquarters investigate and determine if deviation has been made from design specifications or if quality control has been relaxed to the extent to warrant the sub-standard performance indicated in the basic communication and the inclosure thereto.

FOR THE COMMANDER:

3 Incls
1. E-4 FCS Malfunctions
2. UR [illegible]
3. Memo, Survey [illegible]

[illegible]

HEADQUARTERS
MIDDLETOWN AIR MATERIEL AREA
Olmsted Air Force Base, Middletown, Pennsylvania

MAPQW 10 June 1955

SUBJECT: Special Survey
Radio Corporation of America
RCA Victor Division
Camden, New Jersey

TO: Chief, Quality Control Division
ATTN: FQ
Olmsted Air Force Base
Middletown, Pennsylvania

A. AUTHORITY:

1. AMC Regulation 74-4, VO, Deputy Chief, Quality Control Division and Order No. 4442 dated 6 June 1955.

B. GENERAL INFORMATION:

2. Special Survey was accomplished 8 June 1955 by J. Cupper, Weapons Systems and Components Branch, MAPQW.

3. Personnel conferred with:

S. Lev	General Plant Manager
N. Andersen	Camden Plant Manager
A. Kupferschmid	Quality Control Manager
J. Flansburg	RCA Quality Control Coordinator
B. DiFabio	AFQCR
A. Anastasia	AFQC Supervisor

C. PURPOSE:

4. This survey was conducted to determine whether the failure rate of RCA Fire Control equipment can be attributed to inadequate quality control at the factory. The Air Defense Command requested the prime AMA, WRAMA to conduct such an investigation. This request was forwarded to MAAMA as the geographical cognizant AMA. In addition, a recent Inspector General's Report received at this AMA indicated that RCA built equipment is being received in poor quality condition. Hamilton AFB Unsatisfactory Report 55-404 is referenced in both the ADC letter and the IG Report.

D. TRANSACTIONS:

5. The E4 Fire Control System is being procured on Contract AF 33(038)-20561. Production of E4 systems was completed during May 1955, however a considerable quantity of spare parts and spare components (black boxes) are on open order. The E6 Fire Control System which is similar to the E4 equipment and other types of fire control systems are in current production

1229

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or will break into production in the near future. The E4 system, which is a subject of the UR's report referenced in the preceding paragraph, consists of approximately twenty-seven (27) components, the majority of which are subcontracted by RCA.

6. The Air Force has a supervisor and three (3) inspectors assigned f[illegible] time to the Fire Control projects at the RCA, Camden plant where the assembly and systems testing is performed. Certain component assemblies for Fire Control equipment are built at the Moorestown plant. AFQC has established ten (10) inspection stations to cover all Fire Control equipment at the Cam[illegible] Plant. The ratio of RCA to AFQC Inspectors is reported to be approximately 40 to 1.

7. A general discussion was held with the AFQC and the responsible AFQC supervisor for the purpose of obtaining background information on the existing problems or trouble areas concerning RCA built E4 and E6 Fire Control equipment. In addition, a conference was held with the RCA personnel listed under Section B3 of this report. The following paragraphs lists information gathered concerning problem areas and actions taken or planned to be taken.

8. A review of the UR S/N 55-485 which is referenced in Section C4 of report indicates that the major cause of failure was a result of several defective component parts which are vendor supplied items. The nature of the defects was not given in the UR, which of course makes it difficult if not impossible to determine the underlying causes of the trouble reported. This is particularly true when exhibits are not available for analysis and study. It was revealed however, that RCA is investigating this UR as well as other failures relating to the reported non-reliability of RCA equipment. The findings of this UR were not complete at the time of this survey, however, during the conference held with the RCA personnel, it was learned that the failure of relays is a major cause of equipment failures. In this connection, the milli-second or fast-acting relay (chopper) is a bad offender. Mr. Lev of RCA informed the writer that the only known solution to eliminate this problem at present is to redesign the equipment to eliminate the use of the relays. This has been done on newly developed equipment.

9. During the discussion with RCA personnel, it was learned that a reliability improvement program has been established in connection with this equipment as well as other electronic equipment. This includes periodic life tests of systems (125 hours) and life testing components parts. Since their findings to date indicate that the major factor which is adversely affecting reliability is the failure of component parts, (vacuum tubes, relays and capacitors, etc), efforts are being taken to increase the working life of these parts. RCA is working with the vendors involved as well as seeking more reliable sources of supply. It was interesting to learn that according to Mr. Lev, RCA studies reveal that the average life without maintenance of the E4 and E6 equipment is reported to be only 8 to 10 hours. The writer recommended to the contractor that since equipment reliability is of utmost importance to the USAF, that every effort be made to increase the life of the equipment and to keep the local AFQC office informed of the prog[illegible] attained. Prior to this survey, much of the information generated by RCA concerning life tests being conducted and other data on reliability was not

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made available to AFQC. A report summarizing the activities to date concerning life tests and other investigations conducted on reliability of equipment is being prepared by RCA and is to be submitted to MAFQW in approximately ten (10) days for review.

10. AFQC records of surveillance for the fire control area indicated adequate implementation of AMCM 74-21, AF Quality Control Plan. It was noted that the product verification results for May 1955 of the final electrical test which is reported to be performed on approximately 1 out of 10 systems, indicated a relatively high percentage of AF product verification rejections which appears to have been due to component part failures.

11. Information received from the AFQC staff at RCA regarding the contractual test requirements for the MA equipments AF33(038)-20561, indicate possible inadequacies with respect to performance and life. Specifically, periodic type tests (sampling tests) i.e., temperature, humidity, and vibration tests are not required and are not conducted at the factory on production units. It is the opinion of this office that these tests should be conducted at regular intervals throughout the production of the equipment. During the investigation accomplished at the manufacturer's plant, it was revealed that only one early equipment was required to be subjected to these special environmental tests for qualification purposes only. Records of this office reveal however, that Unsatisfactory Reports have been received concerning failures during high altitude flying of the aircraft. If altitude tests would have been conducted on a production sampling basis for the equipment involved at the factory, the cause of failures would likely have been detected and the equipment would have been corrected prior to acceptance by AFQC. This apparent contractual inadequacy will be brought to the attention of the procuring agency for whatever action deemed necessary.

E. CONCLUSIONS:

12. It can be concluded that the major portion of the Unsatisfactory Reports received on the MA equipment are attributable to design weaknesses of component parts such as electron tubes and relays which can only be corrected by the processing of engineering changes or by developing more reliable components. The contractor appears to be making every effort to develop or obtain from his vendors a better component to increase the reliability of the equipment.

13. Since this fire control equipment contains thousands of characteristics which can influence reliability and because the nature of circuitry is a challenge to the state of the art, particularly in respect to life, it will be necessary for the contractor to screen out as many defects as possible during factory tests until more reliable parts are developed. Close surveillance on the part of AFQC will be necessary to ensure that the contractor accomplished his work properly.

14. It should be recognized that certain equipment failures which occur during use can be attributable to contractual weaknesses as covered in section III of this report.

PREPARED BY: JACK D CUTTER
[illegible] Systems and Components [illegible]

APPROVED BY: [illegible], Major, USAF
Ch, Quality Control Div. [illegible]

1231

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148

HEADQUARTERS
WARNER ROBINS AIR MATERIEL AREA
Office Of The Commander
ROBINS AIR FORCE BASE, GEORGIA

SUBJECT: Schedule Slippage of E-Series Components [illegible]

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. The problem of our failure to meet the spare component input on Projects "Pull Out" and "Hop Up" has become one of increasing gravity.

2. As an example, on 26 November 1954, our status on the input spare components for Project "Pull Out" was 1552 components short, of which 401 were critical, to date this condition has not been materially relieved. A similar condition exists on Project "Hop Up" where the input shortage was 578 components and 154 were critically short.

3. I am sure you will agree with me that a continuation of the above condition will seriously affect the support of modified F-86D and F-94C aircraft. In addition to endangering the combat readiness of aircraft, the overall cost of the project may be subject to renegotiation due to our failure to meet the input schedules and higher costs may be expected, since the contractor's planning was based upon present schedules.

4. I have been pleased with the results achieved by the [illegible]/ATC inventory teams; however, I believe that equally promising results could be expected if E-Series components were exempted from Air Force Regulation 66-27 for the duration of Projects "Pull Out" and "Hop Up".

5. In an effort to assure support of modified E-Series Fire Control Systems and in view of the present critically short supply position, it is requested that your command wiave that part of Air Force Regulation 66-27 which authorized squadrons to hold E-Series components awaiting parts and ship Project "Pull Out" and "Hop Up" spare components levies promptly, without regard to condition. Your cooperation in this matter will help make Projects "Pull Out" and "Hop Up" a success.

/s/ K. E. Tibbetts
K. E. TIBBETTS
Major General, USAF
Commander

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1232

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Rep WRAMA Subj: Schedule Slippage of E-Series Components

ADMAG-AC (7 Jan 55) 1st Ind 1 Feb 55

HQ AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colorado

TO: Commander, Warner Robins Air Materiel Area, Robins Air Force Base, Georgia

1. I fully realize the problems you are faced with in reference to the input schedules of components for Projects "Pull Out" and "Hop Up"; however, I fail to see how a waiver of AFR 66-27 would affect the successful accomplishment of these projects.

2. A Fire Control System inventory team recently visited all Air Defense Command bases and established minimum stock levels for the E-Series Fire Control System components. My personnel agreed to adhere to these levels, provided any levies made against organizations of this Command to support the input schedules for Projects "Pull Out" and "Hop Up", be made strictly on an exchange basis. Actually, these levels provide so few spare components that an organization cannot affor to hold a component in an "Awaiting Parts" status without jeopardizing its own support.

3. The majority of Air Defense Command units possess a capability to accomplish most maintenance on Fire Control Systems as authorized in T.O. 16-1s-1 and required by AFR 66-27. It would be impractical and uneconomical to return components to the Depot for minor repairs when the capability and bits and pieces are available to repair the component at organizational level thereby eliminating transportation costs and lengthy pipe lines.

4. Our bases are being advised to return reparable components promptly if they do not possess the bits and pieces or capability to effect immediate repair. I would like to see action initiated to procure spare parts, subassemblies and sub-subassemblies in sufficient quantities to permit compliance with AFR 66-27. It is not feasible to continue to support lengthy pipelines with costly components due to nonavailability of low cost bits and pieces.

5. I would be glad to furnish personnel who are familiar with the spare parts requirements to your Depot to assist in the provisioning of these items.

FOR THE COMMANDER:

MARSHALL S. ROTH
Major General, USAF
Deputy Chief of Staff, Materiel

1233

SECRET

149

ADSDN

15 FEB 1955

SUBJECT: (Unclassified) Revision of T. O. 00-25-145

TO: Commander
Air Materiel Command
Wright-Patterson Air Force Base
Dayton, Ohio

1. Reference is made to the conference held at your headquarters on 1 February 1955 between ADC and AMC representatives regarding revisions proposed to T. O. 00-25-145 by ADC. After consideration of all disadvantages posed from all sources, this command still considers a revision to T. O. 00-25-145 is required and submits for consideration the revisions contained in Inclosure 1.

2. The intent of the proposed revisions is as follows:

a. To recognize the fact that ADC is not organized under the wing/base concept and to authorize Jet Engine Field Maintenance at Air Defense Fighter Group level.

b. To establish a total of 25 installed engines of one type as the minimum criteria for authorization to accomplish JEFM. As currently published, T. O. 00-25-145 does not stipulate a minimum number of installed engines required prior to authorization.

c. To clearly define the responsibility of the landlord major command with respect to JEFM support of tenant organizations. This is believed necessary in view of past difficulties experienced by ADC in obtaining this support, in spite of the provisions of AFR 11-4.

3. This command wishes to reiterate its position that JEFM support is completely satisfactory only when provided by a facility located on the same station as the organization(s) being supported. Justification of this position from both a monetary and combat-ready viewpoint is contained in Inclosure 2.

UNCLASSIFIED

Memo for record not required.
Inclosures not essential for
AG files.

This correspondence is classified ______ in accordance with
Par ______, AFR 205-1, 15 Dec 53, or for the reason (s) stated.

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SECRET

Headquarters Air Defense Command, ADMEM, Subject: (Unclassified) Revision of T. O. 00-25-145

4. This command also wishes to re-emphasize its position that in no event will an ADC tactical squadron be designated as a JEFM organization since the tactical squadron has only an inherent organizational maintenance capability and JEFM is a field maintenance function. It is the intent of this command to designate as an authorized JEFM facility only Material or Field Maintenance Squadrons under the Air Defense Fighter Groups when such designation is dictated by the logistic support requirements of ADC. It is also the intent of this command to provide the maximum possible JEFM support to all organizations tenant on ADC bases, and our desire to receive this type support from the landlord on bases where ADC is the tenant.

5. It is realized that designation of additional JEFM facilities will increase the requirement for special tools and Code 3 spares, however it is not believed that the effect with respect to current engines will be as great as anticipated by the AMC representatives attending the referenced conference. To facilitate definite determination of additional requirements the current and proposed ADC JEFM program is forwarded as Inclosure 3. It should be emphasized that a firm decision on this matter must be reached prior to final provisioning for the J-57 engine to insure adequate support. If the proposed revision is accepted this command will continue to coordinate all designations with the prime AMA to insure adequate tools and spares support.

FOR THE COMMANDER:

3 Incls
1. Proposed Revision to T.O. 00-25-145
2. ADC Position on JEFM Policy
3. ADC JEFM Program

MARSHALL S. ROTH
Major General, USAF
Deputy Chief of Staff, Material

M654-2V

1235

seas assignment if they apply for an indefinite active duty status and are accepted or were tendered a commission in the Regular Air Force.

4. The above is provided for your information and personnel planning.

FOR THE COMMANDER:

MICHAEL J KENNEDY
Captain, USAF
Adjutant

M543-2

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[illegible] ADC

CINC SAC OFFUTT AFB [illegible]

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[illegible]
[illegible] AF [illegible]

(S[illegible]T) [illegible]AC-2A5 3307 . For [illegible], Sj [illegible]. This msg in II Parts. Part I. Subj is Jet Engine Fld Maint Support of ADC FTR Sqds tenant on SAC Bases. Recent query by this comd to Hq USAF and [illegible] resulted in fol: a. Recognition of ADC deployment by Sqds and auth to deviate from "[illegible]" and/or 60 Installed engine criteria previously required prior to [illegible] designation. Deviation IAW paras 4a(5) and 4b(1) (1), TO 00-25-4, applicable to both ADC bases and those non-ADC bases supporting ADC F[illegible] Sqds. b. Confirmation of landlord field maint. support responsibility, including J[illegible] support, for those tenant orgs not possessing fld maint capability. Support to be provided IAW joint occupancy agreements by affected comds as outlined in AFR 11-4. Part II. In view of above and recent [illegible] of Westover from [illegible] to SAC req you designate Westover as a J-47-17,-17B,-33 JEFM facility in support of the 60th F.I. Sq. presently deployed and the 319th F.I. Sq. programmed Westover 2nd Qtr FY-56. Both sqds w/b equipped with F-86D acft., J-47-17, 17B, and -33 engines, until FY-59 IAW current program.

ADMAC I MAJ HARMON

Will be Confirmed in 3rd Publication Form Under par 3e, ADCM
S-3 No
Approved by
Telephone
Date 13 June
Capt A/J [illegible]/[illegible]AC-2[illegible]/sm
ADC NO ADMAC-2[illegible]5

SECRET 1 2

[illegible] for the record not [illegible]

2820

This correspondence is classified [illegible] in accordance with

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151

Headquarters
Middletown Air Materiel Area
Office of the Commander
Olmsted Air Force Base, Middletown, Pa.

9 Mar 55

SUBJECT: Analysis of J-33 Engine Removals

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. This AMA is conducting an analysis on J-33 engines returned by the using organizations for overhaul. The purpose is to determine the course of action required to improve the quality of product. This is being achieved through analyzing reasons for removals as outlined on AMC Form 39A, "Aircraft Engine Disassembly Inspection Report." Copies of AMC Form 39A are furnished your Headquarters and all using organizations in accordance with paragraph 7a(5), AMC Regulation No. 66-3.

2. Analysis of data compiled for January and February revealed a number of reasons for removal, such as nozzle diaphragm failures, starter clutch pawl pin failures, and maintenance and operations. This AMA is concentrating on the areas over which local control can be exercised; however, with respect to removals for reasons beyond the control of this Headquarters, 30 engines have been removed because of "Foreign Object Damage" out of a total of 76 engines returned for overhaul from bases under your jurisdiction (see inclosures).

3. This could be caused in part by dirty ramps, runways, or carelessness on the part of maintenance and operations personnel during installation or operations. It is hoped that this communication will be accepted with a view of establishing a cooperative spirit and good customer relations in order that we might utilize our joint resources to the best possible advantage.

4. In the event AMC Forms 39A are not being received by your Command in accordance with existing directives, request this Headquarters be advised. If your Command is compiling and analyzing this information, any corrective action which you can take will aid materially in cutting

1239

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down unnecessary overhaul expense and reduce the number of J-33 engines in supply pipe lines.

5. Any comments or assistance you may be able to give this program will be appreciated.

L. P. WHITTEN
Major General, USAF
Commander

3 Incls (dup)
1. Code Sheet
2. Engine Records, Jan 55
3. " " , Feb 55

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UNCL

Headquarters Middletown Air Materiel Area, Subject: Analysis of J-33 Engine Removals

28 Mar 55

ADMDM (9 Mar 55) 1st Ind

HQ, AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colorado

TO: Commander, Middletown Air Materiel Area, Olmsted Air Force Base, Middletown, Pennsylvania

1. Review of the attached letter indicates that a number of the referenced engines were not assigned to the Air Defense Command; however, it is certainly not my intent to minimize the loss of engines due to foreign object damage.

2. We, here at ADC, are at present working toward a goal of returning more repairable engines to service through improved JEFM operations. This appears feasible and economically sound in view of recent T.O. 2J-J33-252, 1 January 1955, which will be implemented in ADC as soon as tools and spares become available. Further, I have recently reiterated my position on foreign object damage to units within ADC to assure that every effort is made to restrict this type of damage and that there is strict compliance with the provisions of T.O. 2J-1-17.

3. My staff has also recently reviewed the USAF proposal to revise AFR 65-20 and recommended methods of reporting which will allow more precise information as to the cause for engine removal. This will allow us at major air commands to more accurately pinpoint trouble areas and take positive action to reduce losses which occur within the Air Defense Command and which can be controlled by our units.

4. We certainly welcome any information and/or constructive criticism which will enable us to reduce the loss of engines due to foreign object damage. Any information, trends or analyses compiled by this command which may be of value to your AMA will be forwarded upon completion.

FOR THE COMMANDER:

MARSHALL S. ROTH
Major General, USAF
Deputy Chief of Staff, Materiel

3 Incls
n/c

1241

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152

30 March 55

[illegible] AS

SUBJECT: Foreign Object Damage to Jet Engines

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. The number of jet engines being removed for foreign object damage continues to be unacceptably high. This situation has a serious impact on the Air Force mission and proves conclusively that progressive and energetic action is necessary to reduce this problem area. One-third of the engines removed with less than the specified time between overhaul come into this group. Involved are those engine failures which occur immediately and those which are of an insipient nature creating compensation during the flight. As a result there is an excessive flow of engines to overhaul facilities for return to serviceable status. The above condition indicates that the policing of aprons, hangar areas and taxi strips prescribed in AFR [illegible] and T.O. [illegible] has not been completely implemented.

2. It is requested your command take immediate action to require that organizations institute an aggressive and continuing program aimed toward reducing the high incidence of foreign object damage.

BY ORDER OF THE CHIEF OF STAFF:

[illegible]
Brigadier General, USAF
Actg Asst Deputy Chief of Staff,
Materiel

1242

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UNCL

Ltr, USAF [illegible] Subject: Foreign Object Damage to Jet Engines

[illegible] (30 Mar 55) 1st Ind 20 April 55

Hq AIR DEFENSE COMMAND, Ent AFB, Colorado Springs, Colo.

TO: Director of Maintenance Engineering, Deputy Chief of Staff, Materiel, Headquarters USAF, Washington 25, D.C.

1. The problem of jet engine removals for foreign object damage has been one of deep concern to this Command. Numerous letters have been written to subordinate units stressing the seriousness of this problem and directing that certain precautionary measures be put into effect. For the most part, organizations have complied with the referenced regulations within the capabilities of equipment available.

2. This Command will continue to vigorously pursue this problem in an effort to more conclusively isolate the causes, factors or origin so that more effective corrective measures can be instigated. Increases in authorization for sweeping equipment have recently made it possible to obtain adequate quantities to do the required job. ADC organizations are requisitioning this equipment at the present time and it is hoped that procurement action has preceded this action sufficiently to insure timely issues.

3. A study group in this headquarters has recently undertaken the task of analyzing reports of engine removals due to foreign object damage in an attempt to determine susceptibility by engine type, incident rate per flying hour increment, and comparative susceptibility at bases utilized by this Command. It is anticipated that those bases where large numbers of aircraft equipped with reciprocating engines are operated will pose the greatest problem relative to foreign object damage. Any conclusions or trends derived from this analysis will be made available to your headquarters.

FOR THE COMMANDER:

MARSHALL S. ROTH
Major General, USAF
Deputy Chief of Staff, Materiel

Maj [illegible] L. Swaim/lrw
15 Apr 55

Memo for record not required.

1243

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153

18 [illegible] 55

EAFMP

SUBJECT: Aircraft Maintenance Officer Manning

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. Attached is an analysis depicting the low experience level of Maintenance Officers assigned to our fighter-interceptor squadrons. This critical and continuing shortage of experienced officers in the Aircraft Maintenance field within EADF is considered of sufficient urgency to justify special action by your headquarters.

2. In spite of the fact that our monthly statistical reports indicate near 100% manning by duty AFSC in all areas of this career field, the skill level and grade distribution as opposed to actual authorizations is considered unsatisfactory. Although this shortage exists "across-the-board" in this skill area, it is particularly acute in our fighter-interceptor squadrons where authorizations exist for one Major, AFSC 4344, and one Captain or Lieutenant, AFSC [illegible], depending upon type aircraft assigned. Maintenance effectiveness within our fighter squadrons is of vital importance to the accomplishment of our primary mission and is a decisive factor in the effectiveness of accident prevention program.

3. As indicated in the attached study, the current manning of Aircraft Maintenance Officers within our fighter-interceptor squadrons consists of only three Majors assigned out of a total of 31 authorized, only two of whom are fully qualified. In view of the complex responsibilities inherent to the Maintenance Officer of a fighter-interceptor squadron, it is deemed essential that we have at least one highly qualified officer in the grade of Major assigned to each engineering section of each fighter-interceptor squadron.

4. Within the limits of our resources, we have taken every possible step to alleviate this situation. To this end, we have reviewed the records of all assigned officers and those applied against our requisitions to insure proper management, classification, and utilization of available experience. Moreover, we have submitted requisitions for all existing

1244

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Hq [illegible], [illegible]   Subject: Aircraft Maintenance Officer Manning (Cont'd)

expansion and projected losses within this career field. Since October 1954, we have requisitioned 76 majors, AFSC 4314, but have received only 2. Unfortunately, our losses over this same period were five field grade Maintenance Officers.

5. It is requested that your headquarters carefully review this situation and render such assistance as is within your capabilities to effect an increase in the number of experienced officers assigned to these important functions.

FOR THE COMMANDER:

1 Incl
Acft Maint
Off Study (trip)

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[illegible]

([illegible] EADF Fighter-Interceptor Squadrons)

	[illegible]			[illegible]	
	[illegible]	Grade	AFSC	Grade	By AFSC
	[illegible]	Maj Capt	4344 4334	2/Lt	4341
	[illegible]	Maj Capt	4344 4334		Flt Perf Adly
4706	97th	Maj Capt	4344 4334	1/Lt	4344
	438d	Maj Capt	4344 4334	WO	
	436th	Maj Lt	4344 4334	Capt 1/Lt	4344 4331
	456th	Maj Capt	4344 4334	Capt 1/Lt	4341 4331
	47th	Maj Capt	4344 4334	Maj 1/Lt	4344 4344
4707	58th	Maj Lt	4344 4334		Flt Perf Adly
	60th	Maj Capt	4344 4334	Capt	4344
	437th	Maj Lt	4344 4334	Capt 1/Lt	4341 4331
	13th	Maj Capt	4344 4334		Flt Perf Adly
	56th	Maj Capt	4344 4334	Capt	4344
4708	[illegible]	Maj Lt	4344 4334		Flt Perf Adly
	71st	Maj Capt	4344 4334	Capt	4344
	[illegible]	Maj Capt	4344 4334	1/Lt 1/Lt	4341 4331

Encl #13

1246

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Capt	A344
	[illegible]	[illegible]	[illegible]	1/Lt	A344
	[illegible]	[illegible]	A344	Capt	A344
	[illegible]	[illegible]	[illegible]	NO	
	[illegible]	[illegible]	A344 A334	Capt 1/Lt	A344 A334
	[illegible]	[illegible]	A344	NO	
[illegible]	[illegible]	Maj Lt	A344 A334	Maj	A344
	[illegible]	Maj Lt	A344 A334	Maj	A344
	[illegible]	Maj Capt	A344 A334	NO	
	[illegible]	Maj Lt	A344 A334	1/Lt	A344
	[illegible]	Maj Lt	A344 A334	Capt	A341
[illegible]	[illegible]	Maj Lt	A344 A334	Capt 1/Lt	A344 A331
	[illegible]	[illegible]	A344		[illegible]
	[illegible]	[illegible]	A344	Capt 1/Lt	A341 A331
	[illegible]	[illegible]	A344		[illegible]
	[illegible]	Maj Lt	A344 A334	Capt	A344

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3 Feb 55

B/ltr fr Hq EADF, EAFMP   Subj: Aircraft Maintenance Officer Manning

ADFMP-A-XI (19 Jan 55)   1st Ind

HQ AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colorado

TO: Commander, Eastern Air Defense Force, Stewart Air Force Base, Newburgh, New York

1. Records of this headquarters, as of 31 December 1954, reveal your command is authorized a total of sixty-five (65) officers, AFSC 4344, and have sixty-eight (68) performing duty in AFSC 4344. A breakdown by grade is as follows:

	AUTH	ASGD DUTY
Major	50	6
Captain	11	34
Lieutenant	4	28
	65	68

2. While the above figures clearly show your command is manned over 100%, the other two defense forces are manned at less than 80%, and have the same low experience level.

3. We are fully aware of the situation in respect to Aircraft Maintenance Officer and every effort is being made to increase the level of experience not only in your command but in the command as a whole.

BY ORDER OF THE COMMANDER:

1 Incl:
n/c

P J KOSN, CWO, USAF/mss
2 Feb 55

1248

UNCL

154

25 May 1955

27 May 55

Brigadier General R. J. Reeves
Director of Military Personnel
Headquarters, USAF
Washington 25, D. C.

X 201 - Reeves - R. J.

Dear General Reeves:

I have become increasingly concerned since 1 January 1955 about certain personnel problems within this command. Foremost among these have been the manning levels in the primary mission group (Fighter, [illegible] and [illegible] Squadrons). Although the majority of these deficiencies have been made known to your office and are being acted upon, I believe it is necessary to bring them directly to your attention. I do not propose to discuss other than the most critical items.

Air Crew manning and manning both in numbers and skill levels in the jet mechanic area appear to me to be the most critical of all our problems. The present OPP calls for the activation of nine (9) new squadrons in Fiscal Year 1956. This alone presents a considerable problem personnel wise. In addition our aircraft inventory in existing squadrons is on the rise as a result of return from Project Pull-Out, etc., while the number of air crews are on the decline.

It appears from information available to us as results of visits and correspondence with your people, that little relief is to be expected. As you know, we are already accepting day fighter pilots in lieu of all-weather trained pilots. The projected low manning levels of pilots and maintenance personnel indicate this will become the limiting factor in our capability to adequately perform our mission. This has serious implications to the command and operations staffs and I have already pointed this out to them.

Initial procurement and training of personnel are additional factors which bear upon this problem. I am sending a comparable letter to General [illegible] for his attention. I have included training matters in the attachments to this letter for your information, hoping that you can be of assistance in this area.

(Incl not reqd for AG files)

[illegible]/Col, USAF/[illegible]
[illegible]/2700
26 May 55

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I believe these matters to be of major importance to the Air Defense Command and the Air Force. I recommend a meeting of senior representatives of this headquarters, Headquarters ATC, your office and the office of the Director of Training to do whatever possible to alleviate a bad situation that is growing worse.

Sincerely,

1 Incl
a/s

JOHN C. [illegible]
Colonel, USAF
Deputy Chief of Staff,
Personnel

1250

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[redacted]

N.d.

[illegible]

SUBJECT: Personnel Deficiencies

TO: Commander
Western Air Defense Force
Hamilton Air Force Base
Hamilton, California

1. I recently directed that a survey inspection be made of several fighter-interceptor squadrons. The purpose of the survey was twofold: first, to determine whether or not there was a mal-distribution of personnel resources among the squadrons and, second, to inquire into personnel instability and its causes. Statistics compiled in the survey of three squadrons in your command are attached.

2. The data in Attachment I indicates that a mal-distribution of airmen personnel resources does exist, both by total numbers and by skill level. The data in Attachment II indicates that airmen personnel instability is being aggravated by personnel actions of yours and subordinate headquarters.

3. It is the policy of this headquarters that personnel assignment actions be directed toward equality of manning, both number and skill wise, among the defense forces. Our assignment actions are based on your projected assigned against your projected authorizations. We resort to directing inter-defense force reassignments only when military necessity dictates such action as being the solution to fill critical personnel shortages.

4. It is desired that you review the attached data and modify your assignment procedures to:

a. Maintain a balance in effective manning among similar units of your command, except in those cases where valid reasons exist for not doing so. It is preferable that existing inequalities between units be eliminated by normal attrition and/or allocations from this headquarters rather than by PCS action.

b. Reduce the number of permanent changes of station by considering known pipeline gains before making reassignments of personnel between units of your command.

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Hq ADC, [illegible], Subject: [illegible]

c. [illegible]

[illegible]
Major General, USAF
Vice Commander

5 0096

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1. [illegible]
2. [illegible]

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ATTACHMENT 1

AIRMEN MANNING
BY [illegible] - BY AF
31 October 19[illegible]

	WADF			
	WADF	323rd	[illegible]	[illegible]
[illegible]	115	108	[illegible]	[illegible]
[illegible]	[illegible]	97	[illegible]	[illegible]
[illegible]	93	52	93	97

[illegible] manned (assigned/authorized). Percentages for the [illegible] do not [illegible] in the [illegible].

ATTACHMENT II

AIRMEN GAINS AND LOSSES
BY [illegible] - BY [illegible]
1 May 54 thru 31 Oct 54

	323rd				317th			
	Gains	% Of Gains	Losses	% Of Losses	Gains	% Of Gains	Losses	% Of Losses
	8	20	13	16	16	28	31	34
							3	3
	33	80	37	46	42	72	39	42
			30	38			19	[illegible]
	41	100%	80	100%	58	100%	92	100%

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12 Feb 5

Hq ADC, ADPMP-A-2, Subject: Personnel Deficiencies

[illegible] (Undated) 1st Ind

Hq WESTERN AIR DEFENSE FORCE, Hamilton AFB, Hamilton, California

TO: Commander, Air Defense Command, Ent AFB, Colorado Springs, Colorado

1. A thorough study of the comparative manning status within fighter-interceptor squadrons has been made in an attempt to determine the reasons for airmen personnel instability and the reported maldistribution of personnel resources indicated. A continuing effort is made in this command to stabilize personnel, but there are times when requirements beyond our control dictate actions which on the surface do not appear to be good personnel practices.

2. The conditions that adversely affected the manning status of the units referred to were:

a. The deployment of the 440th Fighter-Interceptor Squadron, Geiger Field, Washington, and the 496th Fighter-Interceptor Squadron, Hamilton Air Force Base, California, to overseas stations.

b. The reorganization of the 497th Fighter-Interceptor Squadron from an F-94 unit to an F-89D unit.

c. The establishment of an instrument school at McChord Air Force Base, Washington.

d. The activation of the 413th Fighter-Interceptor Squadron at Travis Air Force Base, California.

e. The activation and manning of the 8th Air Division and subordinate units.

3. The 440th and the 496th Fighter-Interceptor Squadrons were originally planned for deployment overseas during the month of April 1954. Slippage in receipt of aircraft delayed the deployment date to July 1954. The postponement necessitated replacement of those airmen who did not meet the requirements of letter Headquarters ADC, File ADPMP 220.481, dated 27 March 1953, subject: Retainability of Airmen Selected for Overseas Assignment.

4. The instrument school which was established in the 25th Air Division required supervisory personnel to effectively operate the school. To establish this school, airmen were withdrawn from overages in the fighter interceptor squadrons on McChord Air Force Base and assigned to the 567th Maintenance Squadron, thereby creating PCA's which could be

H.A.M.

1 Nov 56

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interpreted as PCS's on morning reports. Losses incurred by this action did not adversely affect the squadron's combat effectiveness. Two units were effectively manned at 80% while the 323rd Fighter-Interceptor Squadron's manning was 82% effective with NADF having an 81.4% average effectiveness.

5. Division commanders have the continuous and difficult task of maintaining an equitable distribution of personnel due to overseas commitments and attrition. Pipeline personnel are inadequate in numbers and in skill to meet present authorizations and requirements. Only through a continuous on-the-job training effort and readjustment of skilled personnel within their jurisdiction can division commanders maintain their operational capability.

6. This headquarters attempted to man the 8th Air Division and its subordinate units from pipeline resources; but due to the early discharge program and inadequate AFSC's, we could not depend fully on pipeline personnel. It was, therefore, necessary to utilize resources within this command to partially meet these requirements.

7. Reference is made to Inclosure 1 which reflects the percentage manned of the three fighter-interceptor squadrons for 5 and 7-level airmen as compared to NADF manning. An attempt has been made to reconcile these figures with statistical data available in this headquarters, and the indicated high percentage of airmen assigned to the 317th Fighter-Interceptor Squadron cannot be verified. This survey has disclosed, however, that within the area of the "hard-core" airmen specialties, the 25th Air Division was manned 40% of authorized at the 7-level and 58% of authorized at the 5-level compared to 40% and 54% respectively throughout NADF.

8. I have directed my air division commanders and their deputies for personnel to meet at this headquarters on 24 February 1956 to discuss personnel matters, and the content of basic letter will be covered in detail with them at that time.

9. It is suggested that future surveys of this nature provide for a representative from this headquarters who, upon completion of the survey, can brief me as to the findings. It is felt that this procedure will greatly reduce the time necessary for any corrective action which may be indicated.

8210

Walter E. Todd
WALTER E. TODD
Major General, USAF
Commander

2 Incls
w/o

1256

85TH FIGHTER INTERCEPTOR SQUADRON
Scott Air Force Base, Illinois

FER 9 February 1955

SUBJECT: Projected Inventory of Combat Aircrews

TO: Commander
33rd Air Division (Defense)
Tinker Air Force Base
Oklahoma City, Oklahoma

1. The projected inventory of combat air crews assigned to this organization during the next six month period is:

a. 12 February 1955 - 33 Combat crews assigned

b. 9 May 1955 - 29 Combat crews assigned. (4 lost to termination of active service and one lost to reassignment overseas).

c. 1 August 1955 - 28 Combat crews assigned. (1 lost to termination of service).

2. Current status of the 28 Combat crews projected to remain assigned to this organization is:

a. 12 crews are serving in an indefinite active duty status or are Regular Air Force Officers.

(1) 7 Crews with a FSSD of 7 Dec 41.

(2) 1 Crew with a FSSD of 26 Mar 45.

(3) 1 Crew with a FSSD of 26 Oct 46.

(4) 1 Crew with a FSSD of 3 Sept 51.

b. 16 Crews with a specified period time contract which expires April through November 1956. All these crews possess an FSSD of 7 Dec 41.

3. The 8 crews listed in paragraphs 2a (1) & (2) constitute the bulk of the pilot experience level of this organization and their FSSD indicated their extreme vulnerability for overseas assignment. The 16 crews listed in paragraph 2b would immediately become vulnerable for over-

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Ltr, 85th FIS, PER, Subject: Projected Inventory of Combat Aircrews

DPMP (9 Feb 55) 1st Ind

HQ, 33D AIR DIVISION (DEFENSE), Tinker AFB, Oklahoma

TO: Commander, Central Air Defense Force, Grandview AFB, Grandview, Missouri

1. The information contained in basic communication is in agreement with records this headquarters. There are no 1124C forecast to this Division within the next ninety (90) days.

2. Request this headquarters be advised of any anticipated gains which would alleviate the shortages which will occur, as stated in basic communication.

3. Request all possible assistance in this matter.

FOR THE COMMANDER:

CADF 1369 -55

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Ltr, 85th FIS, PER, Subject: Projected Inventory of Combat Aircrews

MIL PERS-OA (9 Feb 55) 2nd Ind

HQ CENTRAL AIR DEFENSE FORCE, Grandview Air Force Base, Grandview, [illegible].

TO: Commander, Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado

1. Forwarded for your information and any possible assistance in this matter.

2. There are presently 319 1124C's assigned this command against an authorization of 370. Overseas losses and expiration terms of service separations will reduce assigned figure to [illegible] by 1 August 1955. [illegible] 1124C's are forecast for assignment to this command and [illegible] indications none will be available for assignment in the near future. [illegible] 319 assigned, only 24[illegible] are present for duty [illegible] of authorized strength available for alert duty.

M543-4

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Ltr, 85th FIS, PER, Subj: Proj Inventory of Combat Aircrews

ADPRT-O (9 Feb 55) 3d Ind 15 APR 1955

HQ, AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colora

TO: Commander, Central Air Defense Force, Grandview Air Force Base, Grandview, Missouri

1. Records this headquarters, basically, are in agreement with the information reflected in the preceding indorsement. However, considering the known losses (39) and projected gains (9), as of 1 August 1955, your command should have assigned 276 pilots, AFSC 1124C, against an authorization of 370, or 75% manned. The transfer of the 35th Air Division should proportionately effect these figures.

2. Your concern over this situation is highly understandable. This headquarters, however, has been cognizant of the present and projected shortages of aircrews for sometime, and is taking every plausible action to alleviate this situation even to the extent of accepting jet day fighter pilots who are highly qualified. In addition to the nine 1124C pilots referred to in paragraph 1, four jet day fighter pilots have been assigned to your command to report during June 1955 for training as all weather pilots. We have also been advised by Headquarters USAF that approximately fifteen jet day fighter pilots will be assigned to ADC each month until a sufficient number of graduates from the All Weather School and overseas returnees qualified in all weather aircraft are available to meet our requirements. Reference letter this headquarters, file ADPRT-O, subject: F-86D Pilots, dated 31 March 1955.

3. The manning of the all weather crews is expected to become even more critical during the next five months. We are continually pressing Headquarters USAF for assistance, and we should receive a limited number of 1124C's from overseas sources and the All Weather School. Project Pull-Out has reduced the number of aircraft available to Air Training Command for training. With the completion of this project in August 1955, Headquarters USAF expects gradual improvement in availability of all weather pilots and by October 1955 the All Weather School is scheduled to attain it's programmed graduation rate of 35 students every two weeks.

V-92546/0032

BY ORDER OF THE COMMANDER:

WALTER W. ROBINSON
Colonel, USAF
Command Adjutant

COMEBACK COPY

Will be Confirmed to 3rd Publication Form Under par 3c, ADCM

S-1 No

Prepared by LT COL JOHN D.W. HASSLER/USAF/mas

Telephone 2955

Date 14 Apr 55

Refers to Fosfeld No

Furnished 14 Apr 1955 (date) (initials)

SECRET

This correspondence is classified secret in accordance with Par 23c, AFR 205-1, 15 Dec 53, or for the reason (s) stated.

M543-5

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157

HEADQUARTERS
CENTRAL AIR DEFENSE FORCE
GRANDVIEW AIR FORCE BASE
GRANDVIEW, MO

25 Feb 1955

[illegible]

25 Feb 1955

SUBJECT: Flight Test Training

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. With few exceptions, the most experienced interceptor pilots in this command are unable to report little more than primary symptoms of malfunctions encountered during test flights. As a consequence,

a. Many man hours are wasted by this command's most skilled maintenance personnel in identifying malfunctions on the ground.

b. Many flying hours are lost to active air defense and unit proficiency flying because of the necessity for additional flight testing.

c. This command's in-commission rate and available flying hours suffer correspondingly

2. It is requested that special training in analyzing and diagnosing malfunctions during flight test be obtained for pilots of flight commander or higher level who may not necessarily have aircraft maintenance backgrounds. Should this training become available, this command's requirements are tabulated below by aircraft type:

[illegible]	[illegible]	[illegible]
20	4	2

FOR THE COMMANDER

[illegible]
Lt Col, USAF

1261

Hq CADF FT Subject: Flight Test Training

ADFAC-3 (25 Feb 55)   1st Ind   11 March 55

HQ AIR DEFENSE COMMAND, Ent AFB, Colorado Springs, Colo

TO: Commander, Central Air Defense Force, Grandview Air Force Base, Grandview, Mo

1. It is agreed that there is a requirement for several pilots in each squadron who are capable of performing systems analysis on flight tests. Much time and effort could be saved by having accurate flight test reports and an accurate diagnosis of each malfunction observed. However, it is not felt that this man should be the flight commander or operations officer. This is particularly true if the man does not have an aircraft maintenance background. A course that would teach an inexperienced man the principles of systems analysis would cover a period of many months, if such a course were available. In addition, the training course would be a continuing function because of the turnover of personnel in squadrons. It appears that selected rated maintenance personnel could be taught flight test procedures and systems diagnosis by the maintenance officer through a daily scheduled OJT program.

2. AFM 36-1 sets forth the qualifications of the individual capable of performing this type of work, namely the Flight Test Maintenance Officer, AFSC 4334. The qualifications listed state, in part, that (a), completion of a course in Aircraft Maintenance is mandatory; and (b), eighteen months' experience in maintenance assignments is mandatory. ADC Manual 66-1, Fighter Interceptor Squadron Materiel Organization, 1 Jan 55, states in par 13 i, Chapter 2, that the quality control officer is responsible for "performance of flight tests, in accordance with current directives, to insure capability of aircraft to perform combat missions."

3. In view of the above, it is recommended that emphasis be placed upon the selection and training of capable aircraft maintenance officers and quality control officers. If it is still felt that additional training is required, then these are the men who should receive that training. In that case, a short course in flight test methods should suffice, since they already have the maintenance background. It would also prove helpful if a standard check list were developed for each type of aircraft, listing the specific items to be covered on a flight test. This command is collecting data for the compilation of such a list, and will keep you informed as to future developments.

BY ORDER OF THE COMMANDER:

11 Mar 55

Memo for record not required

2

7

NE 3

1262

138

JAN 20, 1955

CDMAG-5

SUBJECT: Air Defense Force Fire Control System School

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. The following are suggestions for the establishment of a Central Air Defense Force E-Series Fire Control System Indoctrination Program.

a. The Fire Control System maintenance skill level in shortest supply within Central Air Defense Force is the "70" level technicians and the more capable "50" level mechanics. Thus it is desirable that an Indoctrination Program be conducted to bring promising "30" and "50" level airmen of six months or more line experience closer to the "70" level of training. This headquarters will expect the Indoctrination Program to produce a "50" level airman who can supervise two or three other airmen in performing alignment, trouble shooting, periodic inspections, etc.

b. Space needed will be two classrooms; one to accommodate twelve students, the other to accommodate two mock-ups and six students. Hangar space for two aircraft and six students will also be required for proper conduct of the program. Apart from the electrical wiring required, the above space is now available.

c. Material support requirements are:

(1) Test equipment. Approximately one half of every type of test equipment and special tools authorized to a Fighter-Interceptor Squadron on UDL 20-00-75 dated 2 June 1954.

(2) Mock-ups: Two (2) mock-ups will be required. None are available from resources within this command.

(3) Personnel: Four (4) additional instructor personnel will be required. Hughes Field Engineers with experience instructing in the Hughes Factory Training School are desired.

1263

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(4) Responsibility for supervision and support of this program by Air Force personnel will be assigned to the Base Commander.

FOR THE COMMANDER:

E. G. SMITH
Lt Col USAF
Command Adjutant

56

UNCL

HEADQUARTERS WESTERN AIR DEFENSE FORCE
HAMILTON AIR FORCE BASE
HAMILTON, CALIFORNIA

159

5 April 55

WDPTR

SUBJECT: Evaluation of E-4 Fire Control System Courses 32230D and 32271D, Lowry Air Force Base, Colorado

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. Attached as Inclosure 1 is an evaluation of technical school graduates conducted by Headquarters 28th Air Division, in accordance with Western Air Defense Force Individual Training Letter 13-1, 28 October 1954, submitted for your further evaluation and necessary action.

2. This headquarters has requested commanders at all levels to continually submit evaluation of technical school graduates who are unable to perform satisfactorily as indicated by their job descriptions, or as required by individual commanders to meet minimum requirements. It is hoped that through continuing and comprehensive evaluation a concerted effort will be made by higher headquarters to improve technical school courses.

3. The complexity of modern electronic equipment requires that a thorough indoctrination in basic electronic principles be given each student. This minimum requirement is based on the assumption that the product of these schools will, in the future, be called upon to assume the duties of technicians/supervisors. Although certain tasks associated with fire control system maintenance may be within the scope of present graduates, the ability of the individual to progress with on-the-job training is almost non-existent. This has in most cases resulted in teaching basic electronics at squadron level. If this is expected or desired by technical schools, additional support from higher headquarters within this command should be furnished in the form of authorization for more instructors, training aids, classrooms, etc.

4. The conclusions, based on the recommendations by qualified personnel associated with armament systems maintenance, results of

1265

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57

Hq WADF WDFTN Subj: Evaluation of E-4 Fire Control System Courses 32230D and 32271D, Lowry Air Force Base, Colorado

sample screening examinations, and investigation of student reactions indicate the following course of action should be taken by the training command:

a. Fundamental electronic training at technical schools should be considered important enough and improved so that only qualified personnel are graduated. Partial or a vague understanding of the basic principles involved in electronic theory does not produce an individual with the capability to progress at unit level, and in a large majority of instances, poses an additional burden on the units to conduct duplicate training.

5. In view of results of attached survey and factors mentioned above, it is requested that corrective action be taken which will insure that graduates of technical training schools, particularly the Fire Control Systems School at Lowry, are capable and qualified to assume normal expected duties at the unit level.

FOR THE COMMANDER:

1 Incl
Eval of Technical
Sch Grad

1266

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58

UNCL

To WADF, [illegible], Subj: Evaluation of [illegible] Fire Control System Courses [illegible] and [illegible], Lowry Air Force Base, Colorado

ADCOT-[illegible] (5 Apr 55)   1st Ind   15 April 55

HQ AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colorado

TO: Commander, Western Air Defense Force, Hamilton Air Force Base, Hamilton, California

1. A complete revision of the basic E-4, 5, 6 Course was accomplished during February 1954. Personnel from this command, including representatives of WADF and EADF, collaborated with Lowry Air Force Base personnel in drawing up the course revision. Because of the time required to implement the changes and the [illegible] course length, this command received its first graduates of the revised course during February 1955. Thus the evaluation submitted by your basic letter will be of limited value with regard to the present Lowry course.

2. It is the desire of this command to develop a comprehensive questionnaire which will permit a truly effective evaluation of graduates of the revised course. Past evaluations have not brought about desired results in that Air Training Command has not accepted many of the comments forwarded from this headquarters. As a specific example the fact that graduates were not well-grounded in electronic fundamentals has never been acknowledged as a valid shortcoming. The ATC stand has been that the only true evaluation of a graduate lies in his ability to do his assigned job. If he is unable to make a certain adjustment or troubleshoot a given malfunction, Air Training Command will acknowledge these items as valid training deficiencies. If [illegible] some fundamental knowledge (such as operation of a voltage divider) is the cause of the airman's inability to troubleshoot, Training Command may accept this lack of a specific fundamental as a legitimate shortcoming in their training course. Thus it is imperative that any evaluation submitted to ATC be extremely thorough and definitive in listing deficiencies of Training Command graduates. They particularly desire that evaluations utilize the Job Training Standard for the course in question. A copy of the E-4, 5, 6 Series Systems Mechanic Job Training Standard is inclosed. It is recommended that an evaluation questionnaire closely follow this Standard with considerable expansion where needed - in particular Section 8, Troubleshooting, Alignment and Maintenance.

3. The following is a proposed course of action: This headquarters will draft a questionnaire as suggested above. Upon completion of the draft, it will be forwarded to your headquarters for refinement and coordination with your personnel to include squadron level. The questionnaire will then be administered to all graduates of the revised Lowry E-4, 5, 6 Courses. We will compile the results and submit them to Air

Inclo not nec for AG file ?

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59

[illegible] Evaluation of [illegible] Fire Control System Courses [illegible] Lowry Air Force Base, Colorado

[illegible]

BY ORDER OF THE COMMANDER:

1 Incl
[illegible]

1268

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UNCL

160

FROM: COMDR ADC

13/1745Z/ FEB 55

UNCLASSIFIED

AIR MAIL

TO:

COMDR EADF STEWART AFB NEWBURGH N Y

COMDR WADF HAMILTON AFB HAMILTON CALIF

COMDR CADF GRANDVIEW AFB MO

COMDR 4750TH AD WG (WPNS) YUMA CNTY APRT YUMA ARIZ

COMDR 4600TH AB GP ENT AFB COLO SPRINGS COLO (COURIER)

INFO

COMDR 4602D AISS ENT AFB COLO SPRINGS COLO (COURIER)

COMDR ACTN COMM SQ ENT AFB COLO SPRINGS COLO (COURIER)

COMDR HQ SQ SEC ADC ENT AFB COLO SPRINGS COLO (COURIER)

AFPMP-1 1364M UNCLASSIFIED

2 FEB 55

(UNCLASSIFIED) ADPMT-T-3A 06199. The fol msg from Hq USAF, dt 2 Feb 55 is quoted FYI and nec action: "From AFPMP-1 1364M. At the beginning of FY 55, the AF Bsc Plt Tng Program produced more plt grad than could be utilized in the adv and specl flying tng programs. This condition was a temporary one brought about by the rapid conversion of AF units to more modern acft and the attendant slippage in acft availability and utilization. Because of these conditions, it was both nec and desirable to asg these bsc plt grad that could not be utilized in the adv and specl tng program dir to the using comd for rated dy for which already qual and, in a nr of cases, to Combat Readiness Tng psn in nonrated specl based on previous education or AF Tech Tng. Bsc plt cl 55A (grad Jul 54) through 55F (grad Dec 54) were affected by this change in the program. Recently, because of the introduction of more complex wpn sys into the AF inventory and the increased lgth of time that it would take to bring a plt to

UNCLASSIFIED

PAGE 1 OF 4 PAGES

JOHN J. HAYES, CWO USAF, Asst Comd Adj

DD FORM 173

combat readiness status in these wpns sys, a decision was reached that only indefinit[e] type officers, and those officers with an established dt of separation who would agre[e] to sign a new four yr Specified Pd of Time Contract eff on grad from bsc plt sch, wou[ld] be utilized in the adv and specl flying tng programs. Those bsc plt grad of Cl 55A through 55F who were asg to using comd dir from bsc plt sch were not afforded the opportunity to accept this 4 yr Specified Pd of Time Contract and subq entry into adv or specl tng. In view of the above, a decision has been made to allow these officers to vol now for adv or specl flying tng. Procedures for accomplishing this are as fol: (a) All comd will take immediate action to identify and contact officers in this category. (b) Officers in this category now serving on indefinite svc statements will sbm appl IAW instr contained in USAF Tng Prospectus, listing three courses in order of preference. Appl will be fwd through channels to Dir of Mil Pers, Hq USAF ATTN: AFPMP-1-4-1b, and w/b identified as "Appl from Bsc Plt Grad." These appl w/b retained at this Hq until tng quota is avai, at which time regmt instr w/b issued. In this connection, a delay of several mo can be anticipated prior to rec of asgmt instr in order to integrate these applicants in adv tng program. (c) Officers in this cat who have an estb dt of sep will follow same procedure outlined in b above and in add, will execute new Specified Pd of Time Contract in duplicate as fol: "I, ________ (name), ________ (grade), ________ (AFSN), agree to serve on extended active dy for a min pd of four yrs from the dt of entry into adv or specl flying tng unless sooner relieved for the convenience of the Govt." New SPTC w/b retained with unit pers rcds until officer is asg to adv or specl flying tng. At the time officer actually enters adv or specl flying tng, these contracts will become eff and tng base will sbm DA Form 66A, IAW

1270

(UNCLASSIFIED) [illegible] 16143.

AFR 36-23, to reflect new DOS in Item 22, WD Form 66, and will fwd original cy of SPTC for inclusion in Officer's Master Pers Rcds. It is emphasized that SPTC executed IAW the above instr will not become eff unless officer actually enters adv or specl flying tng. (d) Officers in this cat now serving in os areas will compl min prescribed tour for area in which serving before becoming eligible for entry into adv or specl flying tng. These officers will sbm appl, as outlined in b or c above, and will incl their expected dt of rotation to ZI computed on basis of min foreign svc tour. NOTE: Min foreign svc tour w/b 18 mo for pers in this cat serving in areas where prescribed tour is in excess of 18 mo. Officers serving in os areas where the prescribed tour is 18 mo or less will compl prescribed tour. (e) Officers in this cat now asg to Tech Tng Air Force or Crew Tng Air Force tng pipeline for tng in nonrated skills, will make appl as noted in b or c above and w/b processed as fol: (1) Officers who have not actually entered course of tng w/b withheld from tng pending rec of asgmt instr to adv or specl flying tng. (2) Officers who have entered tng will complete curr course of tng and will indicate their aval dt as the course termination dt. Min dy prov of AFR 36-78 w/b waived for these officers and they w/b retained at tng base pending rec of asgmt instr to adv or specl tng. Officers in this category who have an established dt of sep and who decline to vol for adv or specl flying tng w/b prohibited from executing any other SPTC which would extend their curr dt of sep. The fol entries w/b effected on WD Form 66 for these officers declining further tng and WD Form 66A sbm in accordance with AFR 36-23: (a) In item 22, make reference to item 42, "See Item 42." (b) In item 42, make the fol entry: 'Officer ineligible to extend curr DOS except by entry in adv flying tng and execution of four (4) yr Specified

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Pd of Time Contract." In the event these officers later vol and are accepted for adv or spcl flying tng, the above entries w/b deleted upon entry into tng and the DA Form 66 changed as noted in paragraph 3b. NOTE: Prov of par 4 are not in conflict with intent of AFR 34-8. Forthcoming revision of AFR 34-8 will delete rqr for entry on DA Form 66 and submission of DA Form 66A for officer executing SPTC to obtain tuition assistance."

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27 May 55

Major General N. B. Harbold
Director of Training
Headquarters USAF
Washington 25, D. C.

Dear General Harbold:

I have become increasingly concerned since 1 January 1955 about certain personnel problems within this command. Foremost among these, in the training area, are interceptor pilot output of the Training Command and quality of certain airmen graduates of technical courses.

The Air Defense Command is dependent to a large degree upon the Training Command output for pilot replacements. You are undoubtedly aware of the reduction in graduates from fighter-interceptor courses in the past few months. This reduction has adversely affected our pilot manning status. I have attached for your information the programmed output of all the fighter-interceptor courses as against those numbers we have received from these courses. At recent meetings with the Training Command it was explained to our representatives that shortage of interceptor aircraft for training purposes was the cause of the reduction. Whatever the cause, we are not receiving the necessary flow from the Training Command to meet our pilot requirements. We are, in fact, asking for and receiving day fighter pilots which we must train ourselves. In this respect we are willing to accept a reduction in the present interceptor school curriculum to 38 flying hours per pilot in order to meet our quantitative requirements.

Many airmen in the hard core area received from the Training Command pipeline are incapable of progression without an excessive amount of OJT training, including classroom instruction. It is our belief that the factor primarily responsible for this condition is inadequate screening of basic airmen for input into technical training courses. Surveys conducted by this command have indicated that in certain of the hard core areas a large percentage of airmen have been assigned to technical fields, even though they did not possess the minimum desired aptitude indexes. It is realized that this problem is one which is very largely controlled by the quality of airmen enlisted in the USAF. However, there are also examples where we have received airmen possessing high aptitudes who were not afforded the opportunity of attending a technical school, but rather were given directed duty assignments in our hard core fields.

(Incl not req for 3d files)

G. B. SIMLER/Col, USAF/wlm/
2962/2700
26 May 55

Coordinated by all offices prior to minor change by C/S

1273

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The quality of airmen graduates from technical courses must increase if we are to meet OJT requirements for upgrading in sufficient numbers. The situation will become more critical due to increased requirements for technically trained airmen brought about by the incorporation of new and more complex equipments into the Air Defense Command inventory such as SAGE, F-89H, F-102, TALOS and BOMARC.

I recommend the review of the screening processes presently employed at the indoctrination centers. These processes should be revised as required to insure that only qualified personnel are sent to technical schools so that the absolute minimum number of low aptitudes are entered into technical training. It is also suggested that Project Home Front might be a solution to obtain additional qualified instructors. Under this, military instructors in ATC could be replaced by civilians who have recently separated from the Air Force and possess the skill and field experience required to be well qualified instructors. This action would provide greater stability and negate the need for withdrawing well qualified personnel for instructor duty when they are needed so badly in the field.

I have written a comparable letter to General Reeves pointing out the effect of the foregoing items on the personnel situation within the Air Defense Command along with other personnel problems. I recommend a meeting of senior representatives of this headquarters, Headquarters, Air Training Command, your office and the office of the Director of Military Personnel to do whatever possible to alleviate a bad situation that is growing worse.

Sincerely,

1 Incl
Fighter Interceptor
Course Flow

JOHN C. HORTON
Colonel, USAF
Deputy Chief of Staff,
Personnel

1274

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-09.1

AATP [illegible] 1955

SUBJECT: ([illegible]) Shortage of F-86 Aircrews

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. An analysis of the present and projected aircrew strengths within our fighter-interceptor squadrons reflecting pilot retainability, as of 15 December 1954, and pilot manning, as of 28 January 1955, is attached for your information and review.

2. Aircrew strengths within our F-94C and F-89D units have steadily increased over the past 6 months to the point where manning is considered adequate. However, aircrew strengths within our F-86D squadrons have steadily decreased during this same period. As of 28 January 1955, our authorized versus assigned strengths within our F-86D squadrons was 644 assigned out of [illegible] authorized.

3. In the future, we are faced with additional losses of F-86D pilots due to such circumstances as overseas assignments, separations, flying evaluation boards, and other administrative actions. Without compensatory gains from pipeline sources, our combat potential will decrease proportionately. We presently average 32 pilots assigned to each of our F-86D squadrons, which is considered below acceptable levels.

4. In spite of these shortages, the experience levels within our F-86D squadrons is at a high point which provides us with an excellent training capability; consequently, we are in a position to accept graduates of the F-86D application school to bring our fighter squadrons up to authorized manning levels, which under current authorizations is 37 aircrews per squadron.

5. To take full advantage of our present high training capability and at the same time provide a steady influx of school graduates to insure a vitalization of our aircrew training program, the following action is recommended:

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a. Our F-86D units should be brought up to full strength as soon as possible, utilizing primarily graduates of the F-86D Application School.

b. A steady flow of replacement pilots from the F-86D School should be programmed on a recurring basis to compensate for normal losses due to separations, overseas, etc. A monthly gain of approximately 30 F-86D pilots to this defense force should be sufficient to meet our requirements.

c. Concurrent with the activation of F-86D units overseas, it is recommended that a small number of our experienced F-86D crews, not to exceed 10 per month, be withdrawn against overseas levies.

6. A few of our F-86D units are approaching saturation in the Captain grade; therefore, it would appear advisable to create vacancies in this grade by transferring some of these older pilots overseas. Replacing these pilots through a steady influx of school graduates would insure that our training programs remain dynamic and vitalized.

7. As indicated in the attached pilot retainability study, our aircrew losses through normal ETS is another factor which must be considered in the allocation of F-86D School graduates. If the recommendations set forth above were followed, the impact of these ETS losses would not create a serious problem as existed in July through September 1953 when we received allocations of aircrew personnel which completely saturated our training capability. By phasing replacement pilots into our system now, we can spread the impact of these ETS losses time-wise so that our training requirements will not exceed our training capability. Our monthly personnel requisitions contain our actual requirements by squadron for our fighter-interceptor units, and it is urged that these requisitions be filled as soon as possible in the manner indicated in paragraph 5, above.

8. This letter is classified SECRET in accordance with paragraph 23c, AFR 205-1.

FOR THE COMMANDER:

2 Incls
1. Analysis of Plt Manning
2. Plt Retainability Survey

[illegible]
Captain, USAF
Asst Adjutant

1276

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PILOT MANNING - 28 January 1955

	ORGANIZATION	Aircraft Programmed Type	Aircraft Programmed Nr	Plts Auth	Plts Asgd 28 Jan	Gains thru May 55	Total Asgd May 55
	42d	86D	25	37	35	4	39
4	62d	86D	25	37	34		34
7	97th	86D	25	37	36		36
0	432d	86D	25	37	38		38
6	438th	89D	25	37	35		35
	456th	86D	25	37	26		26
	WING TOTALS			222	204	4	208
4	47th	86D	25	37	30		30
7	58th	94C	25	37	44	2	46
0	60th	86D	25	37	32		32
7	437th	94C	25	37	47		47
	WING TOTALS			148	153	2	155
	13th	86D	25	37	32		32
4	56th	86D	25	37	35		35
7	63d	89D	25	37	32	12	44
0	71st	86D	25	37	35	1	36
8	86th	86D	25	37	33		33
	WING TOTALS			185	167	13	180
	2d	86D	25	37	30	1	31
4	5th	86D	25	37	33		33
7	75th	86D	25	37	25		25
0	330th	86D	25	37	29	1	30
9	331st	86D	25	37	25		25
	539th	86D	25	37	34		34
	WING TOTALS			222	176	2	178
	46th	94C	25	37	42		42
4	48th	94C	25	37	37	1	38
7	95th	86D	25	37	35		35
1	96th	94C	25	37	41	5	46
0	332d	94C	25	37	37	1	38
	WING TOTALS			185	192	7	199
	27th	94C	25	37	36	2	38
4	37th	86D	25	37	41	1	42
7	49th	86D	25	37	28	2	30
1	82d	89D	25	37	32	6	38
1	318th	89D	25	37	33	2	35
	WING TOTALS			185	170	13	183
	COMMAND TOTALS			1147	1062	41	1103

1277

PILOT RETAINABILITY SURVEY

	ORGANIZATION	ASGD PILOTS	RETAINABLE THROUGH Jun 55	31 Dec 55	30 Jun 56	31 Dec 5
	42d	37	33	33	20	17
4	62d	[illegible]	31	[illegible]	21	13
7	97th	39	36	34	24	14
0	432d	38	34	33	16	10
6	438th	36	34	34	21	10
	456th	26	24	24	17	12
	WING TOTALS	211	192	[illegible]	119	76
4	47th	37	32	[illegible]	30	22
7	58th	40	32	[illegible]	27	22
0	60th	34	29	27	23	19
7	437th	45	37	[illegible]	28	19
	WING TOTALS	156	136	131	108	82
	13th	33	32	31	[illegible]	10
4	56th	37	31	[illegible]	15	10
7	63d	33	33	[illegible]	23	13
0	71st	37	32	[illegible]	[illegible]	17
8	86th	33	2[illegible]	[illegible]	17	11
	WING TOTALS	173	153	152	89	66
	2d	35	31	[illegible]	22	16
4	5th	30	30	[illegible]	19	15
7	75th	28	26	26	20	13
0	330th	30	25	25	15	12
9	331st	32	26	24	11	8
	539th	35	27	27	25	14
	WING TOTALS	[illegible]	167	162	112	78
	46th	44	39	37	17	15
4	48th	36	36	36	28	20
7	95th	36	37	36	14	14
1	96th	42	35	35	15	12
0	332d	37	34	33	18	10
	WING TOTALS	195	181	177	92	71
	27th	35	32	30	21	15
4	37th	40	38	37	20	20
7	49th	31	30	28	21	15
1	82d	36	UNK	UNK	UNK	UNK
1	318th	38	26	26	17	17
	WING TOTALS	180	126	121	77	67
	COMMAND TOTALS	1113	[illegible]	731	599	440

M750-4

1278

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CG
VC
CofS
Adj Gen
Adm
Ast
Pub
Surg Gen
JA
IG
Air Insp
PM
Flt Sfty
PIO
DCS/C
Bud
Fin
Mgt Anlys
Stat
DCS/P
Chap
Civ Pers
Mil Pers
Am Div
Off Div
GS
Pers Sv
PP
WAF
Tng
DCS/I
CSD
R&E
ME
DCS/O
AA Staff
CCA
Comm
M&O
OCD
Ops Anlys
O&T
P&R
Wea O
DCS/M
Instl
Log
Maint
Supply
HQ COMDT

1/ltr fr EADF, EAPMP Subj: (Secret) Shortage of F-86D Aircrews

ADPMT-O (10 Feb 55) 1st Ind

HQ AIR DEFENSE COMMAND, Ent Air Force Base, Colorado Springs, Colorado

TO: Commander, Eastern Air Defense Force, Stewart Air Force Base, Newburgh, New York

1. The information you have outlined in your letter, and the supporting documents thereto, have been given careful study and consideration.

2. The current and projected manning of the F-86D Fighter-Interceptor Squadrons, by defense force, as of 31 January 1955 to 30 June 1955, is as follows:

	AUTH	ASGD	% MANNED	ELIG FOR SEPR	[illegible]	PROJ LOSSES	GAINS	PROJ MANNING %
EADF	740	649	89%	32	11	2	8	83%
CADF	370	329	89%	15	20	8	2	78%
WADF	407	269	66%	2	8	4	39	72%
4750th	13	8	62%	0	0	0	0	62%

3. As indicated above, your command is better manned overall than either of the other two defense forces. With reference to my interim reply to you on this subject, this matter was discussed recently at Headquarters USAF. We were advised that Air Defense Command is better manned percentage-wise with F-86D pilots than any other command. We were also advised that due to Project Pull-Out and the converting of units overseas, no noticeable improvement in the assignment of pilots to F-86D interceptor units could be expected before October 1955; however the situation should not become any worse. Six to eight F-86D pilots are now returning per month from the overseas commands and Air Defense Command is receiving, and will continue to receive approximately 75% of these personnel. With more overseas units converting to F-86D's, we should be receiving substantial numbers of these overseas returnees for assignment to our units.

4. In view of the shortage of F-86D pilots throughout ADC and the limited number of graduates being received from the All-Weather School, Headquarters USAF has been requested to assign to ADC a limited number of experienced F-86 day fighter pilots returning from overseas with at least one year service retainability, for conversion to F-86D pilots. Although this will present a training problem, it is believed each squadron is capable of training two or three of these pilots at one time. This interim procedure appears necessary since the All-Weather School is now

Record Evaluation
Permanent ____
Temporary ____
Until ____
Will Be Confirmed
in Std Publication
Form Under par ____
ADCSM 5-3 ____
Prepared by ____
Telephone ____
Date ____

ADC HQ Form 11
12 Mar 52

AF - ADC, Colorado Springs, Colo.

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graduating only 14 students every two weeks, of which ADC has been receiving an average of 5 graduates per class. The graduating rate is programmed to gradually increase until October when it is scheduled to stabalize at 30 graduates every two weeks.

5. During recent months, this headquarters has observed a number of 1124C pilots being utilized in other than flying duties. In view of present shortage of F-86D pilots throughout the Air Force, it is requested that the assignment of all pilots who possess a potential for being an F-86D pilot be reviewed and that the maximum utilization is being made of our 1124C personnel.

6. Reference paragraph 6 of basic letter, this headquarters concurs that it is most desirable to have a balanced grade structure and create vacancies by transfers to provide a promotion incentive to the officers of the lower grades, however, in view of scheduled activation of additional F-86D units in the near future, it is necessary that we retain these experienced pilots within the command for assignment to these new units. Headquarters USAF has informally notified this headquarters that they expect our request for increase of grade structure in the interceptor squadrons to be approved in the near future. This increase will permit the squadron to be manned at 10% Majors, 33% Captains, and 57% Lieutenants of the total authorization.

7. As availability of F-86D pilots improves, every effort will be made to bring your interceptor squadrons up to the desired manning level.

BY ORDER OF THE COMMANDER:

C. F. [illegible]
[illegible]
[illegible] Command Adj

LT COL JOHN D.W. HAESLER/mas/2995

Record Evaluation
Permanent No
Temporary
Until 1 June 1955
Will Be Confirmed
in Std Publication
Form Under par 3a,
ADCSM 5-3 No

Prepared by LT COL JOHN D.W. HAESLER/mas
Telephone 2995
Date 8 Mar 55

ADC HQ Form 11
12 Mar 52

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AF - ADC, Colorado Springs, Colo.

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Surg Gen
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Mgt Anlys
Stat
DCS/P
Chap
Civ Pers
Mil Pers
Asn Div
Off Div
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Pers Sv
WAF
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DCS/O
AA Staff
CCA
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HQ COMDT

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6. Reference paragraph 6 of basic letter, this headquarters concurs that it is most desirable to have a balanced grade structure and create vacancies by transfers to provide a promotion incentive to the officers of the lower grades, however, in view of scheduled activation of additional F-86D units in the near future, it is necessary that we retain these experienced pilots within the command for assignment to these new units. Headquarters USAF has informally notified this headquarters that they expect our request for increase of grade structure in the interceptor squadrons to be approved in the near future. This increase will permit the squadron to be manned at 10% Majors, 33% Captains, and 57% Lieutenants of the total authorization.

7. As availability of F-86D pilots improves, every effort will be made to bring your interceptor squadrons up to the desired manning level.

BY ORDER OF THE COMMANDER:

LT COL JOHN D.W. HAESLER/mas/2995

Record Evaluation
Permanent No
Temporary
Until 1 June 1955
Will Be Confirmed
in Std Publication
Form Under par 3a,
ADCSM 5-3 No

Prepared by LT COL JOHN D.W. HAESLER/mas
Telephone 2995
Date 15 Mar 55

ADC HQ Form 11
12 Mar 52

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163

15 MAR 1955

UNCLASSIFIED

[illegible] ENT AFB COLO [illegible]

[illegible] HQ USAF

10400

(UNCLASSIFIED). ADPMP-O __________. FOR DCP. Confirming telecon between Lt Col [illegible], your directorate and Lt Col Haesler, this hq, 11 Mar 55. ADC will accept and utilize in F-86D units those plts returning fr os who are well quald in F-86 acft and have at least one (1) yr sv retainability after arr at the unit of asgmt. It is believed an sq has the capability to convert two (2) or three (3) well quald day ftr plts to all weather ftr plts while performing their primary mission. Off will be asgd against our rqmts for [illegible]'s in order listed in our Off Pers Rqmts; however, prior to asgn future plts of this category to ADC, it is reqd Off Manning Div, this hq, be contacted to assure proper coordination in ste asgmt.

M/R: In order to improve the plt status in our F-86D units and the shtg of quald F-86D plts fr the All-Weather Sch, it is believed advisable to accept this type F-86 ftr plts until such time as the All-Weather Sch can provide ADC w/sec replmt.

No

JOHN D.W. HAESLER, LT COL, USAF/sms

2995

14 MAR 55

UNCLASSIFIED

JOHN D.W. HAESLER, LT COL, USAF

ADPMP-O

2995

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164

ADOOT-B

31 JAN 1955

MEMO FOR RECORD: This correspondence has been discussed with Pers Plans, ... Plans, and ...

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Hq USAF, SUBJECT: (Uncl) Rotation of Fighter Interceptor Units

4. The very nature of the air defense mission requires that every fighter interceptor base be capable of manning every combat ready aircraft at any time. Under the current personnel rotation system this is feasible. Conversely, the unit rotation plan would create serious gaps in our air defense wall for unacceptable periods of time.

5. For these reasons I recommend continuation of the current system of providing [illegible] personnel to the arctic regions on an individual basis with [illegible] providing the necessary training as required, and amendment of the current personnel policy to preclude repeated rotation of individuals to the arctic regions. A study is underway to determine the implications arising from the F-102 conversion program in FY '57.

B. W. CHIDLAW
General, USAF
Commander

1 Incl
n/c

[illegible]LBACK COPY
____ Not requested, not furnished
✓ Furnished 31 JAN 1955 [illegible]
(Date) (Initials)

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1284

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165

From: Comdr ADC
To: CofS USAF, Washington, D.C.

Info: Comdr ATRC, Scott AFB, Ill.

(UNCLASSIFIED) ADOOT-E 21504. URMSG AFOOP-OC-F 31088. This hq is seriously concerned with quantitative deficiency of AI intcpr aircrews throughout the comd. Present and forecast deficiencies were fwd your hq by ltr this hq ADPTR-O, 13 Mar 55. To effectively meet meet combat needs, cold war tng and alert rqrs, we have urgent need for 1.5 aircrews per assigned U/E aircraft. Alert rqrs must remain at present level or higher, this utilizes 18 crews per squadron on alert duty for ea 24 hr pd. Any reduction in the nr of crews on hand reduces nrs aval for tng with consequent reduction in flying hrs and operational effectiveness. (1) This hq considers 38 hour U/E intcpr crew tng course as previously implemented by ATRC as meeting min qualitative rqrs.of this comd. Any increase in the nr of flying hrs aval for such adv tng should be applied first toward our quantitative rqrs. Only after quantitative rqrs are met and can be maintained should course be increased beyond 38 hrs. (2) Under the premise of quantitative need being met, the type of add tng to receive emphasis is actual wea flying, to include low approaches and formation GCAs, low altitude (below 5000') intcps, and intcps against ECM. (3) This comd considers actual rocket firing desirable in the intcpr crew tng course provided that suf A/C hrs are aval after our rqrs stated in (1) and (2) above are met and provided such tng can be accomp without increasing the duration of the desired course and does not rqr the use of tow and/or range facs presently utilized by this comd. Optimum total hr estimated at 75.

1285

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38

309.3

COMEBACK COPY

General Nathan F. Twining
Chief of Staff
Headquarters United States Air Force
Washington 25, D. C.

Dear General Twining:

The USAF program contained in the May 1955 issue PG-57-2 causes me considerable concern. This Program Guidance which is used to provide direction to the Air Staff has reduced the Air Defense Command's crew ratios to 1.0 for F-86D units and 1.1 for F-89 and F-94 units respectively. This action was taken without the knowledge of this headquarters.

Recently it was brought to my attention that our pilot inventory was on the decline due to ETS, overseas levies, and an insufficient input from training sources. We have, in fact, dropped from a crew ratio of 1.17 in March 1955 to 1.12 in June 1955 and with a projected ratio of 1.10 for September 1955. Meanwhile, our flying time has increased due to return of aircraft from Projects "Pull Out," "Hot Wheel," etc. The command's alert requirements remain the same, i.e., 24 hours a day, 7 days a week. As the squadron aircrew manning is reduced, with the workload imposed by the alert requirement remaining constant, the workload per individual aircrew is increased. The increased time spent on alert by each aircrew reduces the time available to that aircrew for normal flying training. Consequently, flying utilization must decrease, with ensuing degradation of individual pilot proficiency.

At present, our minimum crew ratio, to meet the alert and normal training requirements, is 1.5. Anything less simply means the aircrews will be working excessive hours per crew per week. This is now the case in almost all our squadrons, and it is having adverse affects on morale and the desire of the young reserve officer pilot to stay with air defense and the USAF.

NO
Col. G.B.Simler
Telephone 2582/2700
Date 29 Jun 55

This correspondence is classified SECRET in accordance with Par 23b, AFR 205-1, 15 Dec 53, or for the reason (s) stated.

M505-1

I have already taken action with your Directors of Military Personnel and Training, which I hope will bring about an increase of our pilot manning levels. However, the directive guidance of PG-57-2 gives us a completely new problem.

I strongly recommend that there be either: (a) an immediate revision of PG-57-2 to reinstate the 1.5 ratio or (b) instructions issued to your staff to disregard that portion dealing with crew ratios before it has any further deleterious effects on our pilot manning status. Any reduction in crew ratios below 1.5 reduces the capability of this command to effectively carry out its mission.

Sincerely,

FREDERIC H. SMITH, JR.
Major General, USAF
Commander

M505-2X

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167

Info to:
DCS/O

309.2

VC
Thru: C/S

USAF Meeting on Command Crew Ratios
DCS/P
14 July 1955

1. A meeting was conducted by Headquarters USAF on 12 July 1955 to discuss the reduction in crew ratios for all commands as published in PG-57-2. The crew ratio for the Air Defense Command was reduced by this document from 1.5 to 1.0 in the case of F-86D Squadrons and 1.1 for F-89 and F-94 Squadrons. Representation was from the major AF commands and the Air Staff (Attachment 1).

2. The meeting was opened and conducted by Colonel J. F. Brannock, DCS/O, AFOOP, Headquarters USAF. Colonel Brannock reviewed the problem, i.e., major command objections to the reduction in crew ratios, and the reasoning behind these reductions. Representatives of the major air commands were asked to comment on their respective areas after the introductory remarks. An open discussion followed after which Colonel Brannock reviewed and summarized the opinions expressed.

3. It was readily apparent that the reduction in the crew ratios was an effort by the Manpower and Organization people and the Programmers to bring the crew ratios in line with the number of crews in the inventory. This idea to cut the pie in equal shares for all commands did not take into consideration mission requirements and priorities of the Strategic Air Command and the Air Defense Command.

4. Representatives from AFOOP proposed crew ratios be immediately revised as indicated on inclosure #2. They also requested that 2.0 be the ultimate crew ratio for ADC and be reflected in forthcoming program guidance directives for planning purposes in the FY 60 time period. This was concurred in by the representatives of AFPDP. It was pointed out that a reduction in crew ratios now would necessarily be followed by a reduction in training outputs and materiel procurement planning and was unrealistic since it was anticipated that crew inventories could be increased in FY 57 and 58. Consequently, a reduction in crew ratios for one year would only serve a short range look and confuse planning.

5. The ADC comments pointed out that we must have a crew ratio of 1.5 at the present time in order to meet the mission requirements of the command, i.e., alert 24 hours per day 7 days per week. This was supported by data on flying time, alert requirements, etc. It was further illustrated that our manning at the present time, which is between 1.1 and 1.2 on the average, was causing an excessive number of working hours per week per crew assigned. It was stated that a priority should be established by DCS/O for the utilization of crews now in the inventory for those commands who had the highest military priority by virtue of mission. This would mean that SAC and ADC would receive a greater proportionate share of crews by virtue of their missions than the other major commands. This proposal met with the approval of the Operations representatives

1288

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from the Air Staff as well as the Personnel Plans representatives from the Air Staff. It was pointed out that if we continued on a 1.0 and 1.1 crew ratio that we would in effect be overmanned and could expect levies on our overages, thereby further reducing the crew inventory which would result in a reduction of command capability to meet alert requirements. The serious implications of this were discussed and it was brought to the attention of the representatives that it could result in [illegible]C requesting a reduction in the alert requirements, which was not considered practical or advisable.

6. The USAF crew inventory will not support 100% manning for any single major command in [illegible] Y based on desired crew ratios. It was stated by the Air Staff that with the proper apportionment of the existing inventories by priority, [illegible]C could expect its crew manning to reach 1.4 by the end of the FY, going to 1.5 in FY 57.

7. In summary, the following recommendations and actions were established:

a. PG-57-2 would be amended.

b. ADC would receive a crew ratio of 1.5.

c. F[illegible]-08-0 would hold out for a 2.0 crew ratio in the FY 60 time period.

d. ADC could expect 1.4 actual crew manning by the end of FY 56.

e. DCS/O, Headquarters USAF would review manning capabilities and establish priority for manning in light of mission requirement.

G. B. SIMLER
Colonel, USAF
Director, [illegible]
Ext 2582/2700

JOHN C HESTON
Colonel, USAF
DCS/Personnel
Ext 2248/2249

2 Incls:
1. ~~List of Reps, Crew Ratio Conference~~
2. Crew Ratio Rqmts FY 56 thru FY 62

[illegible]

COMDR [illegible] AFB [illegible]
COMDR [illegible] AFB [illegible]
COMDR [illegible] AFB [illegible]
COMDR [illegible] (RPTD) [illegible] CO AFB [illegible]
COMDR ADCOTS [illegible] OF [illegible] AFB COLORADO
SPRINGS COLO (COMLINE)

AFOOP-OO-F ALMAJCOM 990/55/8 Apr UNCL

(UNCLASSIFIED) ADOOT-G 14449. Folg msg fr Hq USAF quoted FYI and nec action: Quote, AFOOP-OO-F ALMAJCOM 990/55. Analysis of the reasons various comds were unable to fulfill the aloc flying hour program indicates adverse wea was a prim factor. It is desired that all comds initiate a program that will permit units to take advantage of wea cond, enabling them to reach a higher proficiency in inst flying. This program should inc coord with local ATC cens in the estb of rapid approach and dept procedures. The practicability of estb corridors and block time periods should be inves. Improved airspace con and supv ched similar to that being conducted at Moody AFB would result in better utilization of crews and acft and a more proficient all-weather AF. This hq is prep to assist you in resolving airspace matters and in formulating adequate inst approach procedures. Unquote.

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Maj Chandler/[illegible] 14 Apr 55

ADOOP-G 2990

[signature]

[illegible] J. [illegible], Col, USAF, Asst Comd Adj

DD FORM 173

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169

EN

SECR'T

COMDR ADC

ROUTINE

COFS HQ USAF WASHDC

AFOOP-OC-F 35966 UNCLA 'I'TED

(SECRET) ADOOT-P 3269. For AFOOP. URMSG AFOOP-OC-F 35966 dtd 27 May 55. Part 1A. Avg flying time per month per asgd crew is: Jul 16, Aug 16, Sep 16, Oct 14, Nov 14, Dec 12, Jan 14, Feb 14, Mar 20. This amt of flying time is not consd suf to reach and maintain the desired level of combat proficiency. Part 2A. Major limiting factors which pvnt increasing flying time per pilot are: Acft undergoing projr such as Pullout and Hopup, lack of pilot crew pers, and non-assignment of fully quald maint pers. The shrtg of fully quald maint pers will cont to be a major limiting factor thru the foreseeable future and will pvnt aircrews from attaining the optimum amt of flying time desired, for an indefinite period indefinitely. B. Recm no change to Table O-7A of the PFF. These figs are realistic at the present time in that this amt of flying time is nec for the compl of programmed flying tng. Although this comd has not flown all the programmed flying hrs, for reasons as stated in A above, it is anticipated that aircrews will fly at least the nr of hrs as

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SBB

Capt Beaty/irb

ADOOT-E

2727

(S[illegible]T) A[illegible]T- ______________.

inded in Table O-7A in the near [illegible]uture. C. Cons the best flying hrs per month per crew to maintain optimum combat proficiency to be 30 hrs.

Prepared by Capt [illegible]ty/irb
Telephone 2727
Date 10 June 55
Refers to Fanfold No

ADC HQ

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M543-2X

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13 May 55

Major General Jarred V. Crabb
Commander
Central Air Defense Force
Grandview Air Force Base
Grandview, Missouri

Dear Jimmy:

I received your letter of 3 May 1955 and have subsequently passed it on to the staff for perusal.

Your reception of our directive that key personnel be alert qualified is certainly gratifying. Equally so is your feeling toward our goal of 700 hours per month per squadron (or 20 hours per pilot). I feel that the command will realize a definite progression both in morale and training from these two requirements.

As stated in my letter of 22 April, I am planning a trip through WADF in the latter part of May and EADF in June. The information which I gained on my trip through your command will assist me considerably in determining the problem areas to be reviewed command-wide.

Sincerely,

FREDERIC H. SMITH, JR.
Major General, USAF
Vice Commander

M/R: Not necessary

Maj Chandler/gjl
2890
6 May 55

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69

171

HEADQUARTERS
CENTRAL AIR DEFENSE FORCE
GRANDVIEW AIR FORCE BASE
GRANDVIEW, MISSOURI

OFFICE OF THE COMMANDER

3 May 1955

Major General Frederic H. Smith, Jr.
Vice Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

Dear Freddy:

I refer to our telephone conversation of today, and am including here some further details regarding the subjects we discussed.

The following key personnel, listed by division, have previously been alert qualified or have become alert qualified as of 30 April 1955:

29th Air Division

Col Gibson	Qualified 17 March 1955

31st Air Division

Col Orr	Qualified 30 April 1955
Col Hicks	Qualified 3 January 1955
Col Moore	Qualified 30 April 1955
Col Gould	Qualified 25 February 1955

33rd Air Division

Col Weltsin	Qualified 30 April 1955
Col Brown	Qualified 29 January 1955

34th Air Division

Col Clark	Not qualified as of 30 Apr 55. He has total time of 38 hrs 5 minutes. He has been grounded since 18 Apr 55.

You will note that Colonel Clark of the 34th has not quite made the minimum goal, but this is recognizable in view of the fact that he has been grounded due to a virus infection since 18 April. He is eager to fly and there is no question in my mind but that he will get himself qualified at the earliest practicable date.

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Major General Frederic H. Smith, Jr.

I find that the Divisions, Groups, and Squadrons are actually getting a lot of good out of seeing these people flying the UE aircraft. We are also getting many good side benefits out of the program because our commanders are able to make well grounded decisions and are personally taking some vigorous action toward correction of deficiencies. These deficiencies they have probably learned about by flying the UE aircraft.

I do not want to belabor you with too many details, but following is a list of the flying time for CADF Squadrons for the month of April.

29th Air Division	
29th FIS	Over 700 hours
54th FIS	Over 700 hours
31st Air Division	
11th FIS	369.55 hours
14th FIS	565.55 hours
337th FIS	433.40 hours
519th FIS	165.55 hours
33rd Air Division	
85th FIS	Over 700 hours
326th FIS	Over 700 hours
34th Air Division	
15th FIS	415.20 hours
93rd FIS	607.25 hours

I have personally reviewed the various reasons for compliance or non-compliance with the desire to obtain 700 hours minimum. Some of these reasons are valid, others are not. I am taking action as seems appropriate.

May I just confirm what I said on the telephone, that the minimum goal of 700 hours, or 20 hours per pilot, is O.K. and is thoroughly supported throughout my command. We feel that it is definitely not too high and it automatically makes all echelons of our command organize themselves to accomplish the mission. Actually, the 700 hours will probably be a low requirement. We should be able to do better.

Morale in my fighter squadrons is high. I think all of them appreciate the fact they are given goals to shoot at. I have tightened down considerably during the last few months on

1295

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Major General Frederic H. Smith, Jr.

my requirements for combat ready aircraft and combat ready pilots. We have not yet reached the goal that I desire, but we are making progress. Some training programs now in effect should bring up our combat capability quite rapidly.

Also, in accordance with my phone conversation with you this morning, many thanks for your letter of 22 April reference your recent visit throughout CADF. We have all gained a lot from it and the letters which you have sent to me will be utilized by my staff and the divisions as profitably as we can use them.

We are all glad to see you back from your long trip.

Sincerely,

JARRED V. CRABB
Major General, USAF
Commander

1236

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15

HEADQUARTERS
CENTRAL AIR DEFENSE FORCE
GRANDVIEW AIR FORCE BASE
GRANDVIEW, MISSOURI

OFFICE OF THE COMMANDER

SUBJECT: (Unclassified) Report of Underflying (RCS: ADC-FP)

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. In compliance with paragraph 4 of your letter, subject: Flying
Hour Utilization, 31 December 1954, I have attached a consolidated flying
time report for each of our fighter-interceptor squadrons for the quarter
ending 31 March 1955 (Inclosure 1). You will note that during March
there has been considerable improvement in the flying time within each
squadron and two squadrons have exceeded the 700-hour requirement. As
Inclosure 2, I have attached a chart showing the average flying time per
available pilot per month in UE aircraft. Again, a considerable improve-
ment is evident for the month of March. The trend is encouraging and we
expect it to continue through the next quarter.

2. We have received detailed reports from each of the squadrons
outlining the reasons why they have failed to accomplish 2100 hours
during the past quarter. My staff and I have screened each individual
report to determine, insofar as possible, the main problems affecting
flying hour utilization. Naturally, many reasons were submitted by the
squadrons. Some of the reasons were valid and were beyond control of the
squadrons and, in some cases, their higher headquarters. Other reasons
were determined to be of a minor nature and inherent in the operation of
any fighter-interceptor squadron. For this reason I have decided to con-
solidate into one report from my headquarters all of those factors which
we feel were valid. Those factors which we consider to be invalid will
be brought to the attention of our subordinate commands with appropriate
action directed by this headquarters.

3. We thoroughly support 700 hours per month per squadron as a
realistic minimum requirement for a reasonably manned and equipped squad-
ron. It is my intention - and I have so advised my division commanders -
to meet this goal and to exceed it insofar as possible. I have contin-
ually made it clear that we do not want to sacrifice quality of training,
quality in aircraft maintenance, or to compromise flying safety. In
order to emphasize these factors I had previously issued certain direc-
tives from this headquarters, some of which may have affected the flying
time utilization. These directives are as follows:

1237

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a. In [illegible] of last year I issued a policy to the field which required that only [illegible] combat-ready [illegible] tactical aircraft be flown; that deviations from this policy would be held to the absolute minimum. I felt that this was a step forward in using our [illegible] aircraft as a complete weapons system, for which it was intended. While I recognize that complete compliance with such a policy is not possible at the present time, I believe it a worthy goal which will, in the long run, improve our over-all combat effectiveness. Compliance with this policy has, of course, reduced the flying hour utilization to some extent, particularly in cases where an aircraft was in commission and might have been flown on missions not requiring use of the fire control system.

b. On [illegible] November of last year I issued a directive to the field which required that [illegible] aircraft be [illegible] [illegible] for the [illegible] [illegible] [illegible] [illegible] of fuel remaining. This was prompted by a number of accidents which have been directly attributed to fuel starvation resulting from failure of the aft fuselage tank booster [illegible] and erroneous fuel gauge indications. This fuel restriction is still in effect and will remain in effect until certain modifications to the fuel system have been accomplished. I have, by separate correspondence, brought this matter to the attention of your headquarters, urging early action to [illegible] the necessary modifications. My last communication was by message [illegible], [illegible] April [illegible]. This restriction effectively reduces the flying time per individual mission by at least [illegible] minutes, which consequently reduces the over-all flying hour utilization within this command.

c. Earlier this year we implemented [illegible] Regulation 55-16, a copy of which is attached as Inclosure 3. This regulation establishes the minimum monthly flying training requirements for this command and encompasses the [illegible]-hour-per-month requirement. As an attachment to this regulation we have published minimum monthly [illegible] requirements which the squadrons must accomplish. This is intended to prevent the start of a "time war" and to stress over-all progressive training. In order to maintain close supervision of the flying hour utilization I have required a monthly report to be submitted by each squadron. Also, in the event a squadron foresees circumstances which may prevent them from meeting minimum requirements in any one month, they are to submit a report outlining the problems in order that we may take timely action to correct those which are within our capability. These report requirements are outlined in paragraph 7 of [illegible] Regulation 55-16.

d. I have recently discussed the flying hour utilization with my division commanders. We reviewed the entire situation and considered the obstacles confronting the squadrons. All division commanders and the detailed reports from the squadrons listed the following problems which were common to the great majority of our fighter-interceptor units during the past quarter:

SECRET

Hq CADF Subj: (Uncl) Report of Underflying (RCS: ADC-F8)

a. Shortages of squadron maintenance personnel.

(1) Shortages of personnel in the fighter-interceptor squadrons, particularly in the higher skill levels, have been restricting factors. Our average effective manning in all the fighter-interceptor squadrons has been 66 per cent during these three months. This represents a sizable decrease from the December average of 73 per cent which is due to several factors including the activation of the 519th squadron, large losses due to seasonal early release and expiration of enlistment during this period, and necessary support of high priority projects such as the AEW program, the weapons training center at Moody, and, to some extent, the ground observer program. I realize these factors have affected all of ADC, but the fact of a low percentage of effective manning has been a continuing problem.

(2) The relatively low manning in the noncommissioned officer grades during this period has not only affected the ability of the squadrons to perform their day-to-day work but has also inhibited our training and upgrading potential as the supervisors and technicians are the backbone of our training effort. Our average noncommissioned officer manning for ten fighter-interceptor squadrons for each of these three months is as follows:

	January	February	March
M/Sgt	80%	80%	80%
T/Sgt	32%	33%	34%
S/Sgt	28%	29%	28%

The 519th squadron is excluded as its status following activation on 8 December 1954 is not considered representative, and the three squadrons in the 35th Air Division are excluded as records pertaining to these units have been transferred to Eastern Air Defense Force. The average of the ten is considered representative.

b. Maintenance difficulties.

(1) The principal materiel programs that impeded our ability to attain the 2100-hour goal are well known. For example, as a result of the accelerated "Hot Wheel" schedule our aircraft in-commission rate went from a

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high of 63 per cent to a low of 33 per cent by
17 February, while the combat ready rate fell to a low
of 26 per cent. The 29th Fighter-Interceptor Squadron
was and still is engaged in "Hop-Up." The poor condi-
tion of the F-94C aircraft returned to us from "Hop-Up"
has required additional organization maintenance that
consumed from 7 to 14 days on each aircraft. Project
"Pull-Out" affected seven of our F-86D fighter-inter-
ceptor squadrons during this period. The conversion
of the 11th Fighter-Interceptor Squadron from F-86D
to F-89D aircraft and the transfer of the 11th Fighter-
Interceptor Squadron's F-86D aircraft to the newly
activated 519th Fighter-Interceptor Squadron, with
subsequent transfer inspections, kept these two units
from maximum flying effort.

5. In summary, I feel confident that, barring unforeseen difficul-
ties, the majority of our squadrons will meet the minimum flying time
requirements and in some cases exceed them during the current quarter.
Two possible exceptions are the 11th Fighter-Interceptor Squadron which
is in the process of converting from F-86Ds to F-89Ds, and the 519th
Fighter-Interceptor Squadron which is newly activated and received its
first aircraft on 7 March 1955. However, both of these squadrons show a
great deal of promise and will meet the goal if humanly possible.

3 Incls
1. Flying Hours per FINCEPTRON (dup)
2. UE Acft Hrs per Plt (dup)
3. CADFR 55-16, 4 Feb 55

19

FLYING HOURS
Per Fighter-Interceptor Sq

		January	February	March	Total
*11th FI Sq	UE	415	170	107	687
	Other	201	147	95	443
	Total	616	317	202	1135
14th FI Sq	UE	161	315	469	945
	Other	435	171	237	843
	Total	596	486	706	1788
15th FI Sq	UE	296	326	462	1084
	Other	180	182	321	683
	Total	476	508	783	1767
29th FI Sq	UE	380	466	718	1564
	Other	209	177	262	648
	Total	589	643	980	2212
54th FI Sq	UE	467	409	580	1456
	Other	207	198	141	546
	Total	674	607	721	2002
85th FI Sq	UE	473	274	721	1468
	Other	199	225	218	642
	Total	672	499	939	2110
93d FI Sq	UE	644	609	513	1766
	Other	301	308	270	879
	Total	945	917	783	2645
326th FI Sq	UE	294	151	587	1032
	Other	140	98	132	370
	Total	434	249	719	1402
337th FI Sq	UE	271	343	428	1042
	Other	79	57	216	352
	Total	350	400	644	1394
**519th FI Sq	UE			39	39
	Other			41	41
	Total			80	80
444th FI Sq	UE	609	274	429	1312
	Other	138	107	179	424
	Total	747	381	608	1736

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FLYING HOURS
Per Fighter-Interceptor Sq

		January	February	March	Total
460th FI Sq	UE	648	401	323	1372
	Other	195	88	111	394
	Total	843	489	434	1766
469th FI Sq	UE	453	352	526	1331
	Other	122	163	265	550
	Total	575	515	791	1881

* 11th FI Sq converting to F89D A/C.

** 519th FI Sq newly activated Squadron. Received 1st aircraft on 4 March 1955.

Source - AF Form 110-A

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UE AIRCRAFT HOURS PER PILOT

Organization	Average Hours Flown Per Pilot Present For Duty			
	Jan	Feb	Mar	Total
*11	14.3	6.8	4.9	9.2
14	9.5	19.7	36.1	20.5
15	9.9	11.6	17.1	12.8
29	14.6	17.9	23.2	18.8
54	15.6	15.7	21.5	17.5
85	23.7	9.4	31.3	20.4
93	20.8	20.3	17.7	19.6
326	10.1	5.8	26.7	13.4
337	15.9	15.6	20.4	17.4
444	19.6	9.4	15.9	15.1
460	24.0	12.9	9.2	14.8
469	17.4	12.6	19.5	16.4
***519				
TOTAL CADF (Excludes 519)	16.4	12.9	19.3	16.2

*Conversion to F-89D aircraft.

***Newly activated squadron.

1363

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COMDR ADC SECRET

ROUTINE

COMDR ARDC BALTIMORE MARYLAND X

(SECRET) ADOOT-B 80.21. This hq has been informally advised that an improved version of the Mark IV immersion suit is being dev by your comd. It is further understood that this suit incorporates several features which adapt it to long pds of continuous wear, a basic rqr of this comd. The present immersion suit is not suitable for air def type opr due prim to crew discomfo[rt] while standing alert. The recent seaward extension of radar coverage has greatly increased our rqr for over water flying. Future programs will furthe[r] increase this rqr. Mod and new ADC acft will increase our capability of intc[p] and engaging acft at greater dis from shore. Most of this flying will be conducted over extremely cold water, giving downed crews without immersion su[its] little chance for survival. In an effort to expedite the dev of a suitable immersion suit for intcp crews, req 25 suits of the improved version be made aval to ADC for opnl suitability tests at the EPD. Further, this hq would welcome the opportunity to discuss our particular problems as regards this

NBR
7-Jan56

M/R: Not Nec. SECRET 1 2

Lt.Col.Bray
2661

Lt.Col.J.W.Bray/hjd

COMEBACK COPY
O&T-B

ADOOT-B 2661

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COMDR ADC

SECRET

ROUTINE

COMDR ARDC BALTIMORE MARYLAND

X

(SECRET) ADOOT-B __________. (Contd) equip with interested pers of you comd. If convn for your staff, recm the fifth or sixth of Jan as a suitable dt for Jt conf.

SECRET 2 2

Lt.Col.J.W.Bray/bjd

ADOOT-B 2661

1305

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114 Doc 174 55a 1st p. msg. 107

(5) Survival equipment, suitable for terrain over which flight is to be conducted.

(6) Parachute.

(7) Cylinder, assembly, emergency oxygen, appropriate for type of equipment used.

d. Passengers, either military or civilian, will not be cleared to fly in jet aircraft unless equipped, properly fitted, and wearing the equipment specified in paragraph 4c.

5. Turn-In, Reporting, and Disposition of Serviceable Excess Personal Flying Equipment. a. When unit overages of personal flying equipment are turned in to an ADC base supply officer, every effort will be made by the base supply activity to effect lateral redistribution between ADC units within the base supply support area. If items are not required or authorized, further redistribution will be made as directed by the air division (def) and air defense force concerned.

b. After air defense force requirements have been satisfied, remaining excesses not authorized to be retained will be reported to Headquarters ADC, ATTN: ADMSV-3B. Under no circumstances will serviceable excesses be reported direct to AMC depots.

c. Excess reports will be prepared by the ADC base supply officer in six copies, using format of Attachment 1, which will be locally reproduced. Distribution will be as follows:

(1) Original and two copies, Headquarters ADC.

(2) Third copy, air division (def).

(3) Fourth copy, air defense force.

(4) Fifth copy, ADC base supply officer.

d. Excess items will be listed in Federal Stock Number sequence, and immediately under this number will be listed the old Air Force Stock Number. In instances of NSL items, full and complete nomenclature will be listed.

e. Under control number will be listed ADC Base Supply Account Number, and serial number of the report. Each report will bear a separate serial number, so that positive identification is established.

f. Separate reports will be submitted for each of the following categories of items:

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108
115

(1) Prime Depot Regulated.

(2) Headquarters Regulated.

(3) All others.

g. Excess parachutes are excluded from the above procedures and will be reported as outlined under paragraph 9, Section 11, Volume II, AFM 67-1.

h. Commanders, 4750th Air Defense Wing (Weapons) and 4600th Air Base Group, will report excesses direct to Headquarters ADC in accordance with instructions contained in paragraphs 6b, c, d, e, and f, except that only four copies of the report will be prepared. Original and two copies will be forwarded to Headquarters ADC.

i. On receipt of reports by Headquarters ADC, action will be taken to make redistribution command wide. Follow-up action should not be initiated by ADC base supply officers or air defense force headquarters concerned prior to thirty working days after reports have been submitted by the air defense force headquarters.

j. Shipping instructions issued by Headquarters ADC will be forwarded to the ADC base supply officer through his respective air defense force headquarters. If no requirement exists within ADC, listings will then be forwarded to AMC depot for final disposition instructions by letter of transmittal from Headquarters ADC. Information copies of the letter of transmittal will be forwarded to subordinate headquarters and ADC base supply officers concerned, and subsequent follow-up should be made direct to the depot after this information has been received.

k. After reports have been forwarded to AMC depots by headquarters ADC, and if final disposition instructions have not been received by the ADC base supply officer within ninety working days after leaving Headquarters ADC, he will effect shipment to the depot in accordance with paragraph 10a(4), Section 11, Volume II, AFM 67-1.

l. Commanders at all echelons must insure that once items have been reported excess they must be frozen from issue, except in cases of emergency, pending receipt of final disposition instructions. If emergency issues are made, it is mandatory that Headquarters ADC, ATTN: ADMSV-3B, be advised direct by priority message with information to respective air division (def) and air defense force headquarters, within eight working hours, of quantity issued, stock number and serial number and date of excess report. Headquarters ADC will approve such issues and notify AMC depots as required.

m. ADC units who obtain their logistical support from a base supply officer of another major air command will dispose of

116 109

excess serviceable personal flying equipment in the following manner:

(1) Units will report excesses on form prescribed in Attachment 1 to their immediate air division (def). Number of copies as required.

(2) The air division (def) will determine if items are required by other units, code listings and return, directing shipment.

(3) Shipping unit supply officer will prepare AF Form 104-C, make selection, pack, and make shipment by squadron aircraft or vehicle when practicable. If shipment cannot be made as outlined above, he will effect shipment through his base supply officer in accordance with Section 7, Volume IV, AFM 67-1.

(4) Where shipments are made by use of squadron vehicle or aircraft without going through the base supply officer, the receiving unit supply officer will sign one copy of the AF Form 104-C, acknowledging receipt, and return to the shipping unit supply officer within twenty-four working hours.

(5) Accounting for shipments outlined above will be in accordance with Volume IV, AFM 67-1.

(6) If excess items reported by a unit are not required by their air division (def), such reports will in turn be forwarded without delay to the air defense force headquarters. If a requirement exists, listings will be coded and returned to the unit, and shipment accomplished as outlined in paragraphs 5m(3), (4), and (5). If items are not required, unit will be directed to turn in equipment to their base supply officer.

6. Disposition of Repairable and Condemned Personal Flying Equipment. a. When possible, repair of equipment will be made by unit or base maintenance facilities.

b. Items which are beyond the capabilities of base maintenance repair will be reported direct to AMC depot in accordance with current directives.

c. Condemned items will be disposed of locally. Extreme care will be exercised by all concerned that condemned items are not shipped to depots as repairable items.

1308

117

7. Inspection, Maintenance, and Storage.

a. Unit commanders are responsible for insuring that each unit assigned jet aircraft maintains a current record as prescribed in Attachment 2 on all crew members who have been issued, fitted, and instructed in the use of the equipment specified in paragraph 4b.

b. Unit personal equipment officers are responsible for ascertaining that procedures contained in technical orders listed in Attachment 4, or changes thereto, on equipment issued to crew members or in storage, are complied with. Particular attention will be given to equipment listed under paragraph 4c, and necessary notations on all records will be made after each inspection has been accomplished.

c. ADC base supply officers will be responsible for insuring that all items of personal flying equipment in stock receive necessary inspection, maintenance, and storage as set forth in applicable technical orders. Particular attention will be given this equipment to insure that all modifications (TOC) have been accomplished on personal flying equipment prior to issue, and that equipment receives subsequent modifications (TOC) as required.

8. Semiannual Physical Inventory and Inspection.

a. During the months of June and December of each year, unit commanders will insure that a physical inventory and show-down inspection of personal flying equipment is accomplished within each fighter interceptor squadron and in each personal equipment pool, to determine that the equipment on hand is correctly maintained in a satisfactory condition.

b. On the next status report submitted after such inventories and inspections, the unit commander will personally certify on the reverse side of the "Personal Equipment Status Report" that inventory and showdown inspection was accomplished.

9. Personal Equipment Status Reports. Each month a status report will be submitted by each fighter interceptor squadron and all units maintaining personal equipment pools as outlined in Attachment 3. Reports will be retained for six months and then destroyed under paragraph 64, AFM 181-5.

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10. Reports Control Symbol. ADC-S19 applies to all reports. (ADMSV)

BY ORDER OF THE COMMANDER:

OFFICIAL:

GEORGE F. SMITH
Major General, USAF
Chief of Staff

Walter W. Robinson
WALTER W. ROBINSON
Colonel, USAF
Command Adjutant

4 Attachments:
1. Report of Excess Property
2. Individual Record of Issue, Personal Flying Equipment
3. ADC Personal Equipment Status Report
4. List of Applicable TO's

DISTRIBUTION:
A

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112

REPORT OF EXCESS PROPERTY

PAGE____

CONTROL NUMBER BASE DESCRIPTION REGULATED DATE

ITEM	STOCK NUMBER	MAJOR NOUN	UNIT	QTY	ADC ACTION	DEPOT ACTION

Attachment 1, ADCR 65-3, 22 January 1955.

119

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113

Record will be reproduced on a Card, 5" x 8"

INDIVIDUAL RECORD OF ISSUE, PERSONAL FLYING EQUIPMENT

NAME: GRADE: UNIT:

	Helmet P-Type	Oxygen Mask & Microphones	Gloves	Flying Suit Anti-G Type	Flying Suit Other	Survival Equipment	Parachute	Cylinder Assy, Emgy Oxygen		Signature Personal Equipment Off	REMARKS
Date Issue											
Date Fitted											
Date Instructed											
Date Inspected											
"											
"											
"											
"											
"											

Attachment 2, ADCR 65-3, 22 January 1955.

120

1312

121 114

"ADC Personal Equipment Status Report, RCS: ADC-S19 "

1. As of the 15th day of each month, a status report will be submitted by each fighter interceptor squadron and all units maintaining personal equipment pools. If the 15th day falls on Saturday, Sunday, or legal holiday, it will be submitted on the next working day. Report forms will be locally reproduced on 8 x 13" paper in the format prescribed herein. Preparation and submission of reports will be as follows:

a. Report will be prepared in five copies. Distribution of report will be as follows:

(1) Original and first copy for Headquarters ADC, through air defense force headquarters concerned.

(2) Second copy, air division (def).

(3) Third copy, air defense force.

(4) Fourth copy, unit submitting report.

(NOTE: Air defense force headquarters may authorize additional copies as required.)

b. Accomplishment of Columns "A" through "J" will be as follows:

(1) Column "A." List current stock number of reported item. Upon receipt of stock list change, pre-listed stock numbers will be corrected accordingly.

(2) Column "B." List noun and size of currently authorized item.

(3) Column "C." Total quantity of each size required to fit assigned crew members will be listed.

(4) Column "D." List total quantity of prime and authorized substitute items on hand by size as listed in column "B." Unserviceable items on hand being used due to lack of replacement items will not be included in column.

(5) Column "E." Indicate account number of supporting base supply officer.

(6) Column "F." Indicate requisition number support base supply officer used to requisition item from AMC depot.

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122

(7) Column "G." Indicate date requisition was submitted by support base supply officer to AMC depot.

(8) Column "H." Indicate quantity requested by support base supply officer on requisition as listed in column "F."

(9) Column "I." Indicate depot account number to which requisition was submitted.

(10) Column "J." List all action taken by depot, as listed on depot coded copy of returned requisition. When coded copy has not been received at time report is submitted, the notation "none to date" will be entered. Follow-up action including estimated dates of delivery will also be entered under this column.

c. The reverse side of reports made will also be used when necessary to include any remarks deemed necessary by the unit submitting reports.

d. Air defense force headquarters will review reports and take action deemed necessary. Original and first copy of the report will then be forwarded by one letter of transmittal covering all reports submitted by units under its respective command to Headquarters, Air Defense Command, ATTN: ADMSV-3B, to arrive not later than the 5th day of the subsequent month.

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116

Status Report of Flying Clothing and Equipment

Page________of______Pages

RCS: ADC________

No. Pilots Assigned and Attached:_______ Reporting Activity_________________________Date:_________________________

No. Crewmen. (Observers & CR/M): Ob: Cr/m______ _________________________

Item No.	A Stock Number	B Noun and Size	C Quantity Auth	D Qty on Hand Prime and Sub Item	Action Taken to Obtain Shortages and Replacement Items: E Requesting Base Supply	F Base Rqn No.	G Date of Rqn	H Quantity Requested	I Supplying Depot	J Depot Notation on Rqn
1.	8465-261-6906 8330-290453	Glasses, Fly, Sun, Type 2								
2.	8415-266-8180 8310-400750-221	Helmet, Fly, P-3 Sm								
3.	8415-266-8179 8310-400750-225	Helmet, Fly, P-3 Lg								
4.	8310-498000-221	Kit, Visor Assy Small								
5.	8310-498000-225	Kit, Visor Assy Large								
6.	8310-530000-221	Lens Visor Lg								
7.	8310-530000-223	Lens Visor Med								
8.	8310-530000-225	Lens Visor Sm								
9.	1790-2086558000	Microphone								
10.	5509-44D7586	Cylinder H-2								
11.	5509-AAF619200	Mask, Oxygen Large								

Page 3, Attachment 3, ADCR 65-3, 22 January 1955.

129

1315

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Subject: Status Report of Flying Clothing and Equipment, RCS: ADC__________ Page______of______Pages

	A	B	C	D	E	F	G	H	I	J
12.	5509-AAF619300	Mask, Oxygen Medium								
13.	5509-AAF619400	Mask, Oxygen Small								
14.	8415-265-7374 8310-782500-433	Suit, Fly, type K-2B S/S								
15.	8415-265-7375 8310-782500-435	Suit, Fly, type K-2B S/R								
16.	8415-265-7376 8310-782500-437	Suit, Fly, type K-2B S/L								
17.	8415-265-7377 8310-782500-443	Suit, Fly, type K-2B M/S								
18.	8415-265-7378 8310-782500-445	Suit, Fly, type K-2B M/R								
19.	8415-265-7379 8310-782500-447	Suit, Fly, type K-2B M/L								
20.	8415-265-7380 8310-782500-453	Suit, Fly, type K-2B L/S								
21.	8415-265-7381 8310-782500-455	Suit, Fly, type K-2B L/R								
22.	8415-265-7382 8310-782500-457	Suit, Fly, type K-2B L/L								
23.	8415-265-7383 8310-782500-465	Suit, Fly, type K-2B X/L/R								
24.	8415-265-7384 8310-782500-467	Suit, Fly, type K-2B X/L/L								

1316

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	A	B	C	D	E	F	G	H	I	J
38.	8415-261-6366 8310-779800-677	Suit, Fly, Anti- Exposure MK-4 36-Regular								
39.	8415-261-6365 8310-779800-679	Suit, Fly, Anti- Exposure MK-4 36-Long								
40.	8415-261-6362 8310-779800-774	Suit, Fly, Anti- Exposure MK-4 40-Short								
41.	8415-261-6363 8310-779800-776	Suit, Fly, Anti- Exposure MK-4 40-Regular								
42.	8415-261-6364 8310-779800-778	Suit, Fly, Anti- Exposure MK-4 40-Long								
43.	8415-261-6360 8310-779800-781	Suit, Fly, Anti- Exposure MK-4 40-X/Long								
44.	8415-261-6361 8310-779800-844	Suit, Fly, Anti- Exposure MK-4 43-Short								
45.	8415-261-6369 8310-779800-846	Suit, Fly, Anti- Exposure Mk-4 43-Regular								
46.	8415-261-6370 8310-779800-848	Suit, Fly, Anti- Exposure MK-4 43-Long								
47.	8415-261-6372 8310-779800-916	Suit, Fly, Anti- Exposure MK-4 46-Regular								

1317

118

Subject: Status Report of Flying Clothing and Equipment, RCS: ADC____________ Page________of________Pages

	A	B	C	D	E	F	G	H	I	J
25.	8415-261-7029 8310-780950-433	Suit, Fly, type G-4B S/S								
26.	8415-261-7030 8310-780950	Suit, Fly, type G-4B S/R								
27.	8415-261-7031 8310-780950-437	Suit, Fly, type G-4B S/L								
28.	8415-261-7032 8310-780950-443	Suit, Fly, type G-4B M/S								
29.	8415-261-7033 8310-780950-445	Suit, Fly, type G-4B M/R								
30.	8415-261-7034 8310-780950-447	Suit, Fly, type G-4B M/L								
31.	8415-261-7035 8310-780950-453	Suit, Fly, type G-4B L/S								
32.	8415-261-7036 8310-780950-455	Suit, Fly, type G-4B L/R								
33.	8415-261-7037 8310-780950-457	Suit, Fly, type G-4B L/L								
34.	8415-261-7038 8310-780950-463	Suit, Fly, type G-4B X/L/S								
35.	8415-261-7039 8310-780950-465	Suit, Fly, type G-4B X/L/M								
36.	8415-261-7040 8310-780950-467	Suit, Fly, type G-4B X/L/L								
37.	8415-261-6367 8310-779800-675	Suit, Fly, Anti- Exposure MK-4 36-Short								

96

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120

Subject: Status Report of Flying Clothing and Equipment, RCS: ALC____________ Page________of______Pages

	A	B	C	D	E	F	G	H	I	J
48.	8415-261-6371 8310-779800-918	Suit, Fly, Anti-Exposure MK-4 44-Long								
49.	8310-485900-431	Jacket, Fly, type MA-1 Small								
50.	8310-485900-441	Jacket, Fly, type MA-1 Medium								
51.	8310-485900-451	Jacket, Fly, type MA-1 Large								
52.	8310-485900-461	Jacket, Fly, type MA-1 X-Large								
53.	8310-483500-271	Jacket, Fly, type L-2B Size 34								
54.	8310-483500-291	Jacket, Fly, type L-2B Size 38								
55.	8310-483500-321	Jacket, Fly, type L-2B Size 40								
56.	8310-483500-331	Jacket, Fly, type L-2B Size 42								
57.	8310-483500-341	Jacket, Fly, type L-2B Size 44								
58.	8310-483500-351	Jacket, Fly, type L-2B Size 46								
59.	8310-483500-361	Jacket, Fly, type L-2B Size 48								

121

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Applicable technical orders pertaining to inspection, maintenance and storage of personal flying equipment:

(1) TO 14P3-4-1 - - - - - - - - - - - - - - Helmet, Type P-1 & P-3

(2) TO 15X-5-4-2-1 - - - - - - - - - - - - Mask, Oxygen

(3) TO 14P3-6-11 - - - - - - - - - - - - - Suit, Anti-G

(4) TO 14P-3-8-1 - - - - - - - - - - - - - Suit, Flying

(5) TO 14S2-2-1 - - - - - - - - - - - - - - Preservers

(6) TO 14D1-2-11 - - - - - - - - - - - - - Parachutes

(7) TO 15X-1-4-2-1 - - - - - - - - - - - - Cylinders, assy emergency

(8) TO 14S3-1-31 - - - - - - - - - - - - - Life Rafts

(9) TO 14S1-3-21 - - - - - - - - - - - - - Sustenance Kits

(10) TO 16-5-75 - - - - - - - - - - - - - - Microphones and Headsets

The above technical orders are the minimum essential that are required to be maintained by each personal equipment section, however, personal equipment officers should maintain such other publications as required. Technical orders and other administrative publications will be obtained as outlined in administrative technical orders or AFM 67-1.

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Will be Confirmed in Std Publication Form under par 3a, ADCSM

CONFIDENTIAL

COMDR ADC — PRIORITY

C/S HQ USAF WASH D.C. — X

X

COMDR 4750TH AIR DEF WNG (WPNS), YUMA CNTY APRT YUMA ARIZ — AFOOP-OP-R ALMAJCOM 337/55 — CONFIDENTIAL

(CONFIDENTIAL) ADOOT-C______________. UNRSG AFOOP-OP-R ALMAJCOM 337/55 dtd 14 Jan 55. The total no. of pers who must be TDY to meet the tng commitments of this comd are as fols:

Yuma Cnty Aprt, Arizona

FY55	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Offs	____	____	240	2[illegible]
Amn	____	____	1000	1200
FY56				
Offs	288	240	405	405
Amn	1200	1000	1800	1800
FY57				
Offs	405	405	432	[illegible]
Amn	1800	1800	1800	1800

CONFIDENTIAL 1

Capt Sanders/[illegible]

ADOOT-C [illegible]

5

Prepared by ______

Telephone ______

Date ______

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ADC HQ Form 11
Feb 54 Revised

1321

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ADOOT-C_______________. (CONTD)

FY58	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Offs	552	552	552	552
Amn	1800	1800	1800	1800

FY59	Total
Offs	2208
Amn	7200

Moody AFB, Georgia

FY55	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Offs	———	———	176	440
Amn	———	———	300	750
FY56				
Offs	440	440	264	352
Amn	750	750	600	800

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CONFIDENTIAL 2

Capt Sanders/bt

...)_______________
...epared by_______________
...ephone_______________

ADOOT-C 2727

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nder par 3a, ADCSM

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repared by Capt Sanders/bt
elephone 2727
ate Jan 55

ADOOT-C 0123. (CONTD) type of sqdn. At the present time and until the fourth qtr of FY57 Yuma will handle single place acft only. For the present until the 3rd Qtr of FY57 Moody will handle dual place acft only. When Buckingham opens Moody will close and Buckingham will train both single place and dual place sqdns. Stabilization occurs when each Wpns Empl Cen is able to train both types of acft in their proper proportion. To meet our rqrs each cen must have facs to handle 4 TDY sqdns per available tng pd.

M/R: Not necessary

5tt 22/1/55 JRCS

CONFIDENTIAL 5 5

Capt Sanders/bt

ADOOT-C 2727

C HQ Form 11
Feb 54 Revised

This correspondence is classified ______ in accordance with Par 24 a.6, AFR 205-1, 24 Jul 53, or for the reason (s) stated. Alfred Sanders Capt. USAF
SIGNATURE

M573-1

AF-ADC-COLO SPRINGS, COLO

1323

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MEMO FOR RECORD: This hq originally proposed the organization of an air defense group (weapons) and an air defense sq (weapons) at Moody AFB to carry out supervision of rocketing training of certain ADC units. USAF has stated the orgn of the group hq was [illegible] concurred, however, we could organize this unit at [illegible] msg is notification to Commander, 4750th Air Def Wg (Weapons) [illegible] decision to organize such a group, effective 18 Feb 55.

176

Unclassified

COMDR ADC

Routine

COMDR 4750TH AIR DEF WG (WEAPONS) YUMA
COUNTY AIRPORT ANNEX

7 Feb 55

RE-OD 177 Unclassified

(UNCLASSIFIED) ADORG ______________. Reference your msg RE-OD 177 dated [illegible] Jan 55. A GO is being processed which will dsg and org the 4750th Air Def Gru (Weapons) at Moody AFB effective on or about 18 Feb 55. 4750th Air Def Sq (Weapons) w/b asgd to this group and group w/b asgd to 4750th Air Def Wg (Weapons). Concurrent with organization of the group the 4750th Sq UMD w/b reduced to the original UMD of 47 Off and 210 Amn proposed for this unit. A new UMD is being prepared for the 4750th Air Def Gru which reflects the original group table minus the folg:

		Functional			Functional
1 Lt Col	[illegible]	[illegible]	1 A/1C	[illegible]	[illegible]
1 Maj	[illegible]	[illegible]	1 M Sgt	[illegible]	[illegible]
1 Maj	[illegible]	[illegible]	1 A/2C	[illegible]	[illegible]
1 Capt	[illegible]	[illegible]	1 A/2C	[illegible]	[illegible]
1 A/2C	[illegible]	[illegible]	1 A/2C	[illegible]	[illegible]
1 S Sgt	[illegible]	[illegible]	1 S Sgt	[illegible]	[illegible]

[illegible] was converted to [illegible] (Functional Code [illegible])

MEMO FOR RECORD AT TOP OF PAGE

Unclassified 1 2

Will be Confirmed in
Std Publication Form
Under par 34, ADORM

Lt Col Lewis/epd

7 Feb 55

3

1324

(UNCL) ARDCMD [illegible] (Cont'd)

		Functional Code
1 M Sgt	64173	42000
1 S Sgt	70250	47000
1 A/2C	70250	47000
1 S Sgt	43151W	80010
2 S Sgts	43151A	80010

Original group and UMDs referred to above were provided you by our ltr ARDCMD Subj: 4750th Air Def Gru (Weapons) Manning Documents dated 15 Dec 54. Total manpower allocation for these two units effective for Feb 55 reporting is 54 Off 340 Amn and 7 Graded Civs. New UMDs w/b furnd you when pubd. DCS/P this hq will issue appropriate pers instructions required as a result of organizing this group and reducing the 4750th Sq.

Comdr, ARDC

Unclassified 2 2

LT COL A W ARDCMD

ARDCMD [illegible]

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177

HEADQUARTERS
AIR DEFENSE COMMAND
ENT AIR FORCE BASE
COLORADO SPRINGS, COLORADO

ADOOT-B2

SUBJECT: (Unclassified) Aircraft Program for Weapons Employment Centers

TO: Commander
4750th Air Defense Wing
Yuma County Municipal Airport
Yuma, Arizona

1. In view of the rapidly changing aircraft requirements for the two Weapons Employment Centers, the USAF aircraft program (PX) has been unable to currently reflect aircraft allocations which meet your requirements. Therefore, we have prepared a proposed aircraft program for Yuma, Moody, and Buckingham on the basis of various correspondence between Headquarters USAF, Headquarters ADC, and your command plus informal information obtained on visits between this headquarters and your command. It was necessary to prepare these programs prior to receipt of firm aircraft programs from Headquarters USAF so that the Directorate of Manpower and Organization, Headquarters ADC, could calculate the future ADC personnel requirements through FY 59. Also, the amount of lead time necessary for procurement of aircraft, equipments, facilities, and personnel dictates that these requirements be established now.

2. In the attached programs, we have reflected a change from H-13s to H-19s at Yuma in 3rd Qtr FY 56 so as to provide a missile recovery and a greater rescue capability thenceforth. An SA-16 and two H-19s were programmed for Buckingham for the same purposes.

3. Since no Research and Development will be done at Moody AFB, request your detailed justification for five instead of three F-94Cs and F-89Ds. In view of the new ADC policy that all squadrons will provide three T-33s for target aircraft in Phase I and II training at Moody, request detailed justification for the eight T-33s. Your comments and recommendations pertaining to programming of other aircraft are solicited.

1326

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Hq ADC ADOOT-B2 Subj: (Unclas) Aircraft Program for Weapons Employment Centers

4. For your information allocation and programming of aircraft and flying hours is a function of the Programs and Plans Branch, Operational Plans Division, Directorate of O&T. Telephone calls pertaining to the above subjects should be made to extensions 2602, 2603, or 2604.

BY ORDER OF THE COMMANDER:

C Humphreys

3 Incls
1. Qtr End A/C Program, Yuma
2. Qtr End A/C Program, Moody
3. Qtr End A/C Program, Buckingham

M551-34

1327

Hq ADC, ADOOT-B2, Subject: (Uncl) Aircraft Program for Weapons Employment Centers

DW-DO (18 Feb 55) 1st Ind 2

HQ 4750TH AIR DEFENSE WING (WEAPONS), YUMA COUNTY AIRPORT, Yuma, Arizona

TO: Commander, Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado

1. Reference paragraph 3 of basic letter. The mission of the 4756th Air Defense Group (Weapons), Moody Air Force Base. Georgia, is to provide training for 2 fighter-interceptor squadrons and 16 controller-directors per month. To provide this training, 52 officers are presently authorized. Within this total of 52, there are 3 F-94C liaison crews, 3 F-89D liaison crews and 14 T-33 pilots. Of the remaining 26 officers, it is assumed approximately 90% or 24 will be on flying status.

a. F-94C and F-89D Aircraft. Planning must be made to accommodate two fighter-interceptor squadrons equipped with one type aircraft; i.e., F-94C or F-89D in training simultaneously. This will require an absolute minimum of 2 aircraft of one type in commission at all times. It is believed realistic to assume 4 aircraft of any one type must be assigned to assure 2 in commission at all times. It is therefore requested a minimum of 4 F-94C and 4 F-89D aircraft remain assigned to satisfy the liaison requirement.

b. T-33 Aircraft.

(1) Based on the present proficiency of most units arriving for training, Phase I for the aircrews has been almost deleted; however, Phase II training has been increased to approximately 10 days requiring 8 hours of target time per day per unit. This target time requires 10 hours of flying per T-33 aircraft, and in turn requires 2 T-33's to simulate a tow aircraft and target. To provide training for each unit, therefore, requires 200 T-33 flying hours or a total of 400 T-33 hours per month for 2 units. The Air Defense Command policy of having each squadron provide 3 T-33's for target aircraft will satisfy a portion of this requirement. Since these aircraft will fly some 10 hours in transit, it is believed realistic to assume approximately 40 hours per aircraft will be available for target purposes. This leaves a target support deficit of 160 hours per month to be furnished by T-33 aircraft assigned to the 4756th Air Defense Group (Weapons).

7471

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(2) In addition to the T-33 flying hour requirements outlined in paragraph 1b(1), compliance with minimum proficiency flying as directed by AFR 60-2 generates a requirement for additional flying hours. At present as stated above, approximately 44 jet qualified pilots are authorized the 4756th Air Defense Group. The bulk of flying proficiency minimum requirements are met while flying target support for tactical unit training; however, a minimum of 2 hours of instrument training and one hour and twenty minutes night flying proficiency per pilot per month requires 147 flying hours per month. It is believed approximately 10 hours of this amount can be accomplished in assigned interceptor aircraft. This leaves a deficiency to be satisfied by T-33 aircraft of 137 hours per month.

(3) Air Defense Command Letter 60-1, which requires pilot proficiency checks, is also accomplished as far as possible while performing target support flying; however, complete compliance requires approximately 10 hours per month T-33 flying time.

(4) To allow more efficient utilization of the training facilities at Moody by the tactical unit, a team of two individuals is dispatched to visit each unit approximately 30 days prior to its scheduled arrival. This team has proven very successful as evidenced by letters from commanders concerned. It is always highly desirable and in some instances mandatory these trips be made by T-33. This requires approximately 15 hours T-33 flying hours per month.

(5) The total requirement for assigned T-33 flying time at present while supporting 2 TDY units per month is therefore: (Exclusive of that furnished by 6 TDY T-33 aircraft, paragraph 1b(1)).

160 hours - TDY Phase I and II (paragraph 1b(1))
137 hours - (paragraph 1b(2))
10 hours - (paragraph 1b(3))
15 hours - (paragraph 1b(4))
32 hours - Plus 10% for test flights and transition
354 hours - Total

It is recommended 7 T-33 aircraft be assigned to satisfy this requirement.

1551-5

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Hq ADC, ADOOT-B2, Subject: (Uncl) Aircraft Program for Weapons Employment Centers

2. The total requirement established by this letter and summarized in paragraph 1b(5) does not include any administrative support or navigational proficiency flying. These will be supported by increased utilization of assigned aircraft.

3. Reference paragraph 3, last sentence, of basic correspondence. This headquarters recommends T-33 aircraft be programmed for the 4750th Air Defense Wing (Weapons) in accordance with letter this headquarters, DW-DO, dated 21 February 1955, Subject: Requirement for T-33 Aircraft.

FOR THE COMMANDER:

William G. Smith

3 Incls
n/c

WILLIAM G. SMITH
Major, USAF
Adjutant

1551-6X

1330

310.10

ADOOT-SC

22 APR 1955

SUBJECT: Aircraft Program for Weapons Employment Centers

COMEBACK COPY

TO: Commander
4750th Air Defense Wing (Weapons)
Yuma County Airport
Yuma, Arizona

Not requested, not furnished
Furnished 22 APR 1955 RM
(Date) (Initials)

1. Reference your 1st Indorsement, subject as above, dated 24 March 1955. This headquarters agrees in principle with the 4756th Air Defense Group's requirement for additional T-33 aircraft. However, it is impossible at present to augment the requirement because of the stringent distribution of T-33 aircraft throughout ADC.

2. The requirement for F-94C and F-89D aircraft at Moody presents no serious problems as these aircraft are readily available in the quantity requested (four of each type). Currently five each of these aircraft are assigned to the 4756th Air Defense Group.

3. There is little or no prospect of an improvement in the eastern T-33 allocations within the near future. In view of this fact it is recommended that action be taken along the following lines. There are sixteen T-33 aircraft assigned to Yuma and only four to Moody. The stated requirement for T-33 flying at Yuma is 756 hours per month (reference your letter [illegible] dated 21 February 1955, Subject: "Requirement for T-33 aircraft"). For Moody the total requirement (exclusive of that furnished by six TDY T-33 aircraft) is 384 hours. In short, the ratio of aircraft to flying hours required at Yuma is approximately twice that at Moody.

4. Yuma commitments are appreciably higher than those at Moody, so some incompatibility in these ratios is acceptable; however, it is recommended that two T-33's be transferred from Yuma to Moody. This total should not adversely affect the Yuma operations to any extent, but it should assist Moody considerably.

BY ORDER OF THE COMMANDER:

MEMORANDUM FOR THE RECORD: not necessary

RECTOR C. DACUS
Captain, USAF
Asst Command Adj

E-9781

DO
W/C Westlake/lo-adg
2603-2-4
19-20 Apr 55

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M551-1

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84

FILE NUMBER 310.10 [illegible]

180

DOC 180 ADDN 55a

6 JAN 1955

[illegible] General Morris R. Nelson
[illegible]
[illegible] Air Defense Force
[illegible] Air Force Base
[illegible], New York

[illegible] Hollis:

General Chidlaw has asked that I answer your letter of 18 October [illegible].

Since the rocketry program first started, there has been a shortage [illegible] aircraft. We have had a requirement in to USAF for some time for [illegible] speed, high altitude tow vehicle of the B-47 type, and present [illegible] information has led us to believe that this requirement will [illegible]. Because it would be approximately 18 months after USAF approval [illegible] the first B-47 is received, B-29 tow aircraft have been accepted [illegible] interim basis. Since there are only a few of these available, [illegible] to be utilized where they will benefit the entire command in [illegible], at the Weapons Center. Eight of these B-29's will be [illegible] from ADC Radar Evaluation (REF) units, reducing to an absolute [illegible] the number available for this assignment. In view of this, I [illegible] believe it is advisable to modify for tow any of the remaining [illegible].

The problem of targets and ranges continues to plague us. At this [illegible] the 9 x 45 banner target appears to be the best solution for the [illegible]; it provides an area large enough to hit with reasonable [illegible] and produces a sufficiently large photographic image whereby [illegible] rocket pattern may be assessed. We are continuing our efforts [illegible] a target which can be towed by [illegible] aircraft, since we believe [illegible] this type target provides the most promising solution to the unit [illegible] problem. We have placed an urgent requirement for a frangible target [illegible] have received USAF assurance that the first procured item will go [illegible] for test. The Navy [illegible] target is another possible solution [illegible] we are investigating. The problem of assessment on such targets [illegible] not be resolved until we have had an opportunity to work with them.

We have been unable to determine the minimum size range on which [illegible]-to-air rocketry may be fired safely. Conflicting reports on the

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538-1 AF-ADC-COLO. SPRINGS, COLO

1333

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CONFIDENTIAL

[illegible] General Morris R. Nelson

[illegible] distances of rockets after firing have prevented our [illegible] this problem. Data are now being correlated, and we expect [illegible] of the operation shortly.

[illegible] AF has approved a second AIR Weapons Center to be located at [illegible] Myers, Florida. At this base we plan to schedule units from the eastern portion of the command, while Yuma will take care of the western [illegible]. The unit will be similar in operation to Yuma and will augment [illegible] rocketry program to the extent that we will be able to guarantee [illegible] of the fighter-interceptor squadrons one month of rocketry firing [illegible] year.

Since the Fort Myers Center will not be in operation until the [illegible] part of Fiscal Year 1957, we have formulated an agreement with [illegible] whereby we will establish an interim second Weapons Center on their [illegible] at Moody AFB, Georgia. Present plans are that this unit will begin [illegible] in February 1955 on a two-squadron-per-month (F-94C and F-89D) [illegible].

Sincerely,

KENNETH P. BERGQUIST
Major General, USAF
DCS/Operations

M/R: This ltr was rewritten; the same coordination was used, since rewrite did not involve change of policy or meaning expressed in original letter.

J-19381
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Maj Chandler/gji
2727
31 Dec 54

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Log Plans
Hq Sq Sec
FCDA
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SUBJECT: Report of 1954 Annual Fighter Symposium (Uncl)

TO: Director of Operations
Headquarters USAF
Washington 25, D.C.

In reference to letter, your headquarters, AFOOP-OC-F, subject as above, dated 6 January 1955, the discussion outlines contained in subject report have been reviewed by this headquarters. Comments and recommendations to seminar group recommendations (pages 2 through 7 of the 1954 Fighter Symposium report), as applicable to this command, are contained in Inclosures 1 through 6. In addition, comments are included for those group studies which are indirectly related to problem areas peculiar to this command.

FOR THE COMMANDER:

Incls:
1- Tab I, Seminar I
2- Tab II, Seminar II
3- Tab III, Seminar III
4- Tab IV, Seminar IV
5- Tab V, Seminar V
6- Tab VI, Seminar VI

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GEORGE F. SMITH
Major General, USAF
Chief of Staff

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SIGNATURE

AF-ADC-COLO SPRINGS, COLO

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TAB I

SEMINAR I

The Use of Fighter Weapons Systems
for Air Defense of Forward Areas

1. Reference paragraph (6). Self-contained starter units for programmed aircraft is a highly desirable feature. Existing ground starter units are expensive, over-burden support requirements, and restrict aircraft deployment. However, installation of a self-contained starter unit must not impair performance characteristics of the aircraft.

2. Reference paragraph (7). The need for an optical lead-pursuit sight in aircraft utilizing collision course computer is fully concurred in. Letters to USAF established requirements of this command for currently assigned tactical aircraft. The K-14 sight is scheduled for installation in the F-86D during the forthcoming F-86D communication and electronics modernization program. (References: Letters, this headquarters, subject: "F-86D Electronic Configuration Proposal," dated 12 August 1954; subject: "Electronic Configuration of the F-89D/H," dated 12 August 1954; subject: "Electronic Configuration of the F-94C," dated 30 August 1954.

3. Reference paragraph (8). The requirement for alternate armament for all-weather interceptors was contained in letter submitted to USAF, subject: "Increasing Kill Effectiveness of Augmentation Aircraft," dated 1 September 1953.

4. Reference paragraph (9). The current ADC radar improvement program requires an eventual phasing out of the AN/TPS-1D equipment; therefore, further modification of such equipment is not desirable. The program establishes requirements for improvements to and/or replacement of present operational radars. By CY 1960 the ADC radar capability against jet type aircraft will be from 500 to 100,000 feet in altitude and line-of-sight ranges. FPS-14 gap filler radar is presently programmed for this command. No requirement exists at this time for the AN/MPS-20 radar.

5. Reference paragraph (10). During the latter part of 1954, a CONAD Close Support Plan was developed by representatives of the United States Air Force Security Service (AFSS) and the Office of DCS/I, CONAD. This plan provides for the utilization of nine detachments under the 8th Radio Squadron Mobile (RSM) for the collection of communications intelligence for the purpose of close support. Seven of the nine detachments are either installed or in the process of being installed. The plan itself has been approved by Commander in Chief, CONAD, and returned to Headquarters AFSS for submission to the National Security Agency for

final approval. There is already a limited capability for the [illegible] of close support through utilization of the seven det[illegible] [illegible]. Upon installation of the two additional detachments, [illegible] security officers at each of the Joint Air Defense Division [illegible] within CONAD, and full implementation of the [illegible] close support, the capability for close support should be increased considerably.

6. Reference paragraph (11). The need for providing [illegible] with a limited night fighter capability was established in letter [illegible] USAF, subject: "Increasing Kill Effectiveness of [illegible]," dated 1 September 1953.

7. Reference paragraph (13) (a). Providing less contrast between airfield structure and surrounding landscape must be tempered by insuring sufficient runway references are provided for all-weather operations.

8. Reference paragraph (13) (g). Underground storage of [illegible] and ordnance will materially decrease the vulnerability of these critical supplies. However, hydrant refueling is inhibitive due to vulnerability and time-consuming reservicing. Hydrant refueling is expensive, lacks mobility, and its capability in winter operations is limited. (Reference Confidential letter to Chief of Staff, Operations, Headquarters [illegible], File ADHCS 452.1, subject: "Hi-Speed Hydrant Refueling, Air Defense Command," dated 8 September 1953.)

9. Reference paragraph (14). "No Go" lines of demarcation offer a distinct advantage to the immediate application of tactical units. The depth of such a buffer zone would be dependent upon distance of priority targets from the recognized border of the potential enemy. Military and political ramifications must be considered, in that potentially hostile aircraft entering such a buffer zone, although identified, would be closer to critical target areas. In this respect, our forces would be "giving ground". Also, such a zone may encourage border over-fly at low altitudes, thus offering the potential enemy a new propaganda medium.

10. Concur with Seminar I, Recommendations (2) and (3). Remaining recommendations are not compatible with the ADC mission; therefore, no comments are offered.

11. In addition to recommendations enumerated in paragraph (13), recommend that consideration be given to construction of bomb shelters in the proximity of working areas to provide protection for essential personnel from conventional and nuclear explosions.

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1337

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TAB II

SEMINAR II

Future Requirements for Fighter Special Weapons Delivery

1. Reference paragraph (11). This command will not require celestial navigational training prior to the advent of a long-range fighter-interceptor; however, the training responsibility as required should be assigned to the Air Training Command. ADC Special Weapons delivery training can be accomplished within the training capabilities of current ADC resources.

2. Reference paragraphs (12), (15), and (21). Requirements have been submitted by this headquarters in letter, subject: "Nuclear Armament for Interceptors," dated 31 January 1952. ARDC Project 5784 (development of the Ding Dong weapon) includes necessary aircraft and fire control system modifications. This project also includes development of a suitable practice weapon.

3. Reference paragraph (17). The determination for an AFSC suffix to identify sufficiently all individuals trained for nuclear weapons cannot be ascertained at this command level. However, some means of specific identification must be made.

4. Reference paragraph (19). Concur with requirement for simplification for weapons handling, storage, loading, testing, and in-flight monitoring. This is currently a WADC project.

5. Reference paragraph (20). Future nuclear armament must be compatible with the performance characteristics of future interceptors. Future medium and long range interceptors will be required to operate at speeds as high as Mach number 3.0 and altitudes of 80,000 feet.

6. Concur with Seminar II, Recommendations (2), (5), (6), (9), and (24). Remaining recommendations are not within the scope of ADC concepts or do not pertain to command equipments; therefore, no commentaries are offered.

1338

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TAB III

SEMINAR III

Aircrew Retention

1. Reference paragraph (1). This command is not in accord with unit rotation of all-weather interceptor squadrons for the following reasons.

   a. The command operational capability is weakened by the loss of a fully trained organization and the time lag inherent in replacement by the unit from overseas.

   b. The instability factor introduced throughout the command in manning an organization preparing for overseas movement.

2. Reference paragraph (3). Recommend that every effort be made by USAF to initiate necessary personnel readjustments for aircrews prior to their assignment to tactical units. This would minimize transfer of combat qualified personnel from the tactical commander to fill officer school quotas.

3. Reference paragraph (4). The major portion of existing bachelor officers' housing is not in keeping with acceptable environment standards. Reasonable standards of "adequacy" should be provided.

4. Reference paragraph (5). Personnel ramifications were taken into consideration in the placement of F-89 units within this command. However, the high "kill potential" of this aircraft dictated its placement to form a closely knit defense of the target complex.

5. Reference paragraph (6). This command is in full accord in return of historically significant numerical unit designations to the field. This desire was contained in the "Project Arrow" study initiated by this command. Headquarters USAF has been requested to redesignate fighter units within this command, effective 8 July 1955. (Reference letter, subject: "Redesignation of ADC Units (Project Arrow)," dated 14 February 1955.

6. Reference paragraph (7). Headquarters USAF has approved unrestricted use of radar observers in the AC&W system and further progression to the AEW&C system.

7. Reference paragraph (8). There is no existing need for a more positive identification of fighter pilot skills within this command. ADC interceptor pilots are categorized in two areas:

   a. F-86D pilots (AFSC 1124C).

   b. F-94 and F-89 pilots (AFSC 1124B).

M531-5

1339

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It is anticipated that these designated categories will be adaptable to pilots of programmed aircraft. For example, it is assumed that the F-86D pilot is capable with minimum training to become combat qualified in the F-102.

8. Reference paragraphs (9) and (10). This command requested and received an increased grade structure for all-weather pilots in our fighter units. This command does not concur in a spot promotion system for any commands except during the time of hostilities.

9. Reference paragraph (11). The establishment of maximum tours within the AC&W field is recommended only for those tactical aircrews who are assigned to AC&W units against their desires. The rotation of personnel from AC&W units on a maximum tour basis would seriously hamper the effectiveness of the AC&W network.

10. Reference paragraph (12). The demand for a more effective and vigorous dependents' assistance program has been realized and is being emphasized within this command.

11. Reference paragraph (13). The recently enacted legislation to increase military pay is based on a job to be performed. A bonus system, per se, is not concurred in.

12. Reference paragraph (18). Present obligated tours of active duty allow all-weather pilots to leave the Air Force at the time they attain a fully qualified proficiency status. This command is in agreement with the need for a longer obligated tour of duty.

13. Concur with Seminar III, Recommendations (2), (14), (15), (16), (17), (19), and (20). Remaining recommendations do not pertain to command equipments; therefore, no comments are offered.

TAB IV

SEMINAR IV

System Needed to Assure Adequate Fighter Support Requirements

1. Reference paragraphs (1), (2), (3), (8). Recommendations contained in these paragraphs are highly concurred in and are considered to be dire essentials for any weapon to develop full value. The inability to receive adequate support equipment in the past has adversely affected the mission of the Air Defense Command.

2. Reference paragraph (4). Contractor's Field service representatives have been provided this command upon receipt of new weapons systems. Field service representatives and on-the-spot maintenance teams have been provided by AMC in launching the F-84F and F-100 weapons systems. This procedure will be followed as other future fighter weapons systems are initially delivered to using activities.

3. Reference paragraphs (5), (6), (7). Concur in these recommendations; namely, that:

a. Fighter units continue to be organized as T/O units;

b. Non-T/O augmentation be authorized where necessary to meet local requirements;

c. Action on T/O change requests be expedited.

4. Reference paragraph (9). This command is in full accord with revising IRAN policy to include compliance with outstanding Technical Orders. The present system allows TOC's to accumulate while an aircraft is undergoing IRAN; therefore, the aircraft poses a maintenance burden upon its return to the organization. AMC has reflected their interest in this matter in correspondence proposing change in IRAN policy to comply with all outstanding TO's.

5. Reference paragraph (11). A definite requirement exists for providing shelter space for aircraft so that crews may perform radar and aircraft maintenance under adverse weather conditions. Most ADC tactical units are located in areas where inclement weather conditions prevail. This requirement has been established to Headquarters USAF.

6. Reference paragraph (14) and (15). Hydrant refueling offers a ready source of fuel available to the flight line. Its advantages are limited to refueling trailers in proximity to the aircraft, thus reducing turn-around times. Refueling units have a distinct advantage in mobility of operations, therefore should remain the prime refueling source. (Note paragraph 8, Tab I, this report.)

1531-7
Incl 4[3]

1341

7. Reference paragraph (16), (17), and (18). This command is in full accord for the review of personal equipment requirements. Equipment currently being utilized by ADC aircrews, such as the G-4B and Mark IV anti-exposure suit, is not suitable for performing alert duties. T-1 pressure suits contain numerous disadvantages, inasmuch as they are not conducive for wear during extended periods of alert, cannot be readily donned, and are restrictive to vision and movement. (Reference letter, this headquarters, to Director of Requirements, Headquarters USAF, subject: "Qualitative Operational Requirements for Anti-Exposure Suit," dated 7 February 1955.)

8. Concur with Seminar IV, Recommendations (12) and (13). Remaining recommendations do not pertain to this command; therefore, no comments are offered.

TAB V

SEMINAR V

Aircrew Training

1. Reference paragraphs (2), (3), and (5). Crew Training Air Force has recently lengthened flying courses to increase the quality of the aircrew product. An ADC/ATC conference was conducted on 14 March 1955 to review further training programs as applicable to this command and make recommendations to increase the caliber of the Air Training Command product.

2. Reference paragraph (4). Proficiency training programs established by this command require approximately twenty-five hours of flying time per month in unit-equipped aircraft. These programs are directed toward insuring a high state of individual combat effectiveness.

3. Reference paragraph (6). This command is in full accord for a top priority in procurement of weapons ranges. Existing schedules, utilizing Yuma and Moody rocketry centers, allow each tactical unit to fulfill rocket firing requirements only once each year. Rocket firing should be accomplished each month in order to maintain the level of proficiency attained at rocketry centers.

4. Reference paragraphs (8), (10), and (11). TF aircraft are required by tactical units to facilitate initial transition and instrument training programs in the modern high speed aircraft. Current trainer aircraft and the universal trainer concept are not representative of the characteristics and procedures peculiar to unit-equipped aircraft.

5. Reference paragraph (9). Simulators should be provided the tactical unit a minimum of 60 days prior to conversion of aircraft. Simulators should be of similar design in cockpit configuration to the programmed UE aircraft. Representatives of this headquarters attended a USAF conference on 18 January 1955, convened to determine procedures for planning and managing flight simulator procurement, development, production, and modification. AMC and ARDC were given primary responsibilities in these areas.

6. Remaining recommendations in Seminar V do not pertain to this command; therefore, no comments are offered.

1343

TAB VI

SEMINAR VI

Role of Fighter Aircraft in Future Tactical Air Operations

1. Reference paragraphs III b (page 39) and f (page 41). It is stated that three basic types of fighter aircraft are required, one of which is the all-weather fighter. Yet, no conclusion was formulated to indicate that the present TAC and SAC fighter force structures do not include all-weather fighters, nor is there a recommendation to the effect that such fighters be provided in the TAC and SAC force structure. The minimum all-weather fighter forces for all theaters of operation should be determined and programmed over and above ADC requirements. ADC cannot and should not furnish these force requirements for limited wars.

2. Reference paragraph III d (page 40). Two additional military characteristics for the day fighter which should be included among the important requirements are as follows:

a. Improved day fighter armament, such as air-to-air atomic rockets and IR missiles, should be exploited to the maximum for defense against enemy bomber forces. The smaller family of missiles may provide a greater kill capability against fighters than gun type armaments.

b. The necessity exists for day fighters to operate with the tactical ground environment for intercept. Experience indicates that the electronic configuration of the aircraft is one of the major problem areas and can affect the weapon design.

3. Reference paragraph III e (page 41). The air defense of the continental United States is a relatively simpler task than the defense of TAC or SAC overseas battle zones. Yet, the "State of the Art" is falling far short in meeting ADC requirements. It is desirable to obtain the best all-weather fighter that is technically possible in any time period. Consequently, national resources should not be expended in duplicating efforts providing another type all-weather interceptor for TAC and SAC theater task forces. The all-weather fighter of the TAC and SAC theater task forces should be the ADC medium range interceptor of the time period. Modifications as required for compatibility with the TAC ground environment must necessarily be made. The armament configuration must be versatile enough to have some capability against smaller-sized targets (fighter-bombers) as well as medium and heavy bombers.

1344

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DOCUMENT TO ROLL INDEX

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Frame Number	Classification Number	Date Period	Vol.	Pt.	Title	Security Classification	Remarks
4	K410.01-6	Jan-Jun-55	1		History Air Defense Command	S/RD	
482		Jan-Jun-55	2			S	
792		Jan-Jun-55	3			S	
1154		Jan-Jun-55	4			S	
1347	K410.01-6	Jan-Jun-55	5		History Air Defense Command	S/RD	
1529	Index				Index		

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Page 1 of 1 Roll Number K4009

1529