

FILE NUMBER 304.1

302 JUN 57

14 JUN 1957

ADR-1-0

SUBJECT: SAGE/COMARC Crosstie

TO: Commander
4620th Air Defense Wing (Dep SAGE)
Lincoln Laboratory
Lexington 73, Massachusetts

1. Transmitted herewith as Inclosure 1 are two copies of a plan for cross-tying COMARC bases with SAGE direction centers. This plan may be used for establishing communication circuits required for frequency division data link only. When time division data link is introduced, a re-evaluation will be required to determine crosstie and communication requirements.

2. This plan has been coordinated with COMAD and represents firm planning for crossties indicated. However, COMAD has recommended additional crossties as indicated in Inclosure 2 hereto. It is requested that the technical feasibility of these additional crossties be determined by your Headquarters as soon as practicable so that amendments to the plan may be made as required.

BY ORDER OF THE COMMANDER

COMEBACK COPY

Not requested, not furnished
Furnished 14 JUN 1957
(Date) (Initials)

2 Incls

- Plan for cross-tying COMARC Bases with SAGE Direction Centers - 2 cys (SECRET)
- Cross-tying COMARC Bases with SAGE Direction Centers - 2 cys (SECRET) (COMAD plan)

Copy furnished:
ADES Project Office
COM/O Hq USAF

Inclosures not needed for AF file

H. I. TOSO
Capt, USAF
Asst Command Adj

E-17888
E-17889
E-17890

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correspondence is classified per para 30 b, AFR 205-1, or for reason(s) stated.

WRITER: Lt/Col K. A. Tyler/js	OFFICE CODE: A-R-I-0	DATE: 14 June 57	TEL NO: 2669	FANFOLD NUMBER AND SUSPENSE DATE
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ADC HQ FORM 11 (4730) 18 MAR 57 PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE MEMO FOR RECORD: NONE SEE REVERSE

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ADRSI-D, Hq ADC, 5 Apr 57, Subj: Communication Crosstie for
BOMARC/SAGE Integration (U)

COOPR

1st Ind

5 JUN 1957

Hq Continental Air Defense Command, Ent AFB, Colorado Springs, Colo.

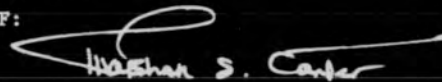
TO: Commander, Air Defense Command, Ent AFB, Colorado Springs, Colo.

1. The concept for Communications Crosstie between BOMARC bases and SAGE centers as set forth in your letter and study is generally concurred in. A detailed examination of the plan attached to your letter reveals the possibility of improving the BOMARC defense potential around the periphery, as well as the defense capability for targets on the East Coast against an attack from the North across Canada.

2. Informal discussions have been held with appropriate staff officers of your headquarters, as a result of which it appears that certain changes to your plan, which would improve its overall efficiency, may be feasible. A revised plan, incorporating these changes, has therefore been drawn up and is attached as Inclosure 3.

3. Subject to your determination of the feasibility of the said changes, the attached revised plan should be the basis for your further actions to implement this concept.

FOR THE COMMANDER-IN-CHIEF:



3 Incls
1 & 2 n/c
Added 1 Incl
3. Revised BOMARC Crosstie
Plan (5 cys)

MARSHALL S. CARTER
Major General, USA
Chief of Staff

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HEADQUARTERS
AIR DEFENSE COMMAND
UNITED STATES AIR FORCE
ENT AIR FORCE BASE, COLORADO

TEL: MELROSE 2-5511
EXT _____

5 APR 1957

[Faint, mostly illegible typed text, likely a memorandum or report]

Marshall S. Roth

MARSHALL S. ROTH
Major General, USAF
Chief of Staff

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KEY:

Column A. PCIMRC (ADMB) Bases connected to
Column B. Direction Centers (DC)

Column C. Direction Center (DC) Connected to
Column D. PCIMRC (ADMB) Bases (ADMB)

A	B	C	D
McGuire ADMB, New Jersey (Sep 1953)	New York DC Washington DC Syracuse DC Boston DC	New York DC	McGuire ADMB Suffolk County ADMB Otis ADMB
Suffolk Co ADMB, New York (Dec 1953)	New York DC Boston DC		
Otis ADMB, Massachusetts (Feb 1960)	Boston DC New York DC	Boston DC	Otis ADMB Dow ADMB Suffolk Co ADMB McGuire ADMB
Dow ADMB, Maine (Jun 1960)	Bangor DC Boston DC	Bangor DC	Dow ADMB Hattisburg ADMB Ottawa ADMB
Niagara Falls ADMB, New York (Aug 1960)	Syracuse DC Detroit DC North Bay DC	Syracuse DC	Niagara Falls ADMB Pittsburg ADMB Hattisburg ADMB McGuire ADMB

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A	B	C	D
North Bay ADMB	North Bay DC Sault Ste Marie DC	North Bay DC	North Bay ADMB Ottawa ADMB Kinross ADMB Niagara ADMB Plattsburg ADMB
Plattsburg ADMB, New York (Sep 1960)	Bangor DC Syracuse DC North Bay DC	Detroit DC	Pittsburg ADMB Kinross ADMB Niagara ADMB Bunker Hill ADMB
Ottawa ADMB	North Bay DC Bangor DC		
Kinross ADMB, Michigan (Nov 1960)	Sault Ste Marie DC Detroit DC* North Bay DC	Sault Ste Marie DC	Kinross ADMB K. I. Sawyer ADMB Truax ADMB North Bay ADMB
K. I. Sawyer ADMB, Michigan (Dec 1960)	Sault Ste Marie DC Duluth DC		
Langley ADMB, Virginia (Dec 1960)	Washington DC Raleigh DC	Washington DC	Langley ADMB Seymore-Johnson ADMB McGuire ADMB Pittsburg ADMB
Truax ADMB, Wisconsin (Feb 1961)	Chicago DC Sault Ste Marie DC	Duluth DC	Duluth ADMB Grand Forks ADMB K. I. Sawyer ADMB

* The tie-in to Detroit should be implemented only if the North Bay DC is not in operation in time to meet the installation of Bomarc at Kinross.

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A	B	C	D
Paine ADMB, Washington (Apr 1961)	Seattle DC Spokane DC Portland	Seattle DC	Paine ADMB Portland ADMB Geiger ADMB
Portland (St Paul) ADMB, Ore. (May 1961)	Portland DC Seattle DC	Portland DC	Portland ADMB Klamath ADMB Paine ADMB
Hamilton ADMB, California (May 1961)	San Francisco DC Los Angeles DC	San Francisco DC	Hamilton ADMB Klamath ADMB Ft Ord ADMB
Oxnard ADMB, California (Jul 1961)	Los Angeles DC San Bernardino DC	Los Angeles DC	Oxnard ADMB Ft Ord ADMB Hamilton ADMB San Diego ADMB
San Diego ADMB, California	San Bernardino DC Los Angeles DC	San Bernardino DC	San Diego ADMB Oxnard ADMB Williams ADMB
Ft. Ord ADMB, California	San Francisco DC Los Angeles DC		
Bunker Hill ADMB, Illinois	Chicago DC Detroit DC	Chicago DC	Truxax ADMB Bunker Hill ADMB

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A	B	C	D
Pittsburg ADB, Pennsylvania	Detroit DC Syracuse DC Washington DC		
Duluth ADB, Minnesota	Duluth DC Grand Forks DC		
Sioux City ADB, Iowa	Sioux City DC Grand Forks DC	Sioux City DC	Sioux City ADB McConnell ADB
Grand Forks ADB, North Dakota	Grand Forks DC Duluth DC Minot DC	Grand Forks DC	Grand Forks ADB Minot ADB Duluth ADB
Cut Bank ADB, Montana	Great Falls DC Gibson DC	Great Falls DC	Cut Bank ADB Gibson ADB Minot ADB Geiger ADB
Gibson ADB, Montana	Great Falls DC Minot DC	Minot DC	Minot ADB Gibson ADB Grand Forks ADB
Minot ADB, North Dakota	Minot DC Grand Forks DC Great Falls DC	Gibson DC	Geiger ADB Cut Bank ADB Inaie ADB

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A	B	C	D
Klamath ADB, California	Portland DC San Francisco DC		
Geiger ADB, Washington	Spokane DC Seattle DC Great Falls DC		
McConnell ADB, Kansas	Kansas City DC Sioux City DC	Kansas City DC	McConnell ADB Ardmore ADB Amarillo ADB
Ardmore ADB, Oklahoma	Kansas City DC Sawyerport DC	Sawyerport DC	Billington ADB New Orleans ADB Ardmore ADB
Amarillo ADB, Texas	San Angelo DC Kansas City DC	San Angelo DC	Amarillo ADB Lubbock ADB Reese ADB
Reese ADB, Texas	San Angelo DC Albuquerque DC	Albuquerque DC	Biggs ADB Reese ADB
Biggs ADB, Texas	Albuquerque Phoenix DC	Phoenix DC	Williams ADB Biggs ADB

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	B	C	D
Laughlin ADMB, Texas	San Angelo DC San Antonio DC	San Antonio DC	Laughlin ADMB Ellington ADMB
William ADMB, Arizona	Phoenix DC San Bernardino DC		
Ellington ADMB, Texas	Shreveport DC San Antonio DC		
New Orleans ADMB, Louisiana	Montgomery DC Shreveport DC	Montgomery DC	New Orleans ADMB Tyndall ADMB
Campbell ADMB, Tennessee	Fort Knox DC St. Louis DC	Fort Knox DC St. Louis DC	Campbell ADMB Campbell ADMB
Pinecastle ADMB, Florida	Atlanta DC	Atlanta DC	Pinecastle ADMB Tyndall ADMB Charleston ADMB
Tyndall ADMB, Florida	Montgomery DC Atlanta DC		
Charleston ADMB, South Carolina.	Raleigh DC Atlanta DC	Raleigh DC	Seymore-Johnson ADMB Charleston ADMB Langley ADMB
Seymore-Johnson ADMB, North Carolina.	Raleigh DC Washington DC		

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

DOC. 303 ADCHR 57A

ADRSI

SUBJECT: (U) ADC Employment Plan for BOMARC

TO: Deputy Chief of Staff, Development
Headquarters USAF
Washington 25, D. C.

1. References:

a. Letter, Headquarters USAF, Subject: IM-99/
SAGE Integration, dated 19 December 1956.

b. Letter, this Command to Headquarters USAF,
ADRSI-D, Subject: (U) IM-99/SAGE Integration, dated 11
January 1957.

2. During the week of 18-21 February 1957, personnel from Headquarters USAF, ARDC, ADC, APGC, AFSWC, Lincoln Laboratory, Boeing, RAND, Burroughs and IBM met to produce an ADC document describing the employment of the BOMARC missile with SAGE. The document, "Employment of BOMARC (IM-99) in the SAGE Era, Revision #1, dated 21 February 1957," describes the manner that ADC plans to use the IM-99A. A limited distribution of the BOMARC employment plan has been made; subsequent distribution of the plan will be made to all interested agencies in the near future.

3. The operational procedures, methods of employment of BOMARC, deployment and description of equipment are covered in detail in the BOMARC employment document referenced in paragraph 2.

4. A brief of the ADC employment plan is attached as Inclosure #1. The brief covers only the SAGE-BOMARC relationships and does not cover the missile or SAGE descriptive information.

5. The areas which require further action in order to obtain the operational capability described in the BOMARC employment document are covered as separate items. A discussion of the following items are attached as Inclosures 2 through 4:

RM-58-4174

[REDACTED]

Hq ADC, ADRSI, Subj: (U) ADC Employment Plan for BOMARC

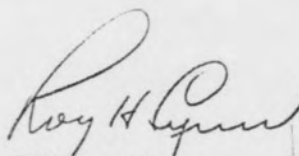
- a. Mark X and SIF.
- b. Data Link.
- c. AN/FSQ-7 Computer Programming and Console Equipment.

6. This data has been compiled to explain the ADC concept of operation of BOMARC with SAGE. Implementation of this BOMARC Employment Plan will provide a SAGE/BOMARC capability at the earliest possible date with a minimum degradation of overall air defense capability.

7. It is recommended that this plan be approved for implementation and that required action by all agencies be initiated as soon as possible.

4 Incls

1. Brief of ADC BOMARC Employment Plan
2. Mark X and SIF
3. Data Link
4. AN/FSQ-7 Computer Programming and Console Equipment


ROY/H. LYMB
Major General, USAF
Vice Commander

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BRIEF OF THE ADC BOMARC EMPLOYMENT PLAN

1. The basic operational procedures which must be a part of the SAGE computer program are described in this document. The equipment or equipment modifications that will be required to make this method of operation possible are covered as separate subjects. The ADC operational capability for BOMARC is considered to be a realistic capability by September 1959.

2. The initial capability for the BOMARC missile which would be considered an acceptable operational capability by ADC should have the following features:

a. The BOMARC missile operating with SAGE should be able to be controlled in any direction and out to the maximum range of the missile.

b. The BOMARC rate of fire should not be limited by the AN/FSQ-7 computer functions.

3. The following description covers the BOMARC/SAGE system and the operation of this system which could be effective by 1 September 1959 and will meet the criteria described in paragraph 2, above:

a. Each BOMARC installation, herein termed squadron, will be initially activated at half strength with no more than 56 installed launchers.

b. Squadrons will be equipped with only one range missile, although two types of warhead (HE and nuclear)

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will be available.

c. The missiles in the squadron may be allocated between two parent Direction Centers. (A parent Direction Center may be in an adjacent sector.) A missile will receive fire guidance commands only from the Direction Center to which it was assigned prior to launch. Allocation of squadron strength between Direction Centers will be under the direction of the Combat Center. Communications will be provided to connect up to four squadrons to a Direction Center.

d. There will be no handover of missiles between sectors; once launched, the missiles will continue to be tracked and to receive guidance commands from the parent Direction Center. A Direction Center should launch missiles only if the predicted interception point falls within its sector. Target tracks may be crosstold for engagement without prior coordination with the Combat Center. Missiles may be launched only against tracks identified HOSTILE, PENDING or UNKNOWN.

e. Of the track capacity available in each Direction Center, not more than one-half may be interceptor aircraft or BOMARC missiles (in assignment, prelaunch, climb or midcourse) whose guidance commands are being calculated by the computer. Within this limitation, interceptor and missile tracks may be allocated interchangeable on a one-to-one basis.

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f. Missile prelaunch and guidance commands will be transmitted via a frequency-division data-link transmitter located at the BOMARC squadron and used exclusively for this purpose. Two separate output sections will be provided at each Direction Center to transmit guidance commands to the four squadrons; this will limit the number of missiles under simultaneous control by a Direction Center to 192.

g. Dynamic status inputs, not including the allocation of missiles between Direction Centers, will be received automatically by crosstell input sections from the four squadrons capable of being controlled by a Direction Center. Missile warm-up instructions will be transmitted by voice telephone.

h. Tracking of the missile will require distinctively identified, BOMARC SIF replies with 128 different personal identity codes. No altitude replies are required from the missile. In order to facilitate tracking of missiles launched by the parent Direction Center from an adjacent sector, there will be selective masking of BOMARC SIF inputs.

i. A missile track will be established and extrapolated within the computer program from the time of assignment. The missile track will be placed in an automatic tracking status after correlation with the first correct SIF code received within 90 seconds of launch or

by the command with something even if there is no data.

j. Missile tracking will use the SIF codes, but command heading and standard missile speed and altitude will be used as an aid to tracking prediction and slant range data correction. Under conditions where a proper code reply (matching and with correct parity) is lacking but either search data, a different BOMARC code or BOMARC code with incorrect parity are found within the tracking gates, these data will be used for tracking.

k. All track monitoring of missiles will be done by the IND's to whom they are assigned. Track monitoring action by the IND will be limited to moving the missile track a limited distance or to dropping the track.

l. Standard target tracking procedures will be used for targets against which BOMARCs are assigned. (These procedures are and will continue to be reviewed to handle unique BOMARC/SAGE requirements.)

m. Each squadron will have a unique two-letter code; each missile track will carry a track number consisting of the two-letter code of the squadron plus a two-digit number.

n. Any or all of the squadrons allocated to a Direction Center may be assigned by SWD or SD by SOP to one or more of the Weapons Directors who may then fire and employ missiles from these squadrons. WD's will commit

[REDACTED]

missiles against one track at a time. (Techniques for increasing a higher rate of commitment against individual tracks or raids are under consideration.)

o. Warm-up orders for all missiles and permission for subsequent use of nuclear warheads will be responsibilities of the SD or SWD. The firing of nuclear warhead missiles (by the WD) will not be permitted by the program unless the SWD or SD has thrown proper switch.

p. The Weapons Assignment Display (WAD) will show, by a single request, interception points for all BOMARC squadrons tied to the Direction Center. Individual intercept points from additional squadrons in adjacent subsectors may be requested. The WAD will show time-to-intercept for interceptions which can be made with immediate launchings; the WAD will show the delay time required prior to launching for any interceptions which at that time are beyond missile range.

q. WD's may order immediate firing of missiles, from the squadron(s) assigned for their use, against target tracks for which they have responsibility. In firing a missile against a track, the WD will designate the squadron, type of missile, number of missiles, target track, and IND to handle the intercept. The computer program will provide proper spacing between multiple missiles fired by a WD against a single track. Cancel

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fire may be by switch action of the WD or by the program if an interception becomes impossible.

r. The WD's may request a delayed missile launching to handle a situation where an interception is presently beyond missile range. Assignment is made as in an immediate launching, however, the target track will be immediately displayed to the IND with a delayed BOMARC firing attention symbol, and missile launching will be delayed until the interception becomes possible, at which time the computer will order firing. During the delay time, the program will continue to check that interception is possible.

s. A Weapons Director may assign both interceptors and missiles against the same target track. All missiles assigned against a track must be assigned to the same IND.

t. Each IND will normally handle only manned interceptors or BOMARCs at any one time; however, there will be no program restrictions prohibiting his handling these two types of weapons simultaneously. The IND will monitor missile tracking and will be alerted by the program if the interception conditions change radically. The IND will insert kill reports as is done for manned interceptor engagements.

u. Reassignments of missiles by the WD to

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different target tracks will be permitted. The missile will remain with the same IND and a new target must then be given to the IND. The program will check to see that the new interception is possible before reassignment is allowed.

v. Facilities will be provided to permit full guidance computations at five-second intervals from assignment through midcourse to TRUD = -5 sec. During certain phases of prelaunch and flight, guidance computations will be made at five-second intervals; at other times after any one computation, a succeeding computation will only be made if changes in target and missile tracking exceed thresholds established for these phases of flight. (The values of thresholds will be established such that intercept probability is not impaired; however, if the thresholds are found to yield an average interval between computations per missile of less than 15 seconds, further limitations on missile capacity as stated in Item e. must be established.) Where available, tracked missile speed will be used for guidance computations.

w. BOMARC will have the highest priority for determining target height at least once during the last three minutes before TRUD = 0.

x. All five command instructions will be sent to each missile each five seconds, regardless of the time since the last guidance computation.


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y. Missile tracks may be dropped manually by
the IND or will be automatically dropped by the computer
program 15 seconds after TRUD = 0.

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ADC PLAN FOR BOMARC EMPLOYMENT WITH SAGE

DATA LINK

ASSUMPTIONS:

1. The data link equipment to be used in the ground and air environment is the same equipment now under production design, i.e., AN/GKA-4 ground equipment and the Boeing version of the AN/ARR-39 receiver.
2. Each IM-99 missile will be controlled throughout the mission by the Direction Center to which it was assigned prior to launch.
3. The AN/FSQ-7 computer will compute and prepare the IM-99 data link message.

PLAN:

Each BOMARC site must have a separate ground-air transmitter and separate data link frequency. The separate transmitters will provide a capability to connect as many as four BOMARC squadrons to a SAGE Direction Center. It will be possible to control BOMARC missiles located in one sector by an adjacent Direction Center.

REQUIRED ACTION:

1. The actions required to provide an effective operational capability for BOMARC are as follows:
 - a. High power transmission system is required. 10 KW amplifiers to drive the separate transmitters and associated equipment, such as appropriate antennae, must

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be programmed and procured. ADC has initiated action to include this equipment in PC documents.

b. Two frequencies per sector must be allocated for BOMARC. These could be frequencies allocated for use during military emergencies only. Two BOMARC sites are planned for each sector.

c. Ground-air transmitters must be sites within coverage range of BOMARC launchers. Boeing Airplane Co. has completed a new siting criteria for the IM-99A missiles which will allow the ground-air transmitter to be located on the BOMARC site.

d. 24 subchannels per transmitter are required to conserve the radio frequency band. Based on a Boeing Airplane Company statistical study of modulation levels required for satisfactory control of the IM-99, it was shown that in order to prevent serious overmodulation effects using 24 subchannels, the modulation percentage was reduced to 20% plus or minus 1.2% which generates overmodulation 16.46% of the time. The IM-99 command system tolerances and reliability will demand rigorous control of sub-carrier frequency, distortion and modulation levels for proper operation.

(1) The tolerance provided in the data link systems for BOMARC control indicate that in order to prevent overmodulation approximately only 12 sub-channels

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may be utilized of the 24 available. Dual channel data communications systems are required at each BOMARC site. To fully utilize facilities to be provided it is essential that action be taken to assure that this system will provide full 24 sub-channel capability.

e. Action must be taken to procure modified data link monitors capable of receiving the BOMARC message format.

f. One data grade circuite must be provided from each Direction Center to the transmitter site of each of the four BOMARC squadrons tied to the Direction Center. In addition, one voice circuit must be provided from a SAGE Direction Center to the squadron supervisor of each of the four squadrons. The normal SAGE back-up circuitry is also required.

g. Two BOMARC output sections per Direction Center must be provided and retrofitted to the AN/FSQ-7's in the field. These two units should have standby units attached to the standby computer.

2. ADC has initiated action on some of these items and others are under study. All of these items have been considered by the ADC Directorate of Communications and Electronics and these actions can be accomplished by September 1959.

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CAPABILITY:

The capability provided with a separate ground-air transmitter on separate frequencies is to be able to commit BOMARC across sector boundaries. The separate ground-air transmitter will provide message reliability, necessary message format, and greater message redundancy required for the IM-99 missile.

OTHER CONSIDERATIONS:

There would be no degradation of ADC manned interceptor capability due to limited weapon address assignment factor inherent in frequency division data link. Common usage of ground transmitting equipment by manned interceptors and BOMARC would result in degradation of control capability of both weapons.

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ADC PLAN FOR BOMARC EMPLOYMENT WITH SAGE

MARK X - SIF

ASSUMPTIONS:

1. The BOMARC weapon system is designed to utilize a transponder which responds with a slightly modified SIF Mode II code when interrogated in any of the three modes. This beacon response is used to identify and track the missile as well as transmit a small amount of information to the ground, if necessary.

2. The SAGE System is designed to utilize a single pulse response from an IFF transponder, for tracking aircraft that are equipped with such transponders particularly interceptors. The Coordinate Data Transmitting Set, AN/FST-2, has space provided for an SIF section. However, the precise way in which all transponder responses will be handled must be defined prior to the design and fabrication of this section. A major revision to the SAGE Direction Center program is required before the SIF information can be utilized. Also, the precise way that SIF will be employed must be specified.

3. Any major change to the ground environment, such as providing a separate beacon system for BOMARC, could not be implemented prior to September 1959.

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PLAN:

The ADC concept of operation of BOMARC with SAGE is basically to use SIF for tracking of the BOMARC missile. To provide the capability to control BOMARC missiles in a SAGE sector other than the one in which the squadron base is located, the technique of selective unmasking of SIF returns in the adjacent SAGE sector would be employed.

ACTION:

To provide a SIF capability for BOMARC the following actions must be accomplished:

1. Institute operational procedures within CONAD and CAA to reduce to a minimum the number of interrogators which are operating at any one time. This will alleviate the beacon over-interrogation and number of false returns. CONAD is now studying this problem and will issue a directive on use of interrogators in the near future.
2. Replace the currently installed AS-295 IFF antenna with the AT-309 antenna. This will improve the resolution and communications reliability of the beacon system and also appreciably reduce both over-interrogation and number of false returns. The AT-309 is a newly developed and tested item. However, it must be programmed, funded, procured and installed. Headquarters USAF has advised that a quantity of 154 AT-309 antennae can be made available by September 1959. ADC is initiating action to program the AT-309 antenna.

3. Provide a modified UPS-4 I-R unit. A quantity of between 70 and 100 UPS-4 (unmodified) IR units are on hand at RAFD. ADC has taken action to program modified UPX-4 equipment. This will provide for ADC a high power interrogator by September 1959.

4. A SIF attachment to the AN/FST-2 must be obtained for production units. (There is presently a SIF attachment to the AN/FST-2 being installed in the Patrick AFB FST-2 for SAGE/BOMARC compatibility testing. Theoretically this model will process basic Mark X and SIF returns. ADC will generate a requirement for SIF for both BOMARC and manned interceptors and a requirement for the AN/FST-2 to process SIF returns. It cannot be determined if the modification of the AN/FST-2 with an SIF capability can be obtained by September 1959. Expeditionary action must be initiated to obtain a capability in the AN/FST-2 to process SIF returns by September 1959.

5. A study should be initiated by ARDC to explore the possibility of using a separate SIF frequency for BOMARC. The purpose of a separate frequency would insure a minimum of over interrogation and spurious responses when limited to proposed employment.

CAPABILITY:

The above plan will provide an appreciably effective operational capability for BOMARC employment with SAGE.

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Track initiation and missile tracking can be accomplished automatically by the SAGE computer. Through the technique of selective unmasking of SIF returns it will be possible to control missiles located in another sector from an adjacent sector.

ADDITIONAL CONSIDERATIONS:

The only questionable area regarding SIF is the modification of the AN/FST-2. If the AN/FST-2 cannot be modified by 1 September 1959, BOMARC could be tracked by single pulse Mark X returns. There would be some operational degradation if the SIF capability cannot be obtained. The degradation would amount to manual track initiation, more computer time devoted to track initiation and tracking and a slower firing rate to accomplish the initiation requirements.

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ADC PLAN FOR BOMARC EMPLOYMENT WITH SAGE
AN/FSQ-7 COMPUTER PROGRAMMING AND CONSOLE EQUIPMENT

STATUS OF BOMARC/SAGE INTEGRATION:

1. A BOMARC/SAGE experimental test program is currently being implemented by IBM and Boeing. This entails flying a single BOMARC missile against a single target in a SAGE data gathering (radar and AN/FST-2) and ground-to-air data link (AN/GKA-4) environment located at AFMTC with telephone connection to the SAGE AN/FSQ-7 (XD-2) computer located at Kingston, New York. Status information also forwarded to the AN/FSQ-7 (XD-2) computer. The first SAGE controlled BOMARC is scheduled for March 1958.

2. Lincoln Laboratory and Boeing are continuing integration studies (effects of BOMARC computation on track capacity, etc.) Simulation studies with a digital computer (more extensive than those conducted a few years ago) may begin in a few months

ASSUMPTIONS:

1. A BOMARC/SAGE capability will be demonstrated in the Gunter sector in mid 1959.
2. The AN/FSQ-7 will have a large memory.
3. The AN/FSQ-7 will have the first major computer program revision installed and checked out.

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4. Weapons direction consoles will have the capability of monitoring both BOMARC and manned interceptors.

PLAN:

1. To provide the greatest air defense capability (BOMARC and manned interceptors) it is Air Defense Commands desire the present computer programming efforts be pursued with the target date of January 1960. This objective will allow the employment of the complete family of air defense weapons against hostile attempts against the continental United States commensurate with the state of the art known during this time period. (Inclosure #1)

2. SAGE operational dates, delivery of the large memory, delivery and checkout of the first major program revision and procurement and installation of supporting electronic systems are all presently in line with the January 1960 date.

3. If the January 1960 date is completely unacceptable and the four month earlier date of September 1959 is absolutely mandatory, delivery and installation of both the big memory and a major program revision will not be the limiting factors in meeting this earlier date. However, the computer program to be operational in McGuire with a September 1959 date will have a degraded air defense capability from that planned for operation in 1960. The reason for this is that ADC, to gain an

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operational computer program in September 1959, must accept a loss in sophistication and best application of air defense of the complete family of air defense weapons.

4. Present proposed delivery and retrofit of the big memory (inclosure #2) will meet delivery of the computer program revision date for either the September 1959 or January 1960 dates. This will include a proven capability fo BOMARC in SAGE displayed in the Gunter sector in mid 1959 substantiating an operational capability in McGuire in September 1959.

5. Weapons direction consoles in either operational time period will have the capability of monitoring both BOMARC and manned interceptors. Modification to consoles to accomplish this is considered minor in nature and well within the time period.

ACTION:

The following action must be taken:

1. The Lincoln Laboratory and RAND must be advised of the priority for the support of the selected operational date.
2. The sequence of installation of retrofit memories to support this plan must be adopted.
3. The ADES-Western Electric contract must be augmented to include BOMARC/SAGE sector tests.

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4. The Gunter sector installation schedule must be examined and the necessary priority assigned.

5. A detailed employment plan for the Gunter sector must be prepared.

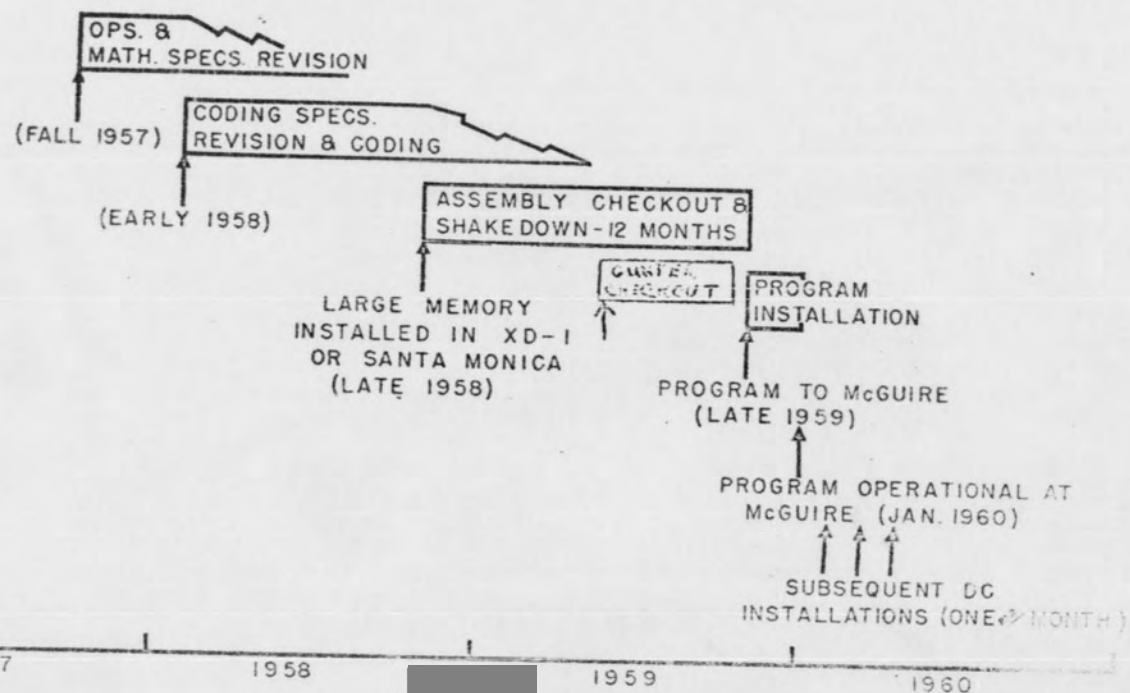
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1960 REVISION OF SAGE COMPUTER PROGRAM

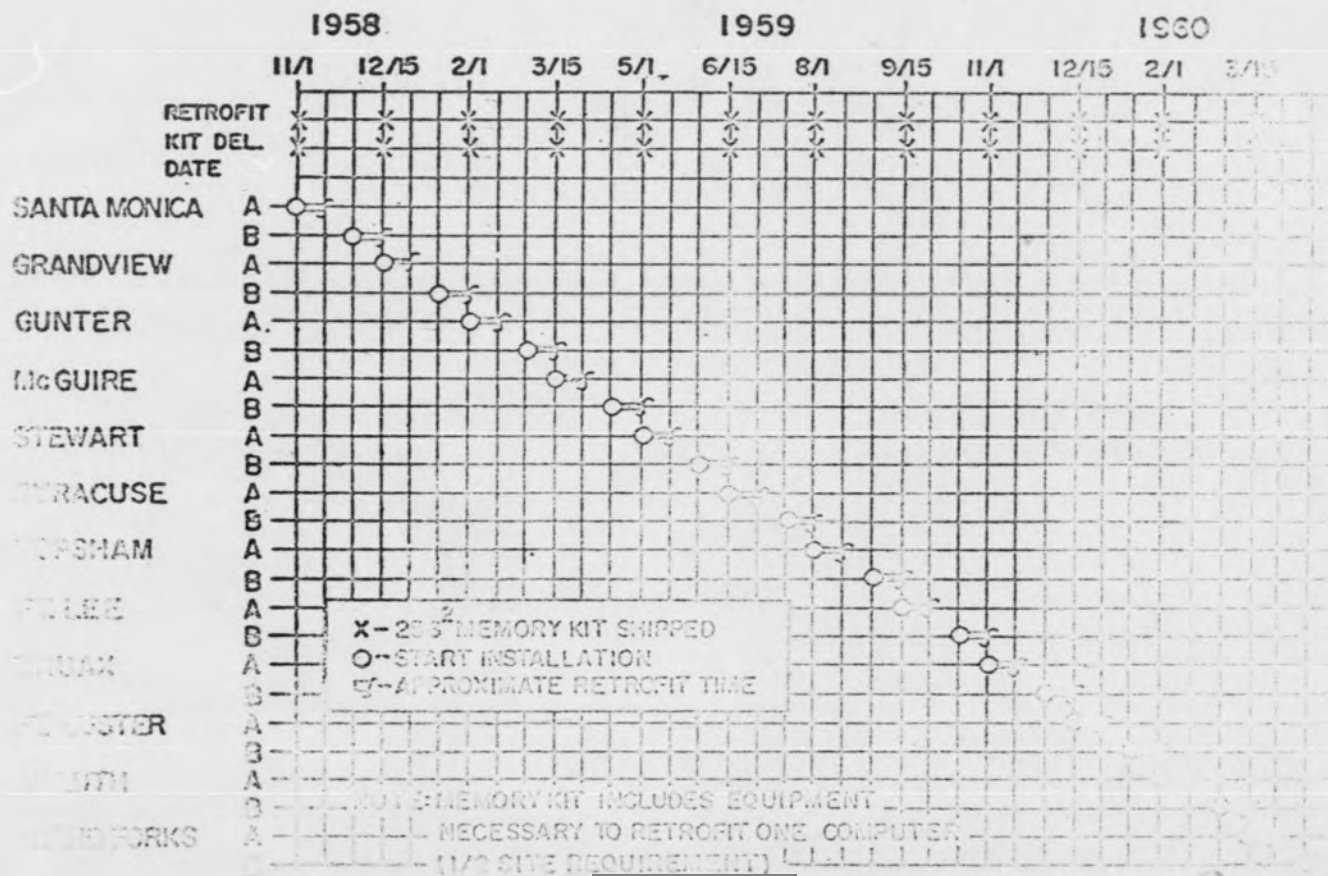


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RETROFIT SCHEDULE EXPANDED CORE MEMORY-PLAN A



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DOC. 304 ADCHR 57A

ADRSI-D

12 MAR 57

SUBJECT: (U) BOMARC Relaunch Capability

TO: Commander-in-Chief -
Continental Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. Your attention is invited to inclosed study, ADC Requirement for Relaunch Capability for the BOMARC System and Redistribution of BOMARC Missiles.

2. It has been determined by this Headquarters that there is a requirement for some degree of relaunch capability in BOMARC missile bases and a consequent need for redistribution of missiles from one base to another. An evaluation is being initiated to determine the factors involved in transporting missiles from one BOMARC base to another to provide a supply of missiles for relaunch.

3. It is requested that Headquarters CINAD provide this Headquarters with the following guidance:

a. Based upon an evaluation of target priorities, which bases should possess the relaunch capability?

b. What percentage of total launching missiles available per site should be capable of relaunching? (1 a. which should have 70%, which 20%, or no relaunch capability?)

FOR THE COMMANDER

1 Incl
ADC Study

MARSHALL S. BOTH
Major General, USAF
Chief of Staff

30b

L/Col K A. Tyler/ma 5 March 57 2633

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[REDACTED]

**REQUIREMENT FOR RELAUNCH CAPABILITY FOR THE BOMARC SYSTEM
AND REDISTRIBUTION OF BOMARC MISSILES**

INTRODUCTION

1. Background.

a. In recent months, efforts have been made by the Department of Defense and Chief of Staff USAF, to reduce the cost of BOMARC bases without jeopardizing the operational capability of the BOMARC system. The launcher-shelter is one area of redesign in which the base cost could be substantially reduced.

b. Prior to September 1956, safety explosive criteria dictated that each BOMARC missile be spaced to such an extent that the real estate required was not feasibly available or, alternatively, a concrete and steel explosive barrier had to be provided. Therefore, the original shelter design became a massive, expensive structure which would inherently withstand many repeated launchings. Regardless of this capability, there was no plan to use the relaunch capability for more than the night missiles which were in the maintenance and assembly line. (112 launcher-shelters per squadron are planned whereas there are 120 BOMARC missiles per squadron.)

c. As a result of the recent economy study conducted by Headquarters USAF, the safety explosive criteria has been reduced to such an extent that only 50 feet unobarricaded separation between missiles is necessary. Therefore, it is possible to use a less costly BOMARC shelter consisting of prefabricated steel panels inserted into a steel beam superstructure. This more economical shelter would not provide for relaunch capability without further redesign. Neither the launcher-shelter electrical system nor the launcher-shelter reeling system for this economy shelter as planned will withstand repeated launchings. However, the launcher erector, which is a part of the launcher-shelter, will withstand repeated launchings.

d. During BOMARC installation conferences in Headquarters USAF, September 1956 to January 1957, it was concluded that the economy shelter described in part c., above, would meet the minimum operational requirement. At the last conference on 8-9 January 1957 the ADC representatives stated that the BOMARC base must be provided with 120 launcher-shelters so that all available BOMARC could be launched from the site. This was agreed to by all USAF representatives.

[REDACTED]

e. Subsequent to this series of conferences, the Commander, Air Defense Command, as well as certain Headquarters USAF staff members, has concluded that there is a requirement for some degree of relaunch capability at BOMARC bases. Missiles to be used for relaunch would be those transported from various bases which had not yet expended missiles.

OBJECTIVES

1. To determine the operational requirement for:
 - a. The degree of relaunch capability at each base, i.e., number of relaunch shelters required.
 - b. A redistribution of BOMARC missiles in the tactical inventory from BOMARC bases which might not have expended their missiles to BOMARC bases which have expended all or nearly all of their missiles.

DISCUSSION

1. An evaluation of the threat may show that a relaunch capability would not be required of all launcher-shelters (or all BOMARC bases). If a portion of the shelters at each base had a relaunch capability, those shelters could be used first and then replenished with missiles.
2. A preliminary evaluation of the threat and target areas of the United States has been accomplished with the object of establishing a tentative requirement for relaunch capability at each base. The general rule applied in this evaluation was to provide a greater relaunch capability around the perimeter of the United States on the East, West and North and in the northern half of the United States as this was considered an area which will be subjected to a greater number of attacks. A lesser capability will be required at southern bases or on the southern perimeter. Accordingly, the following tentative plan for deployment of launcher-shelters of various types is recommended:
 - a. Bases with approximately 50% relaunch type shelters (initial two-flight detachments should be of the relaunch type):

McGuire AFB
Suffolk Co. AFB
Otis AFB
Dow AFB
Plattsburg AFB

Duluth AFB
Sioux City Aprt
Hamilton AFB
Oxnard AFB
San Diego NAS

AC

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Niagara Airport
Kinross AFB
K. I. Sawyer AFB
Langley AFB
Truax AFB
Paine AFB
Portland AFB
Bunker Hill AFB
Greater Pittsburgh
International Appt

Fort Ord
Grand Forks AFB
Cut Bank AFB
Opheim AFB
Minot AFB
Klamath AFB, Calif.
Geiger Field, Wash.
Charleston AFB, S.C.
Seymour Johnson AFB

b. Bases with approximately 25% relaunch type shelters:

McConnell AFB
Ardenmore AFB
Amarillo AFB
Reese AFB
Biggs AFB
Laughlin AFB
Williams AFB

Ellington AFB
New Orleans NAS
Campbell AFB
Pinecastle AFB
Tyndall AFB

CONCLUSION

12 INCH BOMARC

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CONCURRENT studies should be conducted as follows:

a. Operations - To evaluate the threat and determine which bases require relaunch capability and in what degree. (To be prepared or approved by CONAD).

b. Logistics - To determine feasibility of redistribution of BOMARC missile from one BOMARC base to another and problems associated with returning missiles to a ready condition. (To be prepared by Logistic Plans, DCS/Material, ADC).

c. Organization - To determine the impact of the above concept on organization and manpower. Studies a. and b. above will be major factors. (To be prepared by Director of Manpower and Organization, DCS/Plans & Requirements, ADC).

2. Evaluation of 1.a, b, and c, should be conducted by DCS/P&R to determine the final requirements generated by the CONAD approved concept. Subsequently, Assistant Chief of Staff for Installations will be responsible for base redesign and DCS/M will be responsible for the detailed redistribution plan.

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DOC. 365 ADCHR 57A

FILE NUMBER 307.1

AG 38
 A-333-10
 HQA923
 PP RJEDWP RJEDEN
 DE RJEPHQ 119
 P 101621Z

FM HEDUASAF WASH DC
 TO RJEDWP/COMMANDER ARDC DET NO 1 WRIGHT PATTERSON AFB OHIO
 RJEDEN/COMDR ADC ENT AFB COLO
 ZEN/COMMANDER AFGC EGLIN AFB FA
 ZEN/USAF INSTALLATIONS REPRESENTATIVE NORTH ATLANTIC REGION
 90 CHURCH STREET, NEW YORK NY
 ZEN/USAF INSTALLATIONS REPRESENTATIVE NEW ENGLAND REGION
 130 CAUSEWAY STREET BOSTON MASS
 ZEN/USAF INSTALLATIONS REPRESENTATIVE SOUTH ATLANTIC REGION
 OLD POST OFFICE BUILDING FORSYTHE & WALTON STREETS
 ATLANTA GA
 ZEN/ CHIEF OF ENGINEERS DEPT OF THE ARMY WASH DC
 ZEN/COMMANDER ARDC PO BOX 1395 BALTIMORE MD

*Action AIF
 Info IG, PIR
 3618 10 Apr 57*

Scrap 15 Apr 57

FROM AFCIE-C 54632NO UNCLASSIFIED REFERENCE
 IS QUOTED SUBJECT: EXPLOSIVE SAFETY CRITERIA FOR BOMARC
 SITES. FOLLOWING IS MINIMUM SAFETY DISTANCES BASED ON 150 POUNDS
 HE AND OTHER EXPLOSIVE HAZARDS INVOLVED; (1) LAUNCH SHELTERS WITH
 12 INCH REINFORCED CONCRETE WALL CONSTRUCTED EQUIVALENT TO BARRICADE
 REQUIREMENTS BETWEEN THE MISSILE AND MAINTENACE ELECTRICAL SHOP, WILL
 BE SITED AT A MINIMUM OF 32 FEET APART. THIS DISTANCE WILL BE
 MEASURED FROM THE SIED WALL OF THE SHELTER HOUSING THE MISSILE TO
 MUTSIDE WALL OF ADJACENT LAUNCHER SHELTER; (2) LAUCH SHELTERS
 WITH WALLS OF LIGHT METAL, MASORY OR OTHER SUITABLE SUBSTITUTE WHICH

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SEE CRYPTO SECTION BEFORE DECLASSIFYING. PARAPHRASE IS NOT REQUIRED

PAGE TWO RJEPHQ 119
IS NOT EQUIVALENT TO 12 INCH REINFORCED CONCRETE ALL BARRICADE REQUIREMENTS WILL BE SITED AT A MINIMUM OF 59 FEET APART. DISTANCE MEASUREMENTS WILL BE COMPUTED AS INDICATED IN (1) ABOVE. ABOVE DISTANCES HAVE BEEN APPROVED BY ASES FOR BOMARC SITING DEGREE OF SAFETY AFFORDED MAY BE DESCRIBED AS GENERALLY PROVIDING HIGH DEGREE OF PROTECTION AGAINST PROPAGATION OF EXPLOSION FROM ONE LAUNCH SHELTER TO ADJACENT LAUNCH SHELTER BY BALAST AND TO A GREATER DEGREE BY MISSILES. NOMINAL DAMAGE TO ROOFS, SIDED WALLS AND INTERIOR SUPPORTS OF ADJACENT STRUCTURES CONSIDERED OPERATIONAL RISK AND IS ACCEPTABLE TO MAINTAIN MINIMUM REAL ESTATE REQUIREMENTS. WITH REFERENCE TO (1) ABOVE RECOMMEND 65 FEET CENTER TO CENTER OF LAUNCHER SHELTERS HAVING 12 INCH CONCRETE WALLS BE MAINTAINED TO PROVIDE ADEQUATE SERVICE AREA. REDESIGNED METAL TYPE LAUNCH SHELTERS FOR EGLIN EST AND TACTICAL SITES WILL BE SPACED AS INDICATED IN (2) ABOVE. FOR ARDC DET 1 RDZSMB. REQUEST ABOVE CRITERIA BE FURNISHED BACK FOR INCLUSION IN REVISION BOEING DOCUMENT 83129-1.
BT
10/1625Z APR RJEPHQ

UA--PARAPHRASE NOT REQUIRED EXCEPT PRIOR TO CATEGORY B ENCRYPTION--
PHYSICALLY REMOVE ALL INTERNAL REFERENCES BY DATE-TIME GROUP PRIOR
TO DECLASSIFICATION.

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DOC 346 ADCHR 57A

8 Jan 1957

ROUTINE

TO: COFS USAF WASH DC

SECRET FROM ADRSI-D

This message is in reference to current studies to re-evaluate the BOMARC base facility in the interest of economy. ADC is vitally concerned and interested in the economy of the BOMARC base and will actively engage in any attempt to reduce the cost which will not affect the operational capability nor violate safety criteria minimum. The BOMARC type of missile is anticipated to be a major defensive weapon as far in the future as 1980. Reduction in initial construction, ground handling, maintenance and test equipment costs must not seriously increase the annual operating costs. Support equipment and installations must be designed to support the long life expectancy. The BOMARC system must be capable of launching missiles upon demand up to 30 per minute as the tactical situation dictates. This could be within a period of a few minutes. Quantity requirements and deployment have been based upon a minimum stockpile to defend against the predicted threat. This minimum must be maintained and supported in such a way as to be available for use in a matter of minutes as the tactical situation is presented. Since BOMARC is a new and highly technical system the components should be developed as a package. Manning will be highly trained personnel of a quality desirable for industrial employment. In order to encourage their retention, working and living conditions should be provided on acceptable scale.

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DOC 307 ADCHR 57A

ROUTINE
ROUTINE

X AF X

COMDR ABC

Director
of the
AF
Design

COMDR HET 1 HQ ARDC WPafb OHIO

INFO: COMDR ARDC BALTIMORE MD

15 JAN 1957

FROM ADRSI-D

00148

For ADRSMB, ATTN: LtCol J. H. Walker, Det 1; For RDSG,
ATTN: Col E. A. Keisling, Hq ARDC. Reference is made to
Hq USAF letter, Subject: (U) IN-99/SAGE Integration,
dated 19 Dec 56, which assigned to AMC, ARDC and ADC
specific duties in solving problems connected with the
integration of BOMARC and SAGE. This message in three
parts. Part 1. During the preliminary conference at
Hq ARDC, Baltimore, Md, working committees were appointed;
ADC (LtCol J. R. Thornton), and ARDC (Lt Col J. H. Walker)
were assigned the duty to report on the BOMARC base
design to be in the plan for SAGE/BOMARC integration
submitted 1 Feb 57. Although not a specific problem of
the SAGE/BOMARC integration, the BOMARC base is a

16 1957
Jan 57

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LtCol J. R. Thornton/wm
2633

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problem which will affect operational dates. Part 3. As an ABC committee member the following is suggested for inclusion in the ABC plan to Hq USAF, in four paragraphs. Paragraph 1. Problem. To investigate ways and means to reduce the cost of the current design of the BOMARC base. To provide less elaborate components of the present base design which will not reduce the operational capability or the currently approved operational date. Paragraph 2. Discussion. The Boeing Airplane Company, with its several subcontractors, have submitted to the USAF during the past six years several possible designs for the BOMARC base. These designs terminated in the present design which met the operational and technical requirements as imposed by the USAF and was submitted to Hq USAF for approval in mid CY-1956. The Chief of Staff USAF, based upon his evaluations of the BOMARC base and in consideration of the recommendation of the Secretary of the Air Force and the Department of Defense, directed the Director of Installations, Hq USAF, to evaluate ways and means to reduce the cost of the BOMARC base. A series of conferences during the period September 1956 to January 1957 have been conducted by the Directorate of Installations, Hq USAF, the purpose of which was to minimize the cost of the BOMARC base

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COMSEC ADC

without affecting the operational capability or the operational dates of the BOMARC system. ADC, Det 1 ARDC, and SEC have provided the technical and operational criteria and Boeing, with the continuous aid of these commands, is developing the detailed specifications for a minimum cost BOMARC base. Paragraph 3. Conclusions. . . . Decisions are required for a minimum cost BOMARC base which will not affect the operational capability. b. In the event the quote minimum cost unquote base cannot be made available to meet the operational time schedules, the present detailed plan for the BOMARC base should be provided to meet the operational dates. Paragraph 4. Recommendations. a. Vigorously pursue redesign of the base components to provide a quote minimum cost unquote BOMARC base at the earliest possible date. b. Insist that the redesign not affect the operational capabilities of the BOMARC/BOGE system. c. Proceed with the construction of the present design, if necessary, to assure meeting the operational dates as approved. Part 3. Request committee member for Det 1 Hq ARDC, Lt Col J. M. Walker, provide ADC with necessary comments so that a committee report can be ready for the Hq ARDC conference 23-24 January 1957. ADC representative plans to depart Ent AFB 23 Jan 57 for the Baltimore conference.

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AF 08.2 WASH D C

4 Feb 1957

TO COMLDC DET #1 WPAFB OHIO

1166

FILE NUMBER 304.1

DOC 308 ADCHR 57A

FROM AFCIE-C 51856. Subject is planning for Design and Construction Initial Sites, BOMARC Program. Reference messages this hqs AFDRD-AD, 31872, 30 Nov 56 and AFMPP 50484, 2 Jan 57. This message in 4 parts. PART I. The compressed schedule for realizing initial operational capability BOMARC program dictates that firm planning for design and construction be established at once. The plan at this time can generally be segregated into 3 phases. PHASE I. Redesign of launch shelter and construction of 2 launch shelters at Eglin based on this new design. Desired BOD May 1958. PHASE II. Siting, design and construction of first and second operational sites with desired BOD's of 1 May 1959 and 1 Aug 1959 respectively for which FY 58 construction authorization should be available by Sep 1957. PHASE III. Siting, design and construction of sites 3 through 5 presently included in proposed FY 58 program for which authorization should be available by Sep 1957 with desired BOD's of Nov 1959, 1 Jan and 1 Mar 1960. PART II. Based on estimated design and construction schedules with the object of meeting desired BOD's the following are established as critical dates for providing design information: (a) Two redesigned launch shelters for Eglin AFB, completion of final plans and specification by prime contractor through WSPU and AFCIE to AFIR-SAR not later than 1 Sep 1957; (b) Issuance of design guidance by AFCIE to AFIR-SAR for first and second operational sites 15 Feb 57; (c) Issuance of design guidance supplemented with preliminary details of modified shelter from prime contractor to AFIR's SAR and NER for operational sites 3-5, 15 Jul 1957. PART III. Based on information presently available this headquarters it would appear (A) That the new launcher shelters for Eglin MST can be designed and constructed to meet a May 1958 BOD if sufficient priority by all concerned is placed on this facility during design and construction. (B) That it will be necessary to use present design for first and second operational sites accepting possible higher costs than that of subsequent BOMARC installation with the objective of meeting desired BOD's. (C) Effective with design for site 3, a new definitive brochure, outlining criteria and specifications should be available as the basis for a more austere design, thus materially reducing the costs of this and subsequent installations. PART IV. Request all actions be reviewed toward meeting objectives outlined above.

4 Feb 57

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C/S

DOC 309 ADCHR 57A

FILE NUMBER 304.1

AGCS
A-344-10
HQAG2C
PP RJEDEN
DE RJEPHQ 150
P 192108Z
FM HQ USAF WASH D C
TO COMAIRDEFCOM ENT AFB COLO

Action Ail
Info IC. P/A
1771

Suspa 7 Feb 67

[REDACTED] ON AFCIE-P 3122
[REDACTED] SITES BOMARC SITE FOR THE OTIS AFB AREA IS
LOCATED SOUTH OF OTIS ON PRIVATELY OWNED LAND. THE AIR FORCE
CONTROLS 23,720 ACRES OF LAND IN THE VICINITY OF OTIS AND FOR THIS
REASON THE SITE WILL BE EXTREMELY DIFFICULT TO DEFEND UNLESS A
THOROUGH SURVEY HAS BEEN MADE OF THIS LAND. IF A THOROUGH SURVEY
HAS BEEN MADE, IT IS REQUESTED THAT IT BE SO INDICATED IN THE
FEASIBILITY STUDIES WITH STRONGEST POSSIBLE SUPPORTABLE EVIDENCE TO
SUSTAIN NOT PLACING THE SITE ON AIR FORCE CONTROLLED LAND AND FOR
SELECTION OF THE RECOMMENDED SITE.

BT
19/2120Z FEB RJEPHQ

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DOC 510 ADCHR 57A

FILE NUMBER 304.1

PRIORITY

Action AIE

3884

Suspense - 23 Apr

INFO-1G
PR

17 Apr 57

AG 02
 A-609-17
 PP RJEDEN
 DE RJEPHQ 173
 P 172118Z
 FM HQ USAF WASHDC
 TO RJEDEN/COMAIRDEFCON ENT AFB COLO
 INFO ZEN/USAF INSTALLATIONS REPRESENTATIVE NORTH ATLANTIC REGION
 FEDERAL OFFICE BUILDING ROOM 1025 90 CHURCH STREET NEW YORK 7 NEW YORK
 ZEN/USAF INSTALLATIONS REPRESENTATIVE NEW ENGLAND REGION 150
 CAUSEWAY STREET BOSKON 1, MASSACHUSETTS

FROM AFCIR-P 54987
 RE: IM-99 (BOMARC) SITING ACTION NOW IN PROGRESS, INCLUDING REAL ESTATE, AT
 MCGUIRE, SUFFOLK COUNTY, OTIS, DOW, AND NIAGARA FALLS AF BASES WILL
 CEASE UPON RECEIPT OF THIS MESSAGE PENDING THE COMPLETION OF A STUDY
 REVISNG CRITERIA TO PERMIT SITING OF ALL ELEMENTS OF IM-99 (BOMARC)
 UNITS ON EXISTING AF BASES. ALL INSTRUCTIONS PREVIOUSLY ISSUED PER-
 TAINING TO SITING ACTION ARE HEREBY RESCINDED. YOU WILL BE KEPT
 INFORMED OF DEVELOPMENTS.

BT
 17/2136Z APR RJEPHQ

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 PHYSICALLY REMOVE ALL INTERNAL REFERENCES BY DATE-TIME GROUP PRIOR
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DOC 311 ADCHR 57A

5415 3 Jun 57

[REDACTED]
fm USAF WASH D C
TO COMADC

[REDACTED] RCM APCIC-C 56741.

Subject is FY 58 MCP for BOMARC. This message is in two parts. PART I.
At 8-10 May 1957 meeting on revision of document 80129-1 at WPAFB, the following items were recommended for inclusion in the forthcoming revision: Heated vehicle storage, missile spares warehouse; weapons system equipment maintenance shop. The following comments are offered: (1) heated vehicle storage at 8,640 SF for one detachment (56 launchers) expandable to 10,560 SF for two detachments (112 launchers). Is this the same item auto storage previously programmed at 6,000 SF? If so, it is requested that the nomenclature remain the same to avoid confusion. Note that test vehicle storage is provided in the assembly and maintenance shop. It is suggested that automotive maintenance could be accomplished at nearby air bases. If additional storage is needed it must be justified on the basis of what vehicles are to be stored, why they must be stored and under what climatic conditions they may be stored or left in the open. (2) Missile spares warehouse at 12,480 SF for one detachment expandable to 17,160 SF for two detachments. Note that space for storage, shipping and receiving of missile parts is contained in the assembly and maintenance shop. Any additional storage required must be fully justified. (3) Weapons system equipment maintenance shop at 25,000 SF. Insufficient information was furnished at the meeting to justify this item. PARR II. Even if the above items are completely justified by your command it will not be possible to include them in the FY 1958 military construction

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program due to the present status of this program. The FY 1958 military construction authorization program has been finalized and presented to the Congress for review. The Congress has been provided, for their records, a complete list of typical BQMARC technical facilities as they now appear in the FY 58 MCP. This list includes neither items 2 and 3 above or the additional scope of item 1. Only projects of such extenuating emergency conditions as to critically endanger national security could be suggested as additives to the Congress during its review of this program. Otherwise they should be included in the FY 1959 or subsequent programs.

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NO ACTION CONSIDERED NECESSARY
UNTIL NEXT DUTY DAY.
STAFF DUTY OFFICER.

DOC 312 ADCHR 57A

AGA020
A-403-27
R RJEDEN
DE RUEGDA 101
R 261855Z
FM USAFIR NER BSN
TO COMDR DET 1 ARDC WPAFB
INFO ACOFS INSTL USAF WASH DC
COMDR ADC ENT AFB COLO
USAFIR NAS NY
DIVENGR NEW ENGLAND DIV BSN

MDM INR 6104
116
AIE

[REDACTED] FOR AFCIC-CS USAF WASH DC.
CITE USAFIR NER 720/ENG-1. REUR CLASSIFIED MSG
RDZSBM-30931-E DTD 13 JUNE 57, DESIGN INSTRUCTIONS ARE NOT YET
ISSUED FOR OTIS AND DOW BOMARC FACILITIES. FIRM CONSTRUCTION
SCHEDULES CANNOT BE ESTABLISHED UNTIL AFTER DESIGN INSTRUCTION
ARE ISSUED. WE CANNOT GIVE ASSURANCE AT THIS TIME THAT DESIRED
BODS OF NOVEMBER 1959 AND JANUARY 1960 CAN BE MET. REALISTIC
ESTIMATED WOULD INDICATE OTHERWISE. ANY COMMITMENTS APPEARING
IN YOUR CONTRACT WHICH INVOLVE CONSTRUCTION CONTRACTOR SHOULD
PEAR IN THE CONSTRUCTION CONTRACT; HOWEVER, IN VIEW OF THE
ABOVE, IT APPEARS TO BE TOO EARLY TO MAKE COMMITMENTS FOR NEW

PAGE TWO RUEGDA 101
ENGLAND REGION. REQUEST WE BE PROVIDED LIST OF FACILITIES DESIRED
FOR PARTIAL BOD AND DATES DESIRED. WITH THIS INFORMATION, AFTER
DESIGN INSTRUCTIONS ARE ISSUED AND SCHEDULES ESTABLISHED, WE
WILL PROVIDE SAME. ALSO, SUGGEST THIS BE TAKEN UP AT NEXT PHASING
CONFERENCE, AND THAT REPRESENTATIVES OF USAED, NE ATTEND.
OTHERWISE CONCUR WITH ADC MESSAGE ADMLO-B-007.
BT
26/1800 IN RUEGDA 101

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QUALITATIVE OPERATIONAL REQUIREMENT FOR
AN ADVANCED INTERCEPTOR MISSILE SYSTEM (IM-X)

1. References.

- a. General Operational Requirement No. 153(AD-1b-2-63) dated 1 June 1956.
- b. Letter, personal from General E. E. Partridge, Commander Air Defense Command, to Lt. General D. L. Putt, Deputy Chief of Staff, Development, Headquarters USAF, dated 18 April 1956.
- c. Letter, personal from Lt. General Putt, Deputy Chief of Staff, Development, Headquarters USAF, to General Partridge, Commander, Air Defense Command, dated 16 May 1956.
- d. Letter, personal from Brig. General W. M. Canterbury, Commander, Air Force Special Weapons Center, to Lt. General T. S. Power, Commander, Air Research and Development Command, dated 2 August 1956.
- e. Letter ADRRQ-B, Headquarters Air Defense Command, 3 August 1956, subject: (Unclassified) Intermediate Range Ballistic Missile, to Director of Requirements, Headquarters USAF.
- f. Studies on active air defense against intercontinental ballistic missiles under Contracts Nos. AF-339(616)-3283; AF-33(616)-3284; and AF-33(616)-3285.
- g. Lockheed Report on Thermomuclear Weapons for Air Defense Using Sun Lamp Concept, dated June 1956.
- h. Lockheed Sun Lamp Weapon System Proposal dated 1 October 1956.
- i. Rand Corporation Research Memorandum 1831, by Albert Latter and Richard Latter, dated 5 December 1956.

Incl #1

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2. In accordance with the provisions of Air Force Regulations 57-3 and 80-11, the following Qualitative Operational Requirement is submitted.

a. Introduction.

(1) The mission of the Air Defense Command is to:

(a) Provide and support all available USAF forces possessing active air defense capability in a maximum state of readiness to the Commander-in-Chief, Continental Air Defense Command, for employment in the air defense of the Continental United States.

(b) Support, as required, all other forces made available to the Commander-in-Chief, Continental Air Defense Command, for employment in the defense of the continental United States.

(2) General:

(a) Technological advancements made within the past ten years have tremendously increased the strategic air capability. Among the most important of these advancements are the following:

1. The advent of fission and thermonuclear weapons.
2. Greatly improved penetration aids such as Electronic Countermeasures and decoys.
3. High performance delivery vehicles.

(b) Conversely, the air defense capability has increased by a relatively much lower order of magnitude. The major air defense improvements which have been made and which are in being or programmed are:

1. Higher performance interceptors and interceptor missiles with an atomic capability.
2. An integrated semiautomatic ground electronic environment (SAGE) including higher performance radars.

(c) However, none of these improvements have given air defense a technological breakthrough comparable in magnitude to that achieved by strategic air. The air defense system developed and programmed

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is in fact highly vulnerable to certain tactics and techniques which an attacker might employ.

1. The effectiveness of air defense weapons will be directly related to the effectiveness of the ground environment in performing the functions of detection, surveillance and close control of weapons. The surveillance and control capability of the system can be significantly degraded by the attackers' use of Electronic Countermeasures.

2. The system's surveillance and control capability can be saturated by the attackers' use of mass tactics.

3. The slow reaction time of the system (ground environment and weapons) will permit the attacker to penetrate as much as two to three hundred miles of perimeter contiguous radar coverage. First contact can be made by manned or unmanned interceptors. Sufficient combat time is available before the attackers reach local target areas located on or near sea coasts or the Canadian border.

4. The system has a limited rate of intercept (estimated to be 12 to 20 intercepts a minute per subsector under optimum conditions) due to the track capacity of the SAGE system and the time required to accomplish each interception.

b. Evaluation of Conventional Methods of Correcting Deficiencies.

(1) Various methods of coping with these deficiencies have been studied and evaluated, e. g., extension of radar coverage, various Electronic Counter-countermeasures techniques, and aircraft on loiter or combat patrol. These are extremely costly and do not promise to increase the air defense capability significantly.

(2) The action being taken under Air Research and Development Command Proposal Request 5402 to satisfy the General Operational Requirement referenced in paragraph 1.a. will result in essentially a "bigger, better" IM-99 (Bomarc) type of weapon system. This conventional type of weapon system is required to match the increasing performance capability of the threat and is expected through the normal growth and qualitative improvement of the IM-99 (Bomarc) weapon system. However, this improved weapon system will be subject to the same type of limitations outlined above and will not provide the order of magnitude capability increase required.

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c. System Required to Correct Deficiencies.

(1) Numerous studies have been conducted by various agencies, both military and civilian, in an effort to determine how the gap between the strategic air capability and the air defense capability might be narrowed. This headquarters believes that the most promising by far of these studies are the ones referenced in paragraphs l.g. and l.h.

(2) The application of high yield thermonuclear weapons to air defense appears to offer a significant increase in capability.

(3) To overcome the deficiencies of the programmed system cited above (vulnerability to Electronic Countermeasures, saturation and slow reaction time), the carrier should require only a minimum of information from the ground environment and should be capable of significantly reducing the time required from launch to intercept. The type of vehicle which most meets this requirement appears to be a quick reacting, high speed ballistic type missile having inertial guidance and a thermonuclear warhead.

(4) This type of carrier is, in general, the type being considered in the Anti-Intercontinental Ballistic Missile (AICBM) studies referenced in paragraph l.f. Thus the carrier may prove to be a versatile weapon as indicated below.

d. Concept of Operations. This weapon system will be employed within the limits of contiguous radar coverage and under the operational control of the appropriate SAGE direction center. The data required for interception need only be that necessary to compute time and area of warhead stationation. Information on discrete targets or actual number of objects in a raid is not necessary. The ground environment should have the capability, however, to furnish information on the approximate number of objects present, i. e., 10 versus 100 objects. In addition, the ground environment must be capable of determining, under Electronic Countermeasures (ECM) conditions, the area in which the raid is contained. Thus a raid using Electronic Countermeasures and/or saturation tactics need only be identified by the area it encompasses and the velocity of the mass. Using this information, the Advanced Interceptor Missiles can be launched to blanket the area in which the raid is contained. Interception can therefore be initiated as soon as the detection and identification functions have been completed. With a high speed ballistic type weapon, the initial intercept will be accomplished within a minimum of time after detection. The use of high yield thermonuclear warheads with their large lethal radii

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for carrier kill, together with possible crew kill or incapacitation from radiation, will permit the system to operate effectively without the close control and terminal guidance necessary in the more conventional one-against-one type of weapon utilizing a smaller warhead.

e. Objective. To provide a defense system which will markedly increase the air defense capability. The employment of a high speed, ballistic type interceptor missile utilizing a high yield thermonuclear warhead will provide the air defense system with the capability to:

(1) Initiate the air battle at much greater distances from the target areas.

(2) Operate in an Electronic Countermeasures and/or saturation tactics environment.

(3) Force the attacker to separate his carriers in time and space to avoid multiple carrier kills and to deny the manned bomber the tactical flexibility of high altitude operation (above 60,000 feet) because of the hazard of crew incapacitation and/or kill due to radiation.

(4) Achieve greater effectiveness with the other weapons in the system by reducing the effectiveness of Electronic Countermeasure patterns and the effectiveness of saturation tactics, by achieving carrier and/or crew kills, or by forcing the separation and operational altitude cited in paragraph (3) above prior to the time the other weapons will be employed.

f. Description.

(1) Nomenclature: Advanced Interceptor Missile (IM-X).

(2) Purpose: To provide an increased level of defense against airborne threats. In addition, to provide a basic weapon (the high speed, ballistic type carrier) with growth potential, which, when used in conjunction with a separate ground environment, will have a capability against the Intercontinental Ballistic Missile threat. (See paragraph (8) below.)

(3) Performance and/or Characteristics:

(a) Speed: That which will result in the minimum practical time from launch to burst point on a ballistic trajectory.

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(b) Altitude: Optimum ballistic type trajectories designed against targets flying at altitudes of 0 to 100,000 feet at horizontal ranges up to 500 nautical miles.

(c) Range: 500 nautical miles.

(d) Guidance: Initial - Preset (inertial)
Mid-course - None
Terminal - None

(e) Accuracy: The accuracy required of the system would be finally determined when the results of the study cited in paragraph (7)(c) below are available and have been validated. Based on information presently available, the system should be initially designed toward achieving an accuracy of + or -2.5 nautical miles in range and + or -4,000 feet in altitude. (The foregoing includes both guidance and fuzing errors.) The accuracy requirements are based on a Circular Error Probability from the previously computed optimum point of detonation.

(f) Warhead: Megaton class. Exact yield is to be determined when available data on weapon effects (blast, thermal and radiation) at various altitudes, including altitudes above 100,000 feet, are available. Initially a 10 megaton warhead should be planned for from a cost and weight consideration. Further, it is desired that the warhead be of the variable yield type to provide for tactical flexibility.

(g) Alert Status: The system must be capable of maintaining a continuous 2 minute ready status; i. e., it must be capable of being brought from a ready to a launched status within 2 minutes. The alert status as an AICM vehicle will be determined when the characteristics and capabilities of the ground environment are determined.

(h) Special Design Features: The system should be designed for high reliability requiring a minimum amount of maintenance, and should be maintainable by highly skilled technicians.

Program Goals of Issue: As required to meet the tactical

Operational Date: Early Calendar Year 1961.

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1954



(7) Method of Meeting the Requirement:

(a) Investigate all work currently being done in the ballistic missile field. This investigation should include, but need not be limited to, the following:

1. All Intercontinental Ballistic Missile projects and studies being conducted by Department of Defense agencies.
2. All Intermediate Range Ballistic Missile projects and studies being conducted by Department of Defense agencies.
3. All test vehicles associated with the above programs.

(b) Rescind General Operational Requirement Number 153 (AD-1b-2-53) dated 1 June 1956. Publish a General Operational Requirement to reflect the requirement contained herein.

(c) Immediate action should also be taken to obtain and validate the required data on the effects of high yield thermonuclear weapons (blast, thermal and radiation) on carriers and crews when detonated at various altitudes, including altitudes in excess of 100,000 feet.

(8) Versatility Desired: The adaptability of the vehicle associated with this weapon system to be used as an interceptor against the Intercontinental Ballistic Missile in future time periods should be investigated. Such factors as trade-off between warhead weight and space, and guidance package weight and space, should be considered. It is highly desirable, both operationally and economically, that such a dual function be incorporated without prejudice to the requirement stated herein.

g. Summary. This headquarters has conducted numerous studies in an attempt to evaluate the deficiencies of the programmed air defense system. The outstanding deficiencies are those listed in paragraph 2.a.(2)(c) above. Additional studies were conducted to determine methods of decreasing these limitations and of exploiting the capabilities of the air defense system to the maximum. The weapon system cited as required in this Qualitative Operational Requirement appears to offer the best solution to offset the basic deficiencies and limitations of the programmed ground environment and defensive weapon systems.

7



RELATIONSHIP DATA

BY ENERGY ACT

1951

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MAY 6 1957

ADREQ-3, HQ ADC, Subj: (U) Philosophy of Air Defense Weapons

3. In view of the general policies outlined above, the following specific comments on the Air Force Special Weapons Center (AFSWC) letter are submitted:

a. Paragraph 6, "Recommendations follow:"

(1) Subparagraph a., "General." Concur.

(2) Subparagraph b., "Development of New Air Defense Systems." It is felt that two development programs must be pursued for follow-on weapon systems. A qualitative operational requirement has been submitted for a ballistic interceptor missile in letter ADREQ-3, Headquarters Air Defense Command, 28 February 1957, subject: (U) Qualitative Operational Requirement for an Advanced Interceptor Missile System (IM-X). It is envisioned that this missile could capitalize on one of the present IDDM development programs and would be aimed at an earlier time period with less operational performance than that assumed in the AFSWC letter. Simultaneous development of the follow-on interceptor should proceed and not be contingent on the establishment of any other program.

(3) Subparagraph c., "Product Improvements."

(a) Subparagraph (2)(a). We concur that every effort should be made to provide the greatest nuclear weapon capability in our programmed weapon systems. ADC has stated requirements for all Bomarc weapon systems to be equipped with atomic warheads. However, Headquarters USAF has continued the requirement for parallel development of HE and atomic warheads.

(b) Subparagraph (2)(b). ADC is preparing correspondence to request a thermonuclear warhead development for the improved-Bomarc program. It is envisioned that a Bomarc squadron would be composed mainly of standard Bomarc configurations with the lower yield warheads. The remainder would employ the TN warheads and would be optimized for greater simplicity and reliability and less vulnerability to ECM.

(c) Subparagraph (3)(a). Concur.

(d) Subparagraph (3)(b). This command is not satisfied that there is complete agreement as to the limitations in the MB-1 as applied to its various weapons systems. Until it is fully determined which deficiencies are in the greatest need of being corrected, it is difficult to understand how any product improvement could be considered. A letter is being prepared for transmittal to Headquarters USAF outlining the deficiencies this

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command feels are most in need of correction. It is suggested that conversations be held between representatives of our commands to secure mutual agreement on the deficiencies. This was previously suggested in ADC message ADHQ-3 003W dated 5 February 1957.

b. The following eight subparagraphs refer to paragraphs of Inclosure 1 to the AFWSU letter, "Review of Air Force Air Defense Systems Employing Atomic Warheads."

- (1) Paragraph 2. AFWSU statements, while generally true, if taken verbatim do not present a true picture of the F-89J/MB-1 capability. The weapon system does have severe limitations, but even so, the F-89J/MB-1 combination provides ADC with its best defensive weapon.
- (2) Concur with the analysis presented. It is of utmost importance that the extent of the F-101 and F-106 altitude limitations be accurately determined at the earliest possible date. In addition, while both aircraft will have a "snap-up" attack mode, the effectiveness of this capability must also be determined.
- (3) Paragraph 4. Concur with the statements. However, incorporation of the MB-1 into the F-102A aircraft is not possible due to program disapproval by Headquarters USAF.
- (4) Paragraph 5. Concur that a product improvement program for the MB-1 is essential. As stated above, it is believed that a better mutual agreement as to critical deficiencies should be reached prior to considering "fixes." In conducting a program of this type, it is the ADC position that the fire control system modification should be held to a minimum.
- (5) Paragraph 7. It is the understanding of this command that the decision to terminate the GAR-5/6 was based mainly on cost and late operational dates and to a lesser extent on the degradation of carrier kill potential. Since there has been some misunderstanding recently concerning the ADC requirement for weapon kill, this subject is being clarified to Headquarters USAF under separate correspondence.
- (6) Paragraph 8. At the organization meeting of the System 220A Evaluation Committee which met at Detachment No. 1, ARDC, during the week 11 - 15 February 1957, a letter was read from

MAY 6 1957

AFHQ-2, By ADC, Subj: (U) Philosophy of Air Defense Weapons

Headquarters Air Research and Development Command to Director of Requirements, Headquarters USAF, 2 January 1957, subject: (Unclassified) Classification of Kill Requirement, with 1st Indorsement AFHQ-AD, Headquarters USAF, to Commander Air Research and Development Command, 25 January 1957. In the indorsement the carrier kill requirement was stressed and the weapon kill requirement was stated as "desired." The ADC observer at this meeting confirmed to the Committee that ADC concurred with this letter, with the addition that active technical effort should proceed to add to the weapon kill capability and that weapon kill should not be relegated to the status of a "bonus" aspect of any weapon design.

(7) Paragraphs 10 and 11. Comments contained in paragraphs 3.a.(3)(a) and (b) apply.

(8) Paragraphs 12, 13 and 14. Paragraph 12 describes a system similar to that defined in OOR 153 (AD-1b-2-63) dated 1 June 1956. The referenced ADC Qualitative Operational Requirement for a ballistic type surface-to-air missile sufficiently explains our position on this subject.

4. Following is a summarization of the Air Defense Command position.

a. Intensive scientific effort must be employed to enhance the use of nuclear energy in air defense.

b. Nuclear weapons must be added to our programmed weapon systems with the highest possible priority.

c. A named interceptor program to follow-on the F-106A must be initiated at the earliest possible date.

d. A ballistic type surface-to-air missile appears to be a desirable vehicle to introduce thermonuclear weapons into air defense, on a large scale.

5. It is encouraging to note the growing enthusiasm for applying nuclear energy to air defense weapons, as indicated by the AFHQ letter. Stimulation resulting from letters of this type can do much toward enhancing air defense effectiveness. It

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MAY 6 1957

ADREQ-3, Hq ADC, Subj: (U) Philosophy of Air Defense Weapons

is hoped that comments from ADC, such as provided above, can give additional assistance to your command to insure proper placement of emphasis in your research and development programs.

FOR THE COMMANDER:

Copy furnished:
Comdr AFSWC,
ATTN: ADC Resident
Representative

LOREN G. McCOLLUM
Colonel, USAF
DCS/Plans and Requirements

NO DAILY DIARY ITEM

MEMO FOR RECORD: This letter is prepared to provide ADC comments on the AFSWC letter attached to the comeback copy. It was decided to prepare the letter by referring to individual paragraphs in the AFSWC letter to eliminate confusion in referring to specific statements contained in the letter.

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MAY 15 1957

13 MAY 1957

General Thomas D. White
Vice Chief of Staff
Headquarters USAF
Washington 25, D. C.

COMEBACK COPY

Dear Tommy:

Over a year ago, on 3 April 1956, COMAD (Atlantic) with providing the Intercontinental Ballistic Missile (ICBM) defense capability to COMAD (see Inclosure 1). To discharge that responsibility, we have worked with other USAF agencies to determine the feasibility and means of providing ICBM defense, and as a result of our findings, we developed a preliminary operational concept for this task. We briefed the Air Council on this concept on 25 July 1956, and provided the material to CINCOMAD for inclusion in the COMAD Objectives Plan 56-66. Recently, we have participated in the evaluation of the studies conducted for the Air Force in this area. We feel that we have progressed to the limit of our authority at this time and now await USAF determination upon a system to be developed.

Since time is of the essence in this matter, ADC recommends that immediate formulation of plans be made to attain a progressively increasing defense capability against the ICBM. In this regard, the report prepared for ARDC by the General Electric Company, entitled "MS-219L System Initial Operational Capabilities", 28 February 1957, offers a feasible approach to an early defense. If it is true that an active defense necessarily lags a passive capability by a considerable period, it then appears that the USAF has no choice but to develop the two systems. ADC would accept the lower order of performance offered by such a system as described in the General Electric report, provided that growth potential was built into the system to provide ultimately the capability originally contemplated, and if an active area defense were under development simultaneously.

A "point defense" which provides protection only to selected targets is unacceptable to this Command, for the reasons that it actually offers very little real defense to the targets specified and because it offers no defense to other areas. It would be costly and ill-considered to build a defense which could be so easily circumvented by the enemy in a campaign based on fall-out. We understand the responsibilities to the people

DESTROY AFTER: 90 DAYS 1 YR 2 YRS 3 YRS 4 YRS 5 YRS
DISPOSITION: PERMANENT

E-486/0639
E-1481/1

This correspondence is classified by W.A. TAPSCOTT, LT COL, USAF/H

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WRITER (and typist's initials): W.A. TAPSCOTT, LT COL, USAF/H

ADC HQ FORM 11 18 MAR 57

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

302 AFM 205-1, or for reason(s) stated.

TEL NO: 2183

PANFOLD NUMBER AND SUSPENSE DATE

MEMO FOR RECORD: NONE

COMDR
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13 May 57

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6 of 15 1957
General Thomas D. White, Page 2

of this country, nor would we have supported the national policy of defending our retaliatory forces except in token manner. Of the four studies we have examined, we consider the Douglas-Bell and Convair-USA proposals to be unrealistic because they are essentially point defense programs. The Lockheed-Raytheon and General Electric "Area Defense Anti-Missile Missile" (ADAMM) proposals are much closer to coming to grips with the real problem, and it is this sort of approach which this Command urges Headquarters USAF to follow.

There is general agreement with the intelligence estimate of the Soviet capability to launch effective numbers of missiles in 1960. It is therefore imperative that immediate effectivity be given to a program which will insure national survival in event the deterrent effect of a capable offense is ignored by the Soviets.

A further compelling reason for immediate and positive action by headquarters USAF is the aggressive action being taken by the Army to assume the ICBM defense mission. ADC must be able, very soon, to offer a concrete and feasible plan to CINCOMAD in order for him to support his assignment of this task to the Air Force component of COMAD.

Sincerely,

Copy furnished:
ARDC - RDZPA

J. H. ATKINSON
Lieutenant General, USAF
Commander

1 Incl
CINCOMAD ltr, Subj:
Assignment of ICBM and
TBM Defense Responsibility
in COMAD, 3 April 1956

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DISPOSITION FORM		SECURITY CLASSIFICATION (If any)
		[REDACTED]
DC: 316 ADCHR 57a		
FILE NO.	SUBJECT Results of ARDC-ADC Meetings at Hq ADC - 9, 10 and 11 July 1957	
TO Commander Vice Commander	FROM Deputy for Plans	DATE 18 July 1957 COMMENT NO. 1
<p>1. A summary of the more significant results of the ARDC-ADC meetings at Hq ADC on 9, 10, and 11 July is submitted for your information.</p> <p>2. ADC representatives agreed to study the ADC IM-X from a technical feasibility standpoint. To narrow and expedite study effort, the following assumptions and ground rules were established:</p> <ul style="list-style-type: none">a. Ground environment will outline radar boundaries under ECM/saturation conditions.b. Maximum IM-X range will be 600 n.m.c. Range selectivity, i.e., the ability to deliver bursts over various ranges short of the 600 n.m. maximum, will be investigated in range increments of 20 n.m., 50 n.m., 75 n.m., etc. The degree of selectivity adopted as a development objective will be based on the range increment shown to be most feasible in terms of weapon effectiveness, cost, development time, complexity, etc.d. IM-X will have all-azimuth capability.e. Only two burst altitudes will be considered, i.e., 200,000 feet for radiation effects and 40,000 feet for blast/thermal effects.f. Maximum speeds will be estimated by projecting current state-of-the-art plus probable technical progress.g. A 10 MT warhead will be used for size and weight computation.h. Time from "ready" to take-off will be two minutes.i. Rate of fire considered for system analysis will be on the basis of a minimum salvo of 10 missiles and a capability to fire a second salvo within 4-7 minutes.j. Squadron will have one hundred missiles.k. ADC will undertake a complete feasibility study of the design and higher performance than an improved MB-1 type missile. A system effectiveness analysis of the proposed MB-1 and the F-106A will be conducted. The analysis will include system capability and acknowledge the probable effect of burst conditions. <p>C will firm up a [REDACTED] feasibility study program [REDACTED]</p>		

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RESTRICTED DATA STRATEGIC ENERGY ACT 1954		SECURITY CLASSIFICATION (if any)
DISPOSITION FORM		[REDACTED]
FILE NO.	SUBJECT Results of ARDC-ADC Meetings at Hq ADC - 9,10 and 11 July 1957 (Cont'd)	
TO	FROM	DATE COMMENT NO. 1
<p>with their studies on an improved missile. To narrow and expedite study effort, three ECM conditions were assumed as follows:</p> <ol style="list-style-type: none"> a. <u>Condition 1.</u> No AI radar operation. b. <u>Condition 2.</u> AI radar provides search information only. c. <u>Condition 3.</u> AI radar is not jammed until after lockon. <p>Following the studies which will take about four months, a weapon configuration will be selected for development. To assure priority for the ECM-MB-1 studies, an appropriate directive will be issued by Hq USAF.</p> <ol style="list-style-type: none"> 1. A joint ARDC-ADC message on the F-101/MB-1 configuration was dispatched to Hq USAF establishing the following priorities: <ol style="list-style-type: none"> a. The F-101/MB-1 armament configuration to have top development priority over all other F-101/F-106 armament programs. b. Reallocation of MB-1 test rockets as required will be effected by Hq ADC to support the F-101/MB-1 development effort. c. Hq ARDC will adjust the priorities of the F-101/MB-1 test support functions to expedite the F-101/MB-1 development. d. Preliminary arrangements were made for quarterly meetings of senior representatives of Hq USAF, Hq ARDC and Hq ADC to isolate problem areas, resolve differences and assign priorities and direction to development efforts in support of air defense. e. A letter to the Commander, ARDC is being prepared for your signature confirming the agreements which were reached and reaffirming our preference for quality over quantity. <p style="text-align: right;">DOLF E. MUEHLEISEN Brigadier General, USAF Deputy for Plans</p>		

DD - 9

359

317 ADCHR 57A

RE-APPROVED 452.1 Gen., National Guard Bureau, 12 Dec 56, Subjects (Gen.) Priority for Receipt of All-Weather Aircraft

ADDP-3 1st Ind 15 FEB 1957

Headquarters, Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado

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

FM: Chief, National Guard Bureau, Air Force Division, Washington 25, D. C.

1. In preparing the recommendations (inal 2), consideration was given to the limited conversion schedule of the ANG for the next year. Therefore, the recommendations are limited to the areas which are considered for priority effort in support of the air defense system.

2. Prior to receipt of the basic letter, this headquarters had undertaken a study to evaluate and establish definite air defense requirements for the Air National Guard. This study will require considerable additional time and will furnish our position in conjunction with COMAD for long range planning and equipping policies.

3. Consideration has been given in our present recommendations to factors limiting complete conversion to all-weather fighters such as: control capability of portions of the air defense system, proximity of ANG and other all-weather fighters to ANG units, uncertainty of the ANG to convert completely to more complex all-weather aircraft, and availability of aircraft in the USAF inventory. On this basis, the recommendations contain a second category where day fighters could be employed. Although use of these aircraft is considered an interim measure, the locations shown will be compatible to employment of future high performance clear air mass fighters as soon as they can be made available to the ANG.

FOR THE COMMANDER:

1 Inal
w/o
Added 1 Inal
2. Recommendations

Vertical routing table with columns for 'TO', 'FROM', and 'DATE'. Includes handwritten circled numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50.

Administrative routing form with fields for 'TO', 'FROM', 'DATE', and 'REMARKS'. Includes a section for 'The responsibilities of the recipient are to be indicated in this space'.

M-632-1

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WG-AFOTO

12 December 1956

SUBJECT: (Uncl) Priority for Receipt of All Weather Aircraft

TO: Commander
Air Defense Command
Ent Air Force Base
Colorado Springs, Colorado

1. Reference is Air Defense Command letter, subject: "(Uncl) Priority for Receipt of All Weather Aircraft," dated November 1955, with one inclosure.

2. The National Guard Bureau requests that the Air Defense Command reconfirm, or indicate, the priority for equipping the remaining Air National Guard squadrons. The Air National Guard squadrons that have received all weather aircraft are indicated by asterisk on subject inclosure. The six (6) Air National Guard Tactical Bomb Squadrons added to the priority listing will convert to Fighter Interceptor aircraft early in FY 1958.

FOR THE CHIEF, NATIONAL GUARD BUREAU:

1 Incl:
Ltr fr AEC, subj: "(Uncl)
Priority for Receipt of All
Weather Acft," dtd Nov 55,
w/1 Incl

JACK D. BLANCHARD
Colonel, USAF
Chief, O. & T. Br., Air Force Div.



M-632-2X

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DOC 318 ADCH 57A

F.L.C. V.B. 355

Action - ~~DEP~~ MTO
1781
Suspense - 25 Feb

INFO-16
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DO
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AG-010
A-863-20
RR RJEDEN
DE RJEPHQ 132
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FM HQ USAF WASH DC
TO COMAIRDEFCOM
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INFO COLO

REF ID: A6000-01 52500
REFERENCE TO THE
COMPONENTS IN AC
CERNING PARAGRA
ALL-WEATHER FIGHT
LIMIT THEM TO 2
LETTER RECOMMEN
LIMITED ALL-WEAT
55, USAF PROGRAM
WEATHER AIRCRAFT

REF ID: A6000-01 52500
15 NOV 56, SUBJECT: (U) ADC POLICY ON RESERVE
DEFENSE, ADDITIONAL INFORMATION IS REQUESTED
2.1. THE ANG HAS NOW CONVERTED 25 SQUADRONS TO THE
FIGHTER MISSION; PARAGRAPH 2.1.(1) OF YOUR LETTER WOULD
SQUADRONS FOR THIS ROLE. PARAGRAPH 2.1.(2) OF YOUR
AND ADDITIONAL SQUADRONS BE ORIENTED TOWARD
FIGHTER AND/OR DAY FIGHTER MISSIONS. PARAGRAPH
2.1.1, STATES THAT UNITS TO BE ASSIGNED ALL-
WEATHER AIRCRAFT BE REORGANIZED IN THE ADC STRUCTURE DURING THE

PAGE TWO
12 MONTHS PERIOD
THIS CRITERIA
ADC STRUCTURE
ELIGIBLE DURING
TOTAL THAT WOULD
QUESTIONS: (1)
REORGANIZATION
FIGHTER INTERCEPT
UNITS THAT ARE
DAY FIGHTER MISSION
FOR CONVERSION
PRIORITY LIST
BT
19/2000

DEFENDING THE ASSIGNMENT OF THOSE AIRCRAFT. UNDER
ALL SQUADRONS BECOME ELIGIBLE FOR REORGANIZATION TO
THE REMAINDER FY 57 AND 6 MORE SQUADRONS WILL BECOME
1ST QUARTER FY 58. THIS WOULD BRING TO 41, THE
BE CONVERTED TO THE ALL-WEATHER FIGHTER MISSION.
2. PARAGRAPH 2.1.(2) OF YOUR LETTER CONTEMPLATE
FIGHTER GROUPS (AIR DEFENSE) AND/OR AUGMENTED
OF SQUADRONS, DEPENDING UPON BASE LOCATIONS, FOR
ORIENTED TOWARD LIMITED ALL-WEATHER FIGHTER AND /OR
DAY FIGHTER MISSIONS. IN THAT RESPECTS WOULD YOUR PRIORITY
LISTING OF ANG FIGHTER UNITS DIFFER FROM THE
PRIORITY LIST

PHW

EXCEPT CATEGORY 3 ENCRYPTION
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Doc 319 ADGW 57A

ADGWP-3

21 MAR 57

SUBJECT: (Unclassified) AEC Command Policy on Reserve Components in Air Defense

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

1. In support of AEC Policy Letter ADGWP-1, dated 14 November 1956, a more detailed position is submitted.
2. This position is not to be considered or construed as an air defense requirement, but rather a practical solution to the problem along with a realistic appraisal of the USAF capability to support a reserve component force for the air defense mission.
3. In reviewing the AEC portion of the problem area, the ADF position was influenced by the following considerations:
 - a. The cost of equipping, maintaining and operating 75 AEC squadrons in augmentation of AEC with century series all-weather aircraft is prohibitive.
 - b. The present and programmed concentrations of air defense provided by AEC assigned forces will remain relatively the same to meet the requirements of the OMBD Objective Plan.
 - c. The AEC will be programmed for and receive only an extremely limited number of aircraft with a true air defense capability against the future threat (aircraft availability).
 - d. AEC can effectively utilize and employ a limited all-weather aircraft in its augmentation forces if a dramatic increase in speed and altitude capability is realized in order to counter the anticipated threat.
 - e. It is assumed that with the advent of surface to air missiles in volume, the AEC manned fighter force will be reduced.
 - f. AEC and OMBD war gaming reveal certain geographical areas within which the AEC cannot be effectively controlled and employed in the air defense battle.

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ADDP-5, By ADC, Subjects: (Unclassified) ADC Command Policy on Reserve Components in Air Defense

g. In certain areas, ADC does not possess and is not programmed for the necessary control capacity to utilize and effectively employ all ADC forces with an H-Day assignment to ADC (see enclosure #1).

(1) In certain areas, USAF assigned Class A weapons, (contour series aircraft, air to air missiles and ground to air missiles, all carrying atomic war heads) will consume the entire available control capacity. Extensive studies have indicated to this headquarters that these weapons will consume the total SAGE computer capacity even though the computers reach a 400 track capability, and therefore, that ADC aircraft in the Eastern U. S. will probably not be scrambled off the ground.

(2) Only a limited number of F-86 and F-89 aircraft in the ADC program will be modified so as to become compatible with SAGE equipment. Without an extensive additional modification program, most ADC aircraft will continue to require manual voice control. In any event, ADC aircraft compatible or not compatible with SAGE, are a needless expense when applied to augmenting ADC since they will probably not be utilized as long as Class A weapons are available.

(3) It is the opinion of this headquarters that the ADC units in the northeastern areas of the U. S., as designated in enclosure one, should be utilized to complement the forces of ADC, and they are therefore available for primary augmentation to other USAF commands.

h. In view of the above considerations, ADC supports:

a. The Air Force Reserve can best be utilized in the role of air transport.

b. The ADC forces augmenting ADC should be reduced to 30-40 fighter interceptor squadrons. For areas of best employment, see enclosure one.

(1) If some of the remaining forces are assigned to augment other USAF commands, the loss of air defense potential to ADC would not be complete inasmuch as all USAF fighter forces are available for air defense for limited periods and subject to certain other conditions.

c. In return for the reduction in forces, with the resultant monetary savings, it is anticipated that ADC units retaining assignment to ADC would receive equipment with a true air defense capability.

UNCLASSIFIED



ADDP-3, Sq ADC, Subject: (Unclassified) ADC Command Policy on Reserve Components in Air Defense

d. If no great additional cost is involved, 6-8 AND fighter interceptor squadrons should be relocated to strengthen the air defense system (see enclosure one).

e. The basic organizational structure for AND units augmenting ADC should be aligned more rapidly to the structure of this command. This structure will permit smooth integration and efficient operations in the event of mobilization.

f. Manning of missile units by reserve components in augmentation of ADC should be held in abeyance pending the operation of missile units by ADC for a period sufficient to evaluate the reserve component capability to operate and maintain air defense missile units.

g. This position in support of the referenced ADC Policy Letter has been coordinated with COMAD.

1 Incl
Way

ROY E. LYNN
Major General, USAF
Vice Commander



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FILE NUMBER 355

DO 320 ADCH 57A

8 Apr 57

AC-804
A 256-89
IKAS02
PP RJEDEM
PP RJEDEM RJEPLG
DE RJEPLG 170
P 032216Z
FM HEADQUARTERS
TO RJEDEM/COMAIRDC
INFO ZEN/COMAIRDC
RJEPLG/COMAIRDC
BT

1490-16 DB
37000-14 APRIL
3501

REFERENCE CONVERSATION... AND LT COL WINDERS... HELD ON 8 MARCH 1957... AS A RESULT OF SUBSEQUENT... THIRTY ZI BASED AIR... THE AIR DEFENSE... INTENDED TO... UPON MUTUAL AGREEMENT... ABOVE.

- | | | |
|---------------------|----------|--|
| PAGE TWO RJEPLG 170 | | |
| PRIORITY | SQUADRON | |
| 1. | 111 FIS | |
| 2. | 122 FIS | |
| 3. | 181 FIS | |
| 4. | 124 FIS | |
| 5. | 130 FIS | |
| 6. | 117 FIS | |
| 7. | 173 FIS | |
| 8. | 175 FIS | |
| 9. | 178 FIS | |
| 10. | 182 FIS | |
| 11. | 128 FIS | |
| 12. | 127 FIS | |
| 13. | 126 FIS | |
| 14. | 125 FIS | |
| 15. | 116 FIS | |
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PAGE THREE

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29. 129 F12
30. 130 F12

DESIRE THAT YOU REVISION THESE SQUADRONS LISTED AND INDICATE YOUR CONCURRENCE OR ANY CHANGE DEEMED NECESSARY. ANY ADDITIONS MUST BE JUSTIFIED ON A BASIS OF INDIVIDUAL SQUADRONS. (2) COORDINATE YOUR REPLY WITH GROUNDWAY OR PROVIDE THIS RE WITH EXPLANATION OF DIFFERENCES IF AGREEMENT CANNOT BE REACHED. (3) PROVIDE REPLY TO REACH THIS HEADQUARTERS NOT LATER THAN 12 APRIL 1957.

BT

33/22382 WIT RJEFIN

A--PARAPHRASE NOT REQUIRED EXCEPT PRIOR TO CATEGORY 5 ENCRYPTION--
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TO DECLASSIFICATION.

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COMER ADJ

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 FIB - Van Nuys, Calif 27. 157 FIB - Eastover, S. C. 28. 196 FIB -
 Charlotte, S. C. 29. 190 FIB - Boise, Idaho 30. 191 FIB - Salt Lake
 City, Utah. Part II. This has been coordinated with COMAD.

COMDR
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198-2
 This correspondence is classified _____ per para _____ AFR 205-1, or for reason(s) stated.

WRITER (and typist's initials)	OFFICE CODE	DATE	TEL NO.	FANFOLD NUMBER AND SUSPENSE D.
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DOC 322 ADCHR 57A

COMER
VC
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ADJ
2430
Date

ADMLO-C

28 MAR 57

SUBJECT: Logistic Support of ANG-air Defense Augmentation Forces, (U)

TO: Commander
Air Materiel Command
attn: MCFE
Wright-Patterson Air Force Base, Ohio

1. The majority of problems posed by your letter of 11 March 1957, subject as above, have been resolved, and are covered in AMC Operations Plan 5-37, 1 April 1957, which was published 25 March 1957.

2. To correct the specific statements contained in paragraph 4 of your letter, the following is offered:

a. Reference paragraph 4a. All quantitative requirements have been omitted from AMN OPLAN 5-37. The Consolidated Material Distribution Objectives will be the only document source for this information in the future. This will eliminate disagreement.

b. Reference paragraph 4b. Our supplement to AFM 77-43 will require our defense forces to provide the quantities with USAF authorization.

c. Reference paragraph 4c. The storage and delivery stock has been omitted from the new OPL plan since the major portion of their war reserves will be maintained on the ANG base. This new policy is adequately covered in the plan.

d. Reference paragraph 4d. Under present agreements with the National Guard Bureau, Oxygen, Gas-icing fluid will not be stored on ANG bases. One-third of base inventory is to be earmarked as a war reserve and the balance of their COMC authorization retained in AMC terminal storage.

e. Reference paragraph 4f. The omission of appendix 2 from plan corrects this discrepancy. Only those units listed in the COMC will be supported.

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ADMLO-C 28 Mar 57 2430 H 29869

MAIRI H. Payton, big

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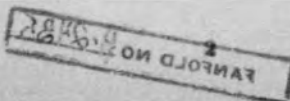
ADWLO-C, Hq ADC 28 Mar 57 Subject: Logistic Support of
ANG-Air Defense Augmentation Forces (U) (cont)

3 The lack of periodic coordination visits is being referred to our defense forces for necessary action. However, by placing the major portion of ANG war reserves on-base, the requirement for visits is substantially reduced. This will permit our defense forces and divisions to concentrate on the more important areas.

FOR THE COMMANDER:

[REDACTED]

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[REDACTED]

AIR MATERIEL COMMAND
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

ADDRESS REPLY TO
THE ATTENTION OF
MEFO

SUBJECT: Logistic Support of ANG-Air Defense Augmentation Forces, (U).

TO: Commander
Air Defense Command
ATTN: DCS/M
Ent Air Force Base
Colorado Springs, Colorado

1. For sometime questions have been directed to this Headquarters by our AMA's and Depots regarding prepositing and delivery of MRM and the other logistic tasks related to support of ANG augmentation squadrons during the pre-D-Day and D-Day time periods.

2. Because the ANG support problem seemed to be prevalent among most of the AMC subordinate installations who have been designated specific tasks in ADC OPLAN 5-56 and Annex C of AMC WFC-57, it was decided to take one AMC base and try to pin-point the source of the difficulty. This was done at a meeting held at Wright-Patterson AFB, on 1 March 1957, attended by representatives of the 58th AD(ADC), 162 FIS (ANG), Wright-Patterson AFB and this Headquarters. The basis for this discussion was the attached letter from Wright-Patterson AFB.

3. The problems encountered in the meeting were many and varied; however, it was generally agreed that few, if any, of the problems would exist if the Eastern Air Defense Force had carried out their coordination responsibilities as stated in par. 3 a(2) and (3) of Annex C, ADC OPLAN 5-56. To our knowledge, coordination visits by the Air Defense Forces have not been accomplished at the following AMA's and Depots:

- a. Wright-Patterson Air Force Base, Ohio.
- b. Olmsted Air Force Base, Middletown, Pennsylvania.
- c. Wilkins Air Force Depot, Shelby, Ohio.
- d. Tinker Air Force Base, Oklahoma City, Oklahoma.

Each of these Bases have expressed some difficulty with the subject problem.

*23 Mar 57
Copy to AMC
add. to file
M. J. [unclear]*

FAMFOLD NO. 56WP-1118

56WP-1118

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[REDACTED]

Ltr, dtd _____, from C, ANE to C, ADC. Subj: (U) Logistic Support of ANG-Air Defense Augmentation Forces.

4. It is believed that the ANG support problem is general enough to require a follow-up on all ANG augmentation units, whether they are being supported by ANE, TAG, SAC, or ATC bases. Some of the problems you may expect to encounter are:

a. MM quantities in ADC OPLAN 5-56 do not agree with the official Air Force Document, Consolidated Materiel Distribution Objectives (CMDO).

b. ANG Squadron has not received the appropriate extract of the CMDO.

c. Adequate delivery and pick-up procedures for ammunition not established.

d. Insufficient available MM (oxygen, de-icing fluid, POL, etc.) to accomplish required combat missions.

e. Designated support base prepositioning ammunition when the ANG Squadron has sufficient reserve to meet D-Day requirements.

f. ANG Squadrons listed as requiring support from ANE base, but Squadron has been deactivated (reference line 12, Appendix 2, Annex C, ADC OPLAN 5-56).

5. This Headquarters will assist you within our capability to correct these deficiencies; however, it is believed the key to these problems is the periodic accomplishment of the coordination visits.

FOR THE COMMANDER:

1 Incl
WPAFB ltr, dtd 14 Jan 57,
"Project Night Life (AFR
67-44)." (1 cy)

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ON 10984

56WP-1118

[REDACTED]

MAY 7 1957

FILE NUMBER 1557

MEMORANDUM, TO: USAF (ADMLO-C), SUBJECT: (Unclassified) Project Flight Life, 12 Mar 57

ADMLO-C Ed Ind 3 MAY 1957

By Air Defense Command, East Air Force Base, Colorado Springs, Colorado

TO: Commander, Eastern Air Defense Force, Stewart Air Force Base, Newburgh, New York

1. The Commander, 50th Air Division and other division commanders should be apprised of the latest prestocking policies for Air National Guard units located on ANG (civilian) bases and United States Air Force bases. These prestocking policies are adequately covered in Air Defense Command Operations Plan E-57, 1 April 1957.

2. The only bases which have a responsibility for prestocking all war reserves for ANG units are those USAF bases upon which ANG units are located. The only prestocking required by a designated support base for a nearby ANG unit has been in prestocking combat ammunition for E-Day delivery to the ANG (civilian) base. The latter will be partly or entirely eliminated through our efforts to transfer combat ammunition to these ANG bases. This headquarters anticipates using USAF support bases for interim storage of E-76* WAA, only pending completion of rocket storage facilities on ANG bases.

3. This headquarters will contact all defense forces in the near future for a report of ANG bases which are unable to fulfill their prestocking responsibilities as outlined in ANG Operations Plan E-57. This information will be used to negotiate new agreements with other USAF major air commands for interim prestocking of ANG war reserves. All negotiations for prestocking ANG war reserves will be accomplished at this level.

BY ORDER OF THE COMMANDANT

COMEBACK COPY

Not requested, not furnished
Furnished 3 MAY 1957
(Date) (Initials)

H. I. TOSO
Capt USAF
Asst Command Ad

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DESTROY AFTER: 30 DAYS 1 YR PERMANENT

WRITER (and typist's initials) Major Harold J Payton/bw OFFICE CODE: ADMLO-C DATE: 2 May 57 TEL NO: 2430 FOLD NUMBER AND SUSPENSE DATE: E-39404 None

ADC HQ FORM 11 15 MAR 57 PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE MEMO FOR RECORD: NONE SEE REVERSE

MAY 7 1957

85 ADMBS, Hq 65th Air Div (Defense), 13 Mar 57, Subj: (U)
Project Night Life

MCSDR 2d Ind

Hq AMC, Wright-Patterson Air Force Base, Ohio APR 26 1957

TO: Commander, Air Defense Command, ATTN: DCSM, Ent Air
Force Base, Colorado

1. Since the CMDO does not indicate Middletown Air
Material Area has any responsibility for prestocking MRM for
the 167th Fighter Interceptor Squadron (Air National Guard),
no action has been taken by that depot to obtain quantities
of the commodities specified in Paragraph 1.

2. In accordance with agreements between your command
and Headquarters AMC, prestocking at any AMC installations
for Air National Guard units located on Air National Guard
bases will be as mutually agreed and negotiated between the
Air Defense Forces and the installation involved. Authority
for AMC installations to enter into such negotiations are
contained in Annex C of AMC NPC Documents.

3. In your letter of 28 March 1957, Subject: (U)
Logistic Support of ANG-Air Defense Augmentation Forces, you
indicated that you were taking action with your Defense
Forces to correct the existing situation.

4. It is requested that this specific instance be
brought to the attention of the Eastern Air Defense Force
to assure that the 167th Fighter Interceptor Squadron attains
the prestocking objectives set forth in the applicable CMDO,
either through prestocking at its own base or by making
provisions for Middletown Air Material Area to assume
responsibility for that portion of the objectives which
cannot be handled by the unit.

FOR THE COMMANDER:

ROBERT F. BARRITT
Deputy Chief, Material Reserve
Branch
Missile Support Division
Directorate of Supply

Copy furnished:
By NAME

141-2

UNCLASSIFIED

[REDACTED]

Andrews AFB, Andrews AFB, Andrews AFB, Andrews AFB
Washington 25, D. C. Subject: (b) Project Night Life
141-3

MARK-4 1st Lt

Mr. William A. [REDACTED] Army, [REDACTED] AF Base, Pennsylvania
18 March 1957
To: Commander, Air Materiel Command, Attn: WCSR, Wright-
Patterson AFB, Ohio

Request information desired in basic letter be forwarded
to the 48th Air Division. For 1st Lt on hand refer to
latest [REDACTED] [REDACTED] [REDACTED]

FOR THE COMMANDER

CHARLES M. STODT, JR.
Assistant to Deputy Director for
Fuels and Lubricants
Directorate of Supply and Services

Info for:
Eq 48th Air Div (Defense)
Andrews AFB, Attn: 86ADSS
Washington 25, D. C.

UNCLASSIFIED

141-3

MAY 7 1957

[REDACTED]

HEADQUARTERS
85TH AIR DIVISION (DEFENSE)
UNITED STATES AIR FORCE
ANDREWS AFB, WASHINGTON 25, D. C.

HEADERS

13 MAR 1957

SUBJECT: (Unclassified) Project Night Life

TO: Commander
Olested Air Force Base
ATTN: Project Night Life Officer
Middletown, Pennsylvania

1. In order for this division to maintain accurate records of the equipment authorized to be in place under Project Night Life, we would like to know the percentage of the following equipment on hand:

Item	Qty authorized	% on hand
Auxiliary Fuel Tanks (AFSA)	841	
Auxiliary Fuel Tanks (AFSA)	841	
JP Fuel	5,458 gal	
Oxygen (Gaseous)	8,120 cu ft	
Fuel Filter De-icing Fluid	182 gal	
50 Cal. AP1-N-3 Ammo	87,470 rds	

2. The above equipment will be utilized by the 167th Fighter Interceptor Squadron (ANG), Martinsburg Municipal Airport, West Virginia.

3. It is desired that the above information reach this headquarters not later than 29 March 1957.

4. This letter is classified SECRET to conform with the classification signed by AFM 67-44 as amended to information pertaining to this project.

FOR THE COMMANDER:

[REDACTED]
[REDACTED]
[REDACTED]

UNCLASSIFIED

57A DOC 330

MEMORANDUM FOR THE SECRETARY OF DEFENSE
SUBJECT: Further Comments on SAGE

1. The informal discussions I held in Washington on Friday, the 15th of December, convinced me that the Air Force is about to slip the SAGE system still further to what is known among the Indians as Schedule S. It would appear that this slippage is being carried out because the Air Force feels that it is inexpedient to risk the expenditure of large amounts of money on the present SAGE system while facing the very firm probability of being required to do extensive and expensive retrofit thereafter in the installed equipment.

2. There are certain benefits to be derived from this slippage because my informal conversation indicated that the money saved on the SAGE system in next year be utilized to very good advantage in improving the radar and communications system. However, I believe it expedient that I go again as forcefully as I am able to bring out to the Secretary of Defense or to such other agency as I can reach, my view that it is mandatory that we get the SAGE system running as soon as possible and with whatever capacity it may enjoy in the initial type of installation. I have the feeling that our effectiveness, even with a degraded SAGE system, will improve wherever it is available by an order of say, 2 to 5. This is equivalent to all advances that have been made in the Air Defense business since World War I, and I do not feel that we can afford to permit consideration of the financial report to prevent us from moving ahead as rapidly as possible even though the objective may not be as technically and operationally effective or at as high a level as is desirable.

3. In handling this problem, you must appreciate that the information which I received in Washington is of a highly classified nature at this particular time. Nevertheless, I should like for our folks to confer with General Atkinson, who was the only other main person there, and collectively dream up a plan by which I can bring this matter which I consider to be of the most fundamental importance to the attention of the highest authorities.

H-50525
E. E. PARVINIENE
General, USAF
Commander-in-Chief

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Action Hist
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Surgeon 26 Feb
57a Doc 331

FROM MCP-575, ACTION HQ USAF FOR AFMDC.
INFO FOR AFMDC, AFMDC, AFMPP, INFO HQ ADC FOR ADCIE.
PART 1. YOUR MESSAGE CITE AFMDC 58718, DATED 8 JANUARY 1957 DIRECTED
A NEW SAGE SYSTEM IMPLEMENTATION SCHEDULE WHICH IS NOT IDENTIFIED
AS SAGE SCHEDULE NO. 6. PART 2. REFERENCE ZIPO-NAR MEMORANDUM DATED
2 JANUARY 1957, AND AFMDC-CS MEMORANDUM NBR 2 DATED 1 FEB 57, SUBJECT:
"SAGE ANCILLARY FACILITIES FUND REQUIREMENTS." INFO CONTAINED IN
REFERENCED AFMDC MEMORANDUM INDICATES THAT FUNDING ACTIONS FOR CERTAIN
SAGE OPS BLDG. ADDITIONS (RADAR SITE ANNEXES) G/A RADIO BLDGS.
AND GAPTILLER SITES ARE VERY MARGINAL. UNLESS POSITIVE ACTION IS TAKEN
TO INSURE TIMELY AWARD OF THESE CONTRACTS WITH FY 57 FUNDS, THE SAGE

PAGE TWO RJEDWP AX
IMPLEMENTATION PROGRAM AS APPROVED BY SECRETARY OF AIR FORCE WILL
BE IMPERILED. LATE FUNDING OF SAGE ANCILLARY FACILITIES IN NEW YORK,
BOSTON, AND SYRACUSE SECTORS HAS ALREADY RESULTED IN DISRUPTION OF
SUBSYSTEMS TEST PROGRAM AND HAS CAUSED STORAGE PROBLEMS FOR EQUIPMENTS
DESTINED FOR THESE FACILITIES. PART 3. ZIPO-NAR NBR 46 DATED 9 JAN
57 ESTABLISHED 31 MAY 57 AS REQUIRED DATE FOR RECEIPT OF AF FORM 378
AUTHORIZING CONSTRUCTION FUNDS FOR SAGE TECHNICAL FACILITY SCHEDULED
FOR PENDLETON AF. VERBAL INFORMATION RECEIVED AT THE ADES PROJECT
OFFICE INDICATES THAT ACTION IS BEING CONSIDERED TO MOVE THIS FACILITY
FROM THE FY 57 MCP TO THE FY 58 MCP. ANY ACTION TAKEN TO EFFECT THIS
CHANGE WILL RESULT IN A SLIPPAGE OF THE OPS DATE OF PENDLETON AIR
DEFENSE SECTOR. PLEASE ADVISE WHAT FUNDING ACTIONS WILL BE TAKEN ON
PARTS 2 AND 3 OF THIS MESSAGE.
BT
20/2143Z FEB RJEDWP

A--PARAPHRASE NOT REQUIRED EXCEPT PRIOR TO CATEGORY 2 ENCRYPTION--
PHYSICALLY REMOVE ALL INTERNAL REFERENCES BY DATE TIME GROUP PRIOR
TO DECLASSIFICATION.

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332 ADCH 57A

PARAPHRASE NOT REQUIRED EXCEPT PRIOR
TO CATEGORY B ENCRYPTION - PHYSICALLY
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THIS GROUP PRIOR TO DECLASSIFICATION.
AF ALMAJCOM 1104/57

ROUTINE
DEFERRED

COMDR ADC ENT AFB COLO

COFS USAF WASHDC

INFO: COMDR AMC WRIGHT PATTERSON AFB OHIO

COMDR ARDC BALTIMORE MD

CHIEF USAF AD&S PROJECT OFFICE 220 CHURCH ST NY NY

[REDACTED] FROM ADORQ-D 0079

PERSONAL FROM ATKINSON TO WHITE. This message in four parts. PART ONE. Reference message from your headquarters ALMAJCOM 1104/57 which directs no advertisement, bid openings or contract awards under budget project 321 and 331 funds on or after 1 July until further notice. PART TWO. Certain items which are absolutely required for satisfactory SAGE operation in early sectors fall under the terms of this freeze on construction. Some of these were funded in Fiscal 1957 and others require early release of Fiscal 1958 funds. Examples are emergency power and electrical distribution systems at prime radar sites, ground/air receiver and transmitter buildings, operations

DISPATCHED
17 JUL 1957
A.D.G.

17 1014
Jul 1957

ADORQ-D

Lt Col Donald H Higgins/djs
2009/2930 1 3

J. H. ATKINSON
Lieutenant General, USAF
Commander

[REDACTED]

UNCLASSIFIED

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COMDR ADC ENT APB COLO

ilding annexes and gap filler buildings. By comparison with the over-all capital expenditures already incurred, the funds involved are minor. However, unless early release of funds to cover these items is accomplished, such SAGE sectors as New York, Boston, Syracuse, and Washington cannot become operational in accordance with SAGE Schedule 6. Your headquarters is in possession of detailed line item listings of the facilities involved. PART THREE. It is considered mandatory at this stage that early SAGE sectors do in fact become operational in accordance with Schedule 6 and that they be capable of performing the air release mission. Both the USAF and Department of Defense will be open to severe criticism if the costly SAGE terminal facilities and communications already in place are left in a stand-by status or if their operational capability is limited by such things as inadequate radio channel coverage. Further, the cost of interrupting and then resuming the complex testing and shutdown activities now in progress would be high. PART FOUR. For the reasons outlined above, recommend that emergency action be taken to obtain immediate release of sufficient funds to cover items as outlined in PART TWO above in accordance with Schedule 6. All Fiscal 1957 items not yet in progress require this special action and those which will require release of Fiscal 1958 funds

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COMDR ADC ENT AFB COLO

rior to 1 November should be included. If establishment
of priority is required, order in which affected SAGE
sectors will become operational should be used as a
guide.

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FILE NUMBER 10721

24 July 57

HBA 6657

11G
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HCS
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OCE

24 Jul 57

AG 022HQA021KWPA25
RR RJEDEN RJEPHQ
DE RJEDWP 3X
P R 241600Z
FM COMDR AMC WRIGHT PAT AFB OHIO
TO RJEPHQ/COFS HQUSAF WASHDC
INFO RJEDEN/COMDR ADC ENT AFB COLO
RJEPGF/COMDR RAFD GRIFFISS AFB NY
RJEPHQ/HQUSAF WASHDC

[REDACTED] MCG 2347E. PERSONAL FROM GEN RAWLINGS
TO GEN WHITE. INFO CYS TO HQ USAF, ATTN: ASST CHIEF OF STAFF FOR AIR
DEFENSE SYSTEMS; ASOAC; AFOOP; AFMPP; AND AFCIE. SUBJ: FUNDING RE-
QUIRED TO MEET SAGE SCHEDULE NO 6. OPERATIONAL DATES OF MANY SAGE
SECTORS CANNOT BE MET IN ACCORDANCE WITH SCHEDULE NBR 6 UNLESS CRITICAL
INSTALLATIONS, MANY OF WHICH WERE DEFERRED FROM FY 57, ARE IMMEDIATELY
FUNDED. MOST CRITICAL ARE THE PENDLETON, LOS ANGELES, AND SAN
FRANCISCO DC AND/OR CC,S; ALSO RADIO SITES P-47 AND RICHARDS CEBEUR
IN THE KANSAS CITY SECTOR ON WHICH PLANNED BOMARC INTEGRATION IS
DEPENDENT; AND RADIO SITES P-62, P-20, P-61, P-81, P-53, P-85 A D P-64

PRIORITY

PAGE TWO RJEDWP 3X
WHICH PROVIDE RADIO COVER

AGE FOR THE CHICAGO AND DETROIT AIR DEFENSE
SECTORS. POWER DISTRIBUTION AND AUGMENTATION REQUIREMENTS FOR P-49,
P-50, AND P-21 ARE ALSO OVERDUE TO MEET OPERATIONAL DATES IN THE
NEW YORK, BOSTON AND SYRACUSE SECTORS. IT IS URGENTLY REQUESTED
THAT P-300 FUNDS REQUIRED TO PROVIDE THE SUPPORTING ELEMENTS FOR
THOSE SAGE SECTORS NOW BEING IMPLEMENTED BE RELEASED WITHOUT DELAY.

BT
24/1-21Z JUL RJEDWP [REDACTED]

A--PARAPHRASE NOT REQUIRED EXCEPT PRIOR TO CATEGORY B ENCRYPTION--
PHYSICALLY REMOVE ALL INTERNAL REFERENCES BY DATE-TIME GROUP PRIOR
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GROUP IS QUOTE.

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DOC 334 ADCHR 57 [Redacted]

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PRIORITY

X AF

ADHBA 03144
5 Jul 57

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COMDR ADC

COFS USAF WASH D C

[Redacted] FROM ADLPR 7008 . Reference our message
ADHBA 03144 dtd 5 Jul 57 and USAF message AFABF ALMAJCOM
1108/57. Justification for ADC unit activations contained in
referenced message is as follows:

a. Chicago SAGE Sector, Montgomery SAGE Sector, Duluth
SAGE Sector, and Seattle SAGE Sector are to be activated in FY 58
and will provide protection for some of the more vital industrial
and populated areas in the United States. In view of the known
inadequacies of the manual air division system, it is imperative that
these facilities be implemented in accordance with the presently
approved Schedule #6 which requires Fiscal Year 58 activation for
all of these units. The SAGE technical buildings which will be the
operational facilities for the units under consideration have already
been constructed at considerable cost and the communications

A. P. [Redacted]
To [Redacted]
[Redacted]
[Redacted]
[Redacted]

1957

10 1957

ADLPR

ROBERT F. FAULKNER, Lt Col, USAF
2409/2489

JAMES R. GUNN, Jr
Colonel, USAF
Director, Programming

[Redacted]



COMDR ADC

construction is well under way. Cost of maintaining such a facility on standby status is unknown; however, it is certain that the amount would be considerable. As an example, under the terms of normal contracts, communications costs could not be deferred. In the case of the Montgomery Air Division Sector, your headquarters directed implementation of an ADC plan for demonstration and test of the SAGE/BOMARC capability in the Montgomery Air Defense Sector. If the BOMARC missile is to become operational on 1 Sep 59 as directed, completion and opening of the Montgomery SAGE facility on schedule is a must. In view of the improvement to be realized in air defense and because of capital and operating costs incurred, all which must be borne in any case, activation of the units under consideration is not only completely justified, but is considered

The ADC units listed below are required to fill gaps in the outer perimeter radar defense system to complete double protected areas, provide coverage in the SAC complex and to extend control capability beyond the SAC borders. Construction of these units is indicated by an asterisk. Several of these units have been deferred in 1959 due to equipment status, personnel, and other factors. The electronic equipment



COMDR ADC

removed, pickled and stored. Once a site is placed on standby status, it takes 6 to 12 months to activate and place in an operational status. Circuit changes would be excessive if sites were placed on standby. Those sites preceded with a single x are 100 percent completed and personnel are moving into the sites. Sites preceded by a double x are to be joint CAA-USA F sites. TM-200 is to also support missile range at APGC.

*M-98	SM-145
*/**M-114	SM-149
*M-116	SM-150
TM-181	*/**SM-151
TM-188	TM-186
*TM-189	*TM-187
TM-190	*TM-192
*TM-191	TM-193
*TM-194	M-102
TM-196	*M-119
TM-200	*SM-153
*/**SM-147	*M-130
TM-177	TM-180
TM-197	

c. The listed gap filler sites are required to provide 500 ft coverage above the terrain on the perimeter of the combat zone, 2,000 ft coverage in the defense zones, and to provide 2,000 ft coverage in the SAC complex.

(1) The activation of the Gap Fillers programmed for FY 58 is an important part of the overall radar coverage program. Many of the gap fillers are necessary for the proper support of the missile program, especially in those areas of dense population. Even if all of the gap fillers programmed are installed and

COMDR ADC

operational in FY 56, it will still only provide the minimum essential radar coverage at the required altitudes. Without the activation of these gap fillers, it will be impossible to provide the proper coverage for the Army Anti-Aircraft Command.

(2) No large savings in funds can be realized by deferring activation of those sites on the following gap fillers where construction is already completed or is in the last stages of completion.

Sites marked with an asterisk are from 50 to 100 percent completed.

P-2A	*M-112C	*M-111B
P-6A	*M-113B	*M-112C
P-8B	*M-114A	P-1A
*P-11A	*M-115A	P-12C
*P-11B	*M-116B	TM-18A
*P-12A	*M-116 C	P-50A
P-14C	*M-126A	M-100A
P-16A	*M-129A	SM-157B
*P-21B	*M-129B	SM-157C
*P-29B	SM-162 A	TM-180A
*P-32A	TM-181B	P-14B
*P-37A	TM-187A	P-19A
*P-49A	TM-187B	P-34A
P-49B	TM-188A	P-50B
*P-80A	TM-189A	P-67C
P-82A	TM-189B	P-67D
P-85A	TM-191A	M-113A
*P-76A	*TM-191B	M-116B
*P-76C	*TM-194A	SM-150C
*P-76A	TM-196B	SM-159D
*P-79B	*TM-198A	P-7
P-80B	*TM-198B	M-89B
*P-92A	*TM-200A	TM-192A
P-92C	P-17B	TM-192B
*P-95A	*P-47A	M-98B
*P-95B	*P-77A	M-128A
P-95E	*P-77D	TM-177A
M-100B	*M-111A	P-19B

COMDR ADC

d. The wing at Eglin 9 and related supporting units are scheduled for activation during the 3rd Quarter FY 58. These units are required for BOMARC weapons training in ADC. The target date of 1 Sep 59 for BOMARC to become operational necessitates that the activation and operation of these units at Eglin not be delayed.

e. On 1 Jul 57, Tyndall Air Force Base was transferred to this command. At the same time, the 4756th Wing was activated. This unit is required to develop and conduct a weapons employment program and to support deployed F-102 units undergoing weapons training.

f. The 73rd Air Division was activated at Tyndall Air Force Base on 1 Jul 57. This division is required to exercise control over the 4750th and 4756th Air Defense Wings and the 4551st Missile Wing. This division is necessary to administer and provide support for all attached units at the weapons employment and missile employment facilities at Vincent Air Force Base, Tyndall Air Force Base, and Eglin 9.

g. The 4756th Drone Squadron is scheduled to be activated the second quarter FY 58 and equipped as soon as possible thereafter. This squadron must be operationally ready in 2nd Quarter FY 58 to support missile drone activities at the Tyndall Weapons Employment Center by deployment of 102 squadrons and the 4750th Test Squadron.

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h. Two Texas Towers are scheduled for activation during
FY 58. Texas Tower #3 is to be activated in Dec 57 and #4 in Jun
58. These installations are required to give defense in depth to the
East coast area. They will provide the necessary surveillance and
control capability to adequately defend the New York and other
densely populated areas on the East coast.

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COMER ADC

TO: COPE USAF WASHINGTON DC

3 May 1957

FROM ADRESI-3 01262

For AFOPF-OC F/3 ATTN: Lt Col M. Paul. Reference your phone conversation with Lt. Col. D. H. Higgins, this headquarters on 1 May 57. Deletion of the discussed SAGE facilities from FY-5E military construction program will result in a slippage of the SAGE program beyond that in schedule #6 recently approved by the Secretary of the Air Force. Any delay beyond schedule #6 is operationally unacceptable to this Command. Overall costs of the program would be materially increased due to rescheduling action. This would include but not be limited to storage of computers and ancillary equipment or production slow down by IBM and associated contractors. Slippage in its early stage would have the effect of creating a gap in the ATC training program with a subsequent over-loading. Doubt exists that ATC could absorb such fluctuations in programming without costly adjustment effort. Western Electric organization capability to implement and test system would have to be dissipated and rebuilt or continue under contract with reduced workload. RAND Computer Programming capability would be similarly affected. Cost of readjusting all these related programs cannot be accurately estimated, but would add substantially to cost of system, with loss rather than gain of operational capability. This headquarters strongly urges immediate reclama action and will provide support as required.

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6 MAY 1957

FILE NUMBER 107.1

X 107.17

HEADQUARTERS
AIR FORCE CAMBRIDGE RESEARCH CENTER
AIR RESEARCH AND DEVELOPMENT COMMAND
LAURENCE G. HANSCOM FIELD
BEDFORD, MASSACHUSETTS

CRIC

11 April 1957

SUBJECT: LPO Report Number CC-2

TO: Commander
Air Defense Command
Attn: Colonel L. B. Johnson
Ent Air Force Base
Colorado Springs, Colorado

1. LPO Report No. CC-2, subject: AN/FSQ-7 Computer Time Allocation for 1957, dated 1 April 1957, is forwarded for your information.

2. If inclosures are withdrawn (or not attached), the classification of this correspondence will be cancelled in accordance with AFR 205-1.

FOR THE COMMANDER:

1 Incl
LPO Rep No. CC-2
Q-52,407-13 & 14

Joseph R. Waterman
JOSEPH R. WATERMAN, Lt. Col, USAF
Chief, Lincoln Project Office

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MAY 6 1957

LPO REPORT NO. CC-2

This document consists of 16 pages
Copy No. 11 of 50 Copies.

Lincoln Project Office
Air Force Cambridge Research Center
Laurence G. Hanscom Field
Bedford, Massachusetts

1 April 1957

SUBJECT: AN/FSQ-7 Computer Time Allocation for 1957

TO: Lt. Colonel Joseph R. Waterman

FROM: 1st Lt. Henry C. Kreide

ABSTRACT: A study of the existing requirements for AN/FSQ-7 (XD-1) computer time matched against the available resources has culminated in the 1957 allocation of XD-1 and Kingston computer time (the latter time being the time IEM has made available on the XD-2 and test cell computers). The status of time requirements versus computer availability is brought up to date. Also, proposals to augment existing computer resources, including those already in effect, are discussed.

As the result of actions taken to date, the prospect of satisfying requirements for AN/FSQ-7 computer time is much better than it ever has been. However, shortage of time during 1957 is still critical and requires that specific action be taken to prevent slippage in schedules.

The computer time allocations will be reviewed quarterly for any modifications that may be necessary.

Signed: *Henry C. Kreide*

Approved: *William J. Zimmer*
for WILLIAM J. ZIMMER
Chief, Test Branch
Lincoln Project Office

Q-52,407-14

MAY 1957

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1 April 1957

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LPO Report No. CC-2

1. INTRODUCTION

1.1 Since December 1956, considerable time has been spent with users of XD-1, XD-2 and Kingston test cell computer time in an effort to produce a mutually acceptable allocation for 1957. Although there is not sufficient computer time to satisfy all requirements that have developed, an allocation which best conforms with existing SAGE schedules can and must be accepted. The allocations contained herein are intended to accomplish this purpose.

1.2 The availability of computer time on SAGE type computers is described in Section 2 while requirements for this time is given in Section 3. Each user of computer time has concurred on the time allocated for his use with the reservation that any difference between required and allocated time (noted in Section 3) may compromise his ability to meet schedules. Section 4 brings up to date the status of solving the overall time allocation problem as compared with the status when last reported.* The conclusions of Section 5 contains a schedule of events deemed necessary for assuring realism in the 1957 time allocations. The period to the left of the dotted lines in Figs. 1 and 2 represents the allocation that was made on a weekly basis during the first three months of 1957.

2. AN/FSQ-7 COMPUTER TIME AVAILABILITY

When it became apparent that XD-1 time alone was insufficient for accomplishing the SAGE development and production tasks assigned to the XD-1, additional computer time was made available at Kingston, N. Y. Also, Hq., USAF, approved the diversion of a duplex computer to Santa Monica, California as a permanent SAGE support facility in addition to those already planned at Grandview and Gunter Direction Centers. Although the Santa Monica machine is scheduled to be in operation by October 1957, it will take until January 1958 to set up a programming facility there. Thus, the only AN/FSQ-7's available to materially reduce the requirements for XD-1 time during 1957 are the XD-2 and test cell computers at Kingston, N. Y.

2.1 Available XD-1 Computer Time

The XD-1 schedule (Fig. 1) is based on six (6) twenty-four (24) hour days per week. The seventh day, Sunday, is scheduled for engineering changes, principally. Since changes to the XD-1 will probably continue indefinitely, a six (6) day week schedule will persist.

* Lincoln Project Office AFRC, "Study of AN/FSQ-7 (XD-1) Computer Time Requirements", 1 August 1956.

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LPO Report No. CC-22.2 Available Kingston Computer Time

IBM has made time available in the test cells at Kingston for relieving the XD-1 of many tasks. The minimum time available is usually one shift of eight (8) hours (five (5) days per week) on a nearly completed duplex computer. This represents sixteen (16) hours per day of simplex time. By virtue of using a different machine every month or so, the reliability of this time tends to be low compared with that of XD-1. Since IBM plans to shutdown one of the test cells in June 1957 and thereby cut the available time to four (4) hours per day, it is proposed to keep one half of a duplex computer in this test cell until January 1958 (see Sec. 4.1.1 for details). This would provide approximately the same amount of time that is available now. With the assumption that some such proposal will be adopted, the schedule of Fig. 2 is based on sixteen (16) hours per day of test cell time throughout 1957.

In addition to time in the test cells, there is also time on the XD-2 at Kingston for relieving the XD-1 load. Beginning in January, this time was five (5) hours per day, five (5) days per week and will increase to eight (8) hours per day by August. Adding this to the figure for test cell time makes a minimum of twenty-one (21) to twenty-four (24) hours per day available at Kingston (see Fig. 2). Also, there is likely to be as much as sixteen (16) hours of week-end time available on the XD-2 during the year (not shown in Fig. 2). It should be noted as it was for the test cell machines, XD-2 time is considerably less reliable than XD-1 time; however, this situation is expected to improve.

3. REQUIREMENTS AND ALLOCATION FOR 1957

Figures 1 and 2 represent the allocation of XD-1, and Kingston computer time, respectively. The following is a brief description of each task scheduled and comments on differences between required and allocated time where applicable. Each block of time in the schedules bears a number which corresponds to its description below. The agency responsible for each activity allocated time is given in parentheses.

3.1 Initial DCA Program Production (LL - Gp 67)

The initial ESS program is scheduled to be completely assembly checked by 1 June 1957. All indications are that this date will be met. The additional packages which complete the initial DCA (Direction Center Active) program are to be assembly tested by September 1957.

3.1.1 Parameter Check3.1.1.1 Initial ESS Program

On the basis of experience with parameter

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checking the Initial Program, approximately twelve (12) hours of XD-1 time per thousand orders is required. Parameter checking of the initial ESS program was completed in March.

3.1.1.2 Additional Packages

There are portions of the McGuire Program which will not be in the ESS program. These packages, such as Crosstelling, Forward Telling, and the active portion of the Duplex Standby Program, are presently being parameter checked. About one hour per day is required for this task until completion in July.

3.1.2 Assembly Test3.1.2.1 Initial ESS Program

On the basis of experience with assembly testing thus far, it was estimated that 600 hours of XD-1 time would be required from 1 January until the initial ESS program is completely assembly tested (about 1 June). The allowance of five (5) hours per day meets this requirement.

3.1.2.2 Additional Packages

The remaining packages for the McGuire program will be assembly tested from June until September and will require about two (2) hours per day of computer time.

3.1.3 Modifications to the Initial ESS Program

Since September 1956, there has been a continuous effort to modify the ESS Program to fit computer storage. When this is completed, the program will be modified, where necessary, to meet the fifteen (15) second frame time requirement. At the same time there are simple improvements being made in some sub-programs while others are being completely rewritten. There will be many other changes made as the result of shakedown and evaluation testing. Also, a number of modifications to improve the utilization of new weapon systems are planned for the summer months and ultimate delivery to McGuire. The time required for all of the modifications mentioned appears separately in Fig. 1 after the completion of parameter checking the ESS program. The most reliable estimate of this time is three (3) to four (4) hours per day.

3.1.4 Maintenance of the Initial ESS Program

After the completed ESS Program has been turned over for shakedown, approximately one hour every day will be used to maintain

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it. This task requires that the master files (tapes and punched cards) be kept up to date with changes in the program.

3.1.5 Support of the ESS Programming Activity

3.1.5.1 Maintenance of the Utility System

The XD-1 Utility System is essentially complete now with only minor additions to be made. Keeping the utility system up to date with additions and modifications will require approximately one hour per day of XD-1 time.

3.1.5.2 Instrumentation for Program Checkout

In order to parameter check and assembly test the ESS program, numerous programs and tables are required to simulate functions which are not contained in the programs being tested and are necessary for their checkout. This is termed "instrumentation". On the basis of the present activity, about one hour per day is required for checking instrumentation programs and tables.

3.1.5.3 Housekeeping for Program Production

The process of maintaining an up to date library of programs, tables, etc. which are used regularly in program checkout activities, is termed "housekeeping". This effort requires one hour per day until June and something less than this after June.

3.1.5.4 Kingston Support of ESS Programming

Some of the routine tasks associated with ESS programming activities, such as compiling and recompiling programs, are being sent to Kingston where at least three (3) hours per day is presently available for such work. The low reliability of the Kingston computers and the delay in communication with Lexington made the utilization of this time rather poor. However, this situation has improved considerably since the reliability of Kingston time has increased and transceiver equipment has been installed. Improved motor transportation to Kingston has further improved this situation.

3.2 Initial Combat Center Program Production (LL and RAND)

The job of producing the first Combat Center program (designed for the Syracuse CC) will be done at Kingston. By May, checkout of this program will have begun and will ultimately require five (5) hours per day of computer time. About 1 October this task is scheduled to be transferred to the Syracuse CC.

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3.3 Program Adaption to SAGE DC's and CC's (LL - Gp 66 and RAND)

The adaption of the air defense programs to the SAGE site air defense programs is done at Kingston and the various field sites. When the Santa Monica computer becomes available, most of this work will be transferred from the Kingston computers; however, the Santa Monica computer is not expected to have any appreciable effect on the Kingston facilities during 1957.

3.3.1 Support of Field Site Activities

When programs are adapted to SAGE sites, master tapes and decks of cards must be produced for delivery to the appropriate sites. The tasks of recompiling programs, verifying field test specifications, and parameter testing program modifications resulting from the differences between ESS and SAGE Subsectors, are done at Kingston. This activity is presently using and will continue to use four (4) hours per day.

3.3.2 Programmer Training

One of the most critical shortages in the whole SAGE programming effort has been that of experienced programmers. This situation can be relieved only by training new personnel as programmers. It has been estimated that a new programmer requires thirty (30) weeks of training. At Kingston, personnel who have had the six (6) week programmer's course are trained in the use of (1) operations office procedures, (2) utility programs and (3) assembly test methods. Six (6) hours per day is required for training programmers for field site teams.

3.3.3 Housekeeping and Utility Program Checkout

Just as there is a housekeeping activity for the XD-1, there is one for Kingston. In addition to the usual jobs of keeping tapes and decks of cards up to date, there is one peculiar to Kingston alone, that of checking utility programs on every new computer used. This support activity requires approximately two (2) hours per day.

3.4 SAGE Program Revision

3.4.1 Revision of the Initial Program (RAND)

The revision of the Direction Center Active Program will begin sometime after the completion of the Initial ESS Program. The revision activity will be aimed towards developing a program which will meet the original design specifications and will operate with new systems presently being developed. This program is scheduled for

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operation in McGuire by September 1959. Approximately three (3) to four (4) hours per day will be available on the XD-1 by July for this activity. Beginning in October, this activity will gradually be phased to the Santa Monica machine.

3.4.2 Support of the Program Revision (LL)

Before incorporating new items in the September 1959 program revision, demonstration of the feasibility and practicability of such items must first be proven in the ESS. Four (4) hours per day are allotted to this activity on Kingston computers after the CC programming effort moves to Syracuse. In addition, the phasing of RAND's revision activity to Santa Monica will provide additional time on XD-1.

3.5 ESS Testing3.5.1 Shakedown Tests (LL - Gp 64)

After portions of the ESS Program have been assembly tested, the system is then subjected to shakedown tests to determine if these programs meet their design specifications. Until October, there will be three (3) four (4) hour tests per week. After that, two (2) four (4) hour tests per week will be conducted for shakedown of modifications and additions to the ESS program.

3.5.2 Evaluation Tests (LL - Gp 22)

When the ESS Program has been sufficiently shaken down for overall system evaluation testing, the entire ESS will be subjected to System Operation Tests (SOT). The purpose of these SOT's will be to determine the extent to which SAGE can accomplish air defense. Beginning in October, one test every week of eight (8) hours maximum duration will be required for this purpose.

3.6 Operator Training (6520th and ATC)

The 6520th AC&W personnel who operate ESS will require systems exercises to "team train" to the extent necessary for operating the Direction Center during evaluation tests. Also, the 6520th must train ATC instructors who will in turn train ADC operators. In addition to developing their operating skills, the ATC instructors must determine the adequacy of simulated inputs (magnetic tapes) and training material for the training of ADC operators. Lincoln Laboratory has agreed to provide an operating system for approximately seventy (70) hours of training exercises between September and December. It is probable that these exercises will consist of one (1) four (4) hour mission each week. The first five (5) or six (6) of these tests will be for 6520th operator proficiency while the remainder will be devoted to training ATC in-

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structors. ATC has felt that more than seventy (70) hours of machine time is necessary for instructor training. However, they have tentatively agreed to Lincoln's proposal pending training knowledge gained through participation in Shakedown and Evaluation tests.

There is no longer any requirement to give live console training (using computer time) to ADC operators until January 1958. At that time there will be a requirement for four (4) hours per day for operator training. Lincoln Laboratory has reviewed the ADC operator training problem and has submitted a proposal to the ADES Project Office recommending that live console training of ADC operators be conducted at the site to which the men will be assigned.*

3.7 New Weapons/SAGE Compatibility Tests (IBM and Others)

Many of the new weapon systems which are to be integrated with SAGE embody concepts never before tried in an air defense system. Thus, it is necessary to conduct preliminary R&D tests and simulation studies to demonstrate compatibility and to gain information necessary for integration. The first of such efforts is being made by IBM to develop a BOMARC/SAGE Compatibility Flight Test Program (BOSCO) on the XD-2. The computer time allotted for this effort will gradually increase to four (4) hours per day by June and will remain at this figure thereafter by virtue of the expansion in BOSCO and other weapons integration work (e.g. simulation) that is anticipated.

3.8 Subsystem Tests3.8.1 ESS Subsystem Test Operation (LL - Gp 62)

During 1957, the subsystem's requiring the most computer time for integration with ESS are the long range radars. This activity will require four (4) hours per week. Another eight (8) hours per week is needed for program checkout and other subsystem testing.

3.8.2 ESS Equipment Checkout (LL - Gp 62)

Before each Shakedown or Evaluation Test, one hour is required to check the computer with inputs from radars and outputs to sites, using Air Force operators where practical. These checkouts determine the operating condition of the equipments. With three (3) such tests per week, this constitutes a requirement for three (3) hours per week. It is probable that more time will be required when Evaluation Tests commence.

* Letter, dated 3 April 1957, to Colonel O. M. Scott, ADES-PO, from B. R. Everett, Lincoln Laboratory.

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3.8.3 Data Reduction Program for SAGE Subsystem Tests (BTL)

BTL is developing a program for reducing data collected during subsystem test at SAGE sites. This will aid them in determining such things as radar orientation. Two (2) hours per week is presently allocated for this activity on the XD-1. Another ten (10) hours per week is available at Kingston. The combination of XD-1 and Kingston computer time just meets the requirement for two (2) hours per day. By July it is expected that BTL will have transferred most of their work to SAGE sites. The time then made available on XD-1 will be used for equipment checkout or subsystem testing.

3.9 AN/FSQ-7 Maintenance (IBM)

3.9.1 XD-1 Routine Maintenance

In consonance with the Air Force requirement that scheduled maintenance on the AN/FSQ-7 be no more than four (4) hours per day, it is appropriate to plan for an eventual allocation of this amount of time for the XD-1, with the provision of such additional time at present as may be required and available. Present allocations to organizations using XD-1 time are based on seventeen (17) hours of scheduled computer time per day, except Sunday. The seventeen (17) hour allocation is not sufficient to meet all requirements. Because of this and the need for IBM studies of maintenance problems (see 3.9.2), six (6) hours per day is presently allocated for maintenance during the remainder of 1957. It is recognized that this allocation is less than the time requested by IBM for maintenance; however, Lincoln Laboratory and Lincoln Project Office personnel have the problem under consideration and proposals for meeting the six hour allocation will be advanced to IBM in the near future.

3.9.2 Systems Maintenance Study Group - SMSG

In order to effectively improve maintenance techniques and procedures and machine reliability, some investment in computer time must be made for a maintenance study. IBM requires twelve (12) hours per week for this purpose. Beginning in April, one (1) hour per day plus four (4) hours on Sundays is allocated to SMSG.

3.9.3 Scheduled Maintenance on Test Cell Computers

When a test cell computer is used for programming purposes, it is necessary to schedule three (3) hours of maintenance per duplex shift. In other words, each computer is scheduled for one and one-half (1½) hours maintenance per eight (8) hour shift.

MAY 1957

LPO Report No. CC-23.9.4 Engineering Changes to the XD-1

Additions and modifications to the XD-1 occur on a regular basis. Since most such changes require power shutdown, they are usually scheduled for Sundays. Twenty (20) hours each Sunday is allocated for this purpose. LPO and Lincoln Laboratory will review all engineering changes planned to insure that adequate time is available. When large scale engineering changes require more than Sunday time for completion, a special allocation of time during the week will be made. When engineering changes do not require the full twenty (20) hours of Sunday time, the remaining time will be used for quality control and such other work as deemed appropriate by IBM.

4. STATUS OF COMPUTERS AND FACILITIES TO SUPPORT SAGE4.1 Additional AN/FSQ-7 Computer Time4.1.1 XD-2 and Kingston Test Cell Computers

The schedule in Fig. 2 assumes that there will be sixteen (16) hours per day available in the test cells throughout 1957 and a maximum of eight (8) hours per day on the XD-2 by late 1957. However, IBM plans to shutdown one of the test cells in June 1957 in order to modify it for the production of 256 x 256 magnetic core memories. As a result, Lincoln has proposed (with IBM concurrence) that half of a duplex computer be frozen in a test cell from June until December 1957. This would not interfere with production schedules, would allow for complete shutdown of the test cell by January 1958 (as required for the large memory schedule), would provide approximately the same amount of computer time as is presently available in the test cells, and would require that the SAGE Program Adaption activity be transferred to Santa Monica, California about 1 January 1958 (as scheduled). This proposal for continued use of a Kingston test cell is being reviewed by the ADES Project Office.

4.1.2 Diversion of the AN/FSQ-7 to Santa Monica, California for RAND

The RAND Program Revision activity (approximately 100 people) will begin moving to Santa Monica in October to establish programming operations. Since the office building to house the division of RAND concerned with SAGE will not be ready until January 1958, the balance of RAND's personnel located in Lexington and Kingston cannot move to Santa Monica before this date. This schedule is compatible with the computer availability at Santa Monica and the proposed use of test cells through December 1957.

1957

LPO Report No. CC-24.2 Reduction of Requirements for XD-1 Computer Time4.2.1 Adaption and Checkout of the DCA Program

The Lincoln-RAND effort to adapt the initial computer program for direction centers is established at Kingston. XD-2 and test cell computer time is used to satisfy nearly all requirements for the support of field site activities, programmer training, house-keeping and utility functions. This effort will be transferred to the AN/FSQ-7 at Santa Monica, California by January 1958.

4.2.2 Production of the CC Program

The Lincoln-RAND effort to produce the initial computer program for Combat Centers will be conducted on the XD-1 until October 1957 when it will be transferred to the Syracuse CC. All subsequent CC program activities (including adaption and revision but excluding site checkouts) will be located at Santa Monica, Cal.

4.2.3 Revision of the Initial DCA Program

RAND will begin revision of the initial program (including utility programs) for direction centers in mid 1957. It is anticipated that Kingston computer time will be used to satisfy most of the requirements for this activity. In October 1957, the revision activity is scheduled to move to Santa Monica, Cal.

4.2.4 SAGE System Training and Data Reduction Programs

Present planning deletes the requirement for XD-1 time to produce System Training Programs (STP) and data reduction programs for use at SAGE sites. This work will be done at the various SAGE sites and at Santa Monica.

4.2.5 ESS Data Reduction Program

Present planning deletes the requirement for XD-1 time to reduce and analyze data recorded during ESS tests. It is now planned to do this work on the IBM 704 for which a computer program is presently being written.

4.2.6 Integration of New Weapon Systems with SAGE

Compatibility testing of new weapon systems with SAGE during 1957 requires the use of Whirlwind I, the XD-2 and the IBM 704. It is not expected that XD-1 time will be used for this purpose during 1957. IBM is presently using the XD-2 for checking

LPO Report No. CC-2

out the BOMARC/SAGE Compatibility Flight Test Program (BOSCO). This program will be used for controlling BOMARC at the Missile Test Center in Florida. Modifications to this program are planned for real time simulation studies. These modifications will be made using the XD-1 or XD-2. Manned interceptors requiring compatibility testing during 1957 are the F-102A and possibly the F-104. These weapons will be tested in the Cape Cod System with the 1957 CCS Program employing some of the capabilities characteristic of century series interceptors. Also, there are plans for doing non-real time and possibly real time simulation studies of new Weapons in SAGE on the IBM 704 scheduled for Lincoln.

4.3 SAGE Support Facilities

4.3.1 Transceiver Communication Between Kingston and Lexington

The transceiver system installed between Kingston and Lexington was placed in operation in January, 1957, after several necessary modifications were made. This system makes possible the transmittal of holerith and octal punch card information via telephone line to a receiving station where the information is restored to punched cards. As many as 10,000 cards have been transmitted in a single week. The system has operated quite reliably. Utilization of transceiver has substantially augmented the air and automobile transportation used between Kingston and Lexington.

4.3.2 Requirements for Peripheral Equipment

The peripheral equipment (i.e. magnetic tape to punched card, punched card to magnetic tape, and magnetic tape to line printer) located in Bldg A of Lincoln Laboratory has contributed to efficient use of XD-1 computer time. In particular, the large volume of print-outs required for program operations can be done indirectly via magnetic tape rather than directly on the line printer. This has effected substantial savings in computer time. So great is the need for print-outs that a second tape to printer is needed for support of XD-1 operations. Similar needs exist for tape to printers at Kingston (for the XD-2 and test cell operations) and at the various SAGE sites. Unless tape to printers are made available at SAGE sites, approximately five (5) hours per day of additional computer time will be required at each site. For this reason, Lincoln has several such equipments on order. According to the schedule IBM has furnished, the first tape to printer will be ready for use in April 1957 at the McGuire DC; the second one will go to Kingston in May (for both Kingston and Stewart operations); the third one will go to Lincoln Laboratory in June; and the fourth one is scheduled for the Syracuse DC and CC in August.

MAY 1957
 LPO Report No. CC-2

4.3.3 Installation of an IBM 704 at Lincoln Laboratory

Lincoln Laboratory is scheduled to receive an IBM 704 computer in June 1957. Construction of a building adjacent to Bldg C in the Lexington complex began in March. This building will house the 704, its associated card room facility, and the personnel who will operate this equipment. Lincoln plans to rent 704 time in New York until their machine is available.

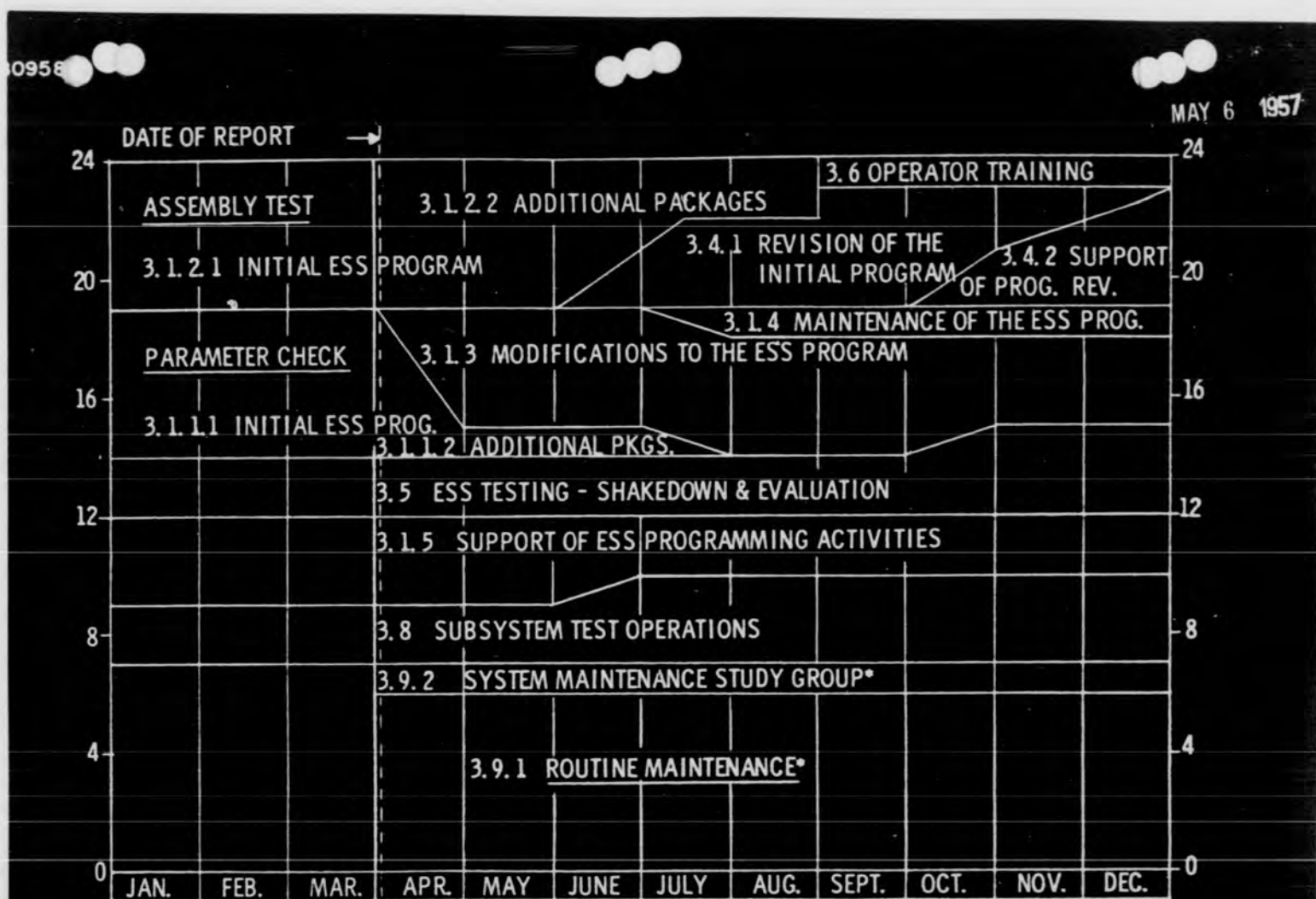
Use of the 704 at Lincoln should eventually result in a substantial savings in XD-1 time. At present, the tasks planned for this machine include: (1) Data reduction and analysis of ESS Shake-down and Evaluation tests, (2) real and non-real time simulation of weapon systems in SAGE, and (3) utility functions for the support of XD-1 programming activities.

5. CONCLUSIONS

The prospect of satisfying nearly all requirements for AN/FSQ-7 computer time are better now than at any time during the history of the time allocation problem. Computer time on other AN/FSQ-7 facilities has been designated for supplementing XD-1 time. Also, the procurement of transceivers, peripheral equipment (e.g. tape to printers), and an IBM 704 computer have further reduced requirements for XD-1 time and will make use of XD-1 time more efficient. It is anticipated that improved maintenance techniques, dual operation of computer programs, and better scheduling will make more AN/FSQ-7 computer time available. However, it will probably be mid-1958 before such improvements have a substantial effect on time allocation.

Although the time-allocation picture has improved considerably, the shortage of computer time is still critical. The allocations of time shown in Figs. 1 and 2 are realistic only if the following events occur on schedule: (1) Magnetic tape to line printer equipment must be delivered to McGuire DC, Stewart DC and Kingston, Lincoln Laboratory, and Syracuse DC and CC in April, May, June and August, respectively; (2) Lincoln's IBM 704 must be in operation by June; (3) at least one half of a duplex computer must be frozen in a test cell from June until December; and (4) the Santa Monica AN/FSQ-7 must be in operation by October. Also, maintenance of the AN/FSQ-7 computers must be adequate to insure reliable computer performance.

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*See Sec. 3.9 for the allocation of Sunday time.

FIGURE 1 XD-1 COMPUTER TIME SCHEDULE FOR 1957 (BASED ON A SIX-DAY WEEK)

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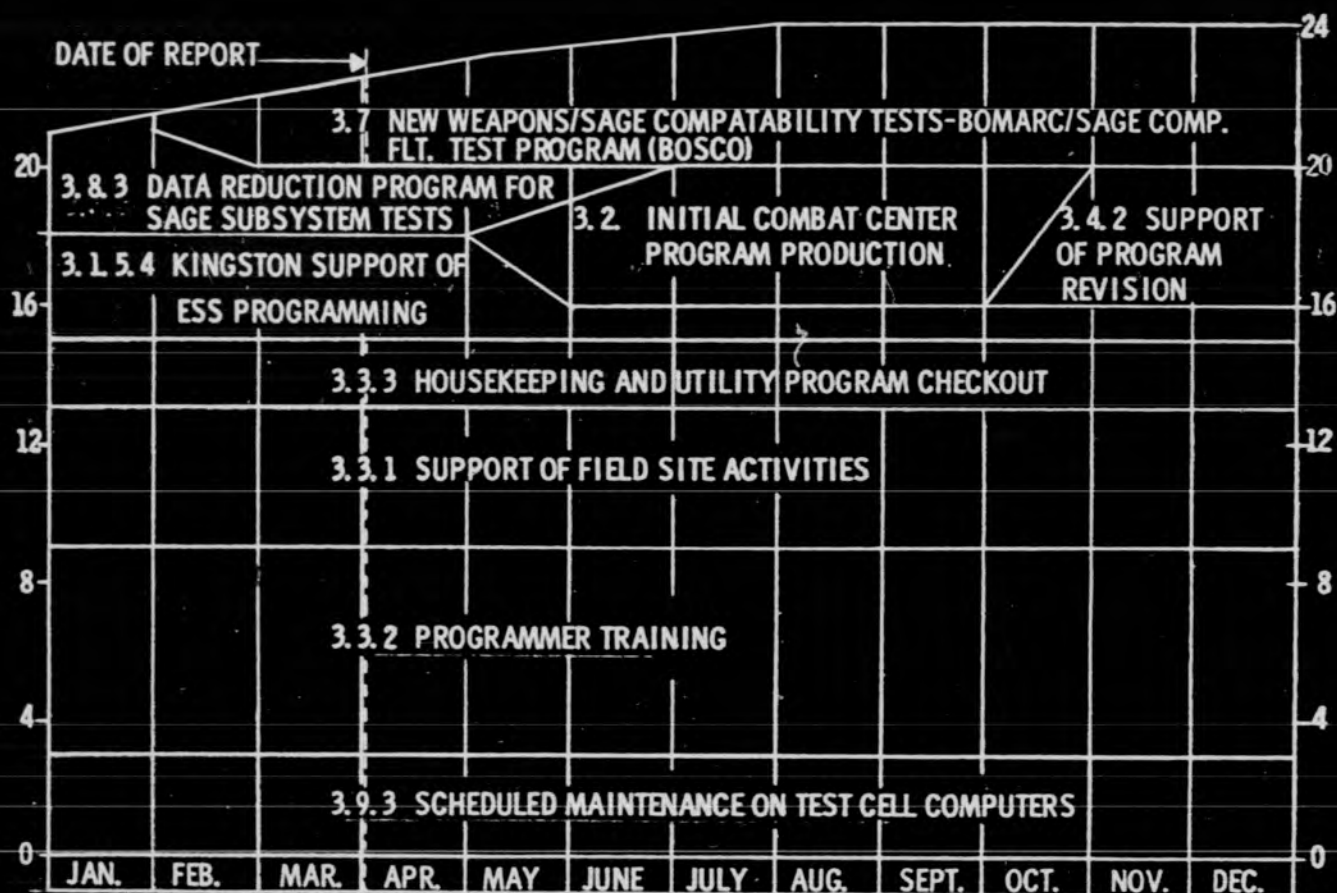


FIGURE 2 KINGSTON (XD-2 AND TEST CELL) COMPUTER TIME SCHEDULE FOR 1957 (BASED ON A FIVE-DAY WEEK)

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107.13

HEADQUARTERS
AIR DEFENSE COMMAND
United States Air Force
Ent Air Force Base, Colorado

DOC 337 ADCHR 57A

ADRSI-C

11 January 1957

SUBJECT: Weapons Employment Plan for SAGE Era

TO: See Distribution List

1. During the previous six months, a series of conferences has been conducted to determine the manner of employing air defense weapons with the Semi-Automatic Ground Environment (SAGE). The foreword of each employment document written at these conferences indicated that an Air Defense Command Employment Plan would be published at a later date.

2. It has been determined the employment documents, as written, will provide initial operational guidance to Lincoln Laboratory and the RAND Corporation for programming the AN/FSQ-7 computer. The employment documents will be revised as new operational data becomes available; however, it is not visualized that the operational concepts, as described, will change prior to operational experience with the various weapons. Changes in the tactical employment of weapons by SAGE, as described in these documents, will be the primary basis for revision of the documents.

3. Following is a list of employment documents published to date which should now be considered as official Air Defense Command Documents:

a. Employment of the F-89H&J Interceptors in the SAGE Era, dated 16-20 July 1956.

b. Employment of the F-101B Interceptor in the SAGE Era, dated 8-12 October 1956.

c. Employment of the F-102A Interceptor in the SAGE Era, dated 18-22 June 1956.

d. Employment of the F-104A Interceptor in the SAGE Era, dated 20-27 July 1956.

e. Employment of the F-106A Interceptor in the SAGE Era, dated 24-28 September 1956.

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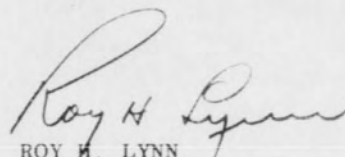
Hq ADC, ADRSI-C, Subj: Weapons Employment Plan for SAGE Era

f. Employment of BOMARC (IM-99) in the SAGE Era,
dated 14-23 May 1956.

g. Employment of TALOS (IM-70) in the SAGE Era,
dated 4-8 June 1956.

4. A copy of this letter will be attached to each
employment document.

1 Incl
Distribution
List


ROY H. LYNN
Major General, USAF
Vice Commander

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DISTRIBUTION LIST

Employment of F-89H&J Interceptors

Hq ADC	55
4620th ADW	3
ADC Rep, AFSWC	3
AFCRC	3
ARDC	6
WSEG - DOD	2
Lincoln Lab - M.I.T.	10
RAND Corp.	5
Hughes Acft Co	6
Douglas Acft Co.	1
Northrop Acft, Inc.	10

Employment of F-101B Interceptor

Hq ADC	45
4620th ADW	4
Hq USAF	3
Hq ARDC	3
ADES Proj Office	7
Det #1, ARDC	10
AFCRC-Lincoln P.O. (CRLB)	3
WSEG - DOD	2
RAND Corp	6
Hughes Acft Co.	7
Lincoln Lab - M.I.T.	10
McDonnell Acft Corp	20

Employment of F-102A Interceptor

Hq ADC	51
4620th ADW	3
F-102 Project	3
CONVAIR	6
WSEG - DOD	2
ADES Proj Office	6
AFCRC	4
ARDC	6
Lincoln Lab - M.I.T.	10
Hughes Acft Co.	6
RAND Corp.	3

Employment of F-104A Interceptor

Hq ADC	55
4620th ADW	3

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F-104A Interceptor (Cont'd)

ARDC	9
NOTS, INYOKERN	1
Lincoln Lab - MIT	10
RAND Corp.	5
Radio Corp of America	1
General Electric	1
Lockheed Acft Corp	15

Employment of F-106A Interceptor

Hq ADC	50
4620th ADW	3
Hq USAF	1
ARDC	20
WSEG - DOD	2
Lincoln Lab - M.I.T.	10
Columbia University	1
RAND Corp.	6
Hughes Acft	7
CONVAIR	15

Employment of BOMARC (IM-99)

Hq ADC	11
4620th ADW	3
ARDC	8
Lincoln Lab	8
RAND Corp.	3
International Business Machine Corp	2
Boeing Airplane Co	5

Employment of TALOS (IM-70)

Hq ADC	24
4620th ADW	3
Radio Corp of America	3
Lincoln Lab - M.I.T.	8
Applied Physics Lab-John Hopkins University	2
IBM Corp	2
RAND Corp	3
BuOrd	2
ARDC	8
ADES Proj Office	3
WSEG - DOD	2

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APR 30 1957

HEADQUARTERS
AIR DEFENSE COMMAND
United States Air Force
Ent Air Force Base, Colorado

ADRSI

26 APR 1957

SUBJECT: (U) Plan for Demonstration and Test of SAGE/
BOMARC Capability in the Montgomery Air Defense
Sector

TO: Deputy Chief of Staff, Development
Headquarters USAF
Washington 25, D. C.

1. References.

- a. TWX, Headquarters ADC, ADRSI-D 00772, dated 20 March 1957.
- b. TWX, Headquarters ADC, ADRSI-C 00902, dated 1 April 1957.
- c. Letter, Headquarters ADC, Subject: ADC Employment Plan for BOMARC, dated 8 March 1957.
- d. Letter, Headquarters ARDC, Subject: Revisions to BOMARC/SAGE Integration Plan, dated 21 March 1957.
- e. Joint APGC-ADC Plan for Implementation and Utilization of a SAGE Facility for Air Defense Weapon Testing and Unit Training, published in January 1956.
- f. Letter, Headquarters USAF, Subject: BOMARC-SAGE Integration, dated 12 April 1957.

2. In view of the requirement to have an operational SAGE/BOMARC capability in the New York Air Defense Sector by 1 September 1959, it is imperative that this capability be demonstrated and proven prior to that date. The Montgomery Air Defense Sector, which encompasses the Air Force Missile Employment Facility and the range facilities of Air Proving Ground Command is the only feasible location at which such a demonstration and test can be accomplished in the required time period. However, the 1 September 1959 operational date of the SAGE facilities in this area under the currently approved Schedule #6 is not satisfactory for the purpose.

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APR 23 1957

Hq ADC, ADRSI, Subj: (U) Plan for Demonstration and Test of SAGE/BOMARC Capability in the Montgomery Air Defense Sector

3. This Command conducted a joint conference at Wright-Patterson AFB on 9-10 April 1957 to examine means by which the operational date of the Montgomery Air Defense Sector could be improved. The agencies which participated are indicated on the attached attendance list, Inclosure #1. The following points were agreed upon by the conference in general:

a. The fully operational date of the Montgomery Air Defense Sector cannot be improved beyond 1 September 1959.

b. That portion of the facilities and of the first major revision to the initial SAGE computer program required to demonstrate the SAGE/BOMARC capability in multiple firings against multiple targets can be made available by 1 June 1959, by expedited action.

c. To accomplish b., above, will delay the fully operational date of the Montgomery Air Defense Sector by an unspecified time period after 1 September 1959.

d. ADC and APGC have an urgent requirement for the fully operational capability of the Montgomery Air Defense Sector at the earliest possible date after 1 September 1959.

e. The demonstration of SAGE/BOMARC capability at the earliest possible date in the Montgomery Air Defense Sector is of paramount importance.

f. The actions required to accomplish e., above, are of an expedited nature, so closely coordinated, and sufficiently unique that no single existing agency can monitor them successfully without disruption of other essential tasks. A task group, headed by ADC, with appropriate military representation from APGC, ARDC, and AMC should be designated to meet on a regular basis to monitor these actions, calling on representatives of all agencies involved as required.

4. The attached plan outlines the actions required to accomplish e., above, in as much detail as was possible


APR 30 1957

Hq ADC, ADRSI, Subj: (U) Plan for Demonstration and Test of SAGE/BOMARC Capability in the Montgomery Air Defense Sector

in the time available for formulation. It is requested that your headquarters approve this plan, and issue necessary implementing instructions to all agencies concerned. This letter and the plan have been distributed to all participating agencies simultaneously to insure that required actions can be promptly initiated when your approval is received.

5. As a corollary to approval of the attached plan, it is requested that the USAF ADES Project Office be directed to conduct the necessary studies to determine a schedule for placing the Montgomery Air Defense Sector in a fully operational status at the earliest possible date following 1 September 1959. SAGE Schedule #6 should be amended to reflect the required action as soon as possible.

- 2 Incls
 1. Attendance List
 2. Montgomery AD Sector Plan


 ROY H. LYNN
 Major General, USAF
 Vice Commander

Incl 2 not needed for CA/C Files

APR 3 1957

ATTENDANCE LISTADC CONFERENCE ON MONTGOMERY AIR DEFENSE SECTORWRIGHT-PATTERSON AFB, 9-10 APRIL 1957

<u>NAME</u>	<u>RANK</u>	<u>ORGANIZATION</u>
C. R. Carter	Lt Colonel	Hq USAF (AFDDP)
F. H. Dietrich	Major	Hq USAF (AFDRQ-AD)
J. A. Pollak	Civilian	Hq USAF (AFCIE)
L. F. Upson, Jr.	Colonel	Hq ARDC (RDZSM)
E. A. Kiessling	Colonel	Hq ARDC (RDZG)
J. H. Walker	Colonel	Hq ARDC (RDZSMB)
W. J. Klein	Lt Colonel	Hq ARDC (RDZSMB)
E. H. Kinney	Captain	Hq ARDC (RDZSMB)
H. Both, Jr.	Captain	Hq ARDC (RDZSMB)
W. G. Schwitzgebel	Captain	Hq ARDC (RDZSV)
S. K. Grinnell	1st Lt	Hq ARDC
R. L. Feik	Civilian	Hq ARDC
T. S. Topper	Civilian	Hq ARDC
D. H. Higgins	Lt Colonel	Hq ADC
K. A. Tyler	Lt Colonel	Hq ADC (ADRSI-D)
T. J. Sowerby	Major	Hq ADC (Install)
W. R. Sturm	Major	Hq ADC (ADOCO-W)
J. D. Muldoon	Captain	Hq AMC (MCPRE)
J. M. Patterson	Civilian	Hq AMC (MCPHMI)
J. M. Moellenberg	Civilian	Hq AMC (MCPHMI)
P. C. Newton	Colonel	Hq APGC (DCS/O)
B. B. Menth	Lt Colonel	Hq APGC (DCS/O-CE)
C. E. Grogan	Lt Colonel	Hq APGC (DCS/O-TR)
F. W. Belue	Major	Hq APGC (RDZDLE)
C. A. Wintermeyer	Major	Hq APGC (SAGE)
W. D. Baxter	Captain	Hq APGC (DCS/O-TR)
F. M. Butler	Civilian	Hq APGC (DCS/O-OT)
F. Kabase	Civilian	Hq APGC (DCS/O-TR)
W. Dailey	Major	RADC (RCMF)
A. J. Frohlich	Civilian	RADC
E. S. Hadfield	Lt Colonel	AFAC (ACTP)
W. C. Lazarus	Civilian	AFAC (ACT)
J. Blaum	Lt Colonel	4620th ADW-Lin. Lab.
L. F. Janek	Major	4620th ADW-Lin. Lab.
D. H. Temme	1st Lt	AFCRC (LPO)
R. Dunn	Civilian	Boeing
R. A. Montgomery	Civilian	Boeing
W. L. Batchelor	Civilian	IBM
P. A. Beeby	Civilian	IBM
J. W. Pepplewell	Civilian	IBM
R. L. Rockefeller	Civilian	IBM

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APR 30 1957

<u>NAME</u>	<u>RANK</u>	<u>ORGANIZATION</u>
W. P. Frawley	Civilian	Bell Tel. Labs
H. L. Baer	Civilian	Western Elec (ADES)
F. H. Bay	Civilian	Western Elec (ADES)
R. E. Ekeblad	Civilian	Western Elec (ADES)
E. C. Proehle	Civilian	Western Elec (ADES)
I. B. Smith	Civilian	Western Elec (ADES)
S. Spool	Civilian	Western Elec (ADES)
J. L. West	Civilian	Western Elec (ADES)
H. E. Anderson	Civilian	Lincoln Lab (MIT)
F. J. Schell	Civilian	RAND (Lincoln)
W. S. Melahn	Civilian	RAND Corp.
G. Johnson	Major	ADES PO
E. W. Marsh	Civilian	Boeing Airplane Co.

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Action: AIE
INFO, IG, DM, PAR, Compt

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TO RJEPHQ/COFS HQ USAF WASH DC
INFO RJEDEN/COMDR ADC ENT AFB COLO
RJEDWP/COMDR AMC WP AFB OHIO
ZEN/COMDR AFCRC LG HANSCOM FLD MASS
ZEN/CHIEF AIR DEFENSE ELECTRONICS SYSTEMS HQ ARDC CHURCH ST NEW YORK NY
ZEN/COMDR DE ONENHQ ARDC WP AFB OHIO
ZEN/COMDR RADG GRIFFISS AFB NY

316-F
11 Jan 57

BT
FROM RDZGT 1-6-E. FOR GENERAL PUTT, DEPUTY CHIEF OF STAFF,
AFCRC FOR LINCOLN PROJECT OFFICE. REFERENCE YOUR SECRET
LETTER SUBJECT IM-99/SAGE INTEGRATION DTD 19 DECEMBER 1956. THIS
COMMAND COMPLYING WITH REFERENCED DIRECTIVE. HOWEVER, PROBLEM EXISTS
WHICH REQUIRES IMMEDIATE RESOLUTION TO PRECLUDE FURTHER DELAY IN
ATTAINMENT OF A BOMARC/SAGE OPERATIONAL CAPABILITY. FAILURE OF THE
OFFICE OF SECRETARY OF DEFENSE TO RELEASE 750,000 DOLLARS FOR CON-
STRUCTION OF THE SAGE (AN/FST-2) BUILDING AT PATRICK IS DELAYING
INITIATION OF TESTS OF BOMARC UNDER SAGE CONTROL. THESE TESTS ARE
VITAL TO INSURE THAT COMPUTER PROGRAM FOR THE MCGUIRE SUBSECTOR WILL

PAGE TWO RJEPYB 36C
BE ADEQUATE. BASED ON AN EXPECTED FUNDS RELEASE DATE OF 15 FEB 1957
INITIATION OF BOMARC CONTROL BY SAGE HAS ALREADY BEEN DELAYED FROM
1 JULY 1957 TO 15 MARCH 1958. THE RESULT OF THIS DELAY IS THAT INSUF-
FICIENT MISSILES REMAIN IN THE PRESENTLY SCHEDULED BOMARC TEST AT
AFMTC TO COMPLETE BOARC/SAGE INTEGRATION AND REALLOCATION OF YIM-99'S
TO AFMTC FOR TESTING IS REQUIRED. FURTHER DELAY IN CONSTRUCTION OF
THE SAGE BUILDING AT AFMTC WILL SERIOUSLY JEOPARDIZE AN OPERATIONAL
BOMARC/SAGE CAPABILITY IN SEPTEMBER 1959. IT IS RECOMMENDED THAT
IMMEDIATE RELEASE OF NECESSARY FUNDS BE OBTAINED.

BT
10/1659Z JAN RJEPYB

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A--PARAPHRASE NOT REQUIRED EXCEPT PRIOR TO CATEGORY 2 DECLASSIFICATION--
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ADC HQ A-372-13 11/1/57
9 April 53

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DCG 341 ADCHR 57A

FILE NO. 10713.....

30 July 57

DEPARTED *Butler* X - AF X

COMDR ADC
CHIEF USAF ADES PROJ OPC 220 CHURCH ST NYK
COMRAFD GRIFFISS AFB NY
COFS USAF WASH DC

FROM ADMEL-P 0121.

Subject: AN/FST-2 Maintenance. This message in 3 parts. Part I.
General. When ADC assumes maintenance responsibility on AN/FST-2 equipments, it will be initially performed jointly by military personnel and contract maintenance technicians. This change in ADC position from 100 per cent contract maintenance reflects the philosophy of the Secretary of Air Force and Headquarters USAF; therefore, ADC must now build-up a military capability. In keeping with the above, this headquarters proposes to accomplish maximum AN/FST-2 maintenance on site. Existing technical supply facilities are deemed adequate to accommodate necessary AN/FST-2 maintenance spare parts providing no more than 1500 line items are involved. If RAFD is able to hold to the February 1957 AN/FST-2 maintenance spare part provisioning schedule with proper Air Force stock numbering and publish Supply Table XVI by 15 April, no difficulties should be encountered in the ACW sites

DISPATCHED
30 JUL 1957
A.D.C.

29 23002
July 1957

ADMEL-P

L/C Federovich/ea

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H-7772
HOWARD B. GAMPER
Lt Colonel, USAF
Actg Director of Electronics

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ADG

tech supply procedures. The Burroughs Corporation part identification system should be phased out as rapidly as possible. All AN/FST-2 maintenance spare part provisioning actions and hi-value provisioning actions should be governed accordingly. ADG further recommends AMC depot support procedures for the AN/FST-2 equipments be finalized at earliest possible date. Recommend all agencies planning and programming be governed by above criteria. Part II. For Headquarters USAF. This headquarters is deeply concerned over the AN/FST-2 TEL. Numerous requests for action by this headquarters, AMC and RAPO to finalize this requirement have brought negative results. Request USAF assistance on this TEL requirement as the ADG operational capability of SAGE may be jeopardized by late or non-receipt of necessary AN/FST-2 TEL. Part III. For all. ADG has not finalized technical representative requirements for AN/FST-2 equipment maintenance as the ATC training capabilities and ADG availability of 5 and 7 level technicians for special training on the AN/FST-2 must be thoroughly evaluated. Due to this unknown extent of technical representative requirements for AN/FST-2 support this date, request the AN/FST-2 information be confined to military channels and not released to civilian contractors.

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342 ARCH 57A

CMDB ADC

TO: COPS USAF WASH DC

15 March 1957

FROM ADRSI-C 00735

FOR AFOOP-OC-F/3, USAF. This message in 7 parts. PART I. At direction of this headquarters, RAND Corp, with IBM, Western Electric and others concerned has recently completed study defining equipment, building modification and communication costs for systems training program with SAGE. Success of manual system training program to date clearly establishes value this type of training. In addition, extension of these methods into SAGE time period considered mandatory for following reasons: A. STP, as outlined below, provides only feasible method to exercise SAGE Direction Center facilities and personnel at full system capacity to insure maximum performance in emergency situation. B. It is foreseen that individual training to be provided by ATC will provide minimum trained personnel for individual operator positions. Constant exercise as team member and situations simulating expected emergency conditions, will be required for proficiency and to realize full equipment capability. C. Live day to day air situation in many SAGE sectors provide little or no operator activity, even for routine actions. Crews at these locations, which may become heavy traffic areas as approaches to target complexes, must be trained in expected emergency situations for effective performance. PART II. A detailed plan for SAGE STP is in preparation for submission to your headquarters late this month. However, to meet desired implementation dates, early action is required by several agencies. Accordingly, following outline of program and estimated costs is presented for your early approval

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FY 59 \$8,515,000, \$10,000; FY 60 \$13,586,000, \$300,000; FY 61 \$99,000, Zero. Figure of \$375,000 in FY 1957 is to permit early development by IBM on SAGE Interceptor Simulator. PART VI. For ADES PO. Request further investigation of most economical means to provide communications for SSTP as outlined at February meeting in your office. Further, request that if your estimates on equipment or building costs differ from those presented above that you notify USAF, info this headquarters. PART VII. Request early approval and implementing instructions to all concerned to permit inclusion of SSTP costs as outlined in appropriate budgets and financial plans. It is emphasized that adoption of the SAGE System Training Program as outlined is mandatory to insure effective use of full SAGE design capacity by operating personnel. Overall costs, on basis of time in which they occur and fact that some four exercises per Direction Center per week are envisaged appear to be entirely acceptable for operational, gains to be realized. Unless this Command has the capability to effectively train assigned personnel to handle simulated threat condition of high capacity no assurance can be made that human error at critical times will not negate the technical advantage offered by SAGE and new air defense weapons.

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DOC 343 ADCHR 57A

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ADDP-3

1 APR 57

SUBJECT: (Unclassified) Operational Planning and Transition to SAGE System

TO: Commander
Eastern Air Defense Force
Seward Air Force Base
Sunderburg, New York

1. The operational concept for phasing from the manual to the SAGE Air Defense System in the 20th Air Defense Division (ADD) area, outlined in enclosure 1 to my letter, ADEPO, Subject: (Unclassified) Scheduled Phasing of Activities for SAGE System, 20 September 1955, was established on the basis of the SAGE system schedule shown on page 70 of the ADD "Operational Plan, SAGE System for Air Defense", dated 7 March 1955. This original schedule called for only two direction centers to become operational prior to the first combat center.

2. The SAGE Program is now being conducted pursuant to Air Defense Engineering Services (ADES) Schedule No. 6, dated 23 January 1957. In accordance with Schedule No. 6, six SAGE direction centers (New York, Boston, Syracuse, Washington, Memphis and Detroit Air Defense Centers) will become operational prior to the operational date of the first SAGE combat center (20th Air Defense Division - ADD). In view of the above, it is necessary to re-evaluate our operational concept and/or revise plans for operationally integrating the SAGE system and phasing out the manual system.

3. The following Air Defense Command positions, to be used for planning and programming purposes, are outlined for your information and guidance:

4. An assessment of the improved air defense capability to be provided by the SAGE system, recently completed by this headquarters reveals that:

(1) Even in the time period from 1 July 1957 to 1 January 1960, when SAGE centers will be equipped with a computer capacity of 100 words, SAGE will overcome many of the deficiencies inherent in the manual system. A SAGE direction center "air defense center" with this reduced initial computer capacity will provide a greater air defense capability than the manual system in the same geographical area.

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Hq ADC Subj: (U) Operational Phasing and Transition to SAGE System

(2) Assuming that SAGE direction centers with the 100 track capacity will have the air defense capability presently anticipated, SAGE direction centers and combat centers will be charged with the primary responsibility for air defense in a given sector or division area as they become operational.

b. Operational dates for SAGE direction centers and combat centers are those dates on which SAGE will have been fully tested and will be ready for operational use in accomplishing the Air Defense Command mission. While this headquarters is confident that operational dates outlined in current SAGE schedules will be met, to assure continuity in our air defense capability in the event of some unforeseen failure in the SAGE system during the transition period, this command will retain the full manual system capability as follows:

(1) In the first two SAGE sectors (New York and Boston Air Defense Sectors), the manual system will retain full operational capability for three months after the SAGE operational dates.

(2) In the following three SAGE Sectors (Syracuse, Washington and Bangor Air Defense Sectors), the manual system will retain full operational capability for two months after the SAGE operational dates.

(3) For all succeeding SAGE sectors - The manual system will retain full operational capability for one month after the SAGE operational dates.

The above will be used by all agencies of this command in consummating planning and programming actions. This position will be reviewed immediately following 1 January 1958 when considerable additional data will be available from the Experimental SAGE Sector and the results of sub-system and system tests of the New York Air Defense Sector (McGuire Direction Center) installation.

4. To insure that the improved air defense capability provided by SAGE will be realized as soon as individual air defense sectors become operational, complete and comprehensive plans for operationally integrating each SAGE sector into the Manual Air Defense Command System must be developed now. In developing these plans full cognizance must be taken of the following basic considerations:

a. Capability to perform the Air Defense Command Mission.

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By All Subjects (Unclassified) Operational Planning and Transition to SAGE System

- b. General and organizational structure.
- c. Manning requirements and personnel resources.
- d. Communications and funding requirements.

5. Recommend that the possible courses of action outlined in Enclosure 1, and/or any alternatives as you may deem appropriate, be given complete study and thorough consideration.

6. Request that your proposed organizational structure, operational planning and plans for transition to the SAGE system in accordance with Schedule No. 6 be furnished this headquarters by 1 May 1957.

7. This headquarters should be advised if any additional information or assistance is desired.

BY ORDER OF THE CHIEF:

**1 Encl:
Possible Alternatives for
Operational Planning and
Transition to SAGE**

**Info copies:
OASD
OASD
Liaison and (copy sent)
OASD and Project Office**

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The following are some of the possible alternatives which should be considered in developing plans for operationally integrating SAGE Air Defense Sectors of the 26th Air Division (SAGE) into the Air Defense Command System:

1. Follow the basic organizational and operational concept as outlined in EADF SAGE Reorganization Plan 101-56, 16 April 56, as pertains to the New York and Boston Air Defense Sectors, applying this concept to the Washington, Syracuse and Bangor Air Defense Sectors.

a. Under this concept, as each SAGE sector becomes operational, it also assumes the operational functions and responsibilities of an Air Division and reports directly to the EADF Combat Operations Center until such time as the SAGE Combat Center (26th Air Division - SAGE) becomes operational.

b. Considerable additional communications facilities would be required on a temporary basis, i.e., communications between each direction center and the EADF GOC, liaison circuits, and CONELRAD, SCATER, MADW networks, etc.

2. Retain the operational elements (Control Center facilities) of the 32nd Air Division (Manual) until the 26th Air Division (SAGE) becomes operational. As each SAGE Air Defense Sector becomes operational, it reverts to the operational control of and reports directly to the 32nd Air Division (Manual).

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a. Under this concept, the 32nd Air Division (Manual) would perform the operational functions and responsibilities of a SAGE Combat Center for SAGE sectors under its control, in addition to those functions and responsibilities within the manual portion of its area. As the New York, Boston, Syracuse and Washington Air Defense Sectors become operational, the SAGE portion of the 32nd Air Division (Manual) area of responsibility would increase considerably and the manual portion would not be phased out until the Bangor Sector becomes operational. For approximately two and one-half months, the SAGE and manual portions of the 32nd Air Division (Manual) area of responsibility would be split geographically.

b. It is visualized that a portion of the duplexed communications facilities now programmed for termination between each SAGE direction center and the SAGE Combat Center could be temporarily terminated at the 32nd Air Division (Manual) Control Center in that both facilities are located in close proximity to each other at Syracuse AFB. These communications could be used for forward tell, mission data, alerting status, command and control, etc. It is also anticipated that the CONELRAD, SCATER, MADW and Liaison circuits currently programmed to terminate in the SAGE Combat Center could be terminated temporarily at the 32nd Air Division (Manual) control Center.

3. Retain the operational elements (control center facilities) of both the 26th and 32nd Air Divisions (Manual) until the 26th Air Division (SAGE) Combat Center becomes operational. The New York and Washington



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Air Defense Sectors would come under this operational control of and report directly to the 26th Air Division (Manual). The Boston, Syracuse and Bangor Air Defense Sectors would come under the operational control of and report directly to the 32nd Air Division (Manual). The areas of responsibility of both the 26th and 32nd Air Divisions (Manual) would be expanded considerably as their respective SAGE sectors become operational. For a period of time both air divisions would be required to conduct manual and SAGE air defense operations simultaneously within their respective areas of responsibility.


a. Under this concept, it is also visualized that those additional communications required for SAGE operations within the 32nd Air Division (Manual) area would be met generally as outlined in paragraph 2.b above. However, considerable additional temporary communications would be required for SAGE operations within the 26th Air Division (Manual) area, especially in the Washington Sector. These would be primarily those communications required between the 26th Air Division (Manual) GOC and its respective SAGE direction centers, and liaison circuits, CONELRAD, SCATER and MADW networks within the Washington sector.

4. Retain the operational elements (control center facilities) of the 26th, 32nd and 85th Air Divisions (Manual) until the 26th Air Division (SAGE) Combat Center becomes operational. As SAGE Air Defense Sectors become operational, they would be assigned for operational control and report directly to manual air division control centers as follows: New York and Boston Air Defense Sectors - 26th Air Division (Manual), Syracuse

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and Bangor Air Defense Sectors - 32nd Air Division (Manual), and
Washington Air Defense Sector - 85th Air Division (Manual).

a. This alternative would require establishing, on a temporary basis, the necessary communications between each manual air division control center and its respective SAGE direction centers. In the 32nd Air Division area, these communications could be provided as described in paragraph 2.b. above. Many of the external communications now used in each manual air division area could be retained, some could be discontinued, or realigned, and soon new circuits would be required as air division boundaries are readjusted as SAGE sectors become operational.

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AMPS-24

SUBJECT: (Declassified) Status of SAGE Implementation

TO: Chief of Staff
Headquarters United States Air Force
Washington 25, D. C.

1. I am writing to discuss our progress toward implementation of a fully operational Semi-automated Ground Environment (SAGE) System. It is well known that the Direction Center in the New York Air Defense Sector is scheduled to become operational on 1 July 1957. Thus far, we have every assurance that the SAGE System will be capable of directing Air Defense operations commencing on that date. Our future planning will therefore be based upon this as a definite policy. However, we will plan for a short manual back-up period in the case of the first few SAGE Direction and Combat Centers. Our optimism regarding SAGE is based upon the best technical advice available, and upon the fact that we now have a respectable operational schedule. In other words, it now appears that the development program has been adequately defined insofar as the delivery of equipment and construction of facilities is concerned. There is one area, however, which gives us cause for concern; that is the overall problem of manning the SAGE System.

2. As is usually the case in reaching the implementation stage of any large program, numerous shortages and readjustments of operational dates and equipment availability have taken place. In the case of SAGE, this has centered to such an extent that until recently valid personnel planning was all but impossible. In December 1954, we were able to formulate a valid estimate of our planned personnel and training requirements for implementation of the SAGE System through the end of the year in 1954. Under the most realistic guide lines we could develop, this evaluation reveals several significant facts. They are:

a. During the initial stages of manning, until back-bank from the Manual SAGE System can begin, SAGE will require approximately 1900 personnel in addition to the Manual System.

b. During the progressive SAGE build-up, the personnel back-bank from the Manual System will not fulfill the new manning requirements on a planned basis. Therefore, additional personnel for SAGE System will be required on a steady basis until 1958. At that time back-bank

Col R L HICKS JR/maf

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ADPWS-24, Rq AAG, Subj: (U) Status of SAGE Implementation

from the Manual System will be in excess of the remaining SAGE requirement. The SAGE Environment will require approximately 39,500 (4,000 more than the projected Manual System and 7,500 more than the present Manual System) by the end position in 1962.

3. We will require better qualified personnel for the SAGE Environment, as well as increased numbers of certain critical skills.

4. Unlike Fighter and AOGW units of the present, the SAGE Direction and Combat Centers cannot become operational with significant personnel shortages. The operation of a SAGE Direction Center or Combat Center depends upon the proper integration of all sub-systems. Unless each sub-system is adequately manned for its operational contribution, the overall system cannot function properly.

3. Through separate correspondence and periodic conferences, appropriate agencies of the Air Staff have been advised of our requirements and our efforts thus far. In this regard, a draft ADC Personnel Plan was distributed for comment in December 1956. The finalized ADC Personnel Plan bearing on all facets of SAGE manning will be forwarded to your Headquarters early in March. Certain alternate courses of action have been required and will probably be required in the future. For example, your Headquarters has recently approved the decision to operate and maintain the electrical power production and air conditioning equipment at all Direction and Combat Centers with civilian contractor personnel rather than with military personnel. Lack of budgetary support with which to implement this decision would seriously jeopardize the SAGE program. In other areas, our special training plans appear realistic and a personnel flow from the pipeline has commenced. Let me say that the fine support which we have received from separate Air Staff agencies has been noteworthy and is, of course, a significant factor in our progress to date.

4. I am most concerned over the fact that we apparently must man a system of the size and complexity of SAGE in a routine manner. For example, I note that the standard unit priority system as established in the USAF Operational Priority of Units Document (OPU) applies to SAGE, and that SAGE manpower requirements are to be included in the overall ADC manpower ceilings, for the future. This may well require that portions of the initial overlap manning of SAGE, as well as the continuing build-up, be accomplished from ADC's own inadequate personnel resources. I am fully prepared to convert the personnel available in the Manual AOGW System into SAGE as rapidly as possible, but I cannot further deplete my fighter and combat support units of personnel. We are presently operating in the face of skill shortages and under such a condition the Air Force could, in the near future, face a situation where complete SAGE facilities are available without adequate numbers of qualified personnel for operation.

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AIRWT-PA, HQ AWC, Subj: (U) Status of SAGE Implementation

5. In order to correlate the manning program for SAGE with the presently defined program for equipment and for facilities, I consider it essential that certain additional steps be taken by the Air Staff. These are:

- a. The overall Air Force capability to support SAGE, in light of our presently stated requirements, be evaluated.
- b. The importance of SAGE in relation to other portions of the Air Force Program be established.
- c. A policy be formulated to provide:
 - (1) An appropriate priority for SAGE manning, and
 - (2) A sufficiently flexible personnel ceiling for this command to implement the SAGE program in accordance with the present operational schedule.

J. R. ATKINSON
Lieutenant General, USAF
Commander

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ADCM 30-1

15 March 1957

(TITLE UNCLASSIFIED)

57A Doc. 345

SAGE

PERSONNEL PLAN

**SEMIAUTOMATIC GROUND
ENVIRONMENT SYSTEM**

FOR

AIR DEFENSE



UNCLASSIFIED

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

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ADCM 30-1A

ORANGE

ADC MANUAL }
NUMBER 30-1A)

HEADQUARTERS AIR DEFENSE COMMAND
ENT AFB, Colorado Springs, Colorado
15 May 1957

FILED 233-~~7~~

SAGE

Personnel Plan

ADCM 30-1, 15 March 1957, is changed as follows:

1. Insert attached revised pages according to page numbers. Insure that pages are inserted in the proper section, i.e., main body of the Plan or Appendix I. The corresponding pages may be destroyed in accordance with AFR 205-1. (Double slash // indicates new or changed material.)

2. Make the following changes in ink:

Page vi: Change number of copies for Technical Training Air Force from 2 to 4.

Page 11, para (4): Change FY 58 to FY 59; 41,375 to 41,377; 14,147 to 14,149.

Page 26: Change "Total Officers and Airmen" in FY 59 from 14,195 to 14,197; in FY 60 from 22,974 to 22,978; in FY 61 from 33,878 to 33,884; in FY 62 from 39,277 to 39,285; in FY 63 from 39,513 to 39,521.

Appendix I, Annex B, page 3: Change the name of Sault Ste Marie ADS location from Kalkaska, Mich to K. I. Sawyer AFB, Mich.

BY ORDER OF THE COMMANDER:

OFFICIAL:

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

PAUL W. SCHEIDECKER
Brigadier General, USAF
Acting Chief of Staff

14 Attachments:

Pages 12-19; Appendix I, 24-27, 37-38

DISTRIBUTION:

Same as ADCM 30-1, 15 Mar 57, plus two additional copies for Technical Training AF

1-15724

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FIGURE I
RECAPITULATION OF GROUND ENVIRONMENT PROGRAM

	As of <u>1 Jan 57</u>	<u>FY 57</u>	<u>FY 58</u>	<u>FY 59</u>	<u>FY 60</u>	<u>FY 61</u>	<u>FY 62</u>	<u>FY 63</u>
I. ZI Manual System Build Up (Without Reference to SAGE) Accumulative	32,169	32,748	34,562	35,724	35,963	36,119	36,190	
II. Manual System Phase Down as Absorbed by SAGE		32,513	34,133	27,228	19,548	9,320	810	
// III. SAGE Environment Build Up Accumulative		2,889	7,619	14,149	22,932	33,840	39,285	39,521
// IV. ADC Total ZI Ground Environ- ment (Totals of II & III) Accumulative		35,402	41,752	41,377	42,480	43,160	40,095	39,521

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b. Figure Ia. This chart was designed to illustrate more effectively the actual manpower relationship of the two (SAGE and Manual) Systems. SAGE is implemented while the Manual System is absorbed. It should be noted that the Manual System is absorbed in two ways; by actual feedback of personnel, and by conversion of certain elements of the System without actual feedback. Figure Ia provides an accurate picture, not only of the total personnel requirements necessary to implement SAGE, but also portrays the progressive generation of these requirements.

(1) Line I represents the yearly personnel requirements attributable to SAGE functions; in other words, the fiscal year personnel requirements for SAGE Sectors, Divisions and augmentation necessary to maintain and support associated SAGE equipment at the ACW Squadrons. Line II indicates the Manual Program requirements by fiscal year, and includes ACW Squadrons and Gap Filler Sites programmed but not yet installed. Line III is the sum of Lines I and II and represents the ADC total programmed Ground Environment personnel requirements by fiscal year. This excludes the Canadian Radar Sites which are not presently scheduled for integration with SAGE.

(2) Line IV indicates the total personnel assets (feedback) available for SAGE by fiscal year. This feedback commences on 1 November 1958 with the New York Sector and continues through FY 63. Line V follows with the resulting yearly and accumulative Headquarters USAF support requirements, both before and after feedback commences.

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FIGURE Ia

	<u>FY 57</u>	<u>FY 58</u>	<u>FY 59</u>	<u>FY 60</u>	<u>FY 61</u>	<u>FY 62</u>	<u>FY 63</u>
// I. SAGE Requirements (AC&W Augm, Sector & Div Hq) Yearly	919	1,948	4,042	4,384	5,275	4,191	236
II. Manual Program Requirements (Gap Filler, Radio Sites & Texas Towers Incl) Yearly	579	1,814	1,162	239	156	71	
// III. Total of I and II Yearly	1,498	3,762	5,204	4,623	5,431	4,262	236
IV. Manual System Assets (Feedback) Yearly			4,602	5,027	6,195	5,396	465
// V. Required USAF Support							
a. Yearly	1,498	3,762	602	* 404	* 764	*1,134	*229
b. Accumulative	1,498	5,260	5,862	5,458	4,694	3,560	3,331

* Feedback is higher than requirement.

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(a) It will be noted that commencing with FY 60, Manual assets available (Line IV) for SAGE are greater than the programmed SAGE and Manual requirements (Line III). This results from the fact that assets available from the programmed conversion of the Manual System to SAGE simply exceeds the final yearly requirements.

// (b) In a strict space accounting, such as Figure Ia, it would appear that 404 spaces in FY 60, 764 spaces in FY 61, 1134 spaces in FY 62, and 229 spaces in FY 63 would be returned to the USAF inventory. As a practical matter, however, this apparent overage in actual personnel bodies (if actually existing) would no doubt be required to replace attrition losses or actual shortages of personnel.

2. Total SAGE Requirements: Figures II and III provide a tabulation of the SAGE Personnel Requirements by grade, skill and AFSC, calculated to the end of each fiscal year. These requirements are based on authorizations contained in current Organization Tables and time phased in accordance with Schedule #6. Included are personnel required for SAGE Divisions, Sector Headquarters, Radar Squadrons (SAGE), Gap Filler augmentation, Radio Sites and Texas Towers.

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FIGURE 2

SAGE Environment - Officer Requirements

<u>AFSC</u>	<u>RANK</u>	<u>FY 57</u>	<u>FY 58</u>	<u>FY 59</u>	<u>FY 60</u>	<u>FY 61</u>	<u>FY 62</u>	<u>FY 63</u>	<u>TOTAL</u>
0002	Gen	2	1	9	8	10	10		40
0016C	Col	2		7	6	7	10		32
0016D	Col			2	1	2	3		8
0036C	Col	2	1	7	6	8	8		32
0036D	Col			4	4	4	4		16
0046C	Col	2		5	8	6	10	1	32
0046D	Col			2	1	2	3		8
0056C	L/C	2		5	7	6	10	2	32
0056D	L/C			1	2	2	2	1	8
0066C	Col	6	5	5	6	9	1		32
0066D	Col			2	2	2	2		8
1416	Maj	5	2	21	28	26	36	2	120
1416	L/C	8	7	20	22	25	21	1	104
1435	Capt	2		6	10	8	12	2	40
1435	Maj			2	1	2	3		8
1444	Maj			1	2	2	2	1	8
1616	Maj	3	29	62	72	80	80	2	328
1616	L/C	2	18	52	48	60	60		240
1644	Lt	14	53	96	86	110	106	1	466
1644	Capt	7	60	123	110	142	139	1	582

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Figure 2 (Contd)

<u>AFSC</u>	<u>RANK</u>	<u>FY 57</u>	<u>FY 58</u>	<u>FY 59</u>	<u>FY 60</u>	<u>FY 61</u>	<u>FY 62</u>	<u>FY 63</u>	<u>TOTAL</u>
2016	Maj	2	1	7	6	8	8		32
2016	L/C			2	2	2	2		8
2054	Lt	2		7	6	7	10		32
3016	Maj	30	49	72	95	114	71	4	435
3016	L/C	14	27	31	42	59	22		195
// 3016	Col	2	3	8	8	10	9		40
3024	Capt	1	1	7	9	8	13	1	40
3034	Lt	1	1	7	7	6	9	1	32
3034	Capt	3	2	16	14	17	19	1	72
3034	Civ			1	2	2	2	1	8
3044	Lt	2	1						3
3044	Capt	14	23	23	34	49	15		158
3044	Maj	2		5	8	6	10	1	32
3216	Maj	2	1	7	6	8	8		32
3216	L/C			2	2	2	2		8
3224	Capt	2	2	10	15	12	20	3	64
3224	Maj			2	4	4	5	1	16
3234	Capt	2		5	8	6	10	1	32
4316	Maj	2		5	7	6	10	2	32
4344	Maj			1	2	2	2	1	8
5525	Lt	7	4	6	7	8			32
5525	Capt	7	5	6	7	7			32

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Figure 2 (Contd)

<u>AFSC</u>	<u>RANK</u>	<u>FY 57</u>	<u>FY 58</u>	<u>FY 59</u>	<u>FY 60</u>	<u>FY 61</u>	<u>FY 62</u>	<u>FY 63</u>	<u>TOTAL</u>
6416	Maj	7	5	7	9	9	2	1	40
6424	Lt	19	26	27	40	55	12		179
6424	Capt	1	1	2	4	5	2	1	16
6746	Maj	2		6	9	8	12	3	40
6834	Capt	2		5	7	6	10	2	32
7016	Maj	2		16	20	21	24	5	88
7024	Lt	2		9	7	9	13		40
7024	Capt			2	4	4	5	1	16
7024	Maj	6	6	7	9	9	2		39
7024	L/C	1							1
7216	Maj	6	5	5	6	9	1		32
7216	L/C			2	1	2	3		8
7224	Capt	1	4	9	6	10	2		32
7316	Maj	2	2	11	8	12	4	1	40
7324	Lt	7	5	8	9	9	2		40
7324	Capt	12	22	22	35	49	14	1	155
7336	Maj	2		9	7	9	13		40
7344	Capt	2		5	7	6	10	2	32
7524	Capt	2		5	7	6	10	2	32
7716	Maj			1	2	2	2	1	8
7816	Maj	2		7	6	7	10		32
9025	Maj			1	2	2	2	1	8

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Figure 2 (Contd)

<u>AFSC</u>	<u>RANK</u>	<u>FY 57</u>	<u>FY 58</u>	<u>FY 59</u>	<u>FY 60</u>	<u>FY 61</u>	<u>FY 62</u>	<u>FY 63</u>	<u>TOTAL</u>
9316	L/C			2	1	2	3		8
9326	Capt	2		5	7	6	10	2	32
9826	Capt			2	4	4	4	2	16
9926	Maj			1	2	2	2	1	8
27300	W/O	1	50	91	90	107	141		480
29100	W/O	1	1	7	7	6	9	1	32
30300	W/O	12	22	21	33	47	12		147
30400	W/O	12	23	21	37	47	12		152
56000	W/O	4	2						6
62000	W/O			1					1
70200	W/O	1	1	5	8	6	10	1	32
73000	W/O	2		8	6	7	9		32
// Total Officers		265	471	992	1121	1339	1136	59	
// Accumulative			736	1728	2849	4188	5324	5383	

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ADCM 30-1

ANNEX E

PERSONNEL PHASING SCHEDULE

Headquarters, Syracuse Air Defense Sector
Syracuse AFS, New York

1 Oct 56

<u>FUNCTIONAL CODE</u>	<u>RANK</u>	<u>TITLE</u>	<u>NUMBER</u>	<u>AFSC</u>
01000	Col	Deputy Commander	1	0066C
01000	Maj	Sq Section Comdr	1	7024
01000	Civ	Stenographic Specl	1	70252
03000	Lt	Adjutant	1	7324
03000	M/Sgt	1st Sergeant	1	73170
03000	S/Sgt	Personnel Specl	1	73250
03000	A/1C	Administrative Clerk	1	70250
04000	Lt	Supply Officer	1	6424
04000	T/Sgt	Orgn Supply Supv	1	64173
39100	Capt	Installations Engr	1	5524
50100	2 S/Sgt 3 A/1C	Air Policeman	5	77150
50100	A/2C	Apr Air Policeman	4	77130
50100	A/3C	Air Police Helper	<u>2</u>	77010

5 Off, 15 Ann, 1 Civ

1 Nov 56

03000	T/Sgt	Personnel Tec	1	73270
03000	A/1C	Personnel Specl	1	73250
04000	1 S/Sgt 1 A/1C	Orgn Supply Specl	2	64151

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04000 A/2C Apr Orgn Supply Spec 1 64131
 5 Amn
 (5 Off, 20 Amn, 1 Civ)

1 Dec 56

27000 Lt Col Operations Staff Off 1 1416
 27000 M/Sgt Administrative Supv 1 70270
 27000 Civ Stenographic Spec 1 70252
 35000 Maj Supply Staff Off 1 6416
 45000 Maj Comm Elect Staff Off 1 3016
 53000 Maj Info Services Staff Off 1 7216
 53000 T/Sgt Information Tec 1 72170
 4 Off, 2 Amn, 1 Civ
 (9 Off, 22 Amn, 2 Civ)

1 May 57

39400 Lt Installations Engr 1 5524
 (10 Off, 22 Amn, 2 Civ)

1 July 57

// 45000 Col Comm Elect Staff Off 1 3016
 (11 Off, 22 Amn, 2 Civ)

15 Sep 57*15 Nov 57

84520 Lt Col Comm Elect Staff Off 1 3016
 84520 Maj Comm Elect Staff Off 4 3016
 5 Off

(16 Off, 22 Amn, 2 Civ)

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Hq Syracuse Air Defense Sector (Contd)

15 Nov 57

84020	Capt	Communications Off	1	3034
84020	A/1C	Administrative Clerk	1	70250
84110	2 M/Sgt 8 T/Sgt	Channel and Tec Con Tec	10	29375
84210	S/Sgt	Comm Machine Rpmn	1	36350
84220	M/Sgt	Comm Center Supv	1	29170
84220	2 S/Sgt 1 A/1C	Comm Center Spec1	3	29150
84220	A/2C	Apr Comm Center Spec1	5	29130
84420	2 S/Sgt 1 A/1C	Gnd Radio Operator	<u>3</u>	29350

1 Off, 24 Amn

(17 Off, 46 Amn, 2 Civ)

15 Feb 58*15 Apr 58

84520	Maj	Acft Cont Staff Off	1	1616
84520	Capt	Intercept Controller	1	1644
84520	W/O	Air Trf Con/Wng Supt	1	27300
84520	1 M/Sgt 3 T/Sgt	Acft Con/Wng Supv	4	27370
84520	2 S/Sgt 4 A/1C	Acft Con/Wng Opr	6	27350
84520	A/2C	Apr Acft Con/Wng Opr	<u>5</u>	27330

3 Off, 15 Amn

(20 Off, 61 Amn, 2 Civ)

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15 Mar 58

84410	1 M/Sgt 2 T/Sgt	Gnd Comm Eqp Main Tec/L	3	30472
84410	2 S/Sgt 3 A/1C	G/C V/UHF DF & A/FM Rpmn	5	30452B
84410	A/2C	G/C V/UHF DF & A/FM Rpmn	<u>1</u>	30432B

9 Amn

(20 Off, 70 Amn, 2 Civ)

15 Apr 58*15 Jul 58

84520	Maj	Acft Cont Staff Off	1	1616
84520	Capt	Intercept Controller	2	1644
84520	Lt	Intercept Controller	4	1644
84520	W/O	Air Trf Con/Wng Supt	1	27300
84520	2 M/Sgt 2 T/Sgt	Acft Con/Wng Supv	4	27370
84520	5 S/Sgt 7 A/1C	Acft Con/Wng Opr	12	27350
84520	A/2C	Apr Acft Con/Wng Opr	<u>9</u>	27330

8 Off, 25 Amn

(28 Off, 95 Amn, 2 Civ)

15 Jun 58*15 Aug 58

01000	B/Gen	Commander	1	0002
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Hq, Washington Air Defense Sector (Contd)

1 July 57

// 45000	Col	Comm Elect Staff Off	1	3016
				(11 Off, 26 Amn, 2 Civ)

1 Nov 57*15 Jan 58

84520	Lt Col	Comm Elect Staff Off	1	3016
84520	Maj	Comm Elect Staff Off	<u>4</u>	3016
				5 Off
				(16 Off, 26 Amn, 2 Civ)

15 Jan 58

84020	Capt	Communications Off	1	3034
84020	A/1C	Administrative Clerk	1	70250
84110	2 M/Sgt 8 T/Sgt	Channel & Tec Con Tec	10	29375
84210	S/Sgt	Comm Machine Rpmn	1	36350
84220	M/Sgt	Comm Center Supv	1	29170
84220	2 S/Sgt 1 A/1C	Comm Center Spec1	3	29150
84220	A/2C	Apr Comm Center Spec1	5	29130
84420	2 S/Sgt 1 A/1C	Ground Radio Operator	<u>3</u>	29350
				1 Off, 24 Amn
				(17 Off, 50 Amn, 2 Civ)

15 Feb 58*15 May 58

84520	Maj	Acft Cont Staff Off	1	1616
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Hq, Washington Air Defense Sector (Contd)

84520	Capt	Intercept Controller	1	1644
84520	W/O	Air Trf Con/Wng Supt	1	27300
84520	2 S/Sgt 4 A/1C	Acft Con/Wng Opr	6	27350
84520	1 M/Sgt 3 T/Sgt	Acft Con/Wng Supv	4	27370
84520	A/2C	Apr Acft Con/Wng Opr	<u>5</u>	27330

3 Off, 15 Amn

(20 Off, 65 Amn, 2 Civ)

15 May 58*15 Aug 58

84520	Maj	Acft Cont Staff Off	1	1616
84520	Capt	Intercept Controller	2	1644
84520	Lt	Intercept Controller	4	1644
84520	W/O	Air Trf Con/Wng Supt	1	27300
84520	2 M/Sgt 2 T/Sgt	Acft Con/Wng Supv	4	27370
84520	5 S/Sgt 7 A/1C	Acft Con/Wng Opr	12	27350
84520	A/2C	Apr Acft Con/Wng Opr	<u>9</u>	27330

8 Off, 25 Amn

(28 Off, 90 Amn, 2 Civ)

1 Jul 58

03000	A/2C	Apr Personnel Spec1	1	73230
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CHANGE
ADC MANUAL)
NUMBER 30-1A)

ADCM 30-1A
HEADQUARTERS AIR DEFENSE COMMAND
ENT AFB, Colorado Springs, Colorado
15 May 1957

SAGE

Personnel Plan

ADCM 30-1, 15 March 1957, is changed as follows:

1. Insert attached revised pages according to page numbers. Insure that pages are inserted in the proper section, i.e., main body of the Plan or Appendix I. The corresponding pages may be destroyed in accordance with AFR 205-1. (Double slash // indicates new or changed material.)

2. Make the following changes in ink:

Page vi: Change number of copies for Technical Training Air Force from 2 to 4.

Page 11, para (4): Change FY 58 to FY 59; 41,375 to 41,377; 14,147 to 14,149.

Page 26: Change "Total Officers and Airmen" in FY 59 from 14,195 to 14,197; in FY 60 from 22,974 to 22,978; in FY 61 from 33,878 to 33,884; in FY 62 from 39,277 to 39,285; in FY 63 from 39,513 to 39,521.

Appendix I, Annex B, page 3: Change the name of Sault Ste Marie ADS location from Kalkaska, Mich to K. I. Sawyer AFB, Mich.

BY ORDER OF THE COMMANDER:

OFFICIAL:

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

PAUL W. SCHEIDECKER
Brigadier General, USAF
Acting Chief of Staff

14 Attachments:

Pages 12-19; Appendix I, 24-27, 37-38

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FOREWORD

Since the acceptance of the Semiautomatic Ground Environment (SAGE) System by the Air Force on 10 April 1953, the program for development of the System has remained in a continual state of flux. Lack of a stabilized operational schedule has caused serious planning problems. The estimated availability of associated electronics equipment and facilities has changed frequently and has been so complicated by budgetary implications that plans and actions were based upon fragmentary and tentative data. In such an atmosphere, personnel planning has been extremely difficult. It is now considered most important that a firm schedule be used as a basis for long range planning, since Air Defense Command is now entering the implementation phase of SAGE planning.

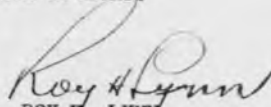
On 9 August 1956, the Air Defense Engineering Services (ADES), in concert with Western Electric, published Study #4 establishing a new SAGE operational schedule. This action became necessary when it was determined that computer programming requirements could not be fulfilled to meet previously scheduled test and operational dates. Headquarters, Air Defense Command accepted Study #4 as a basis for planning with Headquarters, USAF approval following early in December 1956. Later budgetary implications caused the development of a new schedule which was approved on 4 January 1957. This was titled Schedule #6, upon which this Plan is based.

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The Personnel Plan, published in the following pages, has been developed in order to establish complete personnel and training requirements and to provide necessary guidance in personnel problems involved in both the planning and implementing stages of SAGE. Appropriate staff agencies of Headquarters, Air Defense Command; the 4620th Air Defense Wing (Experimental SAGE); Lincoln Laboratory; Air Defense Engineering Services (ADES); the Western Electric Company; Technical Training Air Force (Air Training Command); and the SAGE Operator Research Unit (ARDC) have furnished information for consolidation into the Plan.

This Personnel Plan establishes valid personnel and phasing requirements, personnel policy, training support criteria and requirements, and provides a sound basis for manning actions. It is intended that this Plan will be revised as necessary in order to provide adequate advance planning for SAGE personnel actions.


ROY H. LYNN
Major General, USAF
Vice Commander

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SECTION I

GENERAL

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SECTION I

A. OBJECTIVE

The objective of this plan is to present the personnel and training requirements of SAGE Sector Headquarters, Divisions and initial augmentation of AC&W Squadrons prior to conversion to Radar Squadrons (SAGE) during the SAGE era. Section II provides total SAGE personnel requirements tabulated by grade and AFSC for Fiscal Years 1956 through 1962, and the integration of ADC Manual System assets along with personnel furnished from resources outside of this Command. Section III presents the phased on-site manning requirements by SAGE Sector Headquarters and Divisions. Section IV establishes those personnel policies relating to priority for SAGE manning, selection, assignment and retention of personnel. Section V establishes training criteria and phased training requirements.

B. CONCEPT

After due consideration and staff examination, the CINCONAD accepted the Air Defense Engineering Services (ADES)/Western Electric Study #4 and directed its implementation. However, subsequent budgetary considerations resulted in a revised operational schedule which was approved as Schedule #6 by the Secretary of the Air Force. Utilizing the additional personnel which will be programmed by Headquarters USAF, the Air Defense Command will plan and implement SAGE operational Schedule #6 as a matter of priority.

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C. TASKS

It is not intended that this treatment of the tasks of various Commands and agencies involved in the development of the SAGE Program be construed as directive upon lateral or higher echelons or upon civilian agencies. Rather, it is in the interest of clarifying the functions of these agencies as they relate to the personnel aspects in the development of SAGE that the following is presented:

1. Hq United States Air Force.

a. To evaluate the over-all Air Force capability to support the SAGE build-up in light of personnel requirements stated in this plan.

b. To establish the importance of SAGE in relation to other portions of the Air Force Program.

c. To program the over-all manpower and special training requirements established in this plan.

2. Hq Air Defense Command.

a. To establish appropriate policy guidance, advance personnel planning and control the assignment (to Defense Forces) of personnel resources made available for SAGE.

b. To provide resolution of manning problems as they arise during SAGE implementation. Where resolution of manning problems is not possible within resources available, to recommend alternate courses of action to Hq USAF.

3. Air Defense Command Defense Forces.

a. To provide detailed planning and control of personnel made available for assignment to SAGE Sectors and Divisions.

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b. To advise Hq ADC, as far in advance as possible, of problems which are beyond the control or resources of Defense Forces.

4. 4620th Air Defense Wing (Experimental SAGE).

a. To assist Hq ADC in matters pertaining to training and indoctrination of personnel for SAGE.

b. To provide ADC liaison with field units of the Air Training Command, Air Research and Development Command, and Lincoln Laboratory on matters pertaining to training, qualification and duties of SAGE personnel.

c. To advise Hq ADC on matters pertaining to personnel requirements, training and qualifications for SAGE.

5. Air Training Command.

a. To conduct basic technical and specialized training for SAGE personnel as required within Command and/or contract capability.

b. To provide package OJT programs for SAGE personnel.

6. Air Research and Development Command.

a. To develop Qualitative Personnel Requirement Information (QPRI) for SAGE personnel as required.

7. Air Defense Engineering Services (ADES).

a. With Air Materiel Command as executive agency, to monitor all facets of personnel planning and implementation of the SAGE Program to assure compatibility with operational schedules.

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8. Western Electric, Bell Telephone Laboratory.

a. Serving as an integral part of the ADES Project Office, under contract to the Air Force, to provide the management function for personnel matters during the planning and implementation phases of the SAGE Program.

9. Lincoln Laboratory.

a. To provide technical advice and assistance with regard to operational techniques and procedures used by personnel in the SAGE Program, with particular reference to Qualitative Personnel Requirements Information (QPRI) developed by ARDC.

10. Research and Development Corporation (RAND).

a. Under contract to the Air Force, to develop system training programs (SAGE System Training Program - SSTP) for the operational training (under the crew training concept) of SAGE personnel.

D. PLANNING FACTORS AND ASSUMPTIONS

1. While there is every assurance that the early SAGE computers under Schedule #6 will provide an operational one hundred track capacity, as scheduled, the exact degree of operational capability of this reduced computer capacity in an integrated air defense environment is difficult to assess, at this time. However, the decision has been made by the Commander, ADC, to consider a one hundred track capacity operationally acceptable, pending development and installation of modifications designed to increase this computer capacity. This Plan is, therefore, based on the following basic assumption:

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a. The SAGE System is capable of assuming air defense operational responsibility in accordance with currently scheduled operations dates. Manual system operational back-up will be retained in each Sector on the basis of three months each for the first two Sectors, two months each for the next three Sectors, and one month for each succeeding Sector. When the period of manual system back-up is completed, one month will be utilized to phase out personnel in those sections of the Manual System not required to support SAGE. Actual personnel feed back from the Manual System to SAGE will commence on 1 November 1958 (four months after the scheduled operations date of the New York Air Defense Sector), and will continue on a progressive basis thereafter.

2. The Commander, ADC, determined that operation and maintenance of electrical power production and refrigeration equipment at SAGE Direction and Combat Centers must be accomplished under civilian contract. This decision was rendered after it was determined that military personnel, with the necessary prerequisite criteria for special training, were not available. Therefore, this plan does not indicate military personnel or special training requirements for operation and maintenance of such equipment at Direction and Combat Centers. It is presently intended that power and refrigeration equipment at SAGE Annexes (Radar Squadron - SAGE) will be operated and maintained by military and/or civil service personnel. It is not anticipated that such manning will present significant problems, since Air Force resources will no longer be over taxed in an effort to operate and maintain such equipment at Direction and Combat Centers.

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a. It is assumed that budgetary support will be available for implementation of the decision in paragraph 2 above.

3. Headquarters USAF will program for additional personnel for implementation of the SAGE Program as outlined in this Plan. SAGE manning is depicted by full manning requirements in Section III of this Plan. In addition to the personnel to be made available from resources outside of ADC, feed back from the Manual System, commencing in November 1958, will be phased into SAGE as rapidly as possible in order to provide full manning.

4. The job skills required in SAGE differ widely from the skill requirements in the present manual system, i.e., both in type of job tasks performed and degree of difficulty to perform these jobs. This results in the need for the majority of personnel receiving training prior to assignment in SAGE. The personnel who will require training are shown in Section V. To meet the SAGE Special Training requirements, the following conditions are assumed:

a. Sufficient numbers of personnel will be available in time to meet established special training requirements.


b. These personnel will have the necessary skills and experience to be retrained into SAGE.

c. Air Training Command will meet our quantitative and qualitative special training requirements.

d. Air Training Command will meet the trained on-site requirements established in accordance with Schedule #6. In view of the difficulty sometimes encountered in establishing training schedules to

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meet on-site dates, some flexibility in scheduling may be necessary. In this event, training schedules, which provide personnel within plus or minus two weeks of the established dates, will be acceptable to the Air Defense Command.

5. SAGE System Training Program (SSTP) will be made available two months prior to the operational ready date for each Direction Center.

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SECTION II

PERSONNEL REQUIREMENTS

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SECTION II

A. GENERAL.

1. The personnel requirements discussed here are based on the functions to be performed and the equipment to be utilized at SAGE Sector Headquarters and Divisions. The total requirements also include the augmentation personnel required for SAGE functions in ACW units during SAGE System tests and who will remain after conversion to SAGE status; although phasing of these personnel into ACW units and the eventual reduction of such units to Radar Squadron (SAGE) status will be accomplished through separate action.

2. For planning purposes, the personnel requirements established herein are based on SAGE Organization Table authorizations. The requirements that will exist by superimposing SAGE upon the Manual ACW System are discussed and illustrated. Initially, it will be necessary to obtain personnel in addition to the ADC manual environment resources to man the early SAGE Sector Headquarters and Divisions, and to augment the associated manual ACW Units to support acquired SAGE functions.

3. The personnel calculations are based on the assumption that the active air defense responsibility will revert to SAGE on the scheduled operations dates and the manual system will provide an operational back-up in each Sector on the basis of three months each for the first two Sectors, two months each for the next three Sectors, and one month for each succeeding Sector. When the period of manual system back-up is completed, one month will be utilized to

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phase out personnel in those sections of the Manual System not required to support SAGE. For example, the ACW units in the first operational Air Defense Sector (New York) will remain fully manned until 1 October 1958, three months after the scheduled operations date of the Sector Headquarters. The month of October will be used to phase out the personnel not authorized in the Radar Squadron (SAGE Organization Table. Personnel possessing the proper prerequisites for SAGE Special Training will be phased into this training for subsequent duty at SAGE Direction Centers or Combat Centers. The calculation of personnel feed-back from units in the New York Air Defense Sector would then be based on 1 November 1958. It should be emphasized that all quantitative feed-back calculations are based on UMD authorizations and, while adequate for planning purposes, they do not represent actual numbers of personnel in units manned below 100%.

3. The following figures illustrate the personnel requirements for SAGE as compared to the present and projected manual resources. The Canadian Sites are not included in either system total, but if added to both, the additional requirement for the SAGE System would remain unchanged. The SAGE total represents all personnel authorized in SAGE Sector Headquarters, Divisions, Radar Squadrons (SAGE), Texas Towers, Gap Fillers and separate Radio Sites. The Manual System total represents all personnel authorized in Divisions and ACW Squadrons, as well as Texas Tower, Gap Filler and Radio Site personnel shown under the SAGE total since these installations would have been authorized in the Manual System regardless of the introduction of SAGE. All figures have been rounded off to the nearest 100 for ease of comparison:

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Total SAGE Personnel Requirements (End FY 63)	39,500 *
Total Manual Environment Authorizations:	
As of 1 January 1957	32,200
As of end FY 1962	36,200 **
Total Additional Authorizations Required	7,300
SAGE Requirements in Addition to Total Projected	
Manual Resources:	3,300

* This figure totalled 41,900 prior to the decision to contractually operate and maintain the SAGE DC and CC utilities.

** Includes manpower spaces for units not yet activated.

B. RECAPITULATION OF SAGE PERSONNEL REQUIREMENTS.

1. Recapitulation: The space recapitulation charts, Figures I and Ia, in this section are a consolidation of all space requirements by Fiscal Year for full implementation of SAGE. Each chart is designed specifically to display certain aspects of the relationship between the Manual AC&W System and the SAGE System during the period of SAGE implementation. An explanation of the two figures follows:

a. Figure I. This chart depicts the current Manual System authorizations and the build-up to programmed strength; the Manual System phase down as it is absorbed by SAGE; the SAGE Environmental build-up to the end position and the end Fiscal Year totals for the Air Defense (ZI) Ground Environment (SAGE and Manual) with numbers of personnel in each system.

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(1) Line I indicates the present authorized strength of the Manual Environment (1 January 1957) and the programmed build up. This line is included in order to provide some perspective in comparing SAGE to the Manual Environment.

(2) Line II represents the phase down of the Manual Environment as it is absorbed by SAGE. This line includes the phase out of all present and programmed assets of the ADC Manual System. The increase from 32,513 (end FY 57) to 34,133 (end FY 58) is due to programmed Manual build-up before Manual assets (feedback) are available for SAGE. It should be noted that by end FY 63 the Manual System has been completely absorbed by SAGE.

(3) Line III indicates the accumulative space requirements for full manning of the SAGE System. This line represents the sum of the detailed tabulations in Figures II and III. It should be borne in mind that the two systems are not completely separable. Certain elements of the Manual Environment are common to both, i.e., Gap Filler Radar Sites, GPA-37, Radio Sites, and Texas Towers. Personnel requirements which are common to both are included in both Manual and SAGE total requirements (Lines I and III).

(4) Line IV represents the fiscal year summation of Lines II and III, or the total Air Defense (ZI) Ground Environment requirements at each end Fiscal Year. Thus, at the end of FY ~~58~~⁵⁹ the Air Defense Command (ZI) Ground Environment will consist of 41,37~~8~~⁷ personnel, of which 14,14~~7~~⁹ are required for SAGE and 27,228 for the Manual System.

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FIGURE I
RECAPITULATION OF GROUND ENVIRONMENT PROGRAM

	As of							
	<u>1 Jan 57</u>	<u>FY 57</u>	<u>FY 58</u>	<u>FY 59</u>	<u>FY 60</u>	<u>FY 61</u>	<u>FY 62</u>	<u>FY 63</u>
I. ZI Manual System Build Up (Without Reference to SAGE) Accumulative	32,169	32,748	34,562	35,724	35,963	36,119	36,190	
II. Manual System Phase Down as Absorbed by SAGE		32,513	34,133	27,228	19,548	9,320	810	
// III. SAGE Environment Build Up Accumulative		2,889	7,619	14,149	22,932	33,840	39,285	39,521
// IV. ADC Total ZI Ground Environ- ment (Totals of II & III) Accumulative		35,402	41,752	41,377	42,480	43,160	40,095	39,521

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b. Figure Ia. This chart was designed to illustrate more effectively the actual manpower relationship of the two (SAGE and Manual) Systems. SAGE is implemented while the Manual System is absorbed. It should be noted that the Manual System is absorbed in two ways; by actual feedback of personnel, and by conversion of certain elements of the System without actual feedback. Figure Ia provides an accurate picture, not only of the total personnel requirements necessary to implement SAGE, but also portrays the progressive generation of these requirements.

(1) Line I represents the yearly personnel requirements attributable to SAGE functions; in other words, the fiscal year personnel requirements for SAGE Sectors, Divisions and augmentation necessary to maintain and support associated SAGE equipment at the ACW Squadrons. Line II indicates the Manual Program requirements by fiscal year, and includes ACW Squadrons and Gap Filler Sites programmed but not yet installed. Line III is the sum of Lines I and II and represents the ADC total programmed Ground Environment personnel requirements by fiscal year. This excludes the Canadian Radar Sites which are not presently scheduled for integration with SAGE.

(2) Line IV indicates the total personnel assets (feedback) available for SAGE by fiscal year. This feedback commences on 1 November 1958 with the New York Sector and continues through FY 63. Line V follows with the resulting yearly and accumulative Headquarters USAF support requirements, both before and after feedback commences.

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FIGURE Ia

	<u>FY 57</u>	<u>FY 58</u>	<u>FY 59</u>	<u>FY 60</u>	<u>FY 61</u>	<u>FY 62</u>	<u>FY 63</u>
// I. SAGE Requirements (AC&W Augm, Sector & Div Hq) Yearly	919	1,948	4,042	4,384	5,275	4,191	236
II. Manual Program Requirements (Gap Filler, Radio Sites & Texas Towers Incl) Yearly	579	1,814	1,162	239	156	71	
// III. Total of I and II Yearly	1,498	3,762	5,204	4,623	5,431	4,262	236
IV. Manual System Assets (Feedback) Yearly			4,602	5,027	6,195	5,396	465
// V. Required USAF Support							
a. Yearly	1,498	3,762	602	* 404	* 764	*1,134	*229
b. Accumulative	1,498	5,260	5,862	5,458	4,694	3,560	3,331

* Feedback is higher than requirement.

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(a) It will be noted that commencing with FY 60, Manual assets available (Line IV) for SAGE are greater than the programmed SAGE and Manual requirements (Line III). This results from the fact that assets available from the programmed conversion of the Manual System to SAGE simply exceeds the final yearly requirements.

// (b) In a strict space accounting, such as Figure Ia, it would appear that 404 spaces in FY 60, 764 spaces in FY 61, 1134 spaces in FY 62, and 229 spaces in FY 63 would be returned to the USAF inventory. As a practical matter, however, this apparent overage in actual personnel bodies (if actually existing) would no doubt be required to replace attrition losses or actual shortages of personnel.

2. Total SAGE Requirements: Figures II and III provide a tabulation of the SAGE Personnel Requirements by grade, skill and AFSC, calculated to the end of each fiscal year. These requirements are based on authorizations contained in current Organization Tables and time phased in accordance with Schedule #6. Included are personnel required for SAGE Divisions, Sector Headquarters, Radar Squadrons (SAGE), Gap Filler augmentation, Radio Sites and Texas Towers.

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FIGURE 2

SAGE Environment - Officer Requirements

<u>AFSC</u>	<u>RANK</u>	<u>FY 57</u>	<u>FY 58</u>	<u>FY 59</u>	<u>FY 60</u>	<u>FY 61</u>	<u>FY 62</u>	<u>FY 63</u>	<u>TOTAL</u>
0002	Gen	2	1	9	8	10	10		40
0016C	Col	2		7	6	7	10		32
0016D	Col			2	1	2	3		8
0036C	Col	2	1	7	6	8	8		32
0036D	Col			4	4	4	4		16
0046C	Col	2		5	8	6	10	1	32
0046D	Col			2	1	2	3		8
0056C	L/C	2		5	7	6	10	2	32
0056D	L/C			1	2	2	2	1	8
0066C	Col	6	5	5	6	9	1		32
0066D	Col			2	2	2	2		8
1416	Maj	5	2	21	28	26	36	2	120
1416	L/C	8	7	20	22	25	21	1	104
1435	Capt	2		6	10	8	12	2	40
1435	Maj			2	1	2	3		8
1444	Maj			1	2	2	2	1	8
1616	Maj	3	29	62	72	80	80	2	328
1616	L/C	2	18	52	48	60	60		240
1644	Lt	14	53	96	86	110	106	1	466
1644	Capt	7	60	123	110	142	139	1	582

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Figure 2 (Contd)

<u>AFSC</u>	<u>RANK</u>	<u>FY 57</u>	<u>FY 58</u>	<u>FY 59</u>	<u>FY 60</u>	<u>FY 61</u>	<u>FY 62</u>	<u>FY 63</u>	<u>TOTAL</u>
2016	Maj	2	1	7	6	8	8		32
2016	L/C			2	2	2	2		8
2054	Lt	2		7	6	7	10		32
3016	Maj	30	49	72	95	114	71	4	435
3016	L/C	14	27	31	42	59	22		195
// 3016	Col	2	3	8	8	10	9		40
3024	Capt	1	1	7	9	8	13	1	40
3034	Lt	1	1	7	7	6	9	1	32
3034	Capt	3	2	16	14	17	19	1	72
3034	Civ			1	2	2	2	1	8
3044	Lt	2	1						3
3044	Capt	14	23	23	34	49	15		158
3044	Maj	2		5	8	6	10	1	32
3216	Maj	2	1	7	6	8	8		32
3216	L/C			2	2	2	2		8
3224	Capt	2	2	10	15	12	20	3	64
3224	Maj			2	4	4	5	1	16
3234	Capt	2		5	8	6	10	1	32
4316	Maj	2		5	7	6	10	2	32
4344	Maj			1	2	2	2	1	8
5525	Lt	7	4	6	7	8			32
5525	Capt	7	5	6	7	7			32

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Figure 2 (Gontd)

<u>AFSC</u>	<u>RANK</u>	<u>FY 57</u>	<u>FY 58</u>	<u>FY 59</u>	<u>FY 60</u>	<u>FY 61</u>	<u>FY 62</u>	<u>FY 63</u>	<u>TOTAL</u>
6416	Maj	7	5	7	9	9	2	1	40
6424	Lt	19	26	27	40	55	12		179
6424	Capt	1	1	2	4	5	2	1	16
6746	Maj	2		6	9	8	12	3	40
6834	Capt	2		5	7	6	10	2	32
7016	Maj	2		16	20	21	24	5	88
7024	Lt	2		9	7	9	13		40
7024	Capt			2	4	4	5	1	16
7024	Maj	6	6	7	9	9	2		39
7024	L/C	1							1
7216	Maj	6	5	5	6	9	1		32
7216	L/C			2	1	2	3		8
7224	Capt	1	4	9	6	10	2		32
7316	Maj	2	2	11	8	12	4	1	40
7324	Lt	7	5	8	9	9	2		40
7324	Capt	12	22	22	35	49	14	1	155
7336	Maj	2		9	7	9	13		40
7344	Capt	2		5	7	6	10	2	32
7524	Capt	2		5	7	6	10	2	32
7716	Maj			1	2	2	2	1	8
7816	Maj	2		7	6	7	10		32
9025	Maj			1	2	2	2	1	8

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Figure 2 (Contd)

<u>AFSC</u>	<u>RANK</u>	<u>FY 57</u>	<u>FY 58</u>	<u>FY 59</u>	<u>FY 60</u>	<u>FY 61</u>	<u>FY 62</u>	<u>FY 63</u>	<u>TOTAL</u>
9316	L/C			2	1	2	3		8
9326	Capt	2		5	7	6	10	2	32
9826	Capt			2	4	4	4	2	16
9926	Maj			1	2	2	2	1	8
27300	W/O	1	50	91	90	107	141		480
29100	W/O	1	1	7	7	6	9	1	32
30300	W/O	12	22	21	33	47	12		147
30400	W/O	12	23	21	37	47	12		152
56000	W/O	4	2						6
62000	W/O			1					1
70200	W/O	1	1	5	8	6	10	1	32
73000	W/O	2		8	6	7	9		32
// Total Officers		265	471	992	1121	1339	1136	59	
// Accumulative			736	1728	2849	4188	5324	5383	

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FIGURE 3

SAGE Environment - Airman Requirements

<u>AFSC</u>	<u>RANK</u>	<u>FY57</u>	<u>FY58</u>	<u>FY59</u>	<u>FY60</u>	<u>FY61</u>	<u>FY62</u>	<u>FY63</u>	<u>TOTAL</u>
20450	SSG			2	1	2	3		8
20470	TSG	2		9	7	9	13		40
22350	A1C	2	2	14	15	15	23	1	72
22350	SSG	2		10	9	11	16		48
23250	A1C		6	21	27	24	39	3	120
23250	SSG		4	18	16	17	24	1	80
27330	A2C	57	186	249	269	361	223		1345
27350	A1C	86	333	524	550	744	498		2735
27350	SSG	68	253	393	419	569	368		2070
27370	TSG	53	194	298	322	438	286		1591
27370	MSG	40	152	238	251	341	222		1244
29130	A2C	38	63	114	122	169	96	4	606
29150	A1C	52	80	138	164	206	122	8	770
29150	SSG	22	33	72	74	95	66	4	366
29170	TSG	4	4	31	29	26	38	4	136
29170	MSG	3	4	17	13	17	17	1	72
29230	A1C	26	51	63	87	112	51	3	393
29250	SSG	14	33	56	68	77	57	5	310
29270	TSG		2	7	7	6	9	1	32
29270	MSG		2	7	7	6	9	1	32
29330	A2C		6	21	21	18	27	3	96

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Figure 3 (Contd)

<u>AFSC</u>	<u>RANK</u>	<u>FY57</u>	<u>FY58</u>	<u>FY59</u>	<u>FY60</u>	<u>FY61</u>	<u>FY62</u>	<u>FY63</u>	<u>TOTAL</u>
29350	A1C	4	4	22	19	21	24	2	96
29350	SSG	4	4	16	10	18	12		64
29370	TSG		2	9	11	10	13	3	48
29370	MSG		2	8	9	8	11	2	40
29375	TSG	16	27	59	46	78	54		280
29375	MSG	4	8	16	14	22	16		80
30170	TSG	2		5	7	6	10	2	32
30332C	A2C	35	44	43	73	87	12		294
30332F	A2C	35	44	43	73	87	12		294
30352C	A1C	98	118	107	179	221	36		759
30352C	SSG	78	92	86	146	174	24		600
30352F	A1C	70	88	86	146	174	24		588
30352F	SSG	73	93	96	165	187	39		653
30372	TSG	103	140	139	233	283	65	1	964
30372	MSG	62	67	71	122	135	24	3	484
30450B	A1C	2	1						3
30450B	SSG	2	1						3
30432A	A2C	23	23	22	44	40			152
30432B	A2C	54	60	58	129	127	12		440
30452A	A1C	47	69	64	118	134	24		456
30452A	SSG	35	46	43	81	87	12		304
30452B	A1C	82	110	106	211	221	36		766
30452B	SS ^G	47	64	65	126	134	24		460

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Figure 3 (Contd)

<u>AFSC</u>	<u>RANK</u>	<u>FY57</u>	<u>FY58</u>	<u>FY59</u>	<u>FY60</u>	<u>FY61</u>	<u>FY62</u>	<u>FY63</u>	<u>TOTAL</u>
30470	TSG	2	1	1	2	2	3		11
30470	MSG	2	1						3
30472	TSG	72	88	83	167	174	24		608
30472	MSG	54	60	58	129	127	12		440
32271D	MSG			1	2	2	2	1	8
36152	SSG	12	22	21	33	47	12		147
36270	TSG	12	22	21	33	47	12		147
36330	A2C		2	10	8	8	11	1	40
36350	A1C		4	14	14	12	18	2	64
36350	SSG	14	25	31	39	58	20		187
36351A	A1C		2	7	7	6	9	1	32
36351A	SSG		2	7	7	6	9	1	32
43171B	MSG		2	5	7	6	10	2	32
43171C	MSG			1	2	2	2	1	8
43171D	MSG			1	2	2	2	1	8
47131	A2C	12	22	21	33	47	12		147
47151	A1C	12	22	21	33	47	12		147
47151	SSG	12	22	22	35	49	14	1	155
47170	TSG	12	22	22	35	49	14	1	155
47170	MSG	2		5	7	6	10	2	32
55010	A3C	12	22	21	33	47	12		147
55151	SSG	4	2						6
55250	A1C	12	22	21	33	47	12		147

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Figure 3 (Contd)

<u>AFSC</u>	<u>RANK</u>	<u>FY57</u>	<u>FY58</u>	<u>FY59</u>	<u>FY60</u>	<u>FY61</u>	<u>FY62</u>	<u>FY63</u>	<u>TOTAL</u>
55270	TSG			1	2	2	2	1	8
55270	MSG	12	22	22	35	49	14	1	155
56010	A3C	12	22	21	33	47	12		147
56150	SSG	12	22	21	33	47	12		147
56170	TSG	4	2						6
56450	A1C	16	24	21	33	47	12		153
56450	SSG	4	2						6
56530	A2C	23	22	22	40	40			147
56550	A1C	28	46	42	66	94	24		300
56550	SSG	39	46	43	73	87	12		300
56670	TSG	14	23	21	33	47	12		150
56670	MSG	25	23	22	40	40			150
56750	A1C	20	26	21	33	47	12		159
56750	SSG	27	24	22	40	40			153
56751	SSG	32	39	42	75	76	17		281
56770	TSG	14	23	21	33	47	12		150
56770	MSG	25	23	22	40	40			150
59150	A1C	2	1						3
59150	SSG	2	1						3
59151	A1C	2	1						3
59151	SSG	2	1						3
60330	A2C	24	44	45	66	94	24		297
60331	A1C			1					1

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Figure 3 (Contd)

<u>AFSC</u>	<u>RANK</u>	<u>FY57</u>	<u>FY58</u>	<u>FY59</u>	<u>FY60</u>	<u>FY61</u>	<u>FY62</u>	<u>FY63</u>	<u>TOTAL</u>
60350	A1C	13	22	21	33	47	12		148
60350	SSG			1					1
62010	A3C	13	22	22	33	47	12		149
62150	A1C	12	22	22	33	47	12		148
62230	A2C	28	41	41	66	94	24		294
62250	A1C	32	47	45	66	94	24		308
62250	SSG	30	46	42	66	94	24		302
62270	TSG	14	23	21	33	47	12		150
62270	MSG	1							1
62350	SSG			1					1
64131	A2C	30	49	50	75	104	26		334
64151	A1C	29	43	45	75	104	26		322
64151	SSG	20	26	27	40	55	12		180
64173	TSG	24	30	30	46	61	16	2	209
64173	MSG	2		6	9	8	12	3	40
67270	Civ		2	5	7	6	10	2	32
67270	MSG		2	5	7	6	10	2	32
68150	A1C	1	1	5	7	6	10	2	32
68150	SSG	1	1	5	7	6	10	2	32
68170	TSG	2		5	7	6	10	2	32
70230	A2C	7	1	29	34	33	48	8	160
70250	A1C	28	32	68	86	103	71	8	396
70250	SSG	22	26	70	98	107	92	10	425

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Figure 3 (Contd)

<u>AFSC</u>	<u>RANK</u>	<u>FY57</u>	<u>FY58</u>	<u>FY59</u>	<u>FY60</u>	<u>FY61</u>	<u>FY62</u>	<u>FY63</u>	<u>TOTAL</u>
70250	Civ	1		6	7	6	10	2	32
70252	Civ	39	15	114	146	141	181	26	662
70253	SSG	2		7	6	7	10		32
70270	TSG	2		12	11	13	16	2	56
70270	MSG	9	7	26	30	30	31	3	136
71150	A1C	2		10	8	9	11		40
72150	A1C		4	10	14	12	20	4	64
72150	SSG	13	23	26	40	53	22	2	179
72170	TSG	6	5	5	6	9	1		32
72170	MSG	2		7	8	8	13	2	40
73170	MSG	19	27	29	42	56	14		187
73230	A2C	7	1	27	27	28	42	4	136
73231	A2C	10	17	16	33	47	12		135
73250	A1C	22	27	38	54	70	36	4	251
73250	SSG	12	5	20	22	22	21	2	104
73251	SSG	12	22	21	33	47	12		147
73270	TSG	8	5	11	15	17	13	3	72
73270	MSG	3	1	7	11	11	12	3	48
73370	TSG			2	1	2	3		8
73370	MSG	2		7	6	7	10		32
74150	SSG			1					1
74151	A1C	12	22	22	33	47	12		148
74170	TSG	2		5	7	6	10	2	32

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Figure 3 (Contd)

<u>AFSC</u>	<u>RANK</u>	<u>FY57</u>	<u>FY58</u>	<u>FY59</u>	<u>FY60</u>	<u>FY61</u>	<u>FY62</u>	<u>FY63</u>	<u>TOTAL</u>
75150	SSG	2		5	7	6	10	2	32
75170	MSG	2		5	7	6	10	2	32
77010	A3C	7	7	6	8	11	1		40
77130	A2C	74	124	117	181	257	60		813
77150	A1C	44	75	70	109	154	37		489
77150	SSG	31	51	48	74	105	25		334
77170	TSG	12	22	21	33	47	12		147
90250	A1C	12	22	21	33	47	12		147
90270	MSG	12	22	21	33	47	12		147
90270S	TSG	2	1						3
90270S	MSG	2	1						3
90670	TSG			1	2	2	2	1	8
90670	MSG			2	1	2	3		8
90870	MSG			1	2	2	2	1	8
98150	A1C			1	2	2	2	1	8
98150	SSG			1	2	2	2	1	8
98250	SSG			1	2	2	2	1	8
Total Airmen		2624	4259	5586	7660	9567	4265	177	
Accumulative			6883	12469	20129	29696	33961	34138	
Total Officers and Airmen		2889	7619	14198 ⁷	22974 ⁸	33878 ⁸⁴	39277 ⁸⁵	39523 ²⁴	

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C. SPECIAL MANNING PROBLEMS.

1. This command views certain specialties with concern since the increased demands of SAGE will place large additional requirements upon available Air Force personnel resources. Each problem area is different and therefore will be dealt with separately.

a. Communications-Electronics Officers. There exists a world wide USAF shortage of these officers, so much so, that the Air Defense Command is not presently manned to the level of its equitable priority share (PPD System). This shortage has developed because of the increased demands imposed by the ever increasing reliance upon electronic equipment by the armed forces and civilian industry. The implementation of SAGE will result in a considerable increase in the ADC requirement for C&E officers, particularly for C&E Staff Officers. Following is a tabulation of the requirements for C&E officers common to SAGE. The SAGE and ADC total requirements for all types of Communications-Electronics Officers are tabulated through fiscal year 1963.

	<u>57</u>	<u>58</u>	<u>59</u>	<u>60</u>	<u>61</u>	<u>62</u>	<u>63</u>
Communication and Electronic Staff Officers, AFSC 3016							
SAGE	46	125	236	381	564	666	670
ADC Total	260	348	433	540	682	756	760
Electronic Countermeasures Officer, AFSC 3024							
SAGE	1	3	10	19	27	40	41
ADC Total	52	54	57	62	66	74	75

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57 58 59 60 61 62 63
 Communications Officer, AFSC 3034

SAGE	4	7	31	54	79	109	112
ADC Total	286	298	282	266	233	216	219

Ground Electronics Officer, AFSC 3044

SAGE	18	41	69	111	166	191	192
ADC Total	210	239	227	236	242	222	223

It will be noted that the requirement for C&E Staff Officers increases until the end position when it is more than three times as large as the present authorization. The requirement for Communications Officers, AFSC 3034, and Ground Electronics Officer, AFSC 3044, increases only slightly during the initial implementation of SAGE where an overlap period exists. Although the end requirement for these officers is not considerably larger than current authorizations, the substitution of officers with experience in these specialties to fill C&E Staff Officer functions will substantially detract from the available resources.

b. Air Traffic Control and Warning Superintendent, AFSC 27300. Headquarters USAF presently plans to support this command's Warrant Officer program in the career area by tendering Warrant Officer appointments to senior, well qualified 27370, Master and Technical Sergeants, but the quota for calendar year 1957 is for 200 appointments, which will be adequate to support only the current manual requirements. The programmed requirements in this specialty are as follows:

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Air Traffic Control and Warning Superintendent, AFSC 27300

SAGE	1	51	142	232	339	480	480
ADC Total	222	280	323	365	414	513	513

Presently, insufficient Warrent Officer programming data precludes a valid estimate of future resources that will be available in this specialty.

c. Channel and Technical Control Technician, AFSC 29375. It has been determined that the position description for this AFSC most accurately describes the duties and responsibilities of the required SAGE airmen position, Communications and Electronics System Technical Center Technician. (It is intended that this AFSC replace the two currently authorized - AFSC 30473 and 36271). The requirements for AFSC 29375 are as follows:

Channel and Technical Control Technician, AFSC 29375

SAGE	20	35	75	60	100	70	
ADC Total	20	55	130	190	290	360	360

The input into this specialty will be qualified airmen from the Radio-Radar Career Field with AFSC 3043X, and Communications Operations Career Field with AFSC 293X0, who have sufficient knowledge of communications system principles and operating procedures, and experience, in the operation of electronic and wire communications circuits. Presently, there is not an established basic course, nor is there any established or planned SAGE special training for this position. It is

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envisoned that the only practical type of training will be OJT.

d. Utility Personnel. The Commander, ADC, has determined that contract operation and maintenance of both SAGE refrigeration and power production equipment on a continued basis for Direction and Combat Centers is mandatory in the absence of adequate numbers of qualified military resources. The requirements for these specialties in the Radar Squadrons (SAGE) is still valid and presents a more optimistic picture in this regard. Requirements for utility personnel for Radar Squadrons (SAGE) are as follows:

57 58 59 60 61 62 63

Apr Refrigeration Specialist, AFSC 56630

Radar Sq (SAGE)	0	0	0	0	0	0
ADC Total	1	1	10	20	36	47

Refrigeration Specialist, AFSC 56650

Radar Sq (SAGE)	0	0	0	0	0	0
ADC Total	31	31	44	64	96	128

Refrigeration Supervisor, AFSC 56670

Radar Sq (SAGE)	35	79	122	195	282	282
ADC Total	47	93	145	238	357	401

Apr Electric Power Production Repairman, AFSC 56731

Radar Sq (SAGE)	0	0	0	0	0	0
ADC Total	1	1	4	4	4	4

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57 58 59 60 61 62 63

Electric Power Production Repairman, AFSC 56751

Radar Sq (SAGE)	23	45	67	107	147	147
ADC Total	37	76	127	212	304	337

Apr Electric Power Production Operator, AFSC 56730

Radar Sq (SAGE)	0	0	0	0	0	0
ADC Total	0	0	8	18	34	50

Electric Power Production Operator, AFSC 56750

Radar Sq (SAGE)	35	79	122	195	282	294
ADC Total	233	283	315	376	437	401

Electric Power Production Technician, AFSC 56770

Radar Sq (SAGE)	35	79	122	195	282	294
ADC Total	51	97	149	228	330	356

This command will utilize the personnel that have previously been programmed and trained for Direction and Combat Centers in these specialties to fulfill the Radar Squadron (SAGE) requirements. This is not now considered to be a major personnel problem area.

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SECTION III

SAGE SECTOR HEADQUARTERS AND DIVISION PERSONNEL PHASING PLAN

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SECTION III

A. GENERAL.

1. Many factors have influenced the development of SAGE personnel on-site requirements, such as: new operational dates and testing concepts; training limitations and revised criteria; on-site problems prior to beneficial occupancy date (BOD); changes in equipment installation dates; changes incurred through the normal learning cycle common to all equally complex systems. This section includes discussion on factors influencing the development of Direction Center operations personnel requirements, the phasing of personnel on site for all SAGE Sector Headquarters and Divisions, the justification for this phasing, and discussion concerning sites where standard phasing is not possible.

2. Many BOD and pre-BOD personnel requirements were developed too late to be incorporated at the first five Sector Headquarters. In addition, increased administrative support at these sites in the early stages of SAGE implementation was considered necessary to cope with day-to-day problems associated with a new system for which no precedence has been established. For these reasons it was not possible to establish a typical phasing pattern for the first five SAGE Sector Headquarters (New York through Bangor). Thus, the phasing for these units is provided in separate Personnel Phasing Schedules. The New York and Boston Sector Headquarters are currently fully staffed for Command and supervisory functions connected with units presently assigned. Normally, subordinate units are assigned subsequent to the Sector operations

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date. The phasing schedules for these two Sector Headquarters reflect the current authorizations (within the SAGE Organization Table). The personnel phasing for all other SAGE Sector Headquarters, commencing with the Detroit Air Defense Sector, is covered in two companion documents, the SAGE Sector Headquarters Personnel Phasing Guide and the SAGE Sector Headquarters Personnel Phasing Schedule. Column A of the Phasing Guide represents Organization Table authorizations for separate SAGE Sector Headquarters. Column B represents the authorizations for Sector Headquarters located at combined DC/CC sites. Support personnel authorized in the SAGE O/T for such functions as food service, utilities maintenance and repair, motor vehicle operation and maintenance, etc., are not included in the Phasing Guide. These types of personnel will be programmed by separate action (the Washington Air Defense Sector Headquarters is an exception) and, in the majority of cases, will be authorized in Air Base Squadrons supporting the Sector Headquarters.

3. Personnel phasing for SAGE Divisions is provided in two companion documents in the same manner as for the Sector Headquarters. These documents are the SAGE Division Personnel Phasing Guide and the SAGE Division Personnel Phasing Schedule.

4. The phasing documents for Sector Headquarters and Divisions are to be found in Appendix I, Annex C through Annex K.

5. The personnel phasing outlined herein is in accordance with the recommendations of ADES Schedule #6, (Appendix I, Annex A) and based on authorizations contained in applicable Organization Tables published by Headquarters USAF. With respect to Sector Headquarters

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and Division staff and support personnel, the requirements outlined in the phasing documents will be used as a guide in determining Unit Manning Document (UMD) authorizations based on actual requirements.

B. DIRECTION CENTER OPERATIONS PERSONNEL REQUIREMENTS.

1. Two types of operational load conditions have been distinguished in SAGE Direction Centers which affect personnel planning - a normal load condition and a full, or combat, load condition. Associated with each of these is a corresponding personnel complement requirement. Each will provide the necessary capability, respectively, to perform the normal day-to-day air defense functions of a Direction Center and to engage an enemy in a full scale air battle. Implicit as well in this planning is the capability to engage the enemy in the event of a surprise attack. The normal load conditions and full load conditions are explained in the following paragraphs, as well as factors affecting the total complement of operations personnel. Figure 4 illustrates the detailed personnel requirements for each of these conditions.

2. Normal load complement.

a. Normal load personnel complement requirements are established by the manning of only those operating positions necessary for the successful performance of those functions required for the normal day-to-day air defense mission of a Direction Center.

b. Specification of the exact normal load requirements for a particular SAGE Sector depends on an assessment of several factors

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such as, the average volume and density of air traffic, the configuration and number of external data input sources, standard operating procedures for surveillance, distribution and number of primary target areas and approach routes, etc. These are, of course, different for individual Sectors and, in time, will be reflected in the personnel requirements for individual Sectors. However, personnel planning has been based on the operational requirements for typical installations.

3. Full load complement.

a. Full load conditions have been considered as those operational situations, ordinarily battle conditions, which require operation of a Direction Center at or near the limit of the Sector capability. The full load personnel complement requirements have been established by the complete manning of every operating position. The transition between normal and full load manning is expected to be accomplished as soon as necessary after a warning.

4. Total complement.

a. The total complement of operations personnel required to man each Direction Center is based on the following considerations:

- (1) Continuous operation of the Direction Center.
- (2) Three shift per day operation.
- (3) A normal 40-hour duty week.
- (4) A small augmentation factor to compensate for absences, e.g., leave, illness, other required duties, etc.
- (5) An appropriate distribution of skilled personnel to man each required position per shift.

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FIGURE 4

SAGE DIRECTION CENTER

Operations Personnel Requirements
and Position Identification

<u>Position Title</u>	<u>Abbr.</u>	<u>AFSC</u>	<u>Grade</u>	<u>Nr</u>	<u>*TC</u>	<u>*NL</u>	<u>*FL</u>
Senior Director	SD	1616	Lt Col	5	5	1	2**
Senior Director Tec	SDT	27370	M/Sgt	5	5	1	2**
<u>Air Surveillance Section</u>							
Air Surveillance Off	ASO	1644	Capt	5	5	1	1
Air Surveillance Tec	AST	27370	M/Sgt	2	5	1	1
		27370	T/Sgt	3			
Air Tactics Officer	ATO	27300	W/O	5	5	1	1
Air Tactics Tec	ATT	27370	T/Sgt	2	5	1	1
		27350	S/Sgt	3			
Tracking Officer	TO	27300	W/O	5	5	1	1
Tracking Tec	TT	27370	T/Sgt	1	5	1	1
		27350	S/Sgt	2			
		27350	A/1C	2			
Tracking Supv	TS	27370	M/Sgt	2	5	1	2
		27370	T/Sgt	3			
Track Monitor	TM	27350	S/Sgt	9	27	7	14
		27350	A/1C	13			
		27330	A/2C	5			
Overlap Technician	OT	27370	T/Sgt	2	10	2	3
		27350	S/Sgt	3			
		27350	A/1C	5			

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Figure 4 (Contd)

<u>Position Title</u>	<u>Abbr.</u>	<u>AFSC</u>	<u>Grade</u>	<u>Nr</u>	<u>TC</u>	<u>NL</u>	<u>FL</u>
Track Initiation Supv	IS	27370	M/Sgt	2	5	1	1
		27370	T/Sgt	3			
Track Initiator	TI	27350	S/Sgt	2	10	3	5
		27350	A/1C	8			
Mapping Supervisor	MS	27370	M/Sgt	1	5	1	2
		27370	T/Sgt	1			
		27370	S/Sgt	3			
Radar Mapper	RM	27350	S/Sgt	1	13	3	8
		27350	A/1C	5			
		27330	A/2C	7			
Height Supervisor	HS	27370	M/Sgt	1	5	1	1
		27370	T/Sgt	2			
		27350	S/Sgt	2			
Height Technician	HT	27350	S/Sgt	1	7	2	2
		27350	A/1C	4			
		27330	A/2C	2			
Manual Input Supv	MIS	27370	M/Sgt	2	5	1	1
		27370	T/Sgt	3			
Manual Input Tec	MIT	27370	T/Sgt	2	27	7	15
		27350	S/Sgt	5			
		27350	A/1C	9			
		27330	A/2C	11			
<u>Identification Section</u>							
Identification Off	IDO	27300	W/O	5	5	1	1
Identification Tec	IDT	27370	M/Sgt	1	5	1	2
		27370	T/Sgt	2			
		27350	S/Sgt	2			

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Figure 4 (Contd)

<u>Position Title</u>	<u>Abbr.</u>	<u>AFSC</u>	<u>Grade</u>	<u>Nr</u>	<u>TC</u>	<u>NL</u>	<u>FL</u>
<u>Weapons Direction Section</u>							
Weapons Director	WD	1616	Maj	5	5	1	4
Weapons Director Tec	WDT	27370	M/Sgt	5	5	1	4
Intercept Director	IND	1644	Capt	12	25	5	20
			Lt	13			
Intercept Dir Tec	INT	27370	M/Sgt	3	25	5	20
			T/Sgt	6			
			S/Sgt	7			
			A/1C	9			
Projectionist - Command Post	PCP	23250	S/Sgt	2	5	1	1
			A/1C	3			
				234	52	116	
<u>Systems Technical Center</u>							
Comm and Elect Staff Duty Off	CEDO	3016	Lt Col	1	5	1	1
			Maj	4			
Systems Technical Center Tec	STCT	29375	M/Sgt	2	10	2	2
			T/Sgt	8			
				15	3	3	
GRAND TOTAL:				249	55	119	

* TC: Total Complement. NL: Normal Load. FL: Full Load.

** Under Full Load conditions one Senior Director and one Senior Director Technician will man Senior Weapons Director and Senior Weapons Director Technician positions, respectively.

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C. MONTGOMERY AND KANSAS CITY AIR DEFENSE SECTORS,

1. The Montgomery and Kansas City Sector Direction Centers are involved in other activities in addition to those pertaining to active air defense, and for this reason some explanatory discussion is provided in the following paragraphs. The Montgomery Sector Direction Center will support Air Proving Ground Command (APGC) weapons testing in addition to its air defense mission. The Kansas City Sector Direction Center will initially be used for training and computer programming activities and ultimately as an operational site with an air defense mission.

2. Montgomery Air Defense Sector: The personnel requirements and phasing for the Headquarters, Montgomery Air Defense Sector at Gunter Air Force Base are based on the same ground rules established for other typical SAGE Sector Headquarters. The Direction Center control of APGC test and/or training missions will not produce a conflicting operational load with the primary air defense mission of the Sector. A "Joint APGC-ADC Plan for Implementation and Utilization of the SAGE Facility for Air Defense Weapon Testing and Unit Training" has been published and it is intended that additional implementing agreements will be prepared to further refine joint use of this Direction Center.

3. Kansas City Air Defense Sector: The Direction Center will be used as a Special Training and computer programming facility following acceptance on its currently scheduled operational date. The Direction Center will initially be under the command of the

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4620th Air Defense Group, a unit which will be activated under the 4620th Air Defense Wing (Exp SAGE). The latter is now located at the Lincoln Laboratory site in Lexington, Massachusetts, and is programmed to move to Rand Corporation, Santa Monica, California, in the second quarter of Fiscal Year 1959. The planning factors involved in utilization of the Kansas City Sector Direction Center are outlined in the "Air Defense Command Plan for Providing a SAGE Facility for Computer Programming and Training", dated 27 September 1955. Between the time that the SAGE Direction Center for computer programming and training becomes operational, and the time that the remainder of the 33rd Air Division (SAGE) area possesses a SAGE capability, the air defense of the Kansas City Sector will be conducted by the 20th Air Division under the manual system. When the entire 33rd Air Division area is SAGE equipped in its regular order of priority, it is planned that normal (peace time) air defense of the Kansas City Air Defense Sector will be conducted on a degraded SAGE basis by adjoining Sector Direction Centers under the 33rd Air Division (SAGE). In periods of air defense alert, the Kansas City Sector Direction Center capability would be fully utilized. Two operations dates are shown in the Phasing Schedule. The first represents the date the Direction Center will become operational for training and programming functions. The second date coincides with the operations date of the 33rd Air Division (SAGE). Using this concept of operations and the recommendations contained in Schedule #6, the phasing of personnel for the Kansas City Sector Direction Center has

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been developed as follows:

- a. Activation of the 4620th Air Defense Group at Richards-Gebaur Air Force Base, Missouri, on 1 July 1957 (four months prior to BOD).
- b. Advance Echelon Support Personnel:
 - (1) Four months prior to BOD: Part 1A of SAGE Sector Personnel Phasing Guide, less one Supply Officer, AFSC 6416, and one Installations Engineer, AFSC 5525. (The responsibilities normally discharged by the latter will be vested in the Installations Engineer currently authorized at Richards-Gebaur AFB, Mo.)
 - (2) Two months prior to BOD: Part 2A of the SAGE Sector Personnel Phasing Guide, less one Apprentice Organization Supply Specialist, AFSC 64131.
 - (3) Beneficial Occupancy Date: Part 3A of SAGE Sector Personnel Phasing Guide, less Deputy Commander, Information Services Staff Officer and Information Technician.
- c. C&E Personnel: Training and on-site requirements as established for other Direction Centers. (Parts 5, 6, 9, 14 and 17 of Column A, SAGE Sector Personnel Phasing Guide.)
- d. Direction Center Operations Personnel: Parts 4 and 7 of SAGE Sector Personnel Phasing Guide, constituting one normal load of operations personnel.
- e. Personnel authorizations shown in paragraphs b through d, above, will be from 4620th Air Defense Group authorizations. The remaining 4620th Group authorizations will be phased through separate action in accordance with requirements to be established by the 4620th

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Air Defense Wing (Exp SAGE). Any additional support personnel required to support the Direction Center will be programmed by Central Air Defense Force for the 328th Fighter Group and the 328th Air Base Squadron, both located at Richards-Gebaur AFB, Mo.

f. The Kansas City Air Defense Sector Headquarters personnel are phased in a progressive build-up from 1 January 1962 and oriented toward the operational date of the 33rd Air Division (SAGE). At that time the 4620th Air Defense Group authorizations for Communications-Electronics, Direction Center Operations, and certain support personnel will revert to the Kansas City Air Defense Sector Headquarters. The remaining complement of Direction Center Operations personnel is phased in two months prior to the second operations date of the Kansas City Sector. (See Phasing Schedule, Annex I.)

D. PLANNING FACTORS USED IN DETERMINING TYPICAL SECTOR HEADQUARTERS AND DIVISION ON SITE REQUIREMENTS.

1. Reference SAGE Sector Headquarters Personnel Phasing Guide and Schedule (Appendix I, Annex H and I):

a. Part 1 - Four Months Prior to BOD: This increment consists of six officers, five airmen and one civilian. These personnel are required on site four months prior to Beneficial Occupancy Date (BOD) to activate the unit, provide unit administrative support, and act in a technical liaison capacity with civilian contractors. From experience gained at McGuire Air Force Base, the need for a small technical liaison staff prior to BOD was recognized and is now established as a requirement. This staff consists of one each Operations Staff Officer, Supply Staff Officer, Installations Engineer,

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Communications-Electronics Staff Officer, Administrative Supervisor and a Stenographic Specialist. The requirement for these personnel was not developed soon enough to permit phasing them into the first five Sector Headquarters prior to BOD. (The on-site date for these personnel at each of the first five sites was established for 1 December 1956.) Commencing with Fort Custer, the necessary lead time is available and they are phased at each succeeding Sector Headquarters four months prior to BOD. The functions for the liaison staff personnel are delineated below:

(1) Operations Staff Officer (Lt Colonel): This officer will serve as Cadre OIC working with the Supervisor of the Coordinating Air Defense Engineering Services (ADES) Team, the support base and Air Defense Force on overall installation and test problems. The early efforts of this officer will be devoted to familiarization with the SAGE test program and assisting the Air Defense Force in operations planning for support of the test activity and at a later date coordination of the Air Force operational support required for the tests.

(2) Supply Staff Officer (Major): This officer will work with the support base and AMC activities to assure availability of supplies and equipment required to support activities at the site.

(3) Installations Engineer (Captain, Function Code 39100): This officer will coordinate programs and plans for construction or other arrangements for appropriate base facilities, assist in preparation for acceptance of real property and prepare

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real property records and reports following acceptance. He will also arrange for minor modification of the facility and repairs as required.

(4) Communications-Electronics Staff Officer (Major):

This officer will make arrangements with the support base for telephone communications requirements and initiate Air Force action on changes in wire communications requirements and problems associated with telephone communications requirements throughout the Sector. He will also develop technical procedures for system tests and system operation, and orient Unit Commanders within the Sector on technical test requirements.

(5) The Administrative Supervisor (M/Sgt) and Stenographic Specialist (Civilian) are required to support the above functions.

b. Part 2 - Two Months Prior to BOD: This increment is comprised of unit supply personnel and one Installation Engineer (Lieutenant, Function Code 39400). One Organization Supply Supervisor, Function Code 04000, is phased in with the administrative increment four months prior to BOD. The remaining unit supply personnel under Function Code 04000, consisting of one officer (Lieutenant) and three airmen, are phased in two months prior to BOD. These supply personnel are required at this time to requisition supplies and equipment, establish unit property records, receive and store material as it arrives at the site. The Installation Engineer, whose duties are concerned mainly with the "Powerhouse", is phased in at this time to become familiar with the utilities equipment and observe tests conducted by the prime contractor prior to acceptance on BOD.

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c. Part 3 - Beneficial Occupancy Date: Part 3 is comprised of two officers, eight airmen and one civilian. Included are the Deputy Commander and civilian stenographic specialist; additional unit administrative personnel required for the increased administration workload; the duty air police personnel required for Direction Center security, commencing when the Air Force accepts the installation from the contractor; and two Information Services personnel. The latter are needed to organize, supervise and operate programs designed to provide information concerning the newly activated SAGE unit to the public through media such as newspapers, radio and television. This program must be established in the early phase of the SAGE unit development to anticipate trends in local public opinion which might adversely affect relations between military and civilians of the community and to insure a public understanding of the air defense mission.

d. Parts 4, 7 and 10 - Initial Complement, Balance of Normal Load, and Remaining Complement of Direction Center Operations Personnel: All personnel in each of these increments require special training with the exception of the Still Photographers. (The latter are shown in the phasing schedule as Parts 7* and 10* on the date the remaining personnel in each part are required on site.) Three months lead time is applied in the Phasing Schedule to each increment prior to the date trained operations personnel are required on site. This time allows eight weeks for special training, and four weeks for assignment, travel to and from the training site, and some flexibility in timing for the benefit of the Air Training Command in establishing schedules which will

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support on-site requirements. Phasing of the operations personnel is in accordance with Schedule #6 and is based on the following factors:

(1) Initial Complement: This increment consists of three officers and fifteen airmen. These personnel are required during the Initial Test period to man the Air Surveillance Section of the Direction Center, with the exception of the Air Tactics consoles. Identification and Weapons sections are not needed at this time. The Initial Test period corresponds to the time when the Air Surveillance Section of the computer program first becomes available. Consoles are manned individually and then together as radar sub-systems are integrated and tested. Additionally, the Initial Tests are designed to detect and isolate component malfunctions in a system environment. These tests will be conducted for eight hours per day.

(2) Balance of Normal Load: This increment consists of eight officers and twenty-six airmen. These personnel, together with the personnel in the Initial Complement, comprise a Normal Load (Normal operating shift). Included in this increment are the Air Tactics personnel, (excepted from the Air Surveillance Section of the Initial Complement) the Identification and Weapons Sections, and one Still Photographer. (Also required at this time but not shown in the phasing documents are the Army Anti-aircraft Director and assistant, and Weather personnel.) After some orientation training is provided, Initial System Tests are expanded to include the remainder of the Air Surveillance functions, and the Identification and Weapons functions. As testing progresses, it will be necessary to operate some or all the consoles associated with all three sections up to the maximum capability

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of one Normal Load or operating shift. Before the Initial Tests are completed, the Duplex section of the computer program is delivered and tested.

(3) Remaining Complement: This increment consists of forty-four officers and one hundred thirty-eight airmen. These Remaining Complement personnel, added to the Initial Complement and Balance of Normal Load, comprise the total complement of Direction Center operations personnel. Orientation and team training are provided initially, followed by Systems Tests. These tests are performed to obtain data which will permit certification to the Air Force that the SAGE equipment is operating properly. Testing will be conducted on a 24 hour per day basis and will include tracking and control of aircraft, data reduction, reliability testing, etc. In short, complete system capability will be exercised.

e. Parts 5, 9 and 14 - Initial Complement and Remaining Complement of Communications-Electronics Personnel: Parts 5 and 9 comprise the Initial Complement. Part 5 consists of the five C&E duty officers and is separated, for phasing purposes, from the rest of the Initial Complement to provide necessary lead time for special training. Two months lead time is provided prior to the date these officers are required on site. This time allows for six weeks of special IBM training and two weeks for assignment and travel to and from the training site. Six weeks of operations training will also be provided for each C&E duty officer. This training will be the same as that provided for Command Post personnel, and will be accomplished between the time the officers report to the SAGE site for duty and commencement of final system tests. In addition

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to the five C&E duty officers, the Initial Complement includes System Technical Control Center (STCC) airmen and Communications Center personnel for a total of six officers and thirty-four airmen. The Remaining Complement (Part 14) is comprised of the remaining Communications Center personnel. This increment includes two officers and forty-three airmen in separately located Direction Centers, and two officers and fifty-seven airmen in Direction Centers located at combined DC/CC sites. (Communications Centers are combined at the latter sites.) Included in both Complements are Communication Machine Repairmen. If teletype equipment is not installed at the time the Initial Complement is required on site, the one Communication Machine Repairman in that increment should not be phased in at that time, but rather he should be phased in accordance with the equipment installation schedule. Current authorizations for the STCC airmen is for five each in AFSC 30473 and five each in AFSC 36271. A new and more appropriate AFSC for the STCC function has been established - AFSC 29375, Channel and Technical Control Technician. It is anticipated that this AFSC will be authorized, in lieu of AFSC's 30473 and 36271, and the phasing documents have been revised accordingly. The System Technical Control Center at the Direction Center is manned on a 24-hour per day basis. STCC personnel receive, analyze and record trouble reports, assign responsibility for correction and monitor the progress of repair work. The time phasing for the Initial and Remaining Complements of C&E personnel is based on the following factors:

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(1) The Initial Complement is required on site at the beginning of the sub-system test period. Limited operation of the System Technical Control Center (STCC) and the communications circuits will be required at this time during the evaluation and testing of the sub-systems. Although all the C&E duty officers are not required initially for specific test functions, they are all phased in concurrently in order to obtain on-site training and to learn system test procedures which will be utilized by them after the site is operational.

(2) The Remaining Complement is required on site at the beginning of the overall system test when 24 hour operation of the System Technical Control Center and communications circuits in this test evaluation is required.

f. Parts 6 and 17 - Ground/Air Radio Maintenance Personnel: These personnel are shown only for SAGE Direction Centers programmed for ground/air radio facilities. Phasing of personnel for Radar Squadron (SAGE) ground/air radio facilities will be accomplished by separate action. The seventeen airmen required for radio maintenance at Direction Center facilities are phased in two increments. The first phase-in is based on SAGE sub-system test dates and the second on Direction Center system test dates. The first increment of nine airmen is phased in thirty days prior to commencement of sub-system tests, and the second increment of eight airmen is phased in on the date final system tests begin.

g. Parts 8 and 11 - Command Post: These two Parts include the Sector Headquarters Commander and his Command Post battle staff for a total of eight officers. All of these personnel will require

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special training. For phasing purposes, the Senior C&E officer shown in Part 8 is separated from the remaining Command Post personnel because of additional training requirements. Four months lead time is provided for this officer to allow six weeks of IEM training, six weeks of operations training, and four weeks for assignment and travel and to allow some flexibility in scheduling the required training. For the Command Post personnel shown in Part 11, eight weeks lead time is provided for six weeks of operations training, and two weeks for assignment and travel to and from the training site. The on-site requirement is in accordance with Schedule #6 and is based on the following requirements:

(1) The Commander and his staff will prepare a two week on-site orientation course for Direction Center operations personnel. (The remaining complement of operations personnel are scheduled to arrive one month after the Commander and his staff. By this time, all Direction Center operations personnel have completed special training and are on site.) The orientation course will include, but not be limited to, the following: Location of weapons and radar installations; their operating procedures and capabilities; familiarization with Sector geography; differences between configuration of Sector equipment and equipment at the site where special training took place; the Commander's operational procedures and requirements; working schedules and shift arrangements; and SAGE System Training Program (SSTP) requirements and arrangements.

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(2) Immediately upon completion of the on-site orientation course, the Direction Center will revert to a 24-hour, 7 day per week test schedule involving the use of all operations personnel. The Commander and his staff will perform all duties during this period that will normally be expected after the operations date as pertains directly to Direction Center operation. He and his battle staff will oversee the conduct of the final system test from their Command Post positions.

(3) During the last phase of the test program, the Commander and his staff will firm up all operational procedures to be used when the Direction Center assumes the Air Defense mission.

h. Parts 12, 13, 15 and 16 - Remaining Headquarters Staff and Support Personnel: These personnel are phased into the Sector Headquarters in accordance with support requirements determined by previous personnel build-up, and with regard to Command and supervisory functions as related to the arrival of the Sector Commander and the operational date of the Direction Center.

2. Reference SAGE Division Personnel Phasing Guide and Schedule (Appendix I, Annex J and K):

a. Part 1 - Beneficial Occupancy Date: This Part consists of one Supply Officer and one Supply Supervisor, phased in on BOD to constitute Detachment 1 of the Division. These personnel are provided to establish and maintain property records and the Division supply accounts. They will also serve as the one officer and one airman for morning report purposes. Duty air police personnel, required on BOD, are provided for the Division Combat Center through

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augmentation of the SAC Sector Headquarters located at the new site. BOD's of both the Sector Headquarters and the Division are the same at all combined sites except at Richards-Gebaur AFB. No. Air police for the Kansas City Sector Direction Center at that base are phased with 4620th Air Defense Group personnel. Air police for the 13rd Air Division (SAGE) Combat Center will be programmed through separate action, to be phased in on the Division BOD which occurs much later than the BOD of the Direction Center.

b. Part 2. This Part is comprised of the Squadron Section Commander and a personnel technician. They are phased in just prior to the first arrival of C&E and operations personnel to provide administrative accountability and to initiate personnel reports pertaining to assignment of these personnel.

c. Parts 3 and 6 - Command Post. These two Parts include the Division Commander and his Command Post battle staff for a total of eight officers. All of these personnel will require special training. The Senior C&E officer shown in Part 3 is separated from the remaining Command Post personnel because of additional training requirements. Four months lead time is provided for this officer to allow six weeks of IFM training, six weeks of operations training, and approximately four weeks for assignment and travel, and to allow some flexibility in scheduling the required training. For the Command Post personnel shown in Part 6, eight weeks lead time is provided for six weeks of operations training, and two weeks for assignment and travel to and from the training site. The on-site requirement is in accordance with Schedule #6, and is based on the same requirements outlined

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for Direction Center Command Post personnel except that the orientation course for the Combat Center operations personnel will pertain to all Sectors under the Division's jurisdiction.

d. Parts 4 and 7 - Initial Complement and Remaining Complement of Combat Center Operations Personnel: Part 4 consists of eleven officers and seventeen airmen. Part 7 consists of nine officers and twenty-three airmen. Three months lead time is applied to both Part 4 and Part 7 prior to the date trained personnel are required on site in accordance with Schedule #6. This lead time allows eight weeks for special training and four weeks for assignment, travel to and from the training site, and some flexibility in timing for the benefit of Air Training Command in establishing schedules which will support on-site requirements. Part 4 and Part 7 include Still Photographers who do not require special training prior to reporting to the site for duty. Therefore, no lead time has been applied to these personnel and they are shown separately in the phasing schedule as Part 4* and Part 7* in accordance with the on-site requirement. Phasing of the operations personnel is based on the following requirements:

(1) Initial Complement: These personnel are required on site to participate in Combat Center testing. The on-site requirement is based on the date that one or more Direction Centers become operational. At this time, adequate operational data are made available to the Combat Center for performance of AN/FSQ-8 computer tests.

(2) Remaining Complement: These personnel will initially receive training on site to acquaint them with the air defense sector configurations. This will be followed by final Combat Center tests, on

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a 24-hour per day basis, which exercise the active sectors in a manner as similar as possible to later Combat Center operations in air defense.

e. Parts 5 and 9 - System Technical Control Center Personnel (STCC): Part 5 is comprised of five Communications-Electronics Staff Officers. Two months lead time is provided, prior to the date these C&E duty officers are required on site, for six weeks of special training at the IBM facility and two weeks for assignment and travel to and from the training site. Part 9 is comprised of five airmen (Channel and Technical Control Technician, AFSC 29375) who are required but not yet authorized in O/T 1892C, dated 31 July 1956. (Action will be taken to revise the O/T.) Although the Communications Centers at combined DC/CC sites are combined into a single Center, the System Technical Control Centers are located in separate rooms. Because of the reduced workload in the Combat Center STCC, only five airmen are required (one per shift) to assist the duty C&E officer as opposed to ten required for the Direction Center. Duty STCC personnel receive, analyze and record trouble reports, assign responsibility for correction and monitor the progress of repair work. The time phasing for the STCC personnel is based on the following requirements: To participate in Combat Center tests which involve the checkout of initial forward tell data circuits from one or more Direction Centers; to accomplish training in system check procedures; and train in these procedures in preparation for assumption of System Technical Center responsibilities.

f. Parts 8, 10, 11 and 12 - Division Headquarters Staff and Support Personnel: These personnel are phased in a progressive build-up commencing with Part 8, two months before the Division Commander

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arrives, Part 10 on the date the Commander arrives, and Parts 11 and 12, two months and one month respectively before the operations date. This phasing was determined on the basis of administrative workload resulting from the phased personnel build-up; providing the Commander with a representative staff capability on the date he arrives; and to allow sufficient time for other staff personnel to be indoctrinated in SAGE functions and to develop Division policies, SOP's, etc., prior to the operations date and assumption of command over subordinate Sectors.

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SECTION IV

SAGE PERSONNEL POLICY

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SECTION IV

A. GENERAL.

1. Considerable planning has been accomplished in establishing testing schedules for the check-out and certification of equipment and systems in each SAGE Sector and Division area. Implementation of the testing programs requires the closest possible coordination between the many military and civilian contractors and agencies involved in construction, equipment procurement and installation, communications, computer programming and many other related functions. All of these efforts are oriented toward one goal - achievement of a SAGE operational capability at the earliest possible date. Analysis of ADES Schedule #6 will reveal the relationship between the individual system test requirements and the operations date, and will illustrate the overlapping of tests in various stages of completion at a number of sites. The tight scheduling, resulting in the need for closely spaced personnel actions, is directly related to the small span of time which exists between individual site operations dates. Although more than four years are consumed between the first and the last SAGE unit operations dates, the time span between individual site dates is less than two months, with the majority averaging one month. It appears that the construction and equipment program is properly definitized and is being closely monitored to insure that testing schedules are met. This Plan establishes the personnel requirements for SAGE and correlates these with the time phased test requirements established in ADES Schedule #6. Because of the importance attached to time phased personnel actions, it is necessary to

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establish policies to prevent certain uncontrollable conditions from adversely affecting the operational schedule. In addition to applying the policies outlined herein, they must be carefully monitored by military agencies at all echelons of command.

2. This Section deals with such subjects as manning priorities; retainability; pre-requisite criteria; assignment; leave policy during the testing periods, etc.

B. GENERAL MANNING POLICIES.

1. Personnel Assignment Priority.

a. It is the intent of this Command to man SAGE Direction Centers and Combat Centers to authorized strength with the best qualified personnel within available resources. This is considered necessary to assure successful completion of SAGE systems tests and effective air defense subsequent to the operations dates. The latter is of particular significance since the manual capability will be severely curtailed in the SAGE era, retaining only an emergency operational capability.

b. If we are to achieve a satisfactory SAGE posture, the qualitative and quantitative personnel requirements during the implementation of SAGE must take precedence over the manual system requirements. However, this does not mean that the manual system need be degraded to the extent that its operational capability is impaired. Careful management of available personnel resources must be exercised at all echelons of Command. For instance, if substitution of a lesser qualified AFSC is necessary in a critical skill, the majority of such substitutions can be made in the manual system. With regard to quantitative requirements, it should be emphasized that the SAGE Direction

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Center and Combat Center authorizations for continuous operation is based on a 4.6 manning ratio. This ratio is considered marginal. Any reduction below a minimum of 4.2 could seriously jeopardize the capability to sustain full load operations or to resume normal operations after an emergency. Quantitative personnel reductions in the manual system can be overcome, to some extent, by revisions in crew make-up during low traffic load conditions. However, we do not have the crew composition flexibility in SAGE where a greater number of operating positions must be manned at all times irrespective of the tactical situation. The basic criterion in implementing the policy of providing SAGE a higher priority than the manual system will be that SAGE Direction Centers and Combat Centers must not be manned below a 4.2 manning ratio.

c. The Direction Centers of the New York and Boston Sectors and the 26th Air Division (SAGE) Combat Center at Syracuse commonly referred to as the "first module", represents the first integrated SAGE operational element - two Direction Centers and one Combat Center. According to previous schedules, these were the first to become operational. Because of the five month slippage in the BOD and operations date of the Combat Center, Schedule #6 now reflects all SAGE Direction Centers in the 26th Air Division (SAGE) becoming operational prior to the parent Combat Center. This will cause delay in evaluation of the "first module" but will not necessarily rule out the requirement. Therefore, previous plans to man the first two Direction Centers and the first Combat Center at 100%, in authorized skill levels insofar as possible, remain firm and are based on the following reasons:

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- (1) To provide maximum air defense effectiveness for the first integrated Air Defense Command SAGE operation.
- (2) To determine the operational capability of the first two Sectors and, subsequently, the first complete module under optimum manning conditions.
- (3) To determine as soon as possible in the implementation phase, the accuracy of manning documents and personnel selection criteria, and adequacy of training programs.

2. Application of Personnel Retention Policies.

a. During the implementation of SAGE, all Direction Center and Combat Center duty personnel are assigned, at various intervals, many months before active air defense operations commence. The majority receive special training which, when combined with travel time, averages approximately three months prior to reporting to the site for permanent duty. This is followed by on-site indoctrination and additional training gained in system test participation. Continuity of effective air defense operations and good personnel management demands the retention of these personnel for a reasonable period of time beyond the operations date. Retainability criteria for specific types of personnel are outlined in following paragraphs of this section as well as in Section V.

b. At this writing, action is being taken by Headquarters USAF to identify SAGE trained personnel with shredouts or entirely new AFSC's. This action is considered necessary not only in order for these personnel to be protected from overseas levies during the initial implementation of SAGE, but so that they can be identified

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upon return from later overseas assignments in manual environments. Category B protection for key airman personnel will be obtained from Headquarters USAF. With judicious application of Category B protection for officers, current Air Defense Command Category B resources should be sufficient to assure adequate retention of specially trained operations and C&E officers in SAGE during the implementation period.

c. Defense Force Commanders must exercise maximum control over available personnel resources and those provided from outside this Command. As much as possible, overseas returnees should be assigned directly to SAGE, and personnel from ADC's manual environment assigned to SAGE should be selected from those least vulnerable to overseas levies.

C. SAGE PERSONNEL PRE-REQUISITE CRITERIA.

1. SAGE Operations.

a. Officer Manning Criteria, AFSC 1616, 1644 and 27300:

It is desired that these officers be fully qualified in their duty AFSC. Qualifying experience may include duty in Tactical or Air Defense ACW systems. The experience gained in qualifying for these AFSC's, combined with the SAGE Special Training program, should adequately prepare these personnel to assume SAGE operations responsibilities. Because of the increased number of ACW Staff Officers (AFSC 1616) required in the SAGE system and the current shortage of these officers, it is necessary to initially accept lesser technically qualified personnel. Highly qualified 1644's in the rank of

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Captain can be substituted for AFSC 1616. As a result of this action, it may be necessary to substitute some 1641's for 1644's. Entry level officers thus substituted should have previous experience in manual ACW systems. With regard to Warrant Officer (AFSC 27300) resources, these may be inadequate to fill the requirement. In this event, highly qualified Master Sergeants with PAFSC 27370 may be substituted. Indiscriminate substitutions must not be made. The following limitations will apply:

(1) AFSC 1641 will not be substituted for AFSC 1644 in Air Surveillance Officer and Weapons Director positions.

(2) AFSC substitutions will not be made for personnel comprising the Initial Complement and Balance of Normal Load for Direction Centers.

b. Airman Manning Criteria, AFSC 273x0: It has been determined that approximately fifty percent of Direction Center and thirty-seven percent of Combat Center operations airmen will be assigned to positions where previous manual experience would be of no significant value. These positions are specifically identified in Section V. No pre-requisite qualification is therefore established for this group and they may be drawn from either manual system or basic training resources. (This rule will not apply to the first "Module" where 100% manning in authorized skills is desired.) The remaining airman operations personnel should be fully qualified in their Control AFSC with current manual system experience. This experience, combined with SAGE Special Training, should adequately prepare these personnel for SAGE duties.

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4. Communications and Electronics.

a. Officer Manning Criteria, AFSC 3016: The duties and responsibilities of the SAGE C&E duty officers are more complex than those heretofore performed in other Air Force communications and electronics systems. These officers direct and supervise communications and ground electronics maintenance activities to assure adequate equipment operational capability. In addition, they assist operations personnel concerning technical problems. In view of the highly complex nature of the C&E duty officer functions, it is essential that the best qualified C&E officers be assigned. It must be realized that Air Force resources are presently inadequate in this specialty. Therefore, we must substitute lesser technically qualified personnel until such time as available resources substantially improve. Substitutions for C&E duty officers may be made with fully qualified Captains in AFSC's 3044 and/or 3034. These substitutions must be carefully controlled to insure an adequate spread of skill and experience at each individual SAGE Direction Center and Combat Center. Careful selection to insure assignment of best qualified C&E personnel, accomplishment of IBM and operations Special Training, plus the relatively long period of time these personnel are on site in a training status prior to the operations date, should adequately prepare them for SAGE responsibilities.

b. Airman Manning Criteria, AFSC 29375 (System Technical Control Center - STCC):
AFSC 29375, Channel and Technical Control Technician, is a relatively

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new AFSC. The current authorization for STCC airmen is divided equally between two AFSC's - 30473 and 36271. It has been determined that the position description for AFSC 29375 is more closely related to STCC duties and responsibilities. It is intended that this AFSC replace authorized AFSC's. Since the resource in this new AFSC is limited at this time, it is apparent that substitutions will initially have to be made with AFSC 30473 and 36271. These personnel should be fully qualified in their CAFSC. No special Training is provided for STCC airmen, however, the OJT accomplished during the relatively long period of assignment to the site before the operations date should qualify these personnel to assume responsibilities in SAGE STCC's.

3. Retainability Criteria: The minimum retainability periods specified below, by location and types of personnel, will permit retention of trained personnel on site for six to twelve months subsequent to scheduled operations dates. It is emphasized that the periods shown are considered minimum. It would be highly desirable to retain these trained personnel for the maximum time possible. The retainability period is calculated from the time personnel initially report to the SAGE installation (prior to Special Training) or the reporting date for Special Training, whichever is sooner.

a. Direction Centers.

(1) Operations - Officers and Airmen: All personnel will be retained for a minimum of eighteen months, with one exception - the Initial Complement at the New York ADS Direction Center. This increment will be retained for a minimum of twenty-four months.

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(2) C&E Duty Officers and STOC Airmen: A minimum of thirty months retainability is required at the New York and Boston ADS Direction Centers; twenty-four months at the Syracuse, Washington and Bangor ADS Direction Centers; and eighteen months at all other Direction Centers.

(3) Senior C&E Staff Officers: A minimum retainability of eighteen months is required at all Direction Centers. (Senior C&E Staff Officers assigned early at the New York and Boston ADS Direction Centers should be retained for at least nine months after the scheduled operations dates.)

b. Combat Centers.

(1) Operations - Officers and Airmen: All personnel will be retained for a minimum of eighteen months, with the exception of the Initial Complements at the 26th and 30th Air Division (SAGE) Combat Centers where minimum retainability will be twenty-four months.

(2) C&E Duty Officers and STCC Airmen: Minimum retainability at the 26th and 30th Air Division (SAGE) Combat Centers will be twenty-four months. Retainability period at all other Combat Centers will be eighteen months.

(3) Senior C&E Staff Officer: A minimum retainability of eighteen months is required at all Combat Centers.

D. JOB ASSIGNMENT OF SAGE OPERATIONS PERSONNEL.

1. Because of the limited special training time and facilities, an individual can only be trained for one console position. For this

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reason, the responsibility for selection of an individual for a specific position prior to commencement of training must be delineated. Selection can best be accomplished after trainees arrive at the training site, in groups, comprising the Initial Complement, Balance of Normal Load, or Remaining Complement. The Air Training Command cannot assume the responsibility for this selection. It has previously been recommended that the officer trainees in each group make the selection. This course of action is not wholly acceptable since the officer trainees are not familiar with SAGE operational requirements and cannot properly associate a manual AC&W operator's experience with SAGE operator positions. For these reasons the selection of trainees for job positions in SAGE operations prior to entry in special training will be the direct responsibility of the 4620th ADW (Experimental SAGE). This policy is established as the most practical course of action for the following reasons:

- a. Experience and know-how of 4620th ADW personnel with respect to SAGE operational requirements and standardization of selection criteria.
- b. The current and projected mission of the 4620th ADW, as a subordinate unit of the Air Defense Command, insures realistic assignment of personnel to meet training and tactical requirements.
- c. Physical location with respect to the training site.

E. UNIT ASSIGNMENT AND LEAVE POLICY.

1. In order to adequately support the system tests prior to the operations date of the site concerned and to provide continuity with

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qualified personnel in C&E and operations functions, it is necessary to establish assignment and leave policies for these personnel. These policies are applied only in cases where normal Air Force policies would have an adverse effect on the scheduled test and operational activities of the site concerned.

2. Assignment:

a. All personnel requiring special training will be assigned PCS to the SAGE Wing or Division, as applicable, prior to reporting for special training. If desired, unmarried personnel may be placed on TDY to the training site prior to physically reporting to the SAGE unit. The general rule for married personnel, with accompanying dependents, will require that they report to the SAGE site prior to departing for training to complete housing arrangements and personal affairs. They will then be provided orders placing them on temporary duty at the training site. This general rule need not apply to the SAGE C&E duty officers, since sufficient time will be available after assignment to the SAGE unit to complete housing arrangements.

b. Waivers to this policy may be granted by the Defense Force on an individual basis, where undue personal hardship is involved. The intent of this policy must be recognized and implemented accordingly.

3. Ordinary Leave: The general rule for all Direction Center and Combat Center personnel will require that leave be taken prior to PCS or as delay enroute during PCS. Subsequent to assignment, the operations personnel comprising the Initial Complement and Balance of

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Normal Load will not be granted leave, except in emergency, until the Remaining Complement is in place and initial indoctrination completed. In no case does this exceed eight months. Ordinary leave prior to operations date for personnel other than those specifically covered herein, will be granted according to policies established by the SAGE Sector Headquarters or Division Commander.

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SECTION V

TRAINING

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SECTION V

A. GENERAL

1. The special training required for the SAGE operations personnel, Communication and Electronic staff officers and duty officers, will be conducted by Air Training Command. Normally, "special training" would represent only the training of a limited amount of key personnel for any new equipment or system; however, in the case of SAGE, the total number of personnel assigned to the above functions will receive special training prior to their assignment. The timewise and quantitative trained personnel on-site requirements are based upon the planned Direction Center and Combat Center system testing and operation schedules as outlined in Schedule #6.

2. In addition to the training outlined above, a SAGE Command Staff Course will be conducted by the 4620th Air Defense Wing (Experimental SAGE). This course is designed primarily for the Air Defense Sector and Division Commanders and their respective Command Post staffs, including Communication and Electronic Duty Officers.

3. System Technical Center Airmen Personnel: No special training requirements have been established for the training of these personnel. An on-site package training program is being developed by the New York Air Defense Sector to cover these duties. This training will be conducted by the Communication and Electronic

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Duty Officers after the airmen are assigned to the site.

B. SAGE OPERATIONS SPECIAL TRAINING

1. Officers - AFSC 1616, 1644, 27300:

a. These officers will be trained at the Experimental SAGE Direction Center (XD-1) in accordance with the approved eight week training program. Reference Appendix I, Annex L, SAGE Operator Job Training Standards.

b. Selection criteria for Officers and Warrant Officers entering this training are as follows:

(1) They must have current experience in the manual ACW system in their Duty AFSC.

(2) All officer personnel must have a minimum of eighteen months retainability with the exception of the Initial Complement for the New York Air Defense Sector Direction Center. Personnel in the latter group must have a minimum retainability of twenty-four months.

(3) Security clearance required for entry into training is SECRET.

c. Appendix I, Annex O, provides the ADC timewise Special Training Requirements.

2. Airmen - AFSC 273X0:

a. The eight week SAGE Operator Training Plan proposed by Air Training Command has been approved by this headquarters and will provide the following phases of training:

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Phase I	General Orientation
Phase II	Sectional Orientation
Phase III	Position Proficiency Training
Phase IV	Team Training

Appendix I, Annex L, indicates approved Job Training Standards which contain course curricula and graduate skills.

b. The currently established training program for all personnel for the first "Module" (New York and Boston Direction Centers and 26th Air Division Combat Center) consists of eight weeks training at the Experimental SAGE Direction Center (XD-1). Selection criteria for personnel selected for training are as follows:

- (1) All airmen must have current ACW manual system experience.
- (2) Personnel selected for training should, in so far as possible, possess CAFSC in accordance with required skill levels in current manning documents.

c. It would be highly desirable to continue using best qualified airmen available to enter training for sites subsequent to the first "Module". However, in order to preclude draining the manual system completely of qualified ACW Operations personnel, lower input skill levels will be utilized to satisfy some of the operator positions where previous experience is not a mandatory

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requirement. Approximately 50% of the Direction Center and 37% of the Combat Center Operator Training Requirements may be filled with basic graduate 3-skill level personnel without manual system experience. These lower skill personnel will probably not require the full ACW Operator Course AB 27330, but a modified version of this course designed to satisfy this lower skill requirement.

d. The acceptance of lower skill personnel was not considered for the first "Module" because these sites will be used for the initial SAGE System evaluation. This evaluation, to be effective, requires full skill manning by personnel who have received the best training available. It must be pointed out that acceptance of lower skills, as outlined above, should not be construed in any way to imply that skill manning authorizations as established can or should be reduced.

e. The training requirement for personnel referenced in paragraph c above will be identified as Category I Training. This category covers the following SAGE positions: Track Initiator (TI), Track Monitor (TM), Track Monitor Special (TMS), Overlap Technician (OT), Height Technician (HT), Manual Inputs Technician (MIT), and Radar Mapper (RM). Personnel trained in these positions will receive indoctrination in the Air Defense System and general familiarization in these positions. This training will include actual or simulated console symbology representing realistic air situations. It is not intended that each airman will receive training in all

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seven positions. Airmen trainees will be separated into two groups. One group will train in TI, TM, TMS and OT positions and the other group will train in HT, MIT and RM positions.

f. Training for the remaining operator positions will be called Category II Training. This training will be conducted utilizing 5 and 7-skill level personnel. Selection criteria for this training are as follows:

(1) All airmen must have current manual ACW system experience.

(2) These personnel will be trained in the presently programmed eight week special training course at XD-1 and will cover the following positions:

Air Surveillance Technician (AST)	Mapping Supervisor (MS)
Tracking Technician (TT)	Manual Inputs Supervisor (MIS)
Initiation Supervisor (IS)	Senior Director Technician (SDT)
Air Tactics Technician (ATT)	Weapons Director Technician (WDT)
Identification Technician (IDT)	Intercept Technician (INT)
Tracking Supervisor (TS)	Height Supervisor (HS)

In selecting personnel for Category II Training, the most experienced personnel should train into the SDT, WDT, AST, IDT and MIS positions.

g. A security clearance of SECRET is required for all operations personnel entering training.

h. Appendix I, Annex P shows the ADC timewise Special Training Requirements for all airmen operations training.

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3. Retainability Criteria - Officers and Airmen: Retainability is measured from the time of initial reporting date to the SAGE Installation (prior to Special Training) or reporting date to Special Training, whichever is sooner.

a. Direction Centers: All officer and airman operations personnel must have a minimum retainability of eighteen months with the exception of the Initial Complement for the New York Air Defense Sector Direction Center. The latter will have a minimum retainability of twenty-four months.

b. Combat Centers: Officers and airmen comprising the Initial Complements of the 26th and 30th Air Division Combat Centers must have a minimum retainability of twenty-four months. All other Combat Center Operations personnel must have a minimum retainability of eighteen months.

C. SAGE OPERATIONS ATTRITION TRAINING

1. Attrition training is defined as that type of training given to replace personnel losses at operational Direction Centers and Combat Centers. As attrition occurs, the major portion of the higher skill level positions will be filled from within the individual Direction Centers and Combat Centers by upgrading actions. However, until such time as a career structure in the SAGE Operations field is developed and implemented, attrition training factors for specific SAGE operation positions cannot be accurately predicted. This career determination must include the AFSC, shred and progression ladder for

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both officer and airman SAGE Operations personnel. Based on past experience in manning the ACW Operations career field, we concur with the Air Training Command estimate of 33% over-all airman and officer attrition training factor. Because of the currently established retainability prerequisites, the initial requirement for replacement personnel will begin within six months after the first SAGE site operations date.

2. Until action is taken to develop and implement a career structure in the SAGE Operations field, training of replacement personnel will be as follows:

(a) Officers will receive the same Special Training Course as that provided for personnel in the initial manning stages.

(b) Five and 7-skill level airman replacements will receive the same special training course as that provided for personnel in the initial manning stages. It is expected that the total number of these personnel will be small compared to the total number of 3-skill level personnel due to normal up-grade actions that will be taking place.

(c) Three skill level airman replacements, which are expected to constitute the bulk of the airmen replacements, will be trained as normal pipe line replacements for the 273XO career field; however, they will receive limited additional training on SAGE Operations prior to assignment to the SAGE System.

3. At such time as specific officer and airman identification

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is established and implemented for SAGE Operations, it is expected that the attrition training procedures outlined above will be materially altered to suit long range requirements.

D. SAGE COMMAND STAFF TRAINING.

1. A six week Command Staff Course will be conducted by the 4620th Air Defense Wing (Experimental SAGE) for the SAGE Division Commanders and Air Defense Sector Commanders and their respective Command Post Staffs prior to assignment to sites for duty.

2. Command Post personnel are identified as follows:

- a. Commander.
- b. Deputy for Operations.
- c. Assistant Deputy for Operations
- d. Communication and Electronic Staff Officer.
- e. Missile Officer.
- f. Fighter Officer.
- g. Antiaircraft Artillery Officer
- h. ACW Staff Officer.

In addition to the above personnel, the Vice Commander and Communication and Electronic Duty Officers will also receive this training. However, due to their early requirement on-site, they will accomplish this training some time after assignment, but before commencement of final system tests.

3. The Command Staff Course will cover four phases of instruction:

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a. One week will be devoted to providing the students with general familiarization with computer operations.

b. One week will cover general SAGE Operations familiarization. This part of the course will provide supervised study of basic documents on SAGE Operation such as the "Operational Plan" and selected operational specifications for SAGE Direction Centers and Combat Centers.

c. Four weeks will be given on specific SAGE Air Defense Operations. This phase of the course provides sufficient information and experience to trainees to enable them to fulfill their Command Post and staff responsibilities in SAGE Air Defense Operations. This phase includes:

(1) Memorizing and practicing the use of symbology.

(2) Comprehensive study of SAGE functions to include each operating position.

d. At least thirty hours of actual operational training in the Command Post at XD-1 will be given during the six week course.

e. Security clearance required for this training is SECRET.

E. COMMUNICATIONS-ELECTRONICS OFFICER TRAINING.

1. A six week training program has been established at the IBM Corporation at Kingston, New York. The purpose of this course is to give all Communication and Electronic Duty Officers and the Senior Communication and Electronic Staff Officer at each Direction Center

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and Combat Center a basic understanding of the operation and maintenance of the SAGE Computer as well as an indoctrination in the over-all SAGE System. This training will include AN/TSQ-7 and 8 computer capabilities and limitations. Sufficient training quotas are available to satisfy the needs of higher headquarters Staff Communication and Electronics Officers. Appendix I, Annex M shows the approved training plan for this course.

2. In addition to the computer training at IBM, all Communication and Electronic Duty Officers and the Senior Staff Communication and Electronic Staff Officer will attend the SAGE Command Staff Training conducted by the 4620th ADW (Experimental SAGE).

3. Prerequisites for this training are AFSC 3016 or fully qualified 3034 or 3044. Officers selected must have a minimum of one year of current experience in manual ACW Systems.

a. Retainability Criteria: Retainability is measured from the time of initial reporting date to the SAGE Installation (prior to Special Training) or reporting date to Special Training, whichever is sooner.

(1) Direction Centers: Communication and Electronics Duty Officers must have a minimum retainability of thirty months at the New York and Boston ADS Direction Centers; twenty-four months at the Syracuse, Washington and Bangor ADS Direction Centers; at all other Direction Centers a minimum of eighteen months retainability is required. Senior Communication and Electronics Staff

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Officers at all Direction Centers must have a minimum retainability of eighteen months.

(2) Combat Centers: Communication and Electronics Duty Officers assigned to the 26th and 30th Air Division Combat Centers must have a minimum of twenty-four months retainability. Minimum retainability for Communication and Electronic Duty Officers at all other Combat Centers will be eighteen months. Senior Communication and Electronic Staff Officers assigned to Combat Centers must have a minimum retainability of eighteen months.

b. A security clearance of **SECRET** is required for all Communication and Electronic personnel entering this training.

4. Appendix I, Annex M shows ADC timewise Special Training Requirements through fiscal year 1958.

F. AN/FST-2 TRAINING.

1. Airmen - Maintenance, AFSC 303X2.

a. The AN/FST-2 will be installed at each Radar Squadron (SAGE) connected to the SAGE System. Special training requirements have been established for maintenance personnel on the AN/FST-2 Coordinate Data Transmitter. This will provide training through the Field and Organizational maintenance level. Reference Appendix I, Annex N for the approved training plan for this course.

b. In establishing this training, the quantitative criteria was based upon the training of three airmen per site for the first 24 sites which will have a one year maintenance contract, and four

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airmen per site for the remaining sites which will not have this maintenance contract. In order to limit the amount of personnel away from each squadron at the same time, the training requirements for each site were time-phased in two increments. For the first 24 sites, one airman will complete training and be on-site six months prior to the end of the contract and two airmen will complete training and be on-site one month prior to the end of the contract. For the remaining sites, two airmen will complete training and be on-site three months prior to the FST-2 operations date and two airmen would complete training two months after the operations date. Reference Appendix I, Annex R, for the timewise Special Training Requirements through October 1959. After experience is gained in maintaining the equipment, the validity of training four persons per site will be determined. If deemed necessary, revised requirements will be established at that time.

c. It has been recommended that an additional shred in the 30332 career ladder for the AN/FST-2 equipment be established and that a basic AN/FST-2 training course be established at the earliest possible date.

2. Airmen - Operations, AFSC 273X0: The Operations personnel at the first 24 sites will receive their training by means of an on-site training program conducted by the Burroughs Corporation under the current maintenance contract at these sites. This training will be limited to physical operation of the equipment

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and its capabilities, but will not include utilization of the equipment in actual Air Defense operations. The latter will be accomplished through a vigorous on-site training program utilizing the FST-2 Operator Handbooks.

G. ON-SITE TRAINING.

1. The need for various types of on-site training for personnel assigned to the SAGE System has been firmly established. This training will not only be required during the initial activation of each SAGE Direction Center and Combat Center, but must be programmed on a continuous basis thereafter. In some cases, this training will be unique to the SAGE System. In other cases, this training will involve concepts and policies already in effect which require only their application to the SAGE System.

2. Four types of on-site training have been identified and are outlined in the following paragraphs:

a. Orientation and Familiarization Training: This training will be designed to provide personnel with the information necessary to apply their current skills to the new SAGE System environment.

(1) Headquarters Personnel: Personnel occupying staff or supervisory positions at all Command levels will require a general over-all SAGE System familiarization training. This type of training is currently being provided by the 4620th ADW

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(Experimental SAGE) and in the future will be available through the Air Training Command familiarization course. Training will be scheduled as required.

(2) SAGE Direction Center and Combat Center Personnel:

This training will be limited to the Command Post, Operations and Communication and Electronic personnel. These personnel, upon assignment to the SAGE sites, will require both site adaptation and sector orientation training. Training will cover such subjects as: Command and local SOP's, area geography, weapons systems and employment, equipment variations, radar data inputs and communications systems as they apply to the Sector of Division areas. This training will be similar to the training currently being given to newly assigned personnel in the manual Air Defense system. This policy for orientation will continue under the SAGE System.

(3) Fighter-Interceptor Squadron and AC&W Squadron

Personnel: Personnel assigned to these units will be given training to familiarize them with their role in the SAGE environment prior to the operations date of each SAGE Sector. A minimum of one key officer from each of these organizations will attend a SAGE familiarization course. Upon return, he will be responsible for conducting briefings for all other unit personnel by means of lectures and films specifically designed for the mission of the organization under SAGE. The type of cross-training program for intercept controllers and fighter-interceptor pilots currently in

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effect will be continued for the SAGE System after the Sector operational date.

b. Proficiency Training: Under the current SAGE Operations Special Training program, the Direction Center and Combat Center Operations personnel will be trained in one position with some familiarization training in selected related positions. These positions are identified in the SAGE Operations training plans. The SAGE unit must initiate a comprehensive proficiency training program to fully train these personnel in the other related positions. A requirement for training material necessary to accomplish this training has been established with the Air Training Command. Details for a complete proficiency training plan cannot be finalized until a career ladder structure for SAGE is developed and finally approved by Headquarters USAF.

c. On-the-Job Training: This is defined as that training which leads to and results in a change in AFSC skill level. This type of training cannot be established until a career ladder structure is established for SAGE.

d. SAGE System Training Program (SSTP): A need exists for operational crew training which places emphasis on interactions between sections and individuals and integrates the operations personnel into a cohesive system. A SAGE System Training Program (SSTP) is being developed for the Air Defense Command by the Rand

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Corporation to fulfill this requirement. This program must be available in time to provide system training prior to SAGE site operations dates. It is expected that the SSIP will satisfy some of our proficiency and OJT training requirements.

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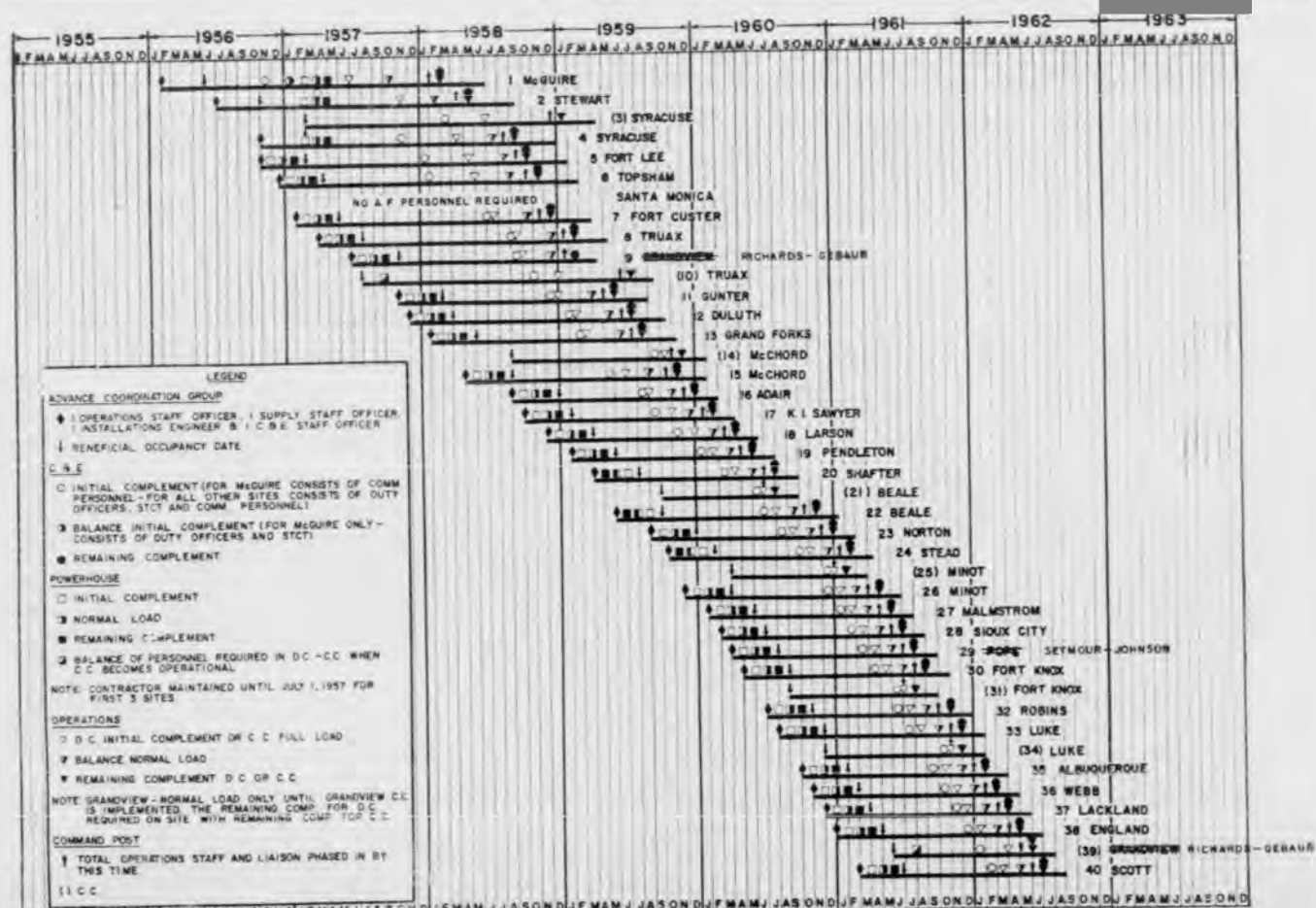
APPENDIX I

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ANNEX A
SCHEDULE #6

ADCM 30-1



D.C. AND C.C. TRAINED PERSONNEL ON-SITE REQUIREMENTS

SERIES 4-08
ISSUE NO. 11
DATE 1-23-57
ISSUED BY ADG

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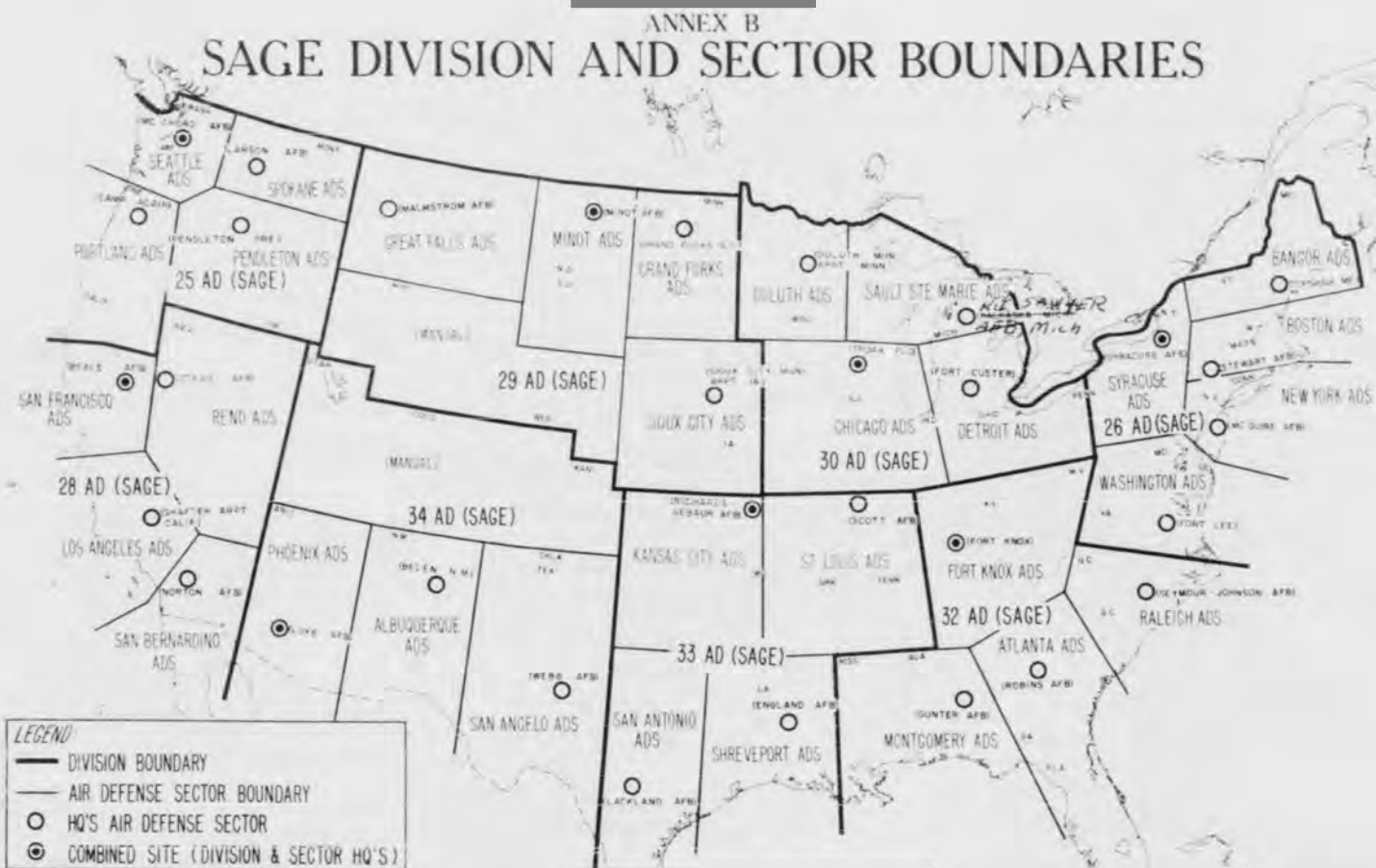
FORM 30-1

LIST OF SAGE ORGANIZATIONS

(In Order of Priority)

<u>Designation</u>	<u>Location</u>
1. New York Air Defense Sector	McGuire AFB, N.J.
2. Boston Air Defense Sector	Stewart AFB, N.Y.
3. <u>26th Air Division</u>	<u>Syracuse AFB, N.Y.</u>
4. Syracuse Air Defense Sector	Syracuse AFB, N.Y.
5. Washington Air Defense Sector	Fort Lee, Va.
6. Bangor Air Defense Sector	Topsham, Maine
7. Detroit Air Defense Sector	Fort Custer, Mich.
8. Chicago Air Defense Sector	Truxex Fld, Wisc.
9. Kansas City Air Defense Sector	Richards-Gebaur AFB, Mo.
10. <u>30th Air Division</u>	<u>Truxey Fld, Wisc.</u>
11. Montgomery Air Defense Sector	Gunter AFB, Ala.
12. Duluth Air Defense Sector	Duluth Muni Appt, Minn.
13. Grand Forks Air Defense Sector	Grand Forks, N.D.
14. <u>25th Air Division</u>	<u>McChord AFB, Wash.</u>
15. Seattle Air Defense Sector	McChord AFB, Wash.
16. Portland Air Defense Sector	Camp Adair, Oregon
17. Sault St Marie Air Defense Sector	K.I. Sawyer AFB, Mich.
18. Spokane Air Defense Sector	Larson AFB, Wash.
19. Pendleton Air Defense Sector	Pendleton, Oregon
20. Los Angeles Air Defense Sector	Shafter Appt, Calif.
21. <u>28th Air Division</u>	<u>Beale AFB, Calif.</u>
22. San Francisco Air Defense Sector	Beale AFB, Calif.
23. San Bernardino Air Defense Sector	Norton AFB, Calif.
24. Reno Air Defense Sector	Stead AFB, Nevada
25. <u>29th Air Division</u>	<u>Minot AFB, N.D.</u>
26. Minot Air Defense Sector	Minot AFB, N.D.
27. Great Falls Air Defense Sector	Malstrom AFB, Mont.
28. Sioux City Air Defense Sector	Sioux City Muni Appt, Ia.
29. Raleigh Air Defense Sector	Seymour-Johnson AFB, N.C.
30. Fort Knox Air Defense Sector	Fort Knox, Kentucky
31. <u>32nd Air Division</u>	<u>Fort Knox, Kentucky</u>
32. Atlanta Air Defense Sector	Robins AFB, Georgia
33. Phoenix Air Defense Sector	Luke AFB, Arizona
34. <u>34th Air Division</u>	<u>Luke AFB, Arizona</u>
35. Albuquerque Air Defense Sector	Bellevue, New Mexico
36. San Angelo Air Defense Sector	Webb AFB, Texas
37. San Antonio Air Defense Sector	Lackland AFB, Texas
38. Shreveport Air Defense Sector	England AFB, La.
39. <u>33rd Air Division</u>	<u>Richards-Gebaur AFB, Mo.</u>
40. St Louis Air Defense Sector	Scott AFB, Ill.

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ANNEX C

PERSONNEL PHASING SCHEDULE

Headquarters, New York Air Defense Sector
McGuire AFB, New Jersey

1 Dec 56

<u>FUNCTIONAL CODE</u>	<u>RANK</u>	<u>TITLE</u>	<u>NUMBER</u>	<u>AFSC</u>
01000	Gen	Commander **	1	0002
01000	Col	Deputy Commander	1	00660
01000	Maj	Sq Section Commander	1	7024
01000	Lt	Aide	1	7024
03000	Lt	Adjutant	1	7324
04000	Lt	Supply Officer	1	6424
07000	Col	Director of Personnel	1	00160
11000	Maj	Personnel Staff Off	1	7316
11000	W/C	Personnel Supt	1	73000
11400	Capt	Education Off	1	7524
12000	Capt	Personnel Serv Off	1	7344
17000	Lt Col	Comptroller	1	00560
19000	Maj	Management Anlys Off	1	6746
23000	Capt	Stat Services Off	1	6834
27000	Capt	Guidance System Off	1	3224
27000	Lt Col	Oprs Staff Officer	1	1416
27000	Col	Director of Oprs **	1	00360
27000	Lt Col	AC&W Staff Off **	1	1616
27000	Maj	Oprs Staff Off **	1	1416

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New York Air Defense Sector (Contd)

27000	Maj	Armament Staff Off **	1	3216
27000	Maj	AC&W Staff Off	1	1616
27000	Maj	Oprs Staff Off	1	1116
27000	Capt	Air Operations Off	1	1435
27000	Capt	Guidance System Off	1	3224
27000	Capt	Intercept Controller	1	1644
27000	Lt	Intercept Controller	1	1644
29000	Maj	Intel Staff Off **	1	2016
29000	Lt	Intel Off	1	2054
30000	Maj	Manpower Mgt Off	1	7336
31000	Maj	Operations Staff Off	1	1116
35000	Col	Director of Materiel	1	00460
35000	Capt	Armament System Off	1	3234
35000	Maj	Acft Maint Staff Off	1	4316
35000	Maj	C & E Staff Off	1	3016
35000	Maj	Supply Staff Off	1	6416
39100	Capt	Inst Engr	1	5525
45000	Maj	C & E Staff Off	1	3016
45000	Col	C & E Staff Off **	1	3016
45000	Maj	Ground Elect Off	1	3044
45000	Capt	Comm Off	1	3034
45000	Capt	Elect Cntr Measure Off	1	3024
47000	Maj	Adjutant (Wing)	1	7016
53000	Maj	Info Services Staff Off	1	7216

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New York Air Defense Sector (Contd)

53000	Capt	Info Services Off	1	7224
54000	Capt	Medical Off General	1	9326
84020	Capt	Comm Off	2	3034
84220	W/O	Comm Center Oper Supt	1	29100
48000	Maj	Judge Advocate	1	7816
47000	W/O	Admin Supt	1	70200
03000	M/Sgt	1st Sergeant	1	73170
03000	S/Sgt	Personnel Spec1	1	73250
03000	A/1C	Administrative Clerk	1	70250
03000	T/Sgt	Personnel Technician	1	73270
03000	A/1C	Personnel Spec1*	1	73250
04300	T/Sgt	Orgn Supply Supv	1	64173
04000	1 S/Sgt 1 A/1C	Orgn Supply Spec1	2	64151
50100	1 S/Sgt 1 A/1C	Air Policeman	2	77150
50100	A/2C	Apr Air Policeman	2	77130
50100	A/3C	Air Police Helper	1	77010
84020	A/1C	Administrative Clerk	1	70250
84210	S/Sgt	Comm Machine Rpmn	1	36350
84220	M/Sgt	Comm Center Supv	1	29170
84220	2 S/Sgt 1 A/1C	Comm Center Spec1	3	29150
84220	A/2C	Apr Comm Center Spec1	5	29130
27000	M/Sgt	Administrative Supv	1	70270

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New York Air Defense Sector (Contd)

03000	A/2C	Apr Personnel Specl	1	73230
03000	A/2C	Apr Administrative Clerk	1	70230
47000	M/Sgt	Sergeant Major	1	70270
47000	T/Sgt	Administrative Supv	1	70270
47000	A/1C	Administrative Clerk	2	70250
47000	A/1C	Dup Devices Oper	1	71150
53000	T/Sgt	Info Technician	1	72170
01000	S/Sgt	Arm Aide	1	70250
29000	T/Sgt	Intel Opr Tec	1	20470
30000	M/Sgt	Manpower Mgt Tec	1	73370
48000	S/Sgt	Legal Specl	1	70253
65000	1 S/Sgt 1 A/1C	Draftman	2	22350
27000	S/Sgt	Administrative Clerk	1	70250
45000	1 S/Sgt 1 A/1C	Administrative Clerk	2	70250
47000	S/Sgt	Administrative Clerk	1	70250
11000	1 M/Sgt 1 T/Sgt	Personnel Tec	2	73270
11000	2 S/Sgt 2 A/1C	Personnel Specl	4	73250
11000	A/2C	Apr Personnel Specl	2	73230
11400	M/Sgt	Education Tec	1	75170
11400	S/Sgt	Education Serv Specl	1	75150
12000	T/Sgt	Special Serv Supv	1	74170
23000	T/Sgt	Stat Services Supv	1	68170

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New York Air Defense Sector (Contd)

23000	1 S/Sgt 1 A/1C	Stat Services Spec1	2	68150
27000	A/1C	Administrative Clerk	1	70250
27000	A/2C	Apr Administrative Clerk	1	70230
35000	M/Sgt	Acft C/W Rdr Maint Tec	1	30372
35000	M/Sgt	Veh Maint Tec	1	47170
35000	M/Sgt	Organ Supply Supv	1	64173
35000	T/Sgt	Acft Radio Maint Tec	1	30170
47000	S/Sgt	Administrative Clerk	1	70250
47000	A/2C	Apr Administrative Clerk	2	70230
53000	M/Sgt	Info Technician	1	72170
53000	S/Sgt	Info Spec1	1	72150
84410	S/Sgt	G/C V/UHF DF & A/FM Rpmn	2	30452B
01000	Civ	Stenographic Spec1	1	70252
27000	Civ	Stenographic Spec1	4	70252
07000	Civ	Stenographic Spec1	1	70252
30000	Civ	Stenographic Spec1	1	70252
48000	Civ	Stenographic Spec1	1	70252
31000	Civ	Stenographic Spec1	1	70252
35000	Civ	Stenographic Spec1	3	70252
11000	Civ	Stenographic Spec1	1	70252
17000	Civ	Stenographic Spec1	1	70252
47000	Civ	Stenographic Spec1	<u>1</u>	70252

(50 Off, 70 Amn, 15 Civ)

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New York Air Defense Sector (Contd)

1 Dec 56*

15 Jan 57

84520	Lt Col	C & E Staff Off	1	3016
84520	Maj	C & E Staff Off	<u>4</u>	3016

5 Off

(55 Off, 70 Amn, 15 Civ)

15 Jan 57

84110	2 M/Sgt 8 T/Sgt	Channel and Tec Control Tec	10	29375
84420	2 S/Sgt 1 A/LC	Ground Radio Operator	<u>3</u>	29350

13 Amn

(55 Off, 83 Amn, 15 Civ)

1 Apr 57*

1 Jul 57

84520	Maj	Acft Cont Staff Off	1	1616
84520	Capt	Intercept Controller	1	1644
84520	W/O	Air Trf Con/Wng Supt	1	27300
84520	2 S/Sgt 4 A/LC	Acft Con/Wng Opr	6	27350
84520	1 M/Sgt 3 T/Sgt	Acft Con/Wng Supv	4	27370
84520	A/2C	Apr Acft Con/Wng Opr	<u>5</u>	27330

3 Off, 15 Amn

(58 Off, 98 Amn, 15 Civ)

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New York Air Defense Sector (Contd)

1 May 57

39400	Lt	Installation Engr	1	5524
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(59 Off, 98 Ann, 15 Civ)

1 Aug 57

84410	1 M/Sgt 2 T/Sgt	Ground Comm Eqp Mai Tec/L	3	30472
84410	2 S/Sgt 3 A/1C	G/C V/UHF DF & A/FM Rpmn	5	30452B
84410	A/2C	G/C V/UHF DF & A/FM Apr	<u>1</u>	30432B

9 Ann
(59 Off, 107 Ann, 15 Civ)

1 Aug 57*15 Oct 57

84520	Maj	Acft Cont Staff Off	1	1616
84520	Capt	Intercept Controller	2	1644
84520	Lt	Intercept Controller	4	1644
84520	W/O	Air Trf Con/Wng Supt	1	27300
84520	2 M/Sgt 2 T/Sgt	Acft Con/Wng Supv	4	27370
84520	5 S/Sgt 7 A/1C	Acft Con/Wng Opr	12	27350
84520	A/2C	Apr Acft Con/Wng Opr	<u>9</u>	27330

8 Off, 25 Ann
(67 Off, 132 Ann, 15 Civ)

15 Oct 57

86520	S/Sgt	Still Photographer	1	23250
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(67 Off, 133 Ann, 15 Civ)

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New York Air Defense Sector (Contd)

1 Dec 57

27000	Lt Col	Operations Staff Off	1	1416
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(68 Off, 133 Amn, 15 Civ)

1 Dec 57*1 Mar 58

84520	Lt Col	Acft Cont Staff Off	5	1616
84520	Maj	Acft Cont Staff Off	3	1616
84520	Capt	Intercept Controller	14	1614
84520	Lt	Intercept Controller	9	1614
84520	W/O	Air Trf Con/Wng Supt	13	27300
84520	M/Sgt	Acft Con/Wng Supv	21	27370
84520	T/Sgt	Acft Con/Wng Supv	25	27370
84520	S/Sgt	Acft Con/Wng Opr	33	27350
84520	A/1C	Acft Con/Wng Opr	44	27350
84520	A/2C	Apr Acft Con/Wng Opr	<u>11</u>	27330

44 Off, 134 Amn

(112 Off, 267 Amn, 15 Civ)

1 Mar 58

84210	A/1C	Comm Machine Rpmn	2	36350
84210	A/2C	Apr Comm Machine Rpmn	1	36330
84220	1 M/Sgt 4 T/Sgt	Comm Center Supv	5	29170
84220	4 S/Sgt 8 A/1C	Comm Center Spec1	12	29150
84220	A/2C	Apr Comm Center Spec1	4	29130

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New York Air Defense Sector (Contd)

84310	1 S/Sgt 1 A/1C	Crypto Eqp Line Rpmn	2	36351A
84320	1 M/Sgt 1 T/Sgt	Crypto Oprs Supv	2	29270
84320	S/Sgt	Crypto Operator	5	29250
84320	A/1C	Apr Crypto Operator	3	29230
84420	1 M/Sgt 1 T/Sgt	Radio Operations Supv	2	29370
84420	A/1C	Ground Radio Operator	2	29350
84420	A/2C	Apr Ground Radio Opr	3	29330
86520	1 S/Sgt 3 A/1C	Still Photographer	<u>4</u>	23250

47 Ann

(112 Off, 314 Ann, 15 Civ)

1 Apr 58

84410	1 M/Sgt 1 T/Sgt	Grd Comm Eqp Mai Tec/L	2	30472
84410	A/1C	G/C V/UHF DF & A/FM Rpmn	3	30452B
84410	A/2C	G/C V/UHF DF & A/FM Rpmn	<u>1</u>	30432B

6 Ann

(112 Off, 320 Ann, 15 Civ)

1 Jun 58

45000	Major	C & E Staff Off	1	3016
04000	A/2C	Apr Org Sup Spec1	1	64131
03000	S/Sgt	Administrative Clerk	1	70250
03000	A/2C	Apr Personnel Spec1	1	73230

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New York Air Defense Sector (Contd)

45000	M/Sgt	Administrative Supv	1	70270
45000	A/IC	Draftsman	1	22350
18000	M/Sgt	Accounting Tec	1	67270
18000	Civ	Accounting Tec	1	67270
35000	M/Sgt	Acft Mai Two Eng Tec	1	43171B
39100	S/Sgt	Administrative Clerk	1	70250
53000	A/IC	Info Specl	2	72150
45000	Civ	Stenographic Specl	1	70252
11100	Civ	Stenographic Specl	1	70252
39100	Civ	Stenographic Specl	<u>1</u>	70252

1 Off, 10 Ann, 4 Civ

(113 Off, 330 Ann, 19 Civ)

* Approximate lead time for special training.

** Indicates personnel presently authorized who will be placed on TDY orders to the SAGE Command Post Special Training Course.

() Accumulative Total.

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ANNEX D

PERSONNEL PHASING SCHEDULE

Headquarters, Boston Air Defense Sector
Stewart AFB, New York

1 Dec 56

<u>FUNCTIONAL CODE</u>	<u>RANK</u>	<u>TITLE</u>	<u>NUMBER</u>	<u>AFSC</u>
01000	B/Gen	Commander **	1	0002
01000	Col	Deputy Commander	1	0066C
01000	Maj	Sq Section Comdr	1	7024
01000	Lt	Aide	1	7024
03000	Lt	Adjutant	1	7324
04000	Lt	Supply Officer	1	6424
07000	Col	Director of Personnel	1	0016C
11000	Maj	Personnel Staff Off	1	7316
11000	W/O	Personnel Supt	1	73000
1140C	Capt	Education Specl	1	7524
12000	Capt	Personnel Serv Off	1	7344
17000	Lt Col	Comptroller	1	0056C
19000	Maj	Management Anlys Off	1	6746
23000	Capt	Stat Services Off	1	6834
27000	Col	Director of Operations	1	0036C
27000	Lt Col	Operations Staff Off **	1	1416
27000	Lt Col	Operations Staff Off	1	1416
27000	Lt Col	Acft Con Staff Off **	1	1616
27000	Maj	Operations Staff Off **	1	1416

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Annex D

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Boston Air Defense Sector (Contd)

27000	Maj	Acft Con Staff Off	1	1616
27000	Maj	Armament Staff Off **	1	3216
27000	Capt	Intercept Controller	1	1644
27000	Capt	Air Operations Off	1	1435
27000	Lt	Intercept Controller	1	1644
29000	Maj	Intel Staff Off **	1	2016
29000	Lt	Intel Off	1	2054
30000	Maj	Manpower Management Off	1	7336
31000	Maj	Operations Staff Off	1	1416
35000	Maj	Supply Staff Off	1	6416
35000	Col	Director of Materiel	1	0046C
35000	Capt	Armament System Off	1	3234
35000	Maj	Acft Maint Staff Off	1	4316
35000	Maj	C & E Staff Off	1	3016
39100	Capt	Installations Engr	1	5525
39400	Lt	Installations Engr	1	5525
45000	Maj	C & E Staff Off	1	3016
45000	Maj	Ground Elect Off	1	3044
47000	Maj	Adjutant (Wing)	1	7016
48000	Maj	Judge Advocate	1	7816
53000	Maj	Info Serv Staff Off	1	7216
54000	Capt	Medical Off Gen	1	9326
84020	Capt	Comm Off	1	3034
45000	Col	C & E Staff Off **	1	3016

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Boston Air Defense Sector (Contd)

45000	Maj	C & E Staff Off	1	3016
03000	M/Sgt	1st Sergeant	1	73170
03000	S/Sgt	Personnel Spec1	1	73250
03000	A/1C	Administrative Clerk	1	70250
03000	T/Sgt	Personnel Tec	1	73270
03000	A/1C	Personnel Spec1	1	73250
04000	T/Sgt	Organ Supply Supv	1	64173
04000	1 S/Sgt 1 A/1C	Organ Supply Spec1	2	64151
04000	A/2C	Apr Organ Supply Spec1	1	64131
03000	A/2C	Apr Personnel Spec1	2	73230
01000	S/Sgt	Airman Aide	1	70250
01000	S/Sgt	Personnel Spec1	1	73250
11000	1 M/Sgt 1 T/Sgt	Personnel Tec	2	73270
11000	S/Sgt	Personnel Spec1	1	73250
11000	A/2C	Apr Personnel Spec1	2	73230
27000	M/Sgt	Administrative Supv	1	70270
27000	S/Sgt	Administrative Clerk	1	70250
27000	A/1C	Administrative Clerk	1	70250
29000	T/Sgt	Intel Opr Tec	1	20470
30000	M/Sgt	Manpower Management Tec	1	73370
27000	A/2C	Apr Administrative Clerk	1	70230
35000	M/Sgt	Acft C/W Rdr Maint Tec	1	30372
35000	M/Sgt	Vehicle Maint Tec	1	47170

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ADCM 30-1

Boston Air Defense Sector (Contd)

35000	M/Sgt	Organ Supply Supv	1	64173
35000	T/Sgt	Acft Radio Maint Tec	1	30170
45000	1 S/Sgt 1 A/1C	Administrative Clerk	2	70250
47000	M/Sgt	Sergeant Major	1	70270
47000	T/Sgt	Administrative Supv	1	70270
47000	A/1C	Administrative Clerk	2	70250
47400	A/1C	Dup Devices Opr	1	71150
47000	S/Sgt	Administrative Clerk	1	70250
48000	S/Sgt	Legal Spec1	1	70253
47000	S/Sgt	Administrative Clerk	1	70250
47000	A/2C	Apr Administrative Clerk	2	70230
53000	T/Sgt	Info Technician	1	72170
53000	M/Sgt	Info Technician	1	72170
65000	1 S/Sgt 1 A/1C	Draftsman	2	22350
84110	1 M/Sgt 4 T/Sgt	Autm Cen Off Eqp Tec	5	36271
84210	S/Sgt	Comm Machine Rpmn	1	36350
84220	M/Sgt	Comm Ctr Supv	1	29170
84220	2 S/Sgt 1 A/1C	Comm Ctr Spec1	3	29150
84220	A/2C	Apr Comm Ctr Spec1	5	29130
84410	1 M/Sgt 4 T/Sgt	Gnd Comm Eqp Mai Tec/H	5	30473
84420	2 S/Sgt 1 A/1C	Ground Radio Opr	3	29350

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ADCM 30-1

Boston Air Defense Sector (Contd)

84410	1 M/Sgt 2 T/Sgt	Gnd Comm Eqp Mai Tec/L	3	30472
84410	2 S/Sgt 3 A/1C	G/C V/UHF DF & A/FM Rpmn	5	30452B
84410	A/2C	G/C V/UHF DF & A/FM Rpmn	1	30432B
84220	1 M/Sgt 4 T/Sgt	Comm Ctr Supv	5	29170
84220	4 S/Sgt 8 A/1C	Comm Ctr Spec1	12	29150
84220	A/2C	Apr Comm Ctr Spec1	4	29130
84420	A/1C	Gnd Radio Operator	2	29350
11400	M/Sgt	Education Tec	1	75170
11400	S/Sgt	Education Serv Spec1	1	75150
12000	T/Sgt	Spec1 Serv Supv	1	74170
23000	T/Sgt	Stat Serv Supv	1	68170
50100	1 S/Sgt 1 A/1C	Air Policeman	2	77150
50100	A/2C	Apr Air Policeman	2	77130
50100	A/3C	Air Police Helper	1	77010
01000	Civ	Stenographic Spec1	1	70252
30000	Civ	Stenographic Spec1	1	70252
07000	Civ	Stenographic Spec1	1	70252
11400	Civ	Stenographic Spec1	1	70252
27000	Civ	Stenographic Spec1	4	70252
48000	Civ	Stenographic Spec1	1	70252
31000	Civ	Stenographic Spec1	1	70252

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ADCM 30-1

Boston Air Defense Sector (Contd)

35000	Civ	Stenographic Spec1	3	70252
45000	Civ	Stenographic Spec1	1	70252
17000	Civ	Stenographic Spec1	<u>1</u>	70252

44 Off, 108 Amn, 15 Civ

1 Jan 57*1 Apr 57

84520	Lt Col	Comm Elect Staff Off	1	3016
84520	Maj	Comm Elect Staff Off	<u>4</u>	3016

5 Off

(49 Off, 108 Amn, 15 Civ)

15 Aug 57*15 Nov 57

84520	Maj	Acft Cont Staff Off	1	1616
84520	Capt	Intercept Controller	1	1644
84520	W/O	Air Trf Con/Wng Supt	1	27300
84520	2 S/Sgt 4 A/1C	Acft Con/Wng Opr	6	27350
84520	1 M/Sgt 3 T/Sgt	Acft Con/Wng Supv	4	27370
84520	A/2C	Apr Acft Con/Wng Opr	<u>5</u>	27330

3 Off, 15 Amn

(52 Off, 123 Amn, 15 Civ)

1 Nov 57*15 Feb 58

84520	Maj	Acft Cont Staff Off	1	1616
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ADCM 30-1

Boston Air Defense Sector (Contd)

84520	Capt	Intercept Controller	2	1644
84520	Lt	Intercept Controller	4	1644
84520	W/O	Air Trf Con/Wng Supt	1	27300
84520	2 M/Sgt 2 T/Sgt	Acft Con/Wng Supv	4	27370
84520	5 S/Sgt 7 A/1C	Acft Con/Wng Opr	12	27350
84520	A/2C	Apr Acft Con/Wng Opr	<u>9</u>	27330

8 Off, 25 Amn

(60 Off, 148 Amn, 15 Civ)

15 Feb 58

86520	S/Sgt	Still Photographer	1	23250
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(60 Off, 149 Amn, 15 Civ)

15 Feb 58*

15 May 58

84520	Lt Col	Acft Cont Staff Off	5	1616
84520	Maj	Acft Cont Staff Off	3	1616
84520	Capt	Intercept Controller	14	1644
84520	Lt	Intercept Controller	9	1644
84520	W/O	Air Trf Con/Wng Supt	13	27300
84520	M/Sgt	Acft Con/Wng Supv	21	27370
84520	T/Sgt	Acft Con/Wng Supv	25	27370
84520	S/Sgt	Acft Con/Wng Opr	33	27350
84520	A/1C	Acft Con/Wng Opr	44	27350

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Boston Air Defense Sector (Contd)

84520 A/2C Apr Acft Con/Wng Opr 11 27330
 44 Off, 134 Ann
 (104 Off, 283 Ann, 15 Civ)

15 May 58

84020 Lt Comm Officer 1 3034
 84220 W/O Comm Ctr Opr Supt 1 29100
 84210 A/1C Comm Machine Rpmn 2 36350
 84210 A/2C Apr Comm Machine Rpmn 1 36330
 84310 1 S/Sgt
 1 A/1C Crypto Eqp Line Rpmn 2 36351A
 84320 1 M/Sgt
 1 T/Sgt Crypto Oprs Supv 2 29270
 84320 S/Sgt Crypto Operator 5 29250
 84320 A/1C Apr Crypto Operator 3 29230
 84420 1 M/Sgt
 1 T/Sgt Radio Operations Supv 2 29370
 84420 A/2C Apr Ground Radio Opr 3 29330
 86520 1 S/Sgt
 3 A/1C Still Photographer 4 23250

2 Off, 24 Ann

(106 Off, 307 Ann, 15 Civ)

15 Jun 58

84410 1 M/Sgt
 1 T/Sgt Ground Comm Eqp Mai Tec/L 2 30472
 84410 2 S/Sgt
 3 A/1C G/C V/UHF DF & A/FM Rpmn 5 30452B

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ADCM 30-1

Boston Air Defense Sector (Contd)

84410	A/2C	G/C V/UHF DF & A/FM Apr	<u>1</u>	30432B
			8 Ann	
			(106 Off, 315 Ann, 15 Civ)	

15 Jul 58

27000	Maj	Operations Staff Off	1	1416
27000	Capt	Guidance System Off	1	3224
45000	Capt	Comm Officer	1	3034
45000	Capt	Elect Ctr Measures Off	1	3024
45000	M/Sgt	Administrative Supv	1	70270
45000	A/1C	Draftsman	1	22350
47000	W/O	Administrative Supt	1	70200
47000	Civ	Stenographic Spec1	<u>1</u>	70252

5 Off, 2 Ann, 1 Civ

(111 Off, 317 Ann, 16 Civ)

15 Aug 58

03000	S/Sgt	Administrative Clerk	1	70250
03000	A/2C	Apr Administrative Clerk	1	70230
11000	A/1C	Personnel Spec1	2	73250
11000	Civ	Administrative Clerk	1	70250
18700	M/Sgt	Accounting Tec	1	67270
18000	Civ	Accounting Tec	1	67270
23000	1 S/Sgt 1 A/1C	Stat Spec1	2	68150
27000	Capt	Guidance System Off	1	3224

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ADCM 30-1

Boston Air Defense Sector (Contd)

35000	M/Sgt	Acft Mai Two Eng Tec	1	43171B
39100	S/Sgt	Administrative Clerk	1	70250
39100	Civ	Stenographic Specl	1	70252
53000	Capt	Info Serv Off	1	7224
53000	1 S/Sgt 2 A/1C	Information Specl	3	72150
84020	A/1C	Administrative Clerk	<u>1</u>	70250

2 Off, 13 Amn, 3 Civ

(113 Off, 330 Amn, 19 Civ)

- * Approximate lead time for special training.
- ** Indicates personnel presently authorized who will be placed on TDY orders to the SAGE Command Post Special Training Course.
- () Accumulative total.

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15 May 1957 (Revised)

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ANNEX E

PERSONNEL PHASING SCHEDULE

Headquarters, Syracuse Air Defense Sector
Syracuse AFS, New York

1 Oct 56

<u>FUNCTIONAL CODE</u>	<u>RANK</u>	<u>TITLE</u>	<u>NUMBER</u>	<u>AFSC</u>
01000	Col	Deputy Commander	1	00660
01000	Maj	Sq Section Comdr	1	7024
01000	Civ	Stenographic Spec1	1	70252
03000	Lt	Adjutant	1	7324
03000	M/Sgt	1st Sergeant	1	73170
03000	S/Sgt	Personnel Spec1	1	73250
03000	A/1C	Administrative Clerk	1	70250
04000	Lt	Supply Officer	1	6424
04000	T/Sgt	Orgn Supply Supv	1	64173
39100	Capt	Installations Engr	1	5524
50100	2 S/Sgt 3 A/1C	Air Policeman	5	77150
50100	A/2C	Apr Air Policeman	4	77130
50100	A/3C	Air Police Helper	<u>2</u>	77010

5 Off, 15 Amn, 1 Civ

1 Nov 56

03000	T/Sgt	Personnel Tec	1	73270
03000	A/1C	Personnel Spec1	1	73250
04000	1 S/Sgt 1 A/1C	Orgn Supply Spec1	2	64151

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15 May 1957 (Revised)

Hq Syracuse Air Defense Sector (Contd)

04000 A/2C Apr Orgn Supply Specl 1 64131

5 Amn

(5 Off, 20 Amn, 1 Civ)

1 Dec 56

27000 Lt Col Operations Staff Off 1 1416

27000 M/Sgt Administrative Supv 1 70270

27000 Civ Stenographic Specl 1 70252

35000 Maj Supply Staff Off 1 6416

45000 Maj Comm Elect Staff Off 1 3016

53000 Maj Info Services Staff Off 1 7216

53000 T/Sgt Information Tec 1 72170

4 Off, 2 Amn, 1 Civ

(9 Off, 22 Amn, 2 Civ)

1 May 57

39400 Lt Installations Engr 1 5524

(10 Off, 22 Amn, 2 Civ)

1 July 57

// 45000 Col Comm Elect Staff Off 1 3016

(11 Off, 22 Amn, 2 Civ)

15 Sep 57*15 Nov 57

84520 Lt Col Comm Elect Staff Off 1 3016

84520 Maj Comm Elect Staff Off 4 3016

5 Off

UNCLASSIFIED (5 Off, 22 Amn, 2 Civ)

Annex E

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15 May 1957 (Revised)

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Hq Syracuse Air Defense Sector (Contd)

15 Nov 57

84020	Capt	Communications Off	1	3034
84020	A/1C	Administrative Clerk	1	70250
84110	2 M/Sgt 8 T/Sgt	Channel and Tec Con Tec	10	29375
84210	S/Sgt	Comm Machine Rpmn	1	36350
84220	M/Sgt	Comm Center Supv	1	29170
84220	2 S/Sgt 1 A/1C	Comm Center Specl	3	29150
84220	A/2C	Apr Comm Center Specl	5	29130
84420	2 S/Sgt 1 A/1C	Gnd Radio Operator	<u>3</u>	29350

1 Off, 24 Amn

(17 Off, 46 Amn, 2 Civ)

15 Feb 58*15 Apr 58

84520	Maj	Acft Cont Staff Off	1	1616
84520	Capt	Intercept Controller	1	1644
84520	W/O	Air Trf Con/Wng Supt	1	27300
84520	1 M/Sgt 3 T/Sgt	Acft Con/Wng Supv	4	27370
84520	2 S/Sgt 4 A/1C	Acft Con/Wng Opr	6	27350
84520	A/2C	Apr Acft Con/Wng Opr	<u>5</u>	27330

3 Off, 15 Amn

(20 Off, 61 Amn, 2 Civ)

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15 May 1957 (Revised)

Hq Syracuse Air Defense Sector (Contd)

15 Mar 58

84410	1 M/Sgt 2 T/Sgt	Gnd Comm Eqp Main Tec/L	3	30472
84410	2 S/Sgt 3 A/LC	G/C V/UHF DF & A/FM Rpmn	5	30452B
84410	A/2C	G/C V/UHF DF & A/FM Rpmn	<u>1</u>	30432B

9 Amn

(20 Off, 70 Amn, 2 Civ)

15 Apr 58*15 Jul 58

84520	Maj	Acft Cont Staff Off	1	1616
84520	Capt	Intercept Controller	2	1644
84520	Lt	Intercept Controller	4	1644
84520	W/O	Air Trf Con/Wng Supt	1	27300
84520	2 M/Sgt 2 T/Sgt	Acft Con/Wng Supv	4	27370
84520	5 S/Sgt 7 A/LC	Acft Con/Wng Opr	12	27350
84520	A/2C	Apr Acft Con/Wng Opr	<u>9</u>	27330

8 Off, 25 Amn

(28 Off, 95 Amn, 2 Civ)

15 Jun 58*15 Aug 58

01000	B/Gen	Commander	1	0002
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ADCM 30-1

Hq Syracuse Air Defense Sector (Contd)

27000	Col	Director of Operations	1	00360
27000	Lt Col	Operations Staff Off	1	1416
27000	Lt Col	Acft Con Staff Off	1	1616
27000	Maj	Operations Staff Off	1	1416
27000	Maj	Armament Staff Off	1	3216
29000	Maj	Intelligence Staff Off	<u>1</u>	2016

7 Off

(35 Off, 95 Amn, 2 Civ)

15 Jun 58*15 Sep 58

84520	Lt Col	Acft Cont Staff Off	5	1616
84520	Maj	Acft Cont Staff Off	3	1616
84520	Capt	Intercept Controller	14	1644
84520	Lt	Intercept Controller	9	1644
84520	W/O	Air Trf Con/Wng Supt	13	27300
84520	M/Sgt	Acft Con/Wng Supv	21	27370
84520	T/Sgt	Acft Con/Wng Supv	25	27370
84520	S/Sgt	Acft Con/Wng Opr	33	27350
84520	A/1C	Acft Con/Wng Opr	44	27350
84520	A/2C	Apr Acft Con/Wng Opr	<u>11</u>	27330

44 Off, 134 Amn

(79 Off, 229 Amn, 2 Civ)

15 Jun 58

03000	A/2C	Apr Personnel Specl	1	73230
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Hq Syracuse Air Defense Sector (Contd)

03000	A/2C	Apr Administrative Clerk	1	70230
11000	W/O	Personnel Supt	1	73000
11000	S/Sgt	Personnel Specl	1	73250
47000	Maj	Adjutant (Wing)	1	7016
47000	M/Sgt	Sergeant Major	1	70270
47000	T/Sgt	Administrative Supv	1	70270
47000	A/1C	Administrative Clerk	2	70250
47400	A/1C	Dup Devices Opr	<u>1</u>	71150

2 Off, 8 Amn

(81 Off, 237 Amn, 2 Civ)

15 Jul 58

86520	S/Sgt	Still Photographer	1	23250
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(81 Off, 238 Amn, 2 Civ)

15 Aug 58

01000	Lt	Aide	1	7024
01000	S/Sgt	Amn Aide	1	70250
03000	S/Sgt	Administrative Clerk	1	70250
03000	A/2C	Apr Persomel Clerk	1	73230
07000	Col	Director of Persomel	1	0016C
07000	Civ	Stenographic Specl	1	70252
29000	Lt	Intelligence Off	1	2054
29000	T/Sgt	Intelligence Opr Tec	1	20470
30000	Maj	Manpower Management Off	1	7336
30000	M/Sgt	Manpower Management Tec	1	73370

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Annex E

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Hq Syracuse Air Defense Sector (Contd)

30000	Civ	Stenographic Spec1	1	70252
48000	Maj	Judge Advocate	1	7816
48000	S/Sgt	Legal Spec1	1	70253
48000	Civ	Stenographic Spec1	1	70252
65000	1 S/Sgt 1 A/1C	Draftsman	2	22350

5 Off, 8 Amn, 3 Civ

(86 Off, 246 Amn, 5 Civ)

15 Sep 58

84020	Lt	Communications Off	1	3034
84210	1 S/Sgt 2 A/1C	Comm Machine Rpmn	3	36350
84210	A/2C	Apr Comm Machine Rpmn	2	36330
84220	W/O	Comm Center Opr Supt	1	29100
84220	2 M/Sgt 5 T/Sgt	Comm Center Supv	7	29170
84220	7 S/Sgt 12 A/1C	Comm Center Spec1	19	29150
84220	A/2C	Apr Comm Center Spec1	7	29130
84310	1 S/Sgt 1 A/1C	Crypto Eqp Line Rpmn	2	36351A
84320	1 M/Sgt 1 T/Sgt	Crypto Oprs Supv	2	29270
84320	S/Sgt	Crypto Operator	5	29250
84320	A/1C	Apr Crypto Operator	3	29230
84420	1 M/Sgt 1 T/Sgt	Radio Operations Supv	2	29370
84420	A/1C	Ground Radio Operator	2	29350

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Hq Syracuse Air Defense Sector (Contd)

84420	A/2C	Apr Ground Radio Opr	3	29330
86520	1 S/Sgt 3 A/1C	Still Photographer	<u>4</u>	23250

2 Off, 61 Ann
(88 Off, 307 Ann, 5 Civ)

1 Nov 58

27000	Maj	Acft Con Staff Off	1	1616
27000	Maj	Operations Staff Off	1	1416
27000	Capt	Air Operations Off	1	1435
27000	Capt	Guidance Systems Off	1	3224
27000	Capt	Intercept Controller	1	1644
27000	Lt	Intercept Controller	1	1644
27000	S/Sgt	Administrative Clerk	1	70250
27000	Civ	Stenographic Spec1	2	70252
31000	Maj	Operations Staff Off (P&R)	1	1416
31000	Civ	Stenographic Spec1	1	70252
35000	Col	Director of Materiel	1	0046C
35000	Capt	Armament Systems Off	1	3234
35000	Civ	Stenographic Spec1	1	70252
45000	Maj	Comm Elect Staff Off	1	3016
45000	Maj	Ground Elect Off	1	3044
45000	Capt	Comm Off	1	3034
45000	Capt	Elect Cntr Measures Off	1	3024
45000	M/Sgt	Administrative Supv	1	70270
45000	1S/Sgt 1A/1C	Administrative Clerk	2	70250

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ADCM 30-1

Hq Syracuse Air Defense Sector (Contd)

45000	A/1C	Draftsman	1	22350
45000	Civ	Stenographic Spec1	1	70252
47000	W/O	Administrative Supt	1	70200
47000	S/Sgt	Administrative Clerk	<u>1</u>	70250

14 Off, 6 Ann, 5 Civ

(102 Off, 313 Ann, 10 Civ)

1 Dec 58

11000	Maj	Personnel Staff Off	1	7316
11000	1 M/Sgt 1 T/Sgt	Personnel Tec	2	73270
11000	1 S/Sgt 2 A/1C	Personnel Spec1	3	73250
11000	A/2C	Apr Personnel Spec1	2	73230
11000	Civ	Administrative Clerk	1	70250
11400	Capt	Education Spec1	1	7524
11400	M/Sgt	Education Tec	1	75170
11400	S/Sgt	Education Serv Spec1	1	75150
11400	Civ	Stenographic Spec1	1	70252
12000	Capt	Personnel Serv Off	1	7344
12000	T/Sgt	Special Serv Supv	1	74170
17000	Lt Col	Comptroller	1	0056C
17000	Civ	Stenographic Spec1	1	70252
18000	M/Sgt	Accounting Tec	1	67270
18000	Civ	Accounting Tec	1	67270
19000	Maj	Management Anlys Off	1	6746

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Hq Syracuse Air Defense Sector (Contd)

23000	Capt	Stat Services Off	1	6834
23000	T/Sgt	Stat Services Supv	1	68170
23000	1 S/Sgt 1 A/1C	Statistical Specl	2	68150
27000	Capt	Guidance Systems Off	1	3224
27000	A/1C	Administrative Clerk	1	70250
27000	A/2C	Apr Administrative Clerk	1	70230
27000	Civ	Stenographic Specl	1	70252
35000	Maj	Acft Maint Staff Off	1	4316
35000	Maj	Comm Elect Staff Off	1	3016
35000	M/Sgt	Acft Maint Two Eng Tec	1	43171B
35000	M/Sgt	Acft C/W Rdr Maint Tec	1	30372
35000	M/Sgt	Vehicle Maint Tec	1	47170
35000	M/Sgt	Orgn Supply Supv	1	64173
35000	T/Sgt	Acft Radio Maint Tec	1	30170
35000	Civ	Stenographic Specl	2	70252
39100	S/Sgt	Administrative Clerk	1	70250
39100	Civ	Stenographic Specl	1	70252
47000	S/Sgt	Administrative Clerk	1	70250
47000	A/2C	Apr Administrative Clerk	2	70230
47000	Civ	Stenographic Specl	1	70252
53000	Capt	Info Services Off	1	7224
53000	M/Sgt	Information Tec	1	72170
53000	1 S/Sgt 2 A/1C	Information Specl	3	72150

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ADQM 30-1

Hq Syracuse Air Defense Sector (Contd)

54000	Capt	Medical Off, General	<u>1</u>	9326
				11 Off, 29 Ann, 9 Civ
				(113 Off, 342 Ann, 19 Civ)

1 Dec 58

84410	1 M/Sgt	Ground Comm Eqp Maint Tec/L	2	30472
	1 T/Sgt			
84410	2 S/Sgt	G/C V/UHF DF & A/FM Rpmn	5	30452B
	3 A/1C			
84410	A/2C	G/C V/UHF DF & A/FM Apr	<u>1</u>	30432B
				8 Ann
				(113 Off, 350 Ann, 19 Civ)

* Approximate lead time for special training.

() Accumulative total.

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ANNEX F

PERSONNEL PHASING SCHEDULE

Headquarters, Washington Air Defense Sector
Fort Lee, Virginia

1 Nov 56

<u>FUNCTIONAL CODE</u>	<u>RANK</u>	<u>TITLE</u>	<u>NUMBER</u>	<u>AFSC</u>
01000	Lt Col	Sq Section Commander	1	7024
03000	Lt	Adjutant	1	7324
03000	M/Sgt	1st Sergeant	1	73170
03000	S/Sgt	Personnel Spec1	1	73250
03000	A/1C	Administrative Clerk	1	70250
03000	Lt	Supply Officer	1	6424
04000	T/Sgt	Orgn Supply Supv	1	64173
36000	M/Sgt	Food Service Supv	1	62270
36000	S/Sgt	Orgn Supply Spec1	1	64151
36000	2 S/Sgt 2 A/1C	Cook	4	62250
36000	A/2C	Apr Cook	2	62230
36000	A/3C	Food Service Helper	1	62010
39100	Capt	Installation Engr	1	5525
92520	A/1C	Vehicle Operator	<u>1</u>	60350

4 Off, 14 Ann

1 Dec 56

39400	Lt	Installation Engr	1	5524
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(5 Off, 14 Ann)

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Hq, Washington Air Defense Sector (Contd)

1 Dec 56

04000	1 S/Sgt 1 A/1C	Orgn Supply Specl	2	64151
04000	A/2C	Apr Orgn Supply Specl	1	64131
27000	Lt Col	Operations Staff Off	1	1416
27000	M/Sgt	Administrative Supv	1	70270
27000	Civ	Stenographic Specl	1	70252
35000	Maj	Supply Staff Off	1	6416
45000	Maj	Comm Elect Staff Off	1	3016
53000	Maj	Info Services Staff Off	1	7216
53000	T/Sgt	Information Tec	<u>1</u>	72170

4 Off, 5 Amn, 1 Civ

(9 Off, 19 Amn, 1 Civ)

1 Jan 57

01000	Col	Deputy Commander	1	0066C
01000	Civ	Stenographic Specl	1	70252
03000	T/Sgt	Personnel Tec	1	73270
03000	A/1C	Personnel Specl	1	73250
50100	1 S/Sgt 1 A/1C	Air Policeman	2	77150
50100	A/2C	Apr Air Policeman	2	77130
50100	A/3C	Air Police Helper	<u>1</u>	77010

1 Off, 7 Amn, 1 Civ

(10 Off, 26 Amn, 2 Civ)

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15 May 1957 (Revised)

ADCM 30-1

Hq, Washington Air Defense Sector (Contd)

1 July 57

// 45000	Col	Comm Elect Staff Off	1	3016
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(11 Off, 26 Amn, 2 Civ)

1 Nov 57*15 Jan 58

84520	Lt Col	Comm Elect Staff Off	1	3016
84520	Maj	Comm Elect Staff Off	<u>4</u>	3016

5 Off

(16 Off, 26 Amn, 2 Civ)

15 Jan 58

84020	Capt	Communications Off	1	3034
84020	A/1C	Administrative Clerk	1	70250
84110	2 M/Sgt 8 T/Sgt	Channel & Tec Con Tec	10	29375
84210	S/Sgt	Comm Machine Rpmn	1	36350
84220	M/Sgt	Comm Center Supv	1	29170
84220	2 S/Sgt 1 A/1C	Comm Center Spec1	3	29150
84220	A/2C	Apr Comm Center Spec1	5	29130
84420	2 S/Sgt 1 A/1C	Ground Radio Operator	<u>3</u>	29350

1 Off, 24 Amn

(17 Off, 50 Amn, 2 Civ)

15 Feb 58*15 May 58

84520	Maj	Acft Cont Staff Off	1	1616
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15 May 1957 (Revised)

Hq, Washington Air Defense Sector (Contd)

84520	Capt	Intercept Controller	1	1644
84520	W/O	Air Trf Con/Wng Supt	1	27300
84520	2 S/Sgt 4 A/1C	Acft Con/Wng Opr	6	27350
84520	1 M/Sgt 3 T/Sgt	Acft Con/Wng Supv	4	27370
84520	A/2C	Apr Acft Con/Wng Opr	<u>5</u>	27330

3 Off, 15 Amn

(20 Off, 65 Amn, 2 Civ)

15 May 58*15 Aug 58

84520	Maj	Acft Cont Staff Off	1	1616
84520	Capt	Intercept Controller	2	1644
84520	Lt	Intercept Controller	4	1644
84520	W/O	Air Trf Con/Wng Supt	1	27300
84520	2 M/Sgt 2 T/Sgt	Acft Con/Wng Supv	4	27370
84520	5 S/Sgt 7 A/1C	Acft Con/Wng Opr	12	27350
84520	A/2C	Apr Acft Con/Wng Opr	<u>9</u>	27330

8 Off, 25 Amn

(28 Off, 90 Amn, 2 Civ)

1 Jul 58

03000	A/2C	Apr Personnel Specl	1	73230
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ADCM 30-1

Hq, Washington Air Defense Sector (Contd)

03000	A/2C	Apr Administrative Clerk	1	70230
11000	W/O	Personnel Supt	1	73000
11000	S/Sgt	Personnel Specl	1	73250
36000	S/Sgt	Meat Cutter	1	62350
36000	A/1C	Cook	1	62250
36000	A/1C	Baker	1	62150
47000	Maj	Adjutant (Wing)	1	7016
47000	M/Sgt	Sergeant Major	1	70270
47000	T/Sgt	Administrative Supv	1	70270
47000	A/1C	Administrative Clerk	2	70250
47400	A/1C	Dup Devices Opr	<u>1</u>	71150

2 Off, 11 Amn

(30 Off, 101 Amn, 2 Civ)

15 Jul 58*15 Sep 58

01000	B/Gen	Commander	1	0002
27000	Col	Director of Operations	1	00360
27000	Lt Col	Operations Staff Off	1	1416
27000	Lt Col	Acft Con Staff Off	1	1616
27000	Maj	Operations Staff Off	1	1416
27000	Maj	Armament Staff Off	1	3216
29000	Maj	Intelligence Staff Off	<u>1</u>	2016

7 Off

UNCLASSIFIED(37 Off, 101 Amn, 2 Civ)

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ADQM 30-1

Hq, Washington Air Defense Sector (Contd)

15 Jul 58*15 Oct 58

84520	Lt Col	Acft Cont Staff Off	5	1616
84520	Maj	Acft Cont Staff Off	3	1616
84520	Capt	Intercept Controller	14	1644
84520	Lt	Intercept Controller	9	1644
84520	W/O	Air Trf Con/Wng Supt	13	27300
84520	M/Sgt	Acft Con/Wng Supv	21	27370
84520	T/Sgt	Acft Con/Wng Supv	25	27370
84520	S/Sgt	Acft Con/Wng Opr	33	27350
84520	A/1C	Acft Con/Wng Opr	44	27350
84520	A/2C	Apr Acft Con/Wng Opr	<u>11</u>	27330

44 Off, 134 Ann

(81 Off, 235 Ann, 2 Civ)

15 Aug 58

86520	S/Sgt	Still Photographer	1	23250
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(81 Off, 236 Ann, 2 Civ)

15 Sep 58

01000	Lt	Aide	1	7024
01000	S/Sgt	Ann Aide	1	70250
03000	S/Sgt	Administrative Clerk	1	70250
03000	A/2C	Apr Personnel Clerk	1	73230
07000	Col	Director of Personnel	1	0016C
07000	Civ	Stenographic Specl	1	70252

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ADQM 30-1

Hq, Washington Air Defense Sector (Contd)

29000	Lt	Intelligence Off	1	2054
29000	T/Sgt	Intelligence Opr Tec	1	20470
30000	Maj	Manpower Management Off	1	7336
30000	M/Sgt	Manpower Management Tec	1	73370
30000	Civ	Stenographic Spec1	1	70252
18000	Maj	Judge Advocate	1	7816
18000	S/Sgt	Legal Spec1	1	70253
18000	Civ	Stenographic Spec1	1	70252
65000	1 S/Sgt 1 A/1C	Draftsman	<u>2</u>	22350

5 Off, 8 Ann, 3 Civ

(86 Off, 244 Ann, 5 Civ)

15 Oct 58

84020	Lt	Communications Off	1	3034
84210	A/1C	Comm Machine Rpmn	2	36350
84210	A/2C	Apr Comm Machine Rpmn	1	36330
84220	W/O	Comm Center Opr Supt	1	29100
84220	1 M/Sgt 4 T/Sgt	Comm Center Supv	5	29170
84220	4 S/Sgt 8 A/1C	Comm Center Spec1	12	29150
84220	A/2C	Apr Comm Center Spec1	4	29130
84310	1 S/Sgt 1 A/1C	Crypto Eqp Line Rpmn	2	36351A
84320	1 M/Sgt 1 T/Sgt	Crypto Oprs Supv	2	29270

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ADGM 30-1

H₁, Washington Air Defense Sector (Contd)

84320	S/Sgt	Crypto Operator	5	29250
84320	A/1C	Apr Crypto Operator	3	29230
84420	1 M/Sgt 1 T/Sgt	Radio Operations Supv	2	29370
84420	A/1C	Ground Radio Opr	2	29350
84420	A/2C	Apr Ground Radio Opr	3	29330
86520	1 S/Sgt 3 A/1C	Still Photographer	<u>4</u>	23250

2 Off, 47 Amn


(88 Off, 291 Amn, 5 Civ)

1 Dec 58

27000	Maj	Acft Con Staff Off	1	1616
27000	Maj	Operations Staff Off	1	1416
27000	Capt	Air Operations Off	1	1435
27000	Capt	Guidance System Off	1	3224
27000	Capt	Intercept Controller	1	1644
27000	Lt	Intercept Controller	1	1644
27000	S/Sgt	Administrative Clerk	1	70250
27000	Civ	Stenographic Spec1	2	70252
31000	Maj	Operations Staff Off	1	1416
31000	Civ	Stenographic Spec1	1	70252
35000	Col	Director of Materiel	1	001.60
35000	Capt	Armament Systems Off	1	3234
35000	Civ	Stenographic Spec1	1	70252
36000	S/Sgt	Cook	1	62250

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Hq, Washington Air Defense Sector (Contd)

36000	A/2C	Apr Cook	1	62230
45000	Maj	Comm Elect Staff Off	1	3016
45000	Maj	Ground Elect Off	1	3044
45000	Capt	Communications Off	1	3034
45000	Capt	Elect Cntr Measures Off	1	3024
45000	M/Sgt	Administrative Supv	1	70270
45000	1 S/Sgt 1 A/1C	Administrative Clerk	2	70250
45000	A/1C	Draftsman	1	22350
45000	Civ	Stenographic Spec1	1	70252
47000	W/O	Administrative Supt	1	70200
47000	S/Sgt	Administrative Clerk	1	70250
92520	S/Sgt	Vehicle Operator	<u>1</u>	60350

14 Off, 9 Amn, 5 Civ

(102 Off, 300 Amn, 10 Civ)

1 Jan 59

11000	Maj	Personnel Staff Off	1	7316
11000	1 M/Sgt 1 T/Sgt	Personnel Tec	2	73270
11000	1 S/Sgt 2 A/1C	Personnel Spec1	3	73250
11000	A/2C	Apr Personnel Spec1	2	73230
11000	Civ	Administrative Clerk	1	70250
11400	Capt	Education Specialist	1	7524
11400	M/Sgt	Education Tec	1	75170
11400	S/Sgt	Education Serv Spec1	1	75150



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Hq, Washington Air Defense Sector (Contd)

11400	Civ	Stenographic Spec1	1	70252
12000	Capt	Personnel Serv Off	1	7344
12000	T/Sgt	Special Serv Supv	1	74170
12400	S/Sgt	Physical Cond Spec1	1	74150
12400	A/1C	Recreation Spec1	1	74151
17000	Lt Col	Comptroller	1	00560
17000	Civ	Stenographic Spec1	1	70252
18000	M/Sgt	Accounting Tec	1	67270
18000	Civ	Accounting Tec	1	67270
19000	Maj	Management Anlys Off	1	6746
23000	Capt	Stat Services Off	1	6834
23000	T/Sgt	Stat Services Supv	1	68170
23000	1 S/Sgt 1 A/1C	Statistical Spec1	2	68150
27000	Capt	Guidance System Off	1	3224
27000	A/1C	Administrative Clerk	1	70250
27000	A/2C	Apr Administrative Clerk	1	70230
27000	Civ	Stenographic Spec1	1	70252
35000	Maj	Acft Maint Staff Off	1	4316
35000	Maj	Comm Elect Staff Off	1	3016
35000	M/Sgt	Acft Mai Two Eng Tec	1	43171B
35000	M/Sgt	Acft C/W Rdr Maint Tec	1	30372
35000	M/Sgt	Vehicle Maint Tec	1	47170
35000	M/Sgt	Orgn Supply Supv	1	64173
35000	T/Sgt	Acft Radio Maint Tec	1	30170

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ADGM 30-1

Hq, Washington Air Defense Sector (Contd)

35000	Civ	Stenographic Spec1	2	70252
36000	W/O	Food Service Supt	1	62000
36000	A/1C	Cook	1	62250
36000	A/2C	Apr Cook	3	62230
36000	A/3C	Food Service Helper	1	62010
36000	A/1C	Administrative Clerk	1	70250
39100	S/Sgt	Administrative Clerk	1	70250
39100	Civ	Stenographic Spec1	1	70252
47000	S/Sgt	Administrative Clerk	1	70250
47000	A/2C	Apr Administrative Clerk	2	70230
47000	Civ	Stenographic Spec1	1	70252
53000	Capt	Info Services Off	1	7224
53000	M/Sgt	Information Tec	1	72170
53000	1 S/Sgt 2 A/1C	Information Spec1	3	72150
54000	Capt	Medical Off, General	1	9326
92520	A/1C	Apr Vehicle Dispatcher	1	60331
92520	A/2C	Apr Vehicle Operators	<u>3</u>	60330

12 Off, 41 Amn, 9 Civ

(114 Off, 341 Amn, 19 Civ)

* Approximate lead time for special training.

() Accumulative total.

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ADCM 30-1

ANNEX G

PERSONNEL PHASING SCHEDULE

Headquarters, Bangor Air Defense Sector
Topsham, Maine

1 Nov 56

<u>FUNCTIONAL CODE</u>	<u>RANK</u>	<u>TITLE</u>	<u>NUMBER</u>	<u>AFSC</u>
01000	Maj	Sq Section Commander	1	7024
03000	Lt	Adjutant	1	7324
03000	M/Sgt	1st Sergeant	1	73170
03000	S/Sgt	Personnel Specl	1	73250
03000	A/1C	Administrative Clerk	1	70250
04000	T/Sgt	Orgn Supply Supv	<u>1</u>	64173

2 Off, 4 Ann

1 Dec 56

27000	Lt Col	Operations Staff Off	1	1416
27000	M/Sgt	Administrative Supv	1	70270
27000	Civ	Stenographic Specl	1	70252
35000	Maj	Supply Staff Off	1	6416
39100	Capt	Installation Engr	1	5525
45000	Maj	Comm Elect Staff Off	<u>1</u>	3016

4 Off, 1 Ann, 1 Civ

(6 Off, 5 Ann, 1 Civ)

1 Jan 57

04000	Lt	Supply Off	1	6424
04000	1 S/Sgt 1 A/1C	Orgn Supply Specl	2	64151

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Hq, Bangor Air Defense Sector (Contd)

04000 A/2C Apr Orgn Supply Specl 1 64131

1 Off, 3 Ann

(7 Off, 8 Ann, 1 Civ)

1 Feb 57

39400 Lt Installation Engr 1 5524

(8 Off, 8 Ann, 1 Civ)

15 Apr 57

01000 Col Deputy Commander 1 0066C

01000 Civilian Stenographic Specl 1 70252

03000 T/Sgt Personnel Tec 1 73270

03000 A/1C Personnel Specl 1 73250

50100 1 S/Sgt
1 A/1C Air Policeman 2 77150

50100 A/2C Apr Air Policeman 2 77130

50100 A/3C Air Police Helper 1 77010

53000 Maj Info Services Off 1 7216

53000 T/Sgt Information Tec 1 72170

2 Off, 8 Ann, 1 Civ

(10 Off, 16 Ann, 2 Civ)

15 Nov 57*1 Feb 58

84520 Lt Col Comm Elect Staff Off 1 3016

84520 Maj Comm Elect Staff Off 4 3016

5 off

UNCLASSIFIED (15 Off, 16 Ann, 2 Civ)

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ADCM 30-1

Hq, Bangor Air Defense Sector (Contd)

1 Feb 58

84020	Capt	Communications Off	1	3034
84020	A/1C	Administrative Clerk	1	70250
84110	2 M/Sgt 8 T/Sgt	Channel and Tec Con Tec	10	29375
84210	S/Sgt	Comm Machine Rpmn	1	36350
84220	M/Sgt	Comm Center Supv	1	29170
84220	2 S/Sgt 1 A/1C	Comm Center Spec1	3	29150
84220	A/2C	Apr Comm Center Spec1	5	29130
84420	2 S/Sgt 1 A/1C	Ground Radio Operator	<u>3</u>	29350

1 Off, 24 Amn

(16 Off, 40 Amn, 2 Civ)

1 Mar 58

84410	1 M/Sgt 2 T/Sgt	Gnd Comm Eqp Mai Tec/L	3	30472
84410	2 S/Sgt 3 A/1C	G/C V/UHF DF & A/FM Rpmn	5	30452B
84410	A/2C	G/C V/UHF DF & A/FM Rpmn	<u>1</u>	30432B

9 Amn

(16 Off, 49 Amn, 2 Civ)

1 Mar 58*

1 Jun 58

84520	Maj	Acft Cont Staff Off	1	1616
84520	Captain	Intercept Controller	1	1644

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ADCM 30-1

Hq, Bangor Air Defense Sector (Contd)

84520	W/O	Air Trf Con/Wng Supt	1	27300
84520	2 S/Sgt 4 A/1C	Acft Con/Wng Opr	6	27350
84520	1 M/Sgt 3 T/Sgt	Acft Con/Wng Supv	4	27370
84520	A/2C	Apr Acft Con/Wng Opr	<u>5</u>	27330

3 Off, 15 Amn

(19 Off, 64 Amn, 2 Civ)

1 Jun 58

84520	Maj	Acft Cont Staff Off	1	1616
84520	Capt	Intercept Controller	2	1644
84520	Lt	Intercept Controller	4	1644
84520	W/O	Air Trf Con/Wng Supt	1	27300
84520	2 M/Sgt 2 T/Sgt	Acft Con/Wng Supv	4	27370
84520	5 S/Sgt 7 A/1C	Acft Con/Wng Opr	12	27350
84520	A/2C	Apr Acft Con/Wng Opr	<u>9</u>	27330

8 Off, 25 Amn

(27 Off, 89 Amn, 2 Civ)

15 Jun 58*15 Oct 58

45000	Col	Comm Elect Staff Off	1	3016
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(28 Off, 89 Amn, 2 Civ)

1 Aug 58

03000	A/2C	Apr Personnel Specl	1	73230
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Hq, Bangor Air Defense Sector (Contd)

03000	A/2C	Apr Administrative Clerk	1	70230
11000	W/O	Personnel Supt	1	73000
11000	S/Sgt	Personnel Specl	1	73250
47000	Maj	Adjutant (Wing)	1	7016
47000	M/Sgt	Sergeant Major	1	70270
47000	T/Sgt	Administrative Supv	1	70270
47000	A/1C	Administrative Clerk	2	70250
47400	A/1C	Dup Devices Opr	<u>1</u>	71150

2 Off, 8 Amn

(30 Off, 97 Amn, 2 Civ)

15 Aug 58*

15 Oct 58

01000	B/Gen	Commander	1	0002
27000	Col	Director of Operations	1	00360
27000	Lt Col	Operations Staff Off	1	1416
27000	Lt Col	Acft Con Staff Off	1	1616
27000	Maj	Operations Staff Off	1	1416
27000	Maj	Armament Staff Off	1	3216
29000	Maj	Intelligence Staff Off	<u>1</u>	2016

7 Off

(37 Off, 97 Amn, 2 Civ)

15 Aug 58*

15 Nov 58

04520	Lt Col	Acft Cont Staff Off	5	1616
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Hq, Bangor Air Defense Sector (Contd)

84520	Maj	Acft Cont Staff Off	3	1616
84520	Capt	Intercept Controller	14	1644
84520	Lt	Intercept Controller	9	1644
84520	W/O	Air Trf Con/Wng Supt	13	27300
84520	M/Sgt	Acft Con/Wng Supv	21	27370
84520	T/Sgt	Acft Con/Wng Supv	25	27370
84520	S/Sgt	Acft Con/Wng Opr	33	27350
84520	A/1C	Acft Con/Wng Opr	44	27350
84520	A/2C	Apr Acft Con/Wng Opr	<u>11</u>	27330

44 Off, 134 Ann

(81 Off, 231 Ann, 2 Civ)

1 Sep 58

86520	S/Sgt	Still Photographer	1	23250
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(81 Off, 232 Ann, 2 Civ)

15 Oct 58

01000	Lt	Aide	1	7024
01000	S/Sgt	Ann Aide	1	70250
03000	S/Sgt	Administrative Clerk	1	70250
03000	A/2C	Apr Personnel Clerk	1	73230
07000	Col	Director of Personnel	1	0016C
07000	Civ	Stenographic Spec1	1	70252
29000	Lt	Intelligence Off	1	2054
29000	T/Sgt	Intelligence Opr Tec	1	20470
30000	Maj	Manpower Management Off	1	7336

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Hq, Bangor Air Defense Sector (Contd)

30000	M/Sgt	Manpower Management Ted	1	73370
30000	Civ	Stenographic Spec1	1	70252
48000	Maj	Judge Advocate	1	7816
48000	S/Sgt	Legal Spec1	1	70253
48000	Civ	Stenographic Spec1	1	70252
65000	1 S/Sgt 1 A/1C	Draftsman	<u>2</u>	22350

5 Off, 8 Amn, 3 Civ

(86 Off, 240 Amn, 5 Civ)

15 Nov 58

84020	Lt	Communications Off	1	3034
84210	A/1C	Comm Machine Rpmn	2	36350
84210	A/2C	Apr Comm Machine Rpmn	1	36330
84220	W/O	Comm Center Opr Supt	1	29100
84220	1 M/Sgt 4 T/Sgt	Comm Center Supv	5	29170
84220	4 S/Sgt 8 A/1C	Comm Center Spec1	12	29150
84220	A/2C	Apr Comm Center Spec1	4	29130
84310	1 S/Sgt 1 A/1C	Crypto Eqp Line Rpmn	2	36351A
84320	1 M/Sgt 1 T/Sgt	Crypto Oprs Supv	2	29270
84320	S/Sgt	Crypto Operator	5	29250
84320	A/1C	Apr Crypto Operator	3	29230
84420	1 M/Sgt 1 T/Sgt	Radio Operations Supv	2	29370

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Hq, Bangor Air Defense Sector (Contd)

84420	A/1C	Ground Radio Opr	2	29350
84420	A/2C	Apr Ground Radio Opr	3	29330
86520	1 S/Sgt 3 A/1C	Still Photographer	<u>4</u>	23250

2 Off, 17 Ann

(88 Off, 287 Ann, 5 Civ)

1 Jan 59

27000	Maj	Acft Con Staff Off	1	1616
27000	Maj	Operations Staff Off	1	1416
27000	Capt	Air Operations Off	1	1435
27000	Capt	Guidance System Off	1	3224
27000	Capt	Intercept Controller	1	1644
27000	Lt	Intercept Controller	1	1644
27000	S/Sgt	Administrative Clerk	1	70250
27000	Civ	Stenographic Spec1	2	70252
31000	Maj	Operations Staff Off	1	1416
31000	Civ	Stenographic Spec1	1	70252
35000	Col	Director of Materiel	1	00460
35000	Capt	Armament Systems Off	1	3234
35000	Civ	Stenographic Spec1	1	70252
45000	Maj	Comm Elect Staff Off	1	3016
45000	Maj	Ground Elect Off	1	3044
45000	Capt	Communications Off	1	3034
45000	Capt	Elect Cntr Measures Off	1	3024
45000	M/Sgt	Administrative Supv	1	70270

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ADCM 30-1

Hq, Bangor Air Defense Sector (Contd)

45000	1 S/Sgt 1 A/1C	Administrative Clerk	2	70250
45000	A/1C	Draftsman	1	22350
45000	Civ	Stenographic Spec1	1	70252
47000	W/O	Administrative Supt	1	70200
47000	S/Sgt	Administrative Clerk	<u>1</u>	70250

14 Off, 6 Amn, 5 Civ

(102 Off, 293 Amn, 10 Civ)

1 Feb 59

11000	Maj	Personnel Staff Off	1	7316
11000	1 M/Sgt 1 T/Sgt	Personnel Tec	2	73270
11000	1 S/Sgt 2 A/1C	Personnel Spec1	3	73250
11000	A/2C	Apr Personnel Spec1	2	73230
11000	Civ	Administrative Clerk	1	70250
11400	Capt	Education Specialist	1	7524
11400	M/Sgt	Education Tec	1	75170
11400	S/Sgt	Education Serv Spec1	1	75150
11400	Civ	Stenographic Spec1	1	70252
12000	Capt	Personnel Serv Off	1	7344
12000	T/Sgt	Special Serv Supv	1	74170
17000	Lt Col	Comptroller	1	00560
17000	Civ	Stenographic Spec1	1	70252
18000	M/Sgt	Accounting Tec	1	67270
18000	Civ	Accounting Tec	1	67270
19000	Maj	Management Anlys Off	1	6746

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Annex G

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Hq, Bangor Air Defense Sector (Contd)

23000	Capt	Stat Services Off	1	6834
23000	T/Sgt	Stat Services Supv	1	68170
23000	1 S/Sgt 1 A/IC	Statistical Spec1	2	68150
27000	Capt	Guidance System Off	1	3224
27000	A/IC	Administrative Clerk	1	70250
27000	A/2C	Apr Administrative Clerk	1	70230
27000	Civ	Stenographic Spec1	1	70252
35000	Maj	Acft Maint Staff Off	1	4316
35000	Maj	Comm Elect Staff Off	1	3016
35000	M/Sgt	Acft Mai Two Eng Tec	1	43171B
35000	M/Sgt	Acft C/W Rdr Maint Tec	1	30372
35000	M/Sgt	Vehicle Maint Tec	1	47170
35000	M/Sgt	Orgn Supply Supv	1	64173
35000	T/Sgt	Acft Radio Maint Tec	1	30170
35000	Civ	Stenographic Spec1	2	70252
39100	S/Sgt	Administrative Clerk	1	70250
39100	Civ	Stenographic Spec1	1	70252
47000	S/Sgt	Administrative Clerk	1	70250
47000	A/2C	Apr Administrative Clerk	2	70230
47000	Civ	Stenographic Spec1	1	70252
53000	Capt	Info Services Off	1	7224
53000	M/Sgt	Information Tec	1	72170
53000	1 S/Sgt 2 A/IC	Information Spec1	3	72150

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ADCM 30-1

Hq, Bangor Air Defense Sector (Contd)

54000	Capt	Medical Off, General	<u>1</u>	9326
				11 Off, 29 Ann, 9 Civ
				(113 Off, 322 Ann, 19 Civ)

1 Feb 59

84410	1 M/Sgt			
	1 T/Sgt	Gnd Comm Eqp Mai Tec/L	2	30472
84410	2 S/Sgt			
	3 A/LC	G/C V/UHF DF & A/FM Rpmn	5	30452B
84410	A/2C	G/C V/UHF DF & A/FM Apr	<u>1</u>	30432B
				8 Ann
				(113 Off, 330 Ann, 19 Civ)

* Approximate lead time for special training.

() Accumulative total.

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ADCM 30-1

ANNEX HSAGE SECTOR HEADQUARTERS PERSONNEL PHASING GUIDE

(For Use With SAGE Wing Personnel Phasing Schedule)

Function Code	Title	AFSC	Grade	Number	
				A	B
Part 1					
01000	Sq Section Comdr	7024	Major	1	1
03000	Adjutant	7324	Lt	1	1
03000	1st Sergeant	73170	M/Sgt	1	1
03000	Personnel Specl	73250	S/Sgt	1	1
03000	Administrative Clerk	70250	A/LC	1	1
04000	Orgn Supply Supv	64173	T/Sgt	1	1
27000	Operations Staff Off	1416	Lt Col	1	1
27000	Administrative Supv	70270	M/Sgt	1	1
27000	Stenographic Specl	70252	Civ	1	1
35000	Supply Officer	6416	Major	1	1
39100	Installations Engr	5525	Captain	1	1
45000	Comm Elect Staff Off	3016	Major	1	1
				12	12
Part 2					
04000	Supply Officer	6424	Lt	1	1
04000	Orgn Supply Specl	64151	S/Sgt	1	1
04000	Orgn Supply Specl	64151	A/LC	1	1
04000	Apr Orgn Supply Specl	64131	A/2C	1	1
39400	Installation Engineer	5525	Lt	1	1
				5	5
Part 3					
01000	Deputy Commander	0066C	Col	1	1
01000	Stenographic Specl	70252	Civ	1	1
03000	Personnel Tec	73270	T/Sgt	1	1
03000	Personnel Specl	73250	A/LC	1	1
50100	Air Policeman	77150	S/Sgt	1	2
50100	Air Policeman	77150	A/LC	1	3

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SAGE Sector Headquarters Personnel Phasing Guide (Contd)

Function Code	Title	AFSC	Grade	Number	
				A	B
50100	Apr Air Policeman	77130	A/2C	2	4
50100	Air Police Helper	77010	A/3C	1	2
53000	Info Services Staff Off	7216	Major	1	1
53000	Information Tec	72170	T/Sgt	1	1
				11	17

Part 4

84520	Acft Cont Staff Off	1616	Major	1	1
84520	Intercept Controller	1644	Captain	1	1
84520	Air Trf Con/Wng Supt	27300	W/O	1	1
84520	Acft Con/Wng Supv	27370	M/Sgt	1	1
84520	Acft Con/Wng Supv	27370	T/Sgt	3	3
84520	Acft Con/Wng Opr	27350	S/Sgt	2	2
84520	Acft Con/Wng Opr	27350	A/1C	4	4
84520	Apr Acft Con/Wng Opr	27330	A/2C	5	5
				18	18

Part 5

84520	Comm Elect Staff Off	3016	Lt Col	1	1
84520	Comm Elect Staff Off	3016	Major	4	4
				5	5

Part 6

84410	Gnd Comm Eqp Mai Tec/L	30472	M/Sgt	1	1
84410	Gnd Comm Eqp Mai Tec/L	30472	T/Sgt	2	2
84410	G/C V/UHF DF & A/FM Rpmn	30452B	S/Sgt	2	2
84410	G/C V/UHF DF & A/FM Rpmn	30452B	A/1C	3	3
84410	G/C V/UHF DF & A/FM Rpmn	30432B	A/2C	1	1
				9	9

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SAGE Sector Headquarters Personnel Phasing Guide (Contd)

Function Code	Title	AFSC	Grade	Number	
				A	B
Part 7					
84520	Acft Cont Staff Off	1616	Major	1	1
84520	Intercept Controller	1644	Captain	2	2
84520	Intercept Controller	1644	Lt	4	4
84520	Air Trf Con/Wng Supt	27300	W/O	1	1
84520	Acft Con/Wng Supv	27370	M/Sgt	2	2
84520	Acft Con/Wng Supv	27370	T/Sgt	2	2
84520	Acft Con/Wng Opr	27350	S/Sgt	5	5
84520	Acft Con/Wng Opr	27350	A/1C	7	7
84520	Apr Acft Con/Wng Opr	27330	A/2C	9	9
*86520	Still Photographer	23250	S/Sgt	1	1
				34	34
Part 8					
45000	Comm Elect Staff Off	3016	Col	1	1
Part 9					
84020	Communications Off	3034	Captain	1	1
84020	Administrative Clerk	70250	A/1C	1	1
84110	Channel and Tec Con Tec	29375	M/Sgt	2	2
84110	Channel and Tec Con Tec	29375	T/Sgt	8	8
84210	Comm Machine Rpmn	36350	S/Sgt	1	1
84220	Comm Center Supv	29170	M/Sgt	1	1
84220	Comm Center Specl	29150	S/Sgt	2	2
84220	Comm Center Specl	29150	A/1C	1	1
84220	Apr Comm Center Specl	29130	A/2C	5	5
84420	Gnd Radio Operator	29350	S/Sgt	2	2
84420	Gnd Radio Operator	29350	A/1C	1	1
				25	25
Part 10					
84520	Acft Cont Staff Off	1616	Lt Col	5	5
84520	Acft Cont Staff Off	1616	Major	3	3
84520	Intercept Controller	1644	Capt	14	14
84520	Intercept Controller	1644	Lt	9	9

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ADOM 30-1

SAGE Sector Headquarters Personnel Phasing Guide (Contd)

Function Code	Title	AFSC	Grade	Number	
				A	B
84520	Air Trf Con/Wng Supt	27300	W/O	13	13
84520	Acft Con/Wng Supv	27370	M/Sgt	21	21
84520	Acft Con/Wng Supv	27370	T/Sgt	25	25
84520	Acft Con/Wng Opr	27350	S/Sgt	33	33
84520	Acft Con/Wng Opr	27350	A/1C	44	44
84520	Apr Acft Con/Wng Opr	27330	A/2C	11	11
*86520	Still Photographer	23250	S/Sgt	1	1
*86520	Still Photographer	23250	A/1C	3	3
				182	182

Part 11

01000	Commander	0002	E/Gen	1	1
27000	Dir of Operations	00360	Col	1	1
27000	Operations Staff Off	1416	Lt Col	1	1
27000	Acft Con Staff Off	1616	Lt Col	1	1
27000	Operations Staff Off	1416	Major	1	1
27000	Armament Staff Off	3216	Major	1	1
29000	Intelligence Staff Off	2016	Major	1	1
				7	7

Part 12

03000	Apr Personnel Specl	73230	A/2C	1	1
03000	Apr Administrative Clerk	70230	A/2C	1	1
11000	Personnel Supt	73000	W/O	1	1
11000	Personnel Specl	73250	S/Sgt	1	1
47000	Adjutant (Wing)	7016	Major	1	1
47000	Sergeant Major	70270	M/Sgt	1	1
47000	Administrative Supv	70270	T/Sgt	1	1
47000	Administrative Clerk	70250	A/1C	2	2
47400	Dup Devices Opr	71150	A/1C	1	1
				10	10

Part 13

01000	Aide	7024	Lt	1	1
01000	Ann Aide	70250	S/Sgt	1	1
03000	Administrative Clerk	70250	S/Sgt	1	1

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SAGE Sector Headquarters Personnel Phasing Guide (Contd)

Function Code	Title	AFSC	Grade	Number	
				A	B
03000	Apr Personnel Clerk	73230	A/2C	1	1
07000	Dir of Personnel	0016C	Col	1	1
07000	Stenographic Specl	70252	Civ	1	1
29000	Intelligence Off	2054	Lt	1	1
29000	Intelligence Opr Tec	20470	T/Sgt	1	1
30000	Manpower Management Off	7336	Major	1	1
30000	Manpower Management Tec	73370	M/Sgt	1	1
30000	Stenographic Specl	70252	Civ	1	1
48000	Judge Advocate	7816	Major	1	1
48000	Legal Specl	70253	S/Sgt	1	1
48000	Stenographic Specl	70252	Civ	1	1
65000	Draftsman	22350	S/Sgt	1	1
65000	Draftsman	22350	A/1C	1	1
				16	16

Part 14

84020	Communications Off	3034	Lt	1	1
84210	Comm Machine Rpmn	36350	S/Sgt	1	1
84210	Comm Machine Rpmn	36350	A/1C	2	2
84210	Apr Comm Machine Rpmn	36330	A/2C	1	2
84220	Comm Center Opr Supt	29100	W/O	1	1
84220	Comm Center Supv	29170	M/Sgt	1	2
84220	Comm Center Supv	29170	T/Sgt	4	5
84220	Comm Center Specl	29150	S/Sgt	4	7
84220	Comm Center Specl	29150	A/1C	8	12
84220	Apr Comm Center Specl	29130	A/2C	4	7
84310	Crypto Eqp Line Rpmn	36351A	S/Sgt	1	1
84310	Crypto Eqp Line Rpmn	36351A	A/1C	1	1
84320	Crypto Oprs Supv	29270	M/Sgt	1	1
84320	Crypto Oprs Supv	29270	T/Sgt	1	1
84320	Crypto Operator	29250	S/Sgt	5	5
84320	Apr Crypto Operator	29230	A/1C	3	3
84420	Radio Operations Supv	29370	M/Sgt	1	1
84420	Radio Operations Supv	29370	T/Sgt	1	1
84420	Ground Radio Opr	29350	A/1C	2	2
84420	Apr Ground Radio Opr	29330	A/2C	3	3
				45	59

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SAGE Sector Headquarters Personnel Phasing Guide (Contd)

Function Code	Title	AFSC	Grade	Number	
				A	B
Part 15					
27000	Acft Con Staff Off	1616	Major	1	1
27000	Operations Staff Off	1416	Major	1	1
27000	Air Operations Off	1435	Captain	1	1
27000	Guidance Systems Off	3224	Captain	1	1
27000	Intercept Controller	1644	Captain	1	1
27000	Intercept Controller	1644	Lt	1	1
27000	Administrative Clerk	70250	S/Sgt	1	1
27000	Stenographic Spec1	70252	Civ	2	2
31000	Operations Staff Off (P&R)	1416	Major	1	1
31000	Stenographic Spec1	70252	Civ	1	1
35000	Dir of Materiel	0046C	Col	1	1
35000	Armament Systems Off	3234	Captain	1	1
35000	Stenographic Spec1	70252	Civ	1	1
45000	Comm Elect Staff Off	3016	Major	1	1
45000	Ground Elect Off	3044	Major	1	1
45000	Communications Off	3034	Captain	1	1
45000	Elect Cntr Measures Off	3024	Captain	1	1
45000	Administrative Supv	70270	M/Sgt	1	1
45000	Administrative Clerk	70250	S/Sgt	1	1
45000	Administrative Clerk	70250	A/1C	1	1
45000	Draftsman	22350	A/1C	1	1
45000	Stenographic Spec1	70252	Civ	1	1
47000	Administrative Supt	70200	W/O	1	1
47000	Administrative Clerk	70250	S/Sgt	1	1
				25	25

Part 16					
11000	Personnel Staff Off	7316	Major	1	1
11000	Personnel Tec	73270	M/Sgt	1	1
11000	Personnel Tec	73270	T/Sgt	1	1
11000	Personnel Spec1	73250	S/Sgt	1	1
11000	Personnel Spec1	73250	A/1C	2	2
11000	Apr Personnel Spec1	73230	A/2C	2	2
11000	Administrative Clerk	70250	Civ	1	1
11400	Education Specialist	7524	Captain	1	1
11400	Education Tec	75170	M/Sgt	1	1
11400	Education Serv Spec1	75150	S/Sgt	1	1
11400	Stenographic Spec1	70252	Civ	1	1
12000	Personnel Serv Off	7344	Captain	1	1

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SAGE Sector Headquarters Personnel Phasing Guide (Contd)

Function Code	Title	AFSC	Grade	Number	
				A	B
12000	Special Serv Supv	74170	T/Sgt	1	1
17000	Comptroller	0056C	Lt Col	1	1
17000	Stenographic Spec1	70252	Civ	1	1
18000	Accounting Tec	67270	M/Sgt	1	1
18000	Accounting Tec	67270	Civ	1	1
19000	Management Anlys Off	6746	Major	1	1
23000	Stat Services Off	6834	Captain	1	1
23000	Stat Services Supv	68170	T/Sgt	1	1
23000	Statistical Spec1	68150	S/Sgt	1	1
23000	Statistical Spec1	68150	A/1C	1	1
27000	Guidance System Off	2224	Captain	1	1
27000	Administrative Clerk	70250	A/1C	1	1
27000	Apr Administrative Clerk	70230	A/2C	1	1
27000	Stenographic Spec1	70252	Civ	1	1
35000	Acft Maint Staff Off	4316	Major	1	1
35000	Comm Elect Staff Off	3016	Major	1	1
35000	Acft Mai Two Eng Tec	43171B	M/Sgt	1	1
35000	Acft C/W Rdr Maint Tec	30372	M/Sgt	1	1
35000	Vehicle Maint Tec	47170	M/Sgt	1	1
35000	Orgn Supply Supv	64173	M/Sgt	1	1
35000	Acft Radio Maint Tec	30170	T/Sgt	1	1
35000	Stenographic Spec1	70252	Civ	2	2
39100	Administrative Clerk	70250	S/Sgt	1	1
39100	Stenographic Spec1	70252	Civ	1	1
47000	Administrative Clerk	70250	S/Sgt	1	1
47000	Apr Administrative Clerk	70230	A/2C	2	2
47000	Stenographic Spec1	70252	Civ	1	1
53000	Info Services Off	7224	Captain	1	1
53000	Information Tec	72170	M/Sgt	1	1
53000	Information Spec1	72150	S/Sgt	1	1
53000	Information Spec1	72150	A/1C	2	2
54000	Medical Off, General	9326	Captain	1	1
				49	49

Part 17

84410	Gnd Comm Eqp Mai Tec/L	30472	M/Sgt	1	1
84410	Gnd Comm Eqp Mai Tec/L	30472	T/Sgt	1	1
84410	G/C V/UHF DF & A/FM Rpmn	30452B	S/Sgt	2	2
84410	G/C V/UHF DF & A/FM Rpmn	30452B	A/1C	3	3
84410	G/C V/UHF DF & A/FM Apr	30432B	A/2C	1	1
				8	8

Personnel not to be phased with others in Part for whom training lead time must be provided. Check Phasing Schedule for Part number with asterisk (viz 7).

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ADOM 30-1
RECAPITULATION

<u>Part</u>	<u>Column</u>		<u>Accumulative Totals</u>	
	<u>A</u>	<u>B</u>	<u>A</u>	<u>B</u>
1	12	12	12	12
2	5	5	17	17
3	11	17	28	34
4	18	18	46	52
5	5	5	51	57
6	9	9	60	66
7	34	34	94	100
8	1	1	95	101
9	25	25	120	126
10	182	182	302	308
11	7	7	309	315
12	10	10	319	325
13	16	16	335	341
14	45	59	380	400
15	25	25	405	425
16	49	49	454	474
17	8	8	462	482

SECRET

SAGE SECTOR HEADQUARTERS PERSONNEL PHASING SCHEDULE

AIR DEFENSE SECTOR AND LOCATION	FISCAL YEAR		FY 57		FY 58		FY 59		FY 60		FY 61		FY 62		FY 63	
	CALENDAR YEAR		CY 56		CY 57		CY 58		CY 59		CY 60		CY 61		CY 62	
	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
DETROIT FORT CUSTER, MICH																
CHICAGO TRUAX FIELD, WIS																
KANSAS CITY RICHARDS-GEBAUR AFB, MO																
MONTGOMERY GUNTER AFB, ALA																
DULUTH DULUTH MUNI APRT, MINN																
GRAND FORKS GRAND FORKS, N. D.																
SEATTLE MECHORD AFB, WASH																
PORTLAND CAMP ADAIR, ORE																
SAULT ST. MARIE K. I. SAWYER, AFB, MICH																
SPOKANE LARSON AFB, WASH																
PENDLETON PENDLETON, ORE																
LOS ANGELES SHAFTER APRT, CALIF																
SAN FRANCISCO BEALE AFB, CALIF																
SAN BERNARDINO NORTON AFB, CALIF																
RENO STEAD AFB, NEV																
MINOT MINOT AFB, N. D.																
GREAT FALLS MALMSTROM AFB, MONT																
SIOUX CITY SIOUX CITY MUNI APRT, IA																
RALEIGH SEYMOUR-JOHNSON AFB, N. CAR																
FORT KNOX FT. KNOX, KY																
ATLANTA ROBINS AFB, GA																
PHOENIX LUKE AFB, ARIZ																
ALBUQUERQUE BELEN, N. M.																
SAN ANGELO WEBB AFB, TEX																
SAN ANTONIO LACKLAND AFB, TEX																
SHREVEPORT ENGLAND AFB, LA																
ST. LOUIS SCOTT AFB, ILL																
*** QUARTERLY PERSONNEL TOTALS																
*** ACCUMULATIVE PERSONNEL TOTALS																

LEGEND
 + - BOO
 - - C&E, INITIAL COMPLEMENT
 * - C&E, REMAINING COMPLEMENT
 - - OPNS, INITIAL COMPLEMENT
 * - OPNS, BALANCE NORMAL LOAD
 - - OPNS, REMAINING COMPLEMENT
 T - COMMAND POST
 - - OPERATIONS DATE

1. PART 1* ONE STILL PHOTOGRAPHER (OAL) NORMAL LOAD; NO SPECIAL TRAINING REQUIRED; NO LEAD TIME APPLIED.
 2. PART 1** FOUR STILL PHOTOGRAPHERS (REMAINING COMPLEMENT); NO SPECIAL TRAINING REQUIRED; NO LEAD TIME APPLIED.
 3. ** SECTOR HEADQUARTERS LOCATED AT DIVISION SITE. PARTS 2 AND 14 AUGMENTED. USE COLUMN 8 OF SECTOR PHASING GUIDE.
 4. *** INCLUDE PHASED TOTALS FOR NEW YORK, BOSTON, SYRACUSE, WASHINGTON AND BANGOR SECTOR HEADQUARTERS. (PART 2) IS COVERED IN SEPARATE PHASING SCHEDULES.
 5. PARTS 4 AND 11 ARE SHOWN ONLY FOR SECTOR HEADQUARTERS PROGRAMMED FOR G-A RADIO SITE.
 6. PERSONNEL IN OPERATIONS ARE SHOWN ON DATED THREE PERSONNEL ARE REQUIRED FOR GUY.
 7. PARTS 4, 5, 7, 8, 10, AND 11 REQUIRE SPECIAL TRAINING PERIOD TO REPORTING PURSUE AND ESTIMATED LEAD TIMES HAVE BEEN APPLIED.
 8. INITIALLY UNDER COMMAND OF WESTS AFB (BASE - PROGRAMMING & TRAINING).

ANNEX I

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ANNEX J

SAGE DIVISION PERSONNEL PHASING GUIDE

(For Use With SAGE Division Personnel Phasing Schedule)

Function Code	Title	AFSC	Grade	Number
Part 1				
04000	Supply Officer	6424	Captain	1
04000	Orgn Supply Supv	64173	T/Sgt	<u>1</u>
				2
Part 2				
01000	Sq Section Comdr	7024	Major	1
07000	Personnel Tec	73270	M/Sgt	<u>1</u>
				2
Part 3				
45000	Comm Elect Staff Off	3016	Colonel	1
Part 4				
84520	Acft Cont Staff Off	1616	Lt Colonel	2
84520	Acft Cont Staff Off	1616	Major	9
84520	Acft Cont/Wng Supv	27370	M/Sgt	1
84520	Acft Cont/Wng Supv	27370	T/Sgt	2
84520	Acft Cont/Wng Opr	27350	S/Sgt	4
84520	Acft Cont/Wng Opr	27350	A/1C	5
84520	Apr Acft Cont/Wng Opr	27330	A/2C	4
*86520	Still Photographer	23250	S/Sgt	<u>1</u>
				28
Part 5				
84520	Comm Elect Staff Off	3016	Lt Colonel	1
84520	Comm Elect Staff Off	3016	Major	<u>4</u>
				5

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SAGE Division Personnel Phasing Guide (Contd)

Function Code	Title	AFSC	Grade	Number
Part 6				
01000	Commander	0002	General	1
27000	Dir of Operations	0036D	Colonel	1
27000	Operations Staff Off	1416	Lt Colonel	1
27000	Acft Cont Staff Off	1616	Lt Colonel	1
27000	Operations Staff Off	1416	Major	1
27000	Armament Staff Off	3216	Lt Colonel	1
29000	Intelligence Staff Off	2016	Lt Colonel	1
				7
Part 7				
84520	Acft Cont Staff Off	1616	Lt Colonel	3
84520	Acft Cont Staff Off	1616	Major	6
84520	Acft Con/Wng Supv	27370	M/Sgt	2
84520	Acft Con/Wng Supv	27370	T/Sgt	2
84520	Acft Con/Wng Opr	27350	S/Sgt	3
84520	Acft Con/Wng Opr	27350	A/1C	6
84520	Apr Acft Con/Wng Opr	27330	A/2C	6
*86520	Still Photographer	23250	S/Sgt	1
*86520	Still Photographer	23250	A/1C	3
				32
Part 8				
01000	Deputy Commander	0066D	Colonel	1
01000	Stenographic Specl	70252	Civilian	1
03000	Adjutant	7324	Lieutenant	1
03000	1st Sergeant	73170	M/Sgt	1
03000	Personnel Specl	73250	S/Sgt	1
03000	Administrative Clerk	70250	A/1C	1
04000	Orgn Supply Specl	64151	A/1C	1
04000	Apr Orgn Supply Specl	64131	A/2C	1
47000	Adjutant (Div)	7016	Major	1
47000	Sergeant Major	70270	M/Sgt	1
47000	Administrative Clerk	70250	S/Sgt	1
47000	Apr Administrative Clerk	70230	A/2C	1
47400	Dup Devices Opr	71150	A/1C	1
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SAGE Division Personnel Phasing Guide (Contd)

Function Code	Title	AFSC	Grade	Number
Part 9				
84410	Chanel and Tec Con Tec	29375	M/Sgt	2
84410	Channel and Tec Con Tec	29375	T/Sgt	<u>3</u>
				5
Part 10				
01000	Aide	7024	Lieutenant	1
01000	Aide	70250	S/Sgt	1
03000	Personnel Spec1	73250	A/1C	1
03000	Apr Personnel Spec1	73230	A/2C	1
07000	Dir of Personnel	0016D	Colonel	1
27000	Operations Staff Off	1416	Lt Colonel	1
27000	Administrative Supv	70270	M/Sgt	1
27000	Stenographic Spec1	70252	Civilian	1
29000	Intelligence Oprs Tec	20470	T/Sgt	1
29000	Intelligence Oprs Spec1	20450	S/Sgt	1
30000	Manpower Management Off	7336	Major	1
30000	Manpower Management Tec	73370	T/Sgt	1
30000	Stenographic Spec1	70252	Civilian	1
35000	Dir of Materiel	0046D	Colonel	1
35000	Comm Elect Staff Off	3016	Major	1
35000	Stenographic Spec1	70252	Civilian	1
45000	Comm Elect Staff Off	3016	Lt Colonel	1
45000	Elect Cntr Measures Off	3024	Captain	1
45000	Communications Off	3034	Captain	1
45000	Gnd Electronics Off	3044	Captain	1
45000	Administrative Supv	70270	T/Sgt	1
45000	Stenographic Spec1	70252	Civilian	1
47000	Stenographic Spec1	70252	Civilian	1
49000	Inspector General	0036D	Colonel	1
49000	Air Operations Off	1435	Major	1
49000	Stenographic Spec1	70252	Civilian	1
53000	Info Services Staff Off	7216	Lt Colonel	1
53000	Information Tec	72170	M/Sgt	1
54000	Medical Staff Off	9316	Lt Colonel	1
54000	Medical Admn Supv	90670	M/Sgt	1
65000	Draftsman	22350	S/Sgt	1
65000	Draftsman	22350	A/1C	<u>1</u>
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SAGE Division Personnel Phasing Guide (Contd)

Function Code	Title	AFSC	Grade	Number
Part 11				
27000	Operations Staff Off	1416	Major	1
27000	Acft Cont Staff Off	1616	Major	1
27000	Guidance System Off	3224	Major	1
27000	Administrative Clerk	70250	S/Sgt	1
27000	Stenographic Specl	70252	Civilian	1
31000	Operations Staff Off	1416	Lt Colonel	1
31000	Operations Staff Off	1416	Major	1
31000	Stenographic Specl	70252	Civilian	1
45000	Comm Elect Staff Off	3016	Major	2
45000	Administrative Supv	70270	M/Sgt	1
45000	Rad Rly Eqp Mai Tec	30470	T/Sgt	1
45000	Draftsman	22350	S/Sgt	1
45000	Administrative Clerk	70250	S/Sgt	1
47000	Administrative Off	7024	Captain	1
47000	Administrative Clerk	70250	A/1C	1
61000	Director (GOC)	1416	Lt Colonel	1
61000	Administrative Staff Off	7016	Major	1
61000	Administrative Clerk	70250	S/Sgt	1
				19
Part 12				
07000	Administrative Clerk	70250	S/Sgt	1
17000	Comptroller	0056D	Lt Colonel	1
17000	Stenographic Specl	70252	Civilian	1
19000	Management Anlys Off	6746	Major	1
27000	Guidance System Off	3224	Major	1
27000	Air Operations Off	1435	Captain	1
27000	Administrative Clerk	70250	A/1C	1
27000	Apr Administrative Clerk	70230	A/2C	1
27000	Stenographic Specl	70252	Civilian	1
28000	Flying Safety Off	1444	Major	1
28000	Stenographic Specl	70252	Civilian	1
35000	Supply Off	6424	Captain	1
35000	Administrative Supv	70270	M/Sgt	1
35000	Orgn Supply Supv	64173	T/Sgt	1
45000	Comm Elect Staff Off	3016	Major	1
45000	Communications Off	3034	Civilian	1
45000	Acft Con/Wng Supv	27370	T/Sgt	1

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SAGE Division Personnel Phasing Guide (Contd)

Function Code	Title	AFSC	Grade	Number
45000	Administrative Clerk	70250	A/1C	1
45000	Apr Administrative Clerk	70230	A/2C	1
49000	Operations Staff Off	1416	Lt Colonel	1
49000	Acft Cont Staff Off	1616	Major	1
49000	Acft Maint Officer	4344	Major	1
49000	Supply Staff Off	6416	Major	1
49000	Personnel Staff Off	7316	Major	1
49000	Administrative Off	7024	Captain	1
49000	Personnel Officer	7324	Captain	1
49000	Acft Con/Wng Supv	27370	M/Sgt	1
49000	Rad Operations Supv	29370	M/Sgt	1
49000	Rad Operations Supv	29370	T/Sgt	2
49000	Acft C/W Radar Mai Tec	30372	M/Sgt	1
49000	Acft C/W Radar Mai Tec	30372	T/Sgt	1
49000	Weapons Ctl Systems Tec	32271D	M/Sgt	1
49000	Acft Mai Jet One Eng Tec	43171C	M/Sgt	1
49000	Acft Mai Jet Two Eng Tec	43171D	M/Sgt	1
49000	Vehicle Maint Tec	47170	T/Sgt	1
49000	Automotive Rpmn	47151	S/Sgt	1
49000	Building Crafts Supv	55270	M/Sgt	1
49000	Building Crafts Supv	55270	T/Sgt	1
49000	Orgn Supply Supv	64173	M/Sgt	1
49000	Orgn Supply Supv	64173	T/Sgt	1
49000	Administrative Clerk	70250	S/Sgt	1
49000	Administrative Clerk	70250	A/1C	2
49000	Apr Administrative Clerk	70230	A/2C	1
49000	Administrative Supv	70270	M/Sgt	1
49000	Administrative Supv	70270	T/Sgt	1
49000	Personnel Tec	73270	M/Sgt	1
49000	Personnel Tec	73270	T/Sgt	1
49000	Stenographic Specl	70252	Civilian	1
50000	Provost Marshal	7716	Major	1
50000	Administrative Clerk	70250	S/Sgt	1
53000	Stenographic Specl	70252	Civilian	1
54000	Medical Serv Admin	9025	Major	1
54000	Medical Admin Supv	90670	T/Sgt	1
54000	Stenographic Specl	70252	Civilian	1
54500	Dental Off General	9826	Captain	2
54500	Dental Lab Specl	98250	S/Sgt	1
54500	Dental Specl	98150	S/Sgt	1
54500	Dental Specl	98150	A/1C	1
54700	Veterinary Off Gen	9926	Major	1

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SAGE Division Personnel Phasing Guide (Contd)

Function Code	Title	AFSC	Grade	Number
51700	Veterinary Tec	90870	M/Sgt	1
61000	Administrative Staff Off	7016	Major	5
61000	Administrative Supv	70270	T/Sgt	1
61000	Administrative Clerk	70250	A/IC	1
61000	Stenographic Specl	70252	Civilian	1
				<u>1</u>
				71

* Personnel not to be phased with others in Part for whom training lead time must be provided. Check Phasing Schedule for Part number with asterisk (viz 4*).

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RECAPITULATION:

<u>Part</u>	<u>Number</u>	<u>Accumulative Total</u>
1	2	2
2	2	4
3	1	5
4	28	33
5	5	38
6	7	45
7	32	77
8	13	90
9	5	95
10	32	127
11	19	146
12	71	217

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REPORT

		SAGE DIVISION PERSONNEL PHASING SCHEDULE																																																																																			
		FY 57		FY 58		FY 59		FY 60		FY 61		FY 62		FY 63																																																																							
		CY 57		CY 58		CY 59		CY 60		CY 61		CY 62																																																																									
DIVISION DESIGNATION AND LOCATION		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
26TH AIR DIV (SAGE) SYRACUSE AFB, N. Y.																																																																																					
30TH AIR DIV (SAGE) TRIAX FIELD, WISC.																																																																																					
25TH AIR DIV (SAGE) McCHORD AFB, WASH.																																																																																					
28TH AIR DIV (SAGE) BEALE AFB, CALIF.																																																																																					
29TH AIR DIV (SAGE) MINOT AFB, N. D.																																																																																					
32ND AIR DIV (SAGE) FORT KNOX, KY.																																																																																					
34TH AIR DIV (SAGE) LUKE AFB, ARIZ.																																																																																					
33RD AIR DIV (SAGE) RICHARDS-GEBAUR AFB, MO.																																																																																					
QUARTERLY PERSONNEL TOTALS		2	3	4	10	27	41	68	95	99	110	126	135	151	169	187	205	223	241	259	277	295	313	331	349	367	385	403	421	439	457	475	493	511																																																			
ACCUMULATIVE PERSONNEL TOTALS		2	5	9	19	46	87	155	250	349	459	585	736	913	1112	1341	1600	1889	2208	2557	2934	3339	3772	4233	4722	5239	5784	6357	6958	7587	8244	8929	9642	10384																																																			
		J <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th> <th>J</th> <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th> <th>J</th> <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th> <th>J</th> <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th> <th>J</th> <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th> <th>J</th> <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th>	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D												

LEGEND
 * - SDC
 + - SYSTEM TECH CONTROL CENTER (STCC)
 - - SDCS INITIAL COMPLIMENT
 • - SDCS MAINTENANCE COMPLIMENT
 * - COMMAND POST
 * - OPERATIONS DATE

1. PART 11 ONE STOP PERSONNEL: NO SPECIAL TRAINING REQUIRED; NO LEAD TIME APPLIED.
 2. PART 11 FOUR STOP PERSONNEL: NO SPECIAL TRAINING REQUIRED; NO LEAD TIME APPLIED.
 3. PERSONNEL REPRESENTATIVE AND OPERATIONS PERSONNEL ARE SHOWN ON DATES THEY PERSONNEL ARE REQUIRED FOR DUTY. PERSONNEL
 ON PARTS 2, 4, 5, 6, AND 7 RECEIVE SPECIAL TRAINING PRIOR TO REPORTING FOR DUTY AND REPORTED LEAD TIME DATA MUST APPLIED.

ANNEX K

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OFFICER AND AIRMAN OPERATOR
TRAINING PLAN

1. Direction Center Training

a. The development of this plan and the accompanying job training standards (lateral training) were based upon the following considerations and/or assumptions.

(1) Graduates will be able to adequately man one particular SAGE Direction Center position upon graduation.

(2) No further formal training of the graduate will be required on the position of his specialty.

(3) Qualification in related or more advanced positions will be accomplished through the use of OJT and/or on-site training at the place of duty.

(4) Operator Training will initially be accomplished at the experimental SAGE Direction Center (XD-1). Training will continue at this location until another suitable location is developed.

(5) Four (4) computer hours per day per shift of operation will be provided for training.

b. Under the current plan SAGE operator training has been divided into ten (10) separate courses of instruction. These will be provided as lateral training and are identified as follows:

(1) Mapping and Height Finding, AL 27370-1

(2) Track Initiation, AL 27370-2

(3) Air Situation, AL 27370-3

(4) Track Monitoring, AL 27370-4

(5) Air Tactics, AL 27370-5

(6) Manual Inputs, AL 27370-6

(7) Identification, AL 27370-7

(8) Intercept Direction, AL 27370-8

(9) Weapons Direction, AL 27370-9

(10) Weapons Assignment, AL 27370-10

2. Combat Center Training

a. At the present time insufficient information is available on the duties and responsibilities of the Combat Center personnel on

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which definitive training plans may be developed. It appears that the Combat Center Operator will require the over-all knowledge of the Direction Center, yet few of the mechanical skills.

b. Although lack of sufficient information prevents the construction of course outlines and job training standards, enough knowledge of Combat Center operational requirements is available that an estimate of the length and nature of training can be made with some validity. It is believed that six (6) weeks of instruction will suffice for this requirement. This training to consist of perhaps five (5) related courses in Combat Center Operations. More elaborate training plans to satisfy this requirement will be formulated as soon as more exact information is made available.

3. Code Key - Proficiency Standard

a. The numbers appearing in Columns 2, 3, 4 and 5 are based on the following code key. The code numbers following each job element indicates the skill level in the formal course of training and the recommended skill level to be attained in an OJT and/or on-site training program for upgrading to the advanced level or proficiency within their current skill level.

- No experience or training on this item

- 1 Has only limited knowledge of the subject or task. Cannot be expected to perform the task.
- 2 Has received a complete briefing on the subject or task but can use the knowledge or skill only if assisted in every step of the operation. Requires much more training and experience.
- 3 Understands the subject or tasks to be done. Has applied part of the knowledge either on the actual job or on a trainer. Can do the job if closely supervised in the more difficult parts.
- 4 Understands the subject or task to be done and has done the job enough times to make sure he can do it. Needs more practice under limited supervision.
- 5 Has a complete understanding of the subject or task. Can do the task completely and accurately without supervision.
- 6 Has complete understanding of the subject or task, can do the task completely and accurately without supervision and can apply the techniques and skills to similar equipment or situations.

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SAGE SYSTEM OPERATION (MAPPING) & HEIGHT FINDING
COURSE NR AL 27370-1
(LATERAL TRAINING)

1. Positions covered:

- a. Radar Mapper for Gap-filler Inputs (RMB)
- b. Mapping Supervisor for Gap-filler Inputs (MSG)
- c. Mapping Supervisor for Long Range Inputs (MSL)
- d. Height Technician (HT)
- e. Height Supervisor (HS)

(This Special Training Standard is based on information available 1 May 1956.)

2. Purpose of Standard:

- a. To indicate the required knowledge and skills necessary for an airman to perform the duties of Radar Mapper, Mapping Supervisor, Height Technician and/or Height Supervisor. (Column 1)
- b. To reflect the amount of knowledge or skill an airman must possess in each element in order to perform his duties at the five (5) level. (Column 2)
- c. To reflect the minimum skill level recommended for each job element for qualification to the seven (7) level. (Column 4)
- d. To reflect the extent of training given in Lateral Training Course Nr 27370-1. (Column 3)
- e. To reflect the recommended extent of training given in a basic course covering these positions. (Column 5)
- f. To use for coordination purposes.

3. Description of Lateral Course Nr AL 27370-1, SAGE System Operation (Mapping & Height Finding):

- a. This course is designed for entry of 27330, 27350, and 27370 students who have graduated from Course AB 27330 and have completed a minimum of six (6) months of field experience. Entering 27330 students will receive AFSC 27350 upon graduation.
- b. Laboratory instruction provided each student will consist of proficiency training in one (1) of the three (3) positions covered by this course. Familiarization training in the remaining two (2) positions as well as other secondary areas will be provided. Secondary areas are areas which encompass duties considered compatible and complementary to the primary training area.

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JOB TRAINING STANDARDS

REQUIRED KNOWLEDGE OR SKILL	<u>PROFICIENCY LEVEL</u>			
	(2) Sk	(3) Crs	(4) Sk	(5) Crs
1. Knows the theory of pulsed radar.	2	3	4	2
2. Knows the quantization process.	2	3	4	2
3. Knows the process of transmitting range and azimuth information from long range and gap-filler radar sites to the Direction Center.	2	3	4	2
4. Knows the employment, capabilities and characteristics of commonly used SAGE radar equipments, including:				
a. Airborne Early Warning Radar.	2	2	4	2
b. Picket ship.	2	2	4	2
c. Texas Tower.	3	3	4	2
d. Long Range Radar Site.	3	3	4	2
e. Gap-filler Radar Site.	2	3	4	2
5. Knows the weapons used in the SAGE System and their employment.	1	1	1	1
6. Knows organization and function of the entire SAGE System.				
a. Understands the sources of radar and non-radar information.	2	3	6	2
b. Understands the communication network.	2	3	4	2
c. Understands the duties and responsibilities of SAGE Agencies down to the section level.	2	3	4	2
7. Knows the duties and responsibilities of the Direction Center Surveillance Section.	2	4	5	2
8. Evaluates visual presentation on Digital Mapping, and Situation Display Scopes and takes indicated action.				

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		(2)	(3)	(4)	(5)
		Sk	Crs	Sk	Crs
		(5)	(7)	(7)	(3)
REQUIRED KNOWLEDGE OR SKILL		Lvl	Lvl	Lvl	Lvl
a.	As Mapper, monitors and controls data entering the Direction Center Computer.				
(1)	Observes and interprets data displayed on the mapping scope.	4	5	6	3
(2)	Filters weather, clutter or other undesired returns.	4	5	6	3
b.	As Mapping Supervisor, understands and uses all features and categories available at the Mapping Supervisor's console.	2	3	6	1
c.	As Mapping Supervisor, utilizes Supervisor Monitor Console.				
(1)	Displays and evaluates the mapping performed by mappers.	2	3	6	-
(2)	Understands and uses as a basis for decisions, information displayed on the Digital Information Display.	3	4	6	2
(3)	Inserts data evaluation into Computer.	3	4	6	2
9.	As Mapping Supervisor, utilizes camera scopes.				
a.	Understands the meaning of each of the four warning lights.	5	6	6	-
b.	Starts and stops camera and insures exposure of film to only desired information.	4	5	6	-
c.	Controls exposure time of film.	4	5	6	-
10.	Understands and utilizes the Communication System provided to members of the Mapping Room.	4	5	6	4
11.	As Mapping Supervisor, supervises the work of others.				
a.	Instructs mappers on most effective mapping method.	3	4	6	2

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REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk Lvl	Crs Lvl	Sk Lvl	Crs Lvl
b. Insures that mappers follow established procedures.	3	4	6	2
12. Assumes during Manual Mode of Operation, the duties and responsibilities of Height Technician.				
a. Receives Site Assignment from his supervisor and makes insertion into computer.	4	4	6	4
b. Monitors and evaluates information requests on Digital Information Display Scopes.	4	4	6	3
c. Relays pertinent information to Height Operator at height finder site.	4	4	6	3
d. Receives and inserts Height Operator's height and/or flight reply into the computer by use of insertion switches.	4	4	6	3
13. Assumes the duties and responsibilities of Height Supervisor.				
a. Establishes method of operation of each site and inserts site status into computer.				
(1) Decides method of operation of each site and inserts site status into computer.	3	4	6	2
(2) Determines what sites must be operated in the emergency (manual) mode.	3	4	6	2
(3) Assigns manual site to the Height Technician.	3	4	6	2
(4) Changes site mode of operation as the situation dictates.	3	4	6	2
b. Utilizes Height Supervisor's console.				
(1) Understands and uses all features and categories available at the Height Supervisor's console.	3	4	6	2
(2) Evaluates visual presentation on Digital and Situation Display scopes on the Height Supervisor's console.	3	4	6	2

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REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk	Crs	Sk	Crs
	(5)	(7)	(7)	(3)
	Lvl	Lvl	Lvl	Lvl
(3) Takes corrective action on visual and audible alarms.	3	4	6	2
c. Establishes or changes computer height request priorities.	3	4	5	2
d. Inserts information from non-height-finding sources into the computer.	3	4	6	3
e. Understands the height priority system.	4	5	6	4
f. Coordinates with other Direction Center sections by use of phone.	4	4	6	3
g. Uses light gun to select height and auxiliary information on tracks.	3	5	6	2
h. Supervises the work of the Height Technicians.	2	4	6	1

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Annex L

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ADGM 30-1

SAGE SYSTEM OPERATION (TRACK INITIATION)
COURSE NR AL 27370-2
(LATERAL TRAINING)

1. Positions Covered:

- a. Track Initiator (TI)
- b. Initiation Supervisor (IS)
- c. Overlap Technician (OT)

(This Special Training Standard is based on information available 1 May 1956.)

2. Purpose of Standard:

- a. To indicate the required knowledge or skills necessary for an airman to perform the duties of Track Initiator or Initiation Supervisor AFSC 27370 or 27350. (Column 1)
- b. To reflect the minimum skill level required for each job element for qualification to the five (5) level and to show the extent of training received in Lateral Training Course Nr AL 27370-2. (Column 2)
- c. To show the extent of training received for the seven (7) level in Lateral Course Training Nr AL 27370-2. (Column 3)
- d. To reflect the minimum skill level recommended for each job element for qualification to the seven (7) level. (Column 4)
- e. To reflect the recommended extent of training given in a basic course covering these positions. (Column 5)
- f. To be used for coordination purposes.

3. Description of Lateral Course Nr AL 27370-2, SAGE System Operation (Track Initiation):

- a. This course is designed for entry of 27330, 27350, and 27370 students who have graduated from Course AB 27330 and have completed a minimum of six (6) months of field experience. Entering 27330 students will receive AFSC 27350 upon graduation.
- b. Laboratory instruction provided each student will consist of proficiency training in one (1) of the three (3) positions covered by this course. Familiarization training in the remaining two (2) positions as well as other secondary areas will be provided. Secondary areas are areas which encompass duties considered compatible and complementary to the primary duties.

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JCE TRAINING STANDARD

REQUIRED KNOWLEDGE OR SKILL	PROFICIENCY LEVEL			
	(2) Sk (5) Lvl	(3) Crs (7) Lvl	(4) Sk (7) Lvl	(5) Crs (3) Lvl
1. Knows the theory of pulsed radar.	2	3	4	2
2. Knows the quantization process.	2	3	4	2
3. Knows the process of transmitting range and azimuth information from Long Range and Gap-filler Radar Sites to the Direction Center.	2	3	4	2
4. Knows the employment, capabilities and characteristics of commonly used SAGE Radar equipments, including:				
a. Airborne Early Warning Radar.	2	2	4	2
b. Picket Ship.	2	2	4	2
c. Texas Tower.	2	3	4	2
d. Long Range Radar Site.	2	3	4	2
e. Gap-filler Radar Site.	1	1	4	1
5. Knows the weapons used in the SAGE System and their employment.	2	2	3	2
* * * * *	*	*	*	*
6. Knows the organization and function of the entire SAGE System.				
a. Understands the sources of radar and non-radar information.	2	4	6	2
b. Understands the communications network.	2	4	5	2
c. Understands the duties and responsibilities of SAGE Agencies down to the section level	2	3	4	2
7. Knows the duties and responsibilities of the Direction Center Surveillance Section.	3	4	5	2
* * * * *	*	*	*	*

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REQUIRED KNOWLEDGE OR SKILL	PROFICIENCY LEVEL			
	(2) Sk (5) Lvl	(3) Crs (7) Lvl	(4) Sk (7) Lvl	(5) Crs (3) Lvl
8. Prepares Track Initiator and Initiation Supervisor's situation consoles for the performance of the job.				
a. Utilizes display contraction or expansion features available at each of the consoles.	4	4	6	3
b. Reports malfunctions of his equipment.	4	5	6	3
9. Utilizes all features and categories available at his console.	4	5	6	3
10. Utilizes the communication system provided to the members of the Initiation Section.	4	5	6	3
11. Assumes the duties and responsibilities of Track Initiator.				
a. Maintains vigilance at position.				
(1) Selects categories applicable to the job.	4	4	6	3
(2) Surveys uncorrelated track data for possible initiation.	4	4	6	3
(3) Estimates speed and heading for insertion into computer.	4	5	6	3
(4) Confirms or rejects any tentative tracks.	4	4	6	3
(5) Assists in establishing other tracks, as directed.	4	4	6	3
b. Accomplishes initiation actions required by situation.				
(1) Confirms TENTATIVE Tracks	4	5	6	3
(2) Initiates SPLIT Tracks	4	5	6	3
(3) Initiates MANUAL INPUT Tracks.	4	5	6	3

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REQUIRED KNOWLEDGE OR SKILL	PROFICIENCY LEVEL			
	(2) Sk (5) Lvl	(3) Crs (7) Lvl	(4) Sk (7) Lvl	(5) Crs (3) Lvl
(4) Initiates INTERCEPTORS.	4	5	6	3
(5) Initiates uncorrelated track data.	4	5	6	3
12. Assumes the duties and responsibilities of Track Initiation Supervisor.				
a. Maintains vigilance at Track Initiation Supervisor position.				
(1) Coordinates matters pertaining to track initiation with the Air Surveillance and Tracking Officers.	3	3	6	-
(2) Operates the area discriminator as directed.	5	4	6	-
(3) Assigns areas for manual track initiation.	3	4	6	3
(4) Coordinates with the Mapping Supervisor concerning Radar inputs.	2	4	6	2
(5) Monitors operation of the track initiation process, and takes supervisory action as appropriate.	2	4	6	-
b. Accomplishes Initiation Supervisor's actions as the situation dictates.				
(1) Requests by switch action digital information required.	3	4	6	2
(2) Reacts favorably to visual and audible alarms.	4	4	6	3
(3) Assumes duties of Track Initiator when work load dictates.	3	4	6	3
c. Supervises the work of the Track Initiators.				
(1) Instructs on most effective initiation methods.	3	4	6	2
(2) Insures the following of established procedures.	4	6	6	2

UNCLASSIFIED

Annex L

ADCM 30-1

SAGE SYSTEM OPERATION (AIR SITUATION)
COURSE NUMBER AL-27370-3
(LATERAL TRAINING)

1. Positions Covered:

- a. Air Surveillance Officer (ASO)
- b. Tracking Officer (TO)
- c. Air Surveillance Technician (AST)
- d. Tracking Technician (TT)

(This Special Training Standard is based on information available 1 May 1956.)

2. Purpose of Standard:

- a. To indicate the required knowledge or skills necessary for an officer to perform the duties of an Air Surveillance and Tracking Officer. (Column 1)
- b. To reflect the minimum skill level required for each job element for qualification to the five (5) level and to show the extent of training received in Lateral Training Course Number AL 27370-3 (Column 2)
- c. To show the extent of training received at the seven (7) level in Lateral Training Course Number 27370-3. (Column 3)
- d. To reflect the minimum skill level recommended for each job element for qualification to the seven (7) level. (Column 4)
- e. To reflect the amount of knowledge or skill an officer must possess in each element in order to perform the duties in AFSC 1644. (Column 5)
- f. To be used for coordination purposes.

3. Description of Lateral Course Number 27370-3, SAGE System Operation (Air Situation):

- a. This course is designed for entry of warrant officers AFSC 27300 with a minimum of six (6) months of field experience and airmen, AFSC 27350 and 27370, who have graduated from Course AB 27330 and have a minimum of six (6) months of field experience.
- b. Laboratory instruction will consist of proficiency training in one (1) of the four (4) positions covered by this course. Familiarization training in the remaining positions as well as other secondary areas will be provided. Secondary areas are areas considered compatible and complementary to the primary training area.

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AICM 30-1

JOB TRAINING STANDARDPROFICIENCY LEVEL

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk Lvl	Crs Lvl	Sk Lvl	Officer Level
1. Knows the theory of pulsed radar.	2	3	4	4
2. Knows the quantization process.	2	3	4	4
3. Knows the process of transmitting range and azimuth information from Long Range and Gap-filler radar sites to the Direction Center.	2	3	4	4
4. Knows the employment, capabilities and characteristics of commonly used SAGE radar equipments, including:				
a. Airborne Early Warning Radar.	3	3	4	4
b. Picket Ship.	3	3	4	4
c. Texas Tower.	3	3	4	4
d. Long Range Radar Site.	3	3	4	4
e. Gap-filler Radar Site.	3	3	4	4
5. Knows the weapons used in the SAGE System and their employment.	3	3	4	5
6. Knows the organization and function of the entire SAGE System.				
a. Understands the sources of radar and non-radar information.	3	4	6	6
b. Understands the communication network.	3	4	5	6
c. Understands the duties and responsibilities of SAGE Agencies down to Section Level.	3	4	5	6
7. Knows the duties and responsibilities of the Direction Center Surveillance Section.	3	4	5	6
8. Uses communication equipment peculiar to his position.	3	4	6	6

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	(2) Sk (5) Lvl	(3) Grn (7) Lvl	(4) Sk (7) Lvl	(5) Officer Prof. Level
REQUIRED KNOWLEDGE OR SKILL				
9. Prepares the Air Surveillance Officer and Technician Console for the performance of the job.				
a. Selects features and categories necessary for the performance of the job.	3	4	6	6
b. Reports malfunction of his equipment.	2	4	6	6
10. Utilizes all features and categories available at his console.				
a. Manipulates switches to insert data into the computer.	3	4	6	6
b. Manipulates switches to obtain required data from the computer.	3	4	6	6
11. Assumes the duties and responsibilities of the Air Surveillance Officer or Air Surveillance Technician.				
a. Surveys and interprets the air situation.	3	4	6	6
b. Recommends operating procedures to Senior Director.	2	4	6	6
c. Insures the compliance with standard operating procedures by Air Surveillance personnel.	3	4	6	6
d. Supervises the processing of radar data.				
(1) Evaluates radar data from the Long Range sites and effects the necessary action.	3	4	6	6
(2) Makes necessary switch insertions to control computer masking process.	3	4	6	6
e. Monitors input radar data to select site status.				

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REQUIRED KNOWLEDGE OR SKILL	ADQM 30-1			
	(2) Sk (5) Lvl	(3) Crs (7) Lvl	(4) Sk (7) Lvl	(5) Officer Prof. Level
(1) Investigates data count analysis and effects the necessary action.	3	4	6	6
(2) Makes switch insertions to establish criteria for radar data acceptance.	3	4	6	6
(3) Coordinates with Mapping Supervisor.	3	4	6	6
(4) Coordinates with C & E Officer on matters that pertain to radar and Mark X equipments.	3	4	6	6
f. Requests, reads, and evaluates the following displays:				
(1) Track Summary.	3	4	6	6
(2) Monitoring Summary.	3	4	6	6
(3) Search Summary (Long Range input conditions).	3	4	6	6
(4) Mark X Summary.	3	4	6	6
(5) GFI (Gap-filler inputs) Summary.	3	4	6	6
(6) Crosstell Summary.	3	4	6	6
(7) Initiating Summary.	3	4	6	6
(8) Height Finding Summary.	3	4	6	6
(9) Track Raid or Group Tote (used to obtain information on a particular track, raid, or group).	3	4	6	6
g. Establishes or cancels automatic initiation.	2	4	6	6
h. Requests that the Tracking Officer monitor a particular track.	3	4	6	6
i. Coordinates with Senior Director on matters that pertain to the defense of the Subsector.	3	4	6	6

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ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk (5) Lvl	Crs (7) Lvl	Sk (7) Lvl	Officer Prof. Level
j. Supervises crossteling by selecting message and mode of transmission.	3	4	6	6
k. Designates subsector boundary conditions.	3	4	6	6
l. Supervises the quality of simulated data.	3	4	6	6
12. Assumes the duties and responsibilities of Tracking Officer or Tracking Technician.				
a. Controls work load of Track Monitors.				
(1) Activates or deactivates stations in the monitoring teams.	3	4	6	6
(2) Assigns areas and sub-areas to the Track Monitors.	3	4	6	6
b. Monitors tracking functions of the Direction Center.				
(1) Screens and assigns strategically important tracks.	3	4	6	6
(2) Screens and assigns tracks which appear to be transmitting emergency Mark X replies.	4	5	6	6
(3) Manually assigns tracks in tracking trouble in the overlap zone in cases where voice communication with adjacent subsector is desirable.	3	4	6	6
(4) Monitors the work of subordinates.	3	3	6	6

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REQUIRED KNOWLEDGE OR SKILL	(2) Sk (5) Lvl	(3) Crs (7) Lvl	(4) Sk (7) Lvl	(5) Officer Prof. Level
c. Coordinates with Weapons Director personnel and with Air Surveillance Officer in dropping tracks and in reinitiating extrapolated tracks.	3	3	6	6
d. Provides verbal track information to any Direction Center personnel requesting.	3	4	6	6

UNCLASSIFIED

ADGM 30-1

[REDACTED]

SAGE SYSTEM OPERATION (TRACK MONITORING)
COURSE NUMBER AL 27370-4
 (LATERAL TRAINING)

1. Positions Covered:

- a. Track Monitor (TM)
- b. Track Monitor Special (TMS)
- c. Tracking Supervisor (TS)

(This Special Training Standard is based on information available 1 May 1956.)

2. Purpose of Standard:

- a. To indicate the required knowledge and skills necessary for an airman to perform the duties of Track Monitor or Tracking Supervisor AFSC 27370 or 27350.
- b. To reflect the minimum skill level required for each job element for qualification to the five (5) level and to show the extent of training received in Lateral Training Course Number AL 27370-4. (Column 2)
- c. To show the extent of training received for the seven (7) level in Lateral Training Course Number AL 27370-4. (Column 3)
- d. To reflect the minimum skill level recommended for each job element for qualification to the seven (7) level. (Column 4)
- e. To reflect the recommended extent of training given in a basic course covering these positions. (Column 5)
- f. To be used for coordination purposes.

3. Description of Lateral Course Number AL 27370-4, SAGE System Operation (Track Monitoring):

- a. This course is designed for entry of 27330, 27350, and 27370 students who have graduated from Course AB 27330 and have completed a minimum of six (6) months of field experience. Entering 27330 students will receive AFSC 27350 upon graduation.
- b. Laboratory instruction provided each student will consist of proficiency training in one (1) of the three (3) positions covered by this course. Familiarization training in the remaining two (2) positions as well as other secondary areas will be provided. Secondary areas are areas which encompass duties considered compatible and complementary to the primary training area.

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ADGM 30-1

JOB TRAINING STANDARD

PROFICIENCY LEVEL

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk (5) Lvl	Crs (7) Lvl	Sk (7) Lvl	Crs (3) Lvl
1. Knows the theory of pulsed radar.	2	3	4	-
2. Knows the quantization process.	2	3	4	-
3. Knows the process of transmitting Range and Azimuth information from Long Range and Gap-filler Radar Sites to the Direction Center.	2	3	4	-
4. Knows the employment, capabilities and characteristics of commonly used SAGE Radar equipments, including:				
a. Airborne Early Warning Radar.	2	2	4	-
b. Picket Ship.	2	2	4	-
c. Texas Tower.	3	3	4	-
d. Long Range Radar Site.	3	3	4	-
e. Gap-filler Radar Site.	2	3	4	-
5. Knows the weapons used in the SAGE System and their employment.	3	4	5	-
* * * * * *	* *	* *	* *	* *
6. Knows the organization and function of the entire SAGE System.				
a. Understands the sources of radar and non-radar information.	3	4	6	-
b. Understands the communications network.	3	4	5	-
c. Understands the duties and responsibilities of SAGE Agencies down to the Section Level.	2	3	4	-

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Annex L



ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk (5) Lvl	Grp (7) Lvl	Sk (7) Lvl	Grp (3) Lvl
7. Knows the duties and responsibilities of the Direction Center Surveillance Section.	3	4	5	2
8. Prepares Track Monitor, Track Monitor Special and Tracking Supervisor situation consoles for the performance of his job.				
a. Utilizes display contraction or expansion features available at each of the consoles.	4	5	6	2
b. Reports malfunctions of his equipment.	4	4	6	3
9. Utilizes all features and categories available at his console.	4	4	6	3
10. Utilizes the communication system provided to members of the Tracking Section.	5	5	6	4
11. Assumes the duties and responsibilities of				
a. Maintains vigilance at position.				
(1) Selects categories applicable to the job.	5	4	6	4
(2) Surveys the development of trouble-track situations in his area.	4	4	6	4
(3) Observes the priority and type of trouble tracks presented to him for monitoring.	4	4	6	3
(4) Anticipates the development of trouble tracks and takes action to prevent their development where possible.	4	4	6	3
b. Accomplishes monitoring actions required by type of trouble.				
(1) Clears "no trouble" track from his display.	5	5	6	4

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REQUIRED KNOWLEDGE OR SKILL

	(2) Sk (5) Lvl	(3) Crs (7) Lvl	(4) Sk (7) Lvl	(5) Crs (3) Lvl
(2) Assigns lost tracks to Track Monitor Special.	5	5	6	4
(3) Re-associates a track with its data.	5	5	6	5
(4) Allows a track to be Dead-Reckoned.	5	5	6	5
(5) Exchanges track designations for close and crossing tracks when necessary.	5	5	6	4
(6) Assigns track to his Tracking Supervisor.	5	5	6	4
(7) Associates known lost tracks with tentative tracks.	5	5	6	3
12. Assumes the duties and responsibilities of Tracking Supervisor.				
a. Maintains vigilance at Tracking Supervisor position.				
(1) Surveys the development of track-trouble situations in the sub-sector.	3	5	6	-
(2) Evaluates Track Monitor's work load and efficiency of operation.	3	5	6	-
(3) Recommends change in Track Monitors or Track Monitor work loads as situation dictates.	3	5	6	-
(4) Observes and evaluates tracks automatically referred to him.	3	4	6	-
(5) Observes and evaluates Digital information.	4	4	6	-



ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk (5) Lvl	Crs (7) Lvl	Sk (7) Lvl	Crs (3) Lvl
(6) Reacts favorably to visual and audible alarms.	5	4	6	-
b. Accomplishes Tracking Supervisor actions as the situation dictates.				
(1) Takes indicated action on tracks referred to him.	4	4	6	-
(2) Assigns particular tracks to Track Monitors.	4	4	6	3
c. Supervises the work of the Track Monitor Special and all Track Monitors.				
(1) Instructs on most effective monitoring methods.	3	4	6	-
(2) Insures the following of established procedures.	4	5	6	-
13. Assumes the duties and responsibilities of Track Monitor Special.				
a. Seeks information on lost tracks from other members of the Direction Center.	4	4	6	3
b. Takes appropriate action on lost tracks.	4	4	6	3
c. Utilizes digital information displays to obtain information required for the dispatch of his duties.	4	4	6	3
d. Inserts appropriate switch actions.	4	4	6	3
e. Evaluates situation display.	4	4	6	3

ADCM 30-1

SAGE SYSTEM OPERATION (AIR TACTICS)
COURSE NUMBER AL 27370-5
(LATERAL TRAINING)

1. Positions Covered:

- a. Air Tactics Officer (ATO)
- b. Air Tactics Technician (ATT)

(This Special Training Standard is based on information available 1 May 1956.)

2. Purpose of Standard:

- a. To indicate the required knowledge or skills necessary for an officer to perform the duties of an Air Tactics Officer. (Column 1)
- b. To indicate the required knowledge or skills necessary for an airman to perform the duties of an Air Tactics Technician, AFSC 27370 or 27350. (Column 1)
- c. To reflect the minimum knowledge or skill an officer must possess in each element in order to function as an Air Tactics Officer. (Column 5)
- d. To reflect the amount of knowledge or skill an airman must possess in each element in order to perform his duties at the five (5) level. (Column 2)
- e. To reflect the minimum skill level recommended for each job element for qualification to the seven (7) level. (Column 4)
- f. To reflect the extent of training given in Lateral Training Course Number AL 27370-5. (Column 3)
- g. To use for coordination purposes.

3. Description of Lateral Course Number AL 27370-5, SAGE System Operation (Air Tactics):

- a. This course is designed for entry of warrant officers, AFSC 27300, with a minimum of six (6) months of field experience and airmen, AFSC 27350 and 27370, who have graduated from Course AB 27330 and have a minimum of six (6) months of field experience.
- b. Laboratory instruction will consist of proficiency training in one (1) of the two (2) positions covered by this course. Familiarization training in the remaining position as well as other secondary areas will be provided. Secondary areas are areas considered compatible and complementary to the primary training area.

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REQUIRED KNOWLEDGE OR SKILL	PROFICIENCY LEVEL			
	(2) Sk (5) Lvl	(3) Crs (7) Lvl	(4) Sk (7) Lvl	(5) Officer Prof. Level
1. Knows the theory of Pulsed Radar.	2	3	4	4
2. Knows the Quantization Process.	2	3	4	4
3. Knows the process of transmitting range and azimuth information from Long Range and Gap-filler Radar sites to the Direction Center.	2	3	4	4
4. Knows the employment, capabilities and characteristics of commonly used SAGE Radar equipments, including:				
a. Airborne Early Warning Radar.	2	3	4	4
b. Picket Ship.	2	3	4	4
c. Texas Tower.	2	3	4	4
d. Long Range Radar Site.	2	3	4	4
e. Gap-filler Radar Site.	2	3	4	4
5. Knows the weapons used in the SAGE System and their employment.	2	4	6	6
6. Knows the organization and function of the entire SAGE System.				
a. Understands the sources of Radar and Non-Radar information.	2	4	6	6
b. Understands the communication network.	2	4	6	6
c. Understands the duties and responsibilities of SAGE Agencies down to Section Level.	3	4	6	6
7. Knows the duties and responsibilities of the Direction Center Weapons Section.	3	4	6	6
8. Knows the duties and responsibilities of the Direction Center Surveillance Section.	3	4	6	6
9. Uses communication equipment peculiar to his position.	4	4	6	6

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Annex L

ADCM 30-1

[REDACTED]

REQUIRED KNOWLEDGE OR SKILL

(2)	(3)	(4)	(5)
Sk	Crs	Sk	Officer
(5)	(7)	(7)	Prof.
Lvl	Lvl	Lvl	Level

- | | | | | | |
|-----|---|---|---|---|---|
| 10. | Prepares the Air Tactics Officer and Technician consoles for the performance of the job. | | | | |
| a. | Selects feature and categories necessary for performance of the job. | 4 | 4 | 6 | 6 |
| b. | Reports malfunctions of his equipment. | 4 | 4 | 6 | 6 |
| 11. | Assumes the duties and responsibilities of the Air Tactics Officer or Air Tactics Technician. | | | | |
| a. | Accomplishes raid formation as required by the air situation. | | | | |
| (1) | Coordinates with the Tracking Officer. | 4 | 4 | 6 | 6 |
| (2) | Inserts into computer raid lead track. | 4 | 4 | 6 | 6 |
| (3) | Selects and inserts additional tracks to be included in the raid. | 4 | 4 | 6 | 6 |
| (4) | Takes appropriate action on tracks leaving raid correlation limits. | | | | |
| (a) | Reinitiates track into raid, or | 4 | 4 | 6 | 6 |
| (b) | Drops track from raid. | 4 | 4 | 6 | 6 |
| (5) | Combines raids when the situation dictates. | 4 | 4 | 6 | 6 |
| (6) | Forms new raids from a position of a raid that separated from the parent raid. | 4 | 4 | 6 | 6 |
| (7) | Changes lead track to indicate the most realistic situation. | 4 | 4 | 6 | 6 |
| (8) | Drops raid of lowest priority when situation dictates. | 4 | 4 | 6 | 6 |

ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk (5) Lvl	Crs (7) Lvl	Sk (7) Lvl	Officer Prof. Level
b. Accomplishes group formation as required by situation.				
(1) Coordinates with Senior Director and Senior Weapons Director.	4	4	6	6
(2) Selects and inserts lead interceptor in the group.	4	4	6	6
(3) Interprets digital information and decides what tracks should be added to group.	4	4	6	6
(4) Adds to the group all interceptors belonging to the group.	4	4	6	6
(5) Drops interceptors from group on the basis of AD and alarm caused by Weapons Deassign or reassignment.	4	4	6	6
(6) Combines two or more groups as situation dictates.	4	4	6	6
(7) Drops groups.	4	4	6	6
(8) Forms new group from a portion of a group that separated from the parent group because of Senior Weapons Direction action.	4	4	6	6
(9) Periodically monitors aircraft within groups and insures a constant, accurate summary is being forward told.	4	4	6	6
c. Monitors all forward told messages to Combat Center.				
(1) Manually selects and inserts items of greater value than those automatically forward told.	3	4	6	6
(2) Consolidates subsector air situation on details into summary.	3	4	6	6
(3) Insures summary items do not exceed design limits.	5	5	6	6

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ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk	Crs	Sk	Officer
	(5)	(7)	(7)	Prof.
	Lvl	Lvl	Lvl	Level

d. Insures the coordinated transfer of raids or groups between subsectors.

(1) Hands over outgoing raids or groups.

(a) Hands over lead element of raid or group. 3 4 6 6

(b) Provides information requested by receiving subsector. 4 4 6 6

(2) Receives incoming raids or groups.

(a) Accepts handover of lead element in raid or group. 4 4 6 6

(b) Obtains information which has been received after handover of lead element, from releasing subsector. 4 4 6 6

UNCLASSIFIED

Annex L

UNCLASSIFIED

ADCM 30-1

SAGE SYSTEM OPERATION (MANUAL INPUTS)
COURSE NUMBER AL 27370-6
(LATERAL TRAINING)

1. Positions Covered:

- a. Manual Inputs Technician (MIT)
- b. Manual Inputs Supervisor (MIS)

(This Special Training Standard is based on information available 1 May 1956.)

2. Purpose of Standard:

- a. To indicate the required knowledge and skills necessary for an airman to perform the duties of Manual Inputs Technician or Manual Inputs Supervisor AFSC 27370 or 27350. (Column 1)
- b. To reflect the minimum skill level required for each job element for qualification to the five (5) level and to show the extent of training received in Lateral Training Course Number AL 27370-6 (Column 2)
- c. To show the extent of training received for the seven (7) level in Lateral Training Course Number AL 27370-6. (Column 3)
- d. To reflect the minimum skill level recommended for each job element for qualification to the seven (7) level. (Column 4)
- e. To reflect the recommended extent of training given in a basic course covering these positions. (Column 5)

3. Description of Lateral Course Number AL 27370-6, SAGE System Operation (Manual Inputs):

- a. This course is designed for entry of 27330, 27350, and 27370 students who have graduated from Course AL 27330 and have completed a minimum of six (6) months of field experience. Entering 27330 students will receive AFSC 27350 upon graduation.
- b. Laboratory instruction provided each student will consist of proficiency training in one (1) of the two (2) positions covered by this course. Familiarization training in the remaining position as well as other secondary areas will be provided. Secondary areas are areas which encompass duties considered compatible and complementary to the primary training area.

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ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	PROFICIENCY LEVEL			
	(2)	(3)	(4)	(5)
	Sk (5) Lvl	Crs (7) Lvl	Sk (7) Lvl	Crs (3) Lvl
1. Knows the theory of pulsed radar.	2	2	2	2
2. Knows the quantization process.	2	2	2	2
3. Knows the process of transmitting range and azimuth information from long range and gap-filler radar sites to the Direction Center.	2	2	2	2
4. Knows the employment, capabilities and characteristics of commonly used SAGE radar equipments, including:				
a. Airborne Early Warning Radar.	2	3	3	2
b. Picket ship.	2	3	3	2
c. Texas Tower.	3	4	5	2
d. Long Range Radar Site.	3	4	5	2
e. Gap-filler Radar Site.	2	2	2	2
5. Knows the weapons used in the SAGE System and their employment.	2	2	2	2
6. Knows the organization and function of the entire SAGE System.				
a. Understands the sources of radar and non-radar information.	2	3	5	2
b. Understands the communication network.	2	3	4	2
c. Understands the duties and responsibilities of SAGE agencies down to the section level.	2	3	4	2
7. Knows the duties and responsibilities of the Direction Center Surveillance Section.	2	3	4	2

ADQM 30-1

REQUIRED KNOWLEDGE OR SKILL

	(2) Sk (5) Lvl	(3) Crs (7) Lvl	(4) Sk (7) Lvl	(5) Crs (3) Lvl
8. Receives, processes and transcribes incoming information.				
a. Receives and understands incoming information in its standard format.	4	6	6	3
b. Transcribes incoming information on transcription card.	4	6	6	4
c. Inserts into computer, by use of Insertion Switches, AA Engagement status.	4	5	6	3
9. Punches cards with 026 or 020 card punch.				
a. Air movement information service data (Flight Plans).	4	4	5	3
b. AA Operational Status.	4	4	5	3
c. Manual crosstell data.	4	4	5	3
(1) AEW&C	4	4	5	3
(2) Picket Ships.	4	4	5	3
(3) GOC Filter Center	4	4	5	3
(4) Manual Direction Centers.	4	4	5	3
d. Weapons status reports.	4	4	5	3
e. Air Base Weather.	4	4	5	3
f. Winds aloft.	4	4	5	3
g. Miscellaneous Inputs.				
(1) Parameter control cards.				
(a) Status of radar sites.	4	4	5	3

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REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk (5) Lvl	Crs (7) Lvl	Sk (7) Lvl	Crs (3) Lvl
(b) AAOC capacity.	4	4	5	3
(2) Operational air base status.	4	4	5	3
(3) Zero velocity tracks.	4	4	5	3
10. Operates O20 as card reader.	5	5	6	3
11. Verifies data.				
a. Visually compares transcription card with punched card for verification of:				
(1) Weapons status.	6	6	6	5
(2) Airbase weather.	6	6	6	5
(3) Track data.	6	6	6	5
b. Makes punch comparison with O56 verifier.				
(1) Flight Plans.	4	4	6	3
(2) AA Operational status.	4	4	6	3
(3) Terminal weather reports.	4	4	6	3
c. Reads back to source data for verification.				
(1) Winds aloft.	4	6	6	3
(2) Miscellaneous data originating at Direction Center.	4	6	6	3
12. Operates receiving only teletypewriter.				
a. Turns machine ON or OFF.	6	6	6	5
b. Replaces paper and teletypewriter ribbon.	5	5	6	5

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REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk	Crs	Sk	Crs
	(5)	(7)	(7)	(3)
	Lvl	Lvl	Lvl	Lvl
c. Cleans type.	5	5	6	5
d. Recognizes malfunctions.	4	5	6	4
e. Reports malfunctions to his supervisor.	4	5	6	4
13. Operates telephone.				
a. Uses proper telephone procedures.	4	5	6	4
b. Knows communication system available in the Manual Inputs Room	4	5	5	3
14. Exercises proper care of equipment.	4	5	6	4

ANNEX 30-1

SAGE SYSTEM OPERATION (IDENTIFICATION)
COURSE NUMBER AL 27370-7
(LATERAL TRAINING)

1. Positions Covered:

- a. Identification Officer (IDO)
- b. Identification Technician (IDT)

(This Special Training Standard is based on information available 1 May 1956.)

2. Purpose of Standard:

- a. To indicate the required knowledge or skill necessary for an officer to perform the duties of an Intercept Controller - Identification. (Column 1)
- b. To indicate the required knowledge or skill necessary for an airman to perform the duties of an Identification Technician. (Column 1)
- c. To reflect the minimum skill level an officer must possess in each element to function as an Intercept Controller - Identification. (Column 5)
- d. To reflect the amount of knowledge or skill an airman must possess in each element in order to qualify at the five (5) level. (Column 2)
- e. To reflect the minimum skill level recommended for each job element for qualification to the seven (7) level. (Column 4)
- f. To reflect the extent of training of Lateral Training Course Number AL 27370-7. (Column 3)

3. Description of Lateral Course Number AL 27370-7, SAGE System Operation (Identification):

- a. This course is designed for entry of warrant officers, AFSC 27300, with a minimum of six (6) months of field experience and airmen, AFSC 27350 and 27370, who have graduated from Course AB 27330 and have a minimum of six (6) months of field experience.
- b. Laboratory instruction provided each student will consist of proficiency training in one (1) of the two (2) positions covered by this course. Familiarization training in the remaining position as well as other secondary areas will be provided. Secondary areas are areas which encompass duties considered compatible and complementary to the primary training area.

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ADCM 30-1

PROFICIENCY LEVEL

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk (5) Lvl	Crs (7) Lvl	Sk (7) Lvl	Officer Prof. Level
1. Knows the theory of pulsed radar.	3	3	3	3
2. Knows the quantization process.	3	3	3	3
3. Knows the process of transmitting range and azimuth information from long range and gap-filler radar sites to the Direction Center.	3	3	3	3
4. Knows the employment, capabilities and characteristics of commonly used SAGE radar equipments, including:				
a. Airborne Early Warning Radar.	2	3	3	3
b. Picket Ship.	2	3	3	3
c. Texas Tower.	3	4	5	5
d. Long Range Radar Site.	3	4	5	5
e. Gap-filler Radar Site.	2	2	2	2
5. Knows the weapons used in the SAGE System and their employment.	2	2	2	2
6. Knows the organization and function of the entire SAGE System:				
a. Understands the sources of radar and non-radar information.	3	3	5	5
b. Understands the communication network.	2	3	5	5
c. Understands the duties and responsibilities of SAGE Agencies down to the Section Level.	2	3	4	4
7. Knows the duties and responsibilities of the Direction Center Surveillance Section.	2	3	4	4
8. Knows the duties and responsibilities of the Direction Center Identification Section.	5	5	6	6
9. Prepares the Identification Officer and the two (2) Identification Technician consoles for the performance of the job.				
a. Utilizes display contraction or expansion features available at each of the consoles.	5	5	6	6
b. Reports malfunctions of his equipment.	5	5	6	6

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Annex L

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ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk (5) Lvl	Crs (7) Lvl	Sk (7) Lvl	Officer Prof. Level
10. Utilizes all features and categories available at his console.	4	4	5	5
11. Utilizes the communication system provided to members of the Identification Section.	4	4	6	6
12. Identifies pending tracks.				
a. Uses station 102 or 104.				
(1) Requests "Times Eight" expansion of the proper area.	5	5	5	5
(2) Requests digital display on pending track and on air movements data believed to correspond to the track.	4	5	5	5
(3) Compares data and decides if a correlation exists.	5	5	5	5
(4) Identifies and directs computer to correlate track.	4	5	6	6
(5) Refers doubtful decisions to Identification Officer.	5	5	5	5
b. Uses Station 103.				
(1) Acknowledges alarm alerting him to appearance of pending track.	6	6	6	6
(2) Requests special expanded display.	6	6	6	6
(3) Requests correlation box on Air Movement data believed to correspond to the track.	4	5	5	6
(4) Directs flight (through Air Movement Information Section) to execute any required maneuver.	5	5	5	6
(5) Observes maneuver through the use of track history.	4	5	5	6
(6) Decides whether Air Movements Data and pending track correlate.	5	5	5	6

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ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk (5) Lvl	Crs (7) Lvl	Sk (7) Lvl	Officer Prof. Level
(7) Directs computer to identify track and correlate track with Air Movements data, or	4	4	4	5
(8) Identifies track as unknown or hostile.	4	4	5	6
(9) May advise the Senior Weapons Director of the reasons and/or circumstances surrounding his decision.	4	5	5	6
13. Assumes the duties and responsibilities of Identification Officer.				
a. Supervises and assigns duties to Identification Technicians.				
(1) Assigns particular tracks or areas of responsibility.	2	4	5	5
(2) Monitors the identification made by Identification Technicians.	2	4	5	5
(3) Makes decision when Identification Technician is in doubt or in error.	2	4	5	6
b. Reidentifies tracks that have dropped out or correlation.				
(1) Requests proper displays.	4	4	5	5
(2) Requests further information from Manual Inputs Room or Air Movements Information Section.	4	4	5	5
(3) Evaluates information and decides future actions.	2	4	5	5
c. Reidentifies tracks to late flight plans.				
(1) Requests expanded display around late flight plan.	6	6	6	6
(2) Investigates area for correlation of late flight plan to tracks previously identified or to new pending tracks.	4	5	5	5

ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk (5) Lvl	Crn (7) Lvl	Sk (7) Lvl	Officer Prof. Level
(3) Directs computer to identify or reidentify track and to correlate track with Air Movements Data.	4	4	4	5
(4) Notifies the Senior Weapons Director when reidentification of a track is made.	2	4	5	6
d. Directs the use of, or discontinuance of, Open Areas.	2	4	5	5
e. Releases display slots as the situation dictates.	2	4	5	5
f. Drops Air Movements Data to provide storage space for more current flight plans.				
(1) Selects air movements data to be dropped.	3	4	5	5
(2) Notifies Manual Inputs Supervisor of Air Movements Data to be dropped.	3	4	5	6
(3) Directs the computer to drop Air Movements Data.	4	4	5	5
g. Evaluates information from interceptor pilots, Ground Observer Corps, or other miscellaneous sources in reviewing past decisions.	2	4	5	5
h. Requests information from Interceptor Pilot through the Intercept Director.	2	4	5	5
14. Assumes the duties and responsibilities of Identification Technician Number 1.				
a. Maintains vigilance over track identified as Hostile or Unknown and advises Identification Officer of any change.	2	5	5	5

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ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2) Sk (5) Lvl	(3) Crs (7) Lvl	(4) Sk (7) Lvl	(5) Officer Prof. Level
b. Concerns himself with Late Flight Plan.				
(1) Notifies Identification Officer of the existence and location of late flight plan's air movements data.	5	5	5	6
(2) May perform reidentification, on request of Identification Officer.	4	5	5	6
15. Assumes the duties and responsibilities of Identification Technician Number 2.				
a. Concerns himself with number of flight plans in the system.	5	5	5	5
b. Advises the Identification Officer when the number of flight plans nears the maximum capacity of the system.	5	5	5	5
16. As Identification Technician 1 or 2, continuously surveys the air situation and assists the Identification Officer in the identification of tracks.	4	5	5	6

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ADCM 30-1

SAGE SYSTEM OPERATION (INTERCEPT DIRECTION)
COURSE NUMBER AL-27370-8
(LATERAL TRAINING)

1. Positions Covered:

- a. Intercept Director (IND)
- b. Intercept Director Technician (INDT)

(This Special Training Standard is based on information available 1 May 1956.)

2. Purpose of Standard:

- a. To indicate the required knowledge or skills necessary for an officer to perform the duties of an Intercept Director. (Column 1)
- b. To indicate the required knowledge or skills necessary for an airman to perform the duties of an Intercept Director Technician AFSC 27370 or 27350. (Column 1)
- c. To reflect the amount of knowledge or skill level an officer must possess in each element in order to function as a 1644. (Column 5)
- d. To reflect the minimum skill an airman must possess in each element in order to qualify at the five (5) level. (Column 2)
- e. To reflect the minimum skill level recommended for each job element for qualification to the seven (7) level. (Column 4)
- f. To reflect the extent of training received in Lateral Training Course Number AL 27370-8. (Column 3)
- g. To use for coordination purposes.

3. Description of Lateral Course Number AL-27370-8, SAGE System Operation (Intercept Direction):

- a. This course is designed for entry of officer graduates of Course 164100 with a minimum of six (6) months of field experience and airmen, AFSC 27350 and 27370, who have graduated from Course AB 27330 and have a minimum of six (6) months of field experience.
- b. Laboratory instruction will consist of proficiency training in one (1) of the two (2) positions covered by this course. Familiarization training in the remaining position as well as other secondary areas will be provided. Secondary areas are areas considered compatible and complementary to the primary training area.

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ADCM 30-1

JOB TRAINING STANDARD

REQUIRED KNOWLEDGE OR SKILL	<u>PROFICIENCY LEVEL</u>			
	(2) Sk (5) Lvl	(3) Crs (7) Lvl	(4) Sk (7) Lvl	(5) Officer Prof. Level
1. Knows the theory of pulsed radar.	2	2	3	3
2. Knows the Quantization process.	2	2	3	3
3. Knows the process of transmitting range and azimuth information from long range and gap-filler sites to the Direction Center.	2	2	3	3
4. Knows the employment, capabilities and characteristics of commonly used SAGE radar equipments, including:				
a. Airborne Early Warning Radar.	2	2	3	3
b. Picket ship.	2	2	3	3
c. Texas Tower.	2	2	3	3
d. Long Range Radar Site.	2	2	3	3
e. Gap-filler Radar Site.	2	2	3	3
5. Knows the weapons used in the SAGE System and their employment.	2	3	4	5
6. Knows the organization and function of the entire SAGE System.				
a. Understands the sources of radar.	3	3	4	4
b. Understands the communication network.	3	3	5	5
c. Understands the duties and responsibilities of SAGE Agencies down to section level.	2	2	4	5

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 ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk (5) Lvl	Ors (7) Lvl	Sk (7) Lvl	Officer Prof. Level
7. Knows the duties and responsibilities of the Direction Center Weapons Section.	2	3	4	5
8. Uses common intercept tactics and techniques.	2	2	3	5
9. Uses communications equipment peculiar to the position.	3	3	5	5
10. Uses approved radio telephone procedures.	3	3	5	5
11. Knows the role weather plays in interception.	2	2	4	5
12. Prepares the Intercept Director and Technician consoles for the performance of the job.				
a. Selects features and categories necessary for the performance of the job.	3	3	5	5
b. Reports malfunctions of his equipment.	3	3	4	5
13. Controls aircraft on intercept missions.				
a. Acknowledges assignment of interceptor.	3	3	4	5
b. Request reidentification of friendlies, specials, round robins, and fakers to interceptor for use in intercept missions.	2	3	4	5
c. Selects tactics and parameters to be employed.	3	3	4	5
d. Inserts into computer tactics and parameters to be used.	3	3	4	5
e. Establishes radio contact with pilot and provides him with climb data.	2	3	4	5

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ADQM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk (5) Lvl	Crs (7) Lvl	Sk (7) Lvl	Officer Prof Level
f. Initiates on assigned interceptors.	3	3	3	5
g. Refers interceptor to the tracking section for initiation and monitoring.	3	3	4	5
h. Briefs pilot on type of mission to be run.	2	2	3	5
i. Provides pilot with vectoring instructions throughout the mission.	2	2	3	5
j. Receives and inserts into the computer information from the pilot throughout the mission.	3	3	4	5
k. Uses data-link.				
(1) Assists pilot in checking out data-link.	2	3	3	5
(2) Monitors data-link instructions and advises pilot of errors in transmission.	2	3	3	5
l. Maintains contact with pilot and provides him with information essential to success of the mission and to his safety.	2	2	3	5
m. Requests information from computer necessary to the accomplishment of his mission.	3	3	4	5
n. Hands control of aircraft to return-to-base Director.	3	3	4	5
14. Controls aircraft on Combat Air Patrol.				
a. Receives and acknowledges telephone call from Weapons Director describing mission to be run.	3	3	4	5

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ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)	(5)
	Sk (5) Lvl	Crs (7) Lvl	Sk (7) Lvl	Officer Prof. Level
b. Requests reidentification of friendlies, specials, round robins, and fakers for use in Combat Air Patrol.	2	3	4	5
c. Briefs and directs pilot throughout the mission.	2	3	3	5
d. Inserts information received from pilot and all mission parameters.	3	3	4	5
e. May designate interceptor for return-to-base.	2	3	4	5
15. Controls aircraft on return-to-base.				
a. Makes radio contact with pilot.	2	2	3	5
b. Briefs and directs pilot toward recovery base, or	2	3	3	5
c. Monitors data-link control of return-to-base.	2	3	3	5
d. Requests digital information pertaining to the program of the mission.	3	3	5	5
e. Drops interceptor.	2	3	4	5
16. Controls deployment of aircraft.				
a. Controls the flight of aircraft to bases indicated on buttons. (This element consists of the following sequence of elements already mentioned: 13.a., 13.c., 13.d., 13.e., 13.i., 13.j., 13.k(1), 13.k(2), 13.l., and 13.m.)	3	3	4	5

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ADCM 30-1



	(2)	(3)	(4)	(5)
	Sk	Crs	Sk	Officer
REQUIRED KNOWLEDGE OR SKILL	(5)	(7)	(7)	Prof.
	Lvl	Lvl	Lvl	Lvl
b. Controls the flight of aircraft to points in subsector not indicated on buttons. (This element consists of element 16.b.(1) plus the following sequence of elements already mentioned: 13.2., 13.c., 13.d., 13.e., 13.i., 13.j., 13.k.(1), 13.k.(2), 13.l., and 13.m.)				
(1) Requests zero velocity vector over point in subsector to which aircraft is being steered.	2	3	4	5
c. Controls rescue aircraft to points on subsector not indicated on buttons. (This element consists of element 16.c.(1) plus the following sequence of elements already mentioned: 13.a., 13.c., 13.d., 13.e., 13.i., 13.j., 13.k.(2), 13.l., and 13.m.)				
(1) Requests zero velocity vector over place where aircraft went down.	2	3	4	5
17. Exchanges control of aircraft on mission.				
a. Transfers control of aircraft to other Intercept Director in the Direction Center.	2	3	4	5
b. Transfers control of aircraft to other Intercept Director in another Direction Center.	2	3	4	5
c. Receives control of aircraft from an Intercept Director in the same Direction Center.	2	3	4	5
d. Receives control of aircraft from an Intercept Director in another Direction Center.	2	3	4	5

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ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2) Sk (5) Lvl	(3) Crs (7) Lvl	(4) Sk (7) Lvl	(5) Officer Prof. Level
18. Assumes the duties and responsibilities of Simulation Supervisor.				
a. Controls starting and stopping of magnetic tape.	3	3	5	5
b. Supervises and aids the simulation of interceptors.	3	3	5	5
c. Manually generates returns for non-interceptor tracks.	3	3	5	5
19. Assumes the duties and responsibilities of Simulator.				
a. Assumes the role of one or more simulated pilots during all phases of an interception.	3	3	5	5
b. Performs the tasks required to simulate the recovery of interceptors.	3	3	5	5

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ADCM 27-1

SAGE SYSTEM OPERATION (WEAPONS DIRECTION)
COURSE NUMBER AL 27370-9
(LATERAL TRAINING)

1. Positions Covered:

- a. Weapons Director (WD)
- b. Weapons Director Technician (WDT)

(This Special Training Standard is based on information available 1 May 1956.)

2. Purpose of Standard:

- a. To indicate the required knowledge or skills necessary for an officer to perform the duties of a Weapons Director. (Column 1)
- b. To indicate the required knowledge or skills necessary for an airman to perform the duties of a Weapons Director Technician. (Column 1)
- c. To reflect the minimum skill level an officer must possess in each element in order to function as a Weapons Director. (Column 4)
- d. To reflect the minimum skill level recommended for each job element for qualification to the seven (7) level. (Column 3)
- e. To reflect the extent of training received in Lateral Training Course Number AL 27370-9. (Column 2)
- f. To use for coordination purposes.

3. Description of Lateral Course Number AL 27370-9, SAGE System (Weapons Direction):

- a. This course is designed for entry of officer graduates of Course 164100 with a minimum of six (6) months of field experience and airmen, AFSC 27370, who have graduated from Course AB 27330 and have a minimum of six (6) months of field experience.
- b. Laboratory instruction provided each student will consist of proficiency training in one (1) of the two (2) positions covered by this course. Familiarization training in the remaining position as well as other secondary areas will be provided. Secondary areas are areas which encompass duties considered compatible and complementary to the primary training area.

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ADCM 30-1

JOB TRAINING STANDARD

REQUIRED KNOWLEDGE OR SKILL	<u>PROFICIENCY LEVEL</u>		
	(2) Crs (7) Lvl	(3) Sk (7) Lvl	(4) Officer Prof. Level
1. Knows the theory of pulsed radar.	3	3	3
2. Knows the quantization process.	3	3	3
3. Knows the process of transmitting range and azimuth information from long range and gap-filler radar sites to the Direction Center.	3	3	3
4. Knows the employment, capabilities and characteristics of commonly used SAGE radar equipments, including:			
a. Airborne Early Warning Radar.	2	3	3
b. Picket ship.	2	3	3
c. Texas Tower.	2	3	3
d. Long Range Radar Site.	2	3	3
e. Gap-filler Radar Site.	2	3	3
5. Knows the weapons used in the SAGE System and their employment.	3	4	6
6. Knows the organization and function of the entire SAGE System:			
a. Understands the sources of radar and non-radar information.	2	3	4
b. Understands the communication network.	2	3	4
c. Understands the duties and responsibilities of SAGE Agencies down to section level.	2	5	5
7. Knows the duties and responsibilities of the Direction Center Weapons Section.	3	5	5

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REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)
	Crs (7) Lvl	Sk (7) Lvl	Officer Prof. Level
8. Assumes the duties and responsibilities of Intercept Director.			
a. Uses common intercept tactics and techniques.	2	5	5
b. Uses approved Radio Telephony Procedures in running intercept missions.	3	5	5
c. Controls aircraft on intercept missions, or	-	-	5
d. Assists in the control of aircraft on intercept missions.	2	5	-
e. Controls aircraft on combat-air patrol, or	-	-	5
f. Assists in the control of aircraft on combat-air patrol.	2	5	-
g. Controls aircraft on return-to-base, or	-	-	5
h. Assists in the control of aircraft on return-to-base.	2	5	-
i. Controls the deployment of aircraft.	-	-	5
j. Assists in the deployment of aircraft.	2	5	-
k. Exchanges control of aircraft on mission, or	-	-	5
l. Assists in the exchanging of control of aircraft on mission.	2	5	-
9. Knows the role weather plays in interception.	3	4	5
10. Knows the activities of the Training and Battle Simulation Group.	3	4	5

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ADGM 30-1

REQUIRED KNOWLEDGE OR SKILL		(2) Crs (7) Lvl	(3) Sk (7) Lvl	(4) Officer Prof. Level
11.	Assumes the duties and responsibilities of Simulator.			
a.	Assumes the role of one or more simulated pilots during all phases of an interception.	3	4	5
b.	Performs the tasks required to simulate the recovery of interceptors.	3	4	5
12.	Prepares the Weapons Director and Weapons Director Technician's console for the performance of the job.			
a.	Utilizes display contraction or expansion features available at each of the consoles.	3	5	5
b.	Recognizes and reports malfunctions of his equipment.	3	5	5
13.	Utilizes all features and categories available at his console.	3	5	5
14.	Utilizes the communication system provided to the Weapons Director and his Technician.	3	5	5
15.	Monitors the air situation and supervises the operation of assigned Intercept Directors.			
a.	Activates Intercept Director Positions.			
(1)	Decides mode of operation of his team.	3	4	5
(2)	Inserts into computer which Intercept Director positions are active.	3	5	5

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AECN 30-1

	(2) Crs (7) Lvl	(3) Sk (7) Lvl	(4) Officer Prof. Level
REQUIRED KNOWLEDGE OR SKILL			
(3) Inserts into computer which Intercept Directors will function as Intercept Directors and which (if any) will function as recovery officer.	3	5	5
b. Designates recovery bases as required.	3	5	5
c. Scrambles additional weapons against a target.	3	4	5
d. Requests Senior Weapons Director designate a track to Anti-Aircraft Artillery.	3	4	5
e. Requests that adjacent subsector commit weapons against target.	3	4	5
f. Requests "hold fire" orders be issued to Anti-Aircraft Artillery.	3	4	5
g. Insures suitable distribution of missions among Intercept Directors.	3	5	5
h. Monitors radio frequencies of Intercept Directors.	3	5	5
i. Drops Hostiles, Unknowns, or Fakers assigned and which are being extrapolated.	3	5	5
j. Refers target track to Senior Weapons Director for dropping.	3	5	5
16. Assigns (or assists in assignment) and scrambles weapons against target tracks.			
a. Inserts into computer information pairing interceptor with a target track.	3	5	5

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ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)
	Crs (7) Lvl	Sk (7) Lvl	Officer Prof. Level
b. Orders the scrambling of interceptors.	3	4	5
c. Specifies to Intercept Director the type of mission to be run.	3	4	5
d. Inserts into computer the type of mission to be run.	3	5	5
e. Inserts "airborne" when notified by base that scramble has been completed.	3	5	5
f. Inserts "abort" if base is unable to scramble or if he decides to cancel before inserting "airborne."	3	5	5
17. Alters Intercept assignments.			
a. Deassigns an interceptor track on an interception mission without affecting other missions being conducted against the target.	3	4	5
b. Reassigns an interceptor track to a new mission if it is on Combat-air-patrol, Return-to-base, or Deployment.	3	4	5
c. Reassigns a mission to another Intercept Director in his team.	3	4	5
d. Reassigns airborne interceptor belonging to a flight on mission (not the lead aircraft) to a new mission.	3	4	5
e. Joins interceptor tracks.	3	5	5
f. Makes assignment of special interceptions and specially designated interceptors.	3	4	5

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REQUIRED KNOWLEDGE OR SKILL

18. Assigns and orders aircraft for missions other than intercepts as follows:

	(2) Crs (7) Lvl	(3) Sk (7) Lvl	(4) Officer Prof. Level
a. Return-to-base.	3	4	5
b. Deployment from his subsector.	3	4	5
c. Combat Air Patrol.	3	4	5
d. Flight Following.	3	4	5

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SAGE SYSTEM OPERATION (WEAPONS ASSIGNMENT)
COURSE NUMBER AL 27370-10
(LATERAL TRAINING)

1. Positions Covered:

- a. Senior Director (SD)
- b. Senior Weapons Director (SWD)
- c. Senior Director Technician (SDT)
- d. Senior Weapons Director Technician (SWDT)

(This Special Training Standard is based on information available 1 May 1956.)

2. Purpose of Standard:

- a. To indicate the required knowledge or skills necessary for an officer to perform the duties of Senior Director and Senior Weapons Director. (Column 1)
- b. To indicate the required knowledge or skills necessary for an airman to perform the duties of Senior Director Technician and Senior Weapons Director Technician. (Column 1)
- c. To reflect the minimum skill level an officer must possess in each element in order to function as a Senior Director and/or Senior Weapons Director. (Column 4)
- d. To reflect the minimum skill level recommended for each job element for qualification to the seven level. (Column 3)
- e. To reflect the extent of training received in Lateral Training Course Number AL 27370-10. (Column 2)
- f. To use for coordination purposes.

3. Description of Lateral Course Number AL 27370-10, SAGE System Operation (Weapons Assignment)

- a. This course is designed for entry of officer graduates of Course 164100 with a minimum of six (6) months of field experience and airmen, AFSC 27370, who have graduated from Course AB 27330 and have a minimum of six (6) months of field experience.
- b. Laboratory instruction provided each student will consist of proficiency training in one (1) of the four (4) positions covered by this course. Familiarization training in the remaining positions as well as other secondary areas will be provided. Secondary areas are areas which encompass duties considered compatible and complementary to the primary training area.

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JOB TRAINING STANDARD

REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)
	Crs (7) Lvl	Sk (7) Lvl	Officer Prof Level
1. Knows the Theory of pulsed Radar	2	3	4
2. Knows the Quantization Process.	2	3	4
3. Knows the Process of Transmitting Range and Azimuth Information from Long Range and Gap-filler Radar sites to the Direction Center.	2	3	4
4. Knows the Employment, Capabilities and Characteristics of commonly used SAGE Radar Equipments, including:			
a. Airborne Early Warning Radar.	2	3	4
b. Picket Ship.	2	3	4
c. Texas Tower.	2	3	4
d. Long Range Radar Site.	2	3	4
e. Gap-filler Radar Site.	2	3	4
5. Knows the weapons used in the SAGE System and their employment.	3	4	5
6. Knows the organization and function of the entire SAGE System.			
a. Understands the sources of radar and non-radar information.	3	4	5
b. Understands the communication network.	3	5	5
c. Understands the duties and responsibilities of SAGE Agencies down to the section level.	3	5	5
7. Knows the duties and responsibilities of the Direction Center Weapons Section.	3	5	6
8. Assumes the duties and responsibilities of Intercept Director of Intercept Director Technician.			
a. Uses common intercept tactics and techniques.	3	4	6

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REQUIRED KNOWLEDGE OR SKILL	(2) Crs (7) Lvl	(3) Sk (7) Lvl	(4) Officer Prof Level
b. Uses approved Radio Telephony procedures in running intercept missions.	3	5	6
c. Controls aircraft on intercept missions, or,	-	-	6
d. Assists in the control of aircraft on intercept missions.	3	5	-
e. Controls aircraft on combat-airpatrol, or	-	-	6
f. Assists in the control of aircraft on combat-air-patrol.	3	5	-
g. Controls aircraft on return to base, or	-	-	6
h. Assists in the control of aircraft on return to base.	3	5	-
i. Controls the deployment of aircraft.	-	-	6
j. Assists in the deployment of aircraft.	3	5	-
k. Exchanges control of aircraft on mission, or	-	-	6
l. Assists in the exchanging of control of aircraft on mission.	3	5	-
9. Knows the role weather plays in interception.	3	5	6
10. Knows the activities of the Training and Battle Simulation Group.	3	5	6
11. Knows the duties and responsibilities of Training and Battle Simulation personnel.	3	5	6
12. Assumes the duties and responsibilities of the Weapons Director or Weapons Director Technician.			
a. Monitors the air situation and supervises the operation of assigned Intercept Directors	3	5	6
(1) Activates Intercept Director positions.	3	5	6

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REQUIRED KNOWLEDGE OR SKILL

	(2) Crs (7) Lvl	(3) Sk (7) Lvl	(4) Officer Prof Level
(2) Designates recovery bases as required.	3	5	6
(3) Scrambles additional weapons against a target.	3	5	6
(4) Requests Senior Weapons Director assign a track Anti-Aircraft Artillery.	3	5	6
(5) Requests that adjacent sub-sector commit weapons against a target.	3	5	6
(6) Requests "hold fire" orders be issued to Anti-Aircraft Artillery.	3	5	6
(7) Insures suitable distribution of missions among Intercept Directors.	3	5	6
(8) Monitors radio frequencies of Intercept Directors.	3	5	6
(9) Drops Hostiles, Unknowns, or Fakers assigned and which are being extrapolated.	3	5	6
(10) Refers target track to Senior Weapons Director for dropping.	3	5	6
b. Assigns (or assists in assignment) and scrambles weapons against target tracks.			
(1) Inserts into computer information pairing interceptor with a target track.	3	5	6
(2) Orders the scrambling of interceptors.	3	5	6
(3) Specifies to Intercept Director the type of mission to be run.	3	5	6

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REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)
	Crs (7) Lvl	Sk (7) Lvl	Officer Prof Level
(4) Inserts into computer the type of mission to be run.	3	5	6
(5) Inserts "Airborne" when notified by base that scramble has been completed.	3	5	6
(6) Inserts "abort" if base is unable to scramble or if he decides to cancel before inserting "Airborne."	3	5	6
c. Alters Intercept Assignments			
(1) Reassigns an interceptor track on an interception mission without affecting other missions being conducted against the target.	3	5	6
(2) Reassigns an interceptor track to a new mission if it is on combat-air-patrol, return-to-base, or deployment.	3	5	6
(3) Reassigns a mission to another Intercept Director in his team.	3	5	6
(4) Reassigns airborne interceptor belonging to a flight on mission (not the lead aircraft) to a new mission.	3	5	6
(5) Joins interceptor track.	3	5	6
(6) Makes assignment of special interceptions and specially designated interceptors.	3	5	6
d. Assigns and orders aircraft for missions other than intercepts as follows:			
(1) Return-to-base.	3	5	6
(2) Deployment from his subsector.	3	5	6

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REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)
	Grs	Sk	Officer
	(7)	(7)	Prof
	Lvl	Lvl	Level
(3) Combat-Air-Patrol.	3	5	6
(4) Flight Following.	3	5	6
13. Assumes the duties and responsibilities of Senior Weapons Director and Senior Weapons Director Technician.			
a. Coordinates the employment of various weapons to achieve maximum defense capability and insure reasonable safety to friendly forces.			
(1) Assigns responsibility for targets and other tracks to Weapons Director.			
(a) Uses digital display, weapons assignment display or tactical action display to aid his decision, or	3	5	6
(b) Makes necessary switch insertions to have digital display, Weapons Assignment Display, or Tactical action display available to Senior Weapons Director.	3	5	6
(c) Assigns target track or raid to one of the Weapons Directors.	3	5	6
(d) Makes necessary switch insertions to assign track or raid to one of the Weapons Directors.	3	5	6
(e) Designates the target track or raid to one or both Anti-Aircraft Directors.	3	5	6
(f) Makes switch insertions to designate tracks to Anti-Aircraft Director.	3	5	6

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REQUIRED KNOWLEDGE OR SKILL

(2) (3) (4)
Crs Sk Officer
(7) (7) Prof.
Lvl Lvl Level

- | | | | |
|---|---|---|---|
| (g) Requests scramble from adjacent subsector. | 3 | 5 | 6 |
| <u>1.</u> Coordinates the scramble (via phone) with Senior Director or Senior Weapons Director of the adjacent subsector. | 3 | 5 | 6 |
| <u>2.</u> Initiates (by switch action the crosstelling of target to adjacent subsector. | 3 | 5 | 6 |
| (h) Contacts Combat Center for necessary action if unable to coordinate scramble with adjacent subsector. | | | |
| (i) Insures that the assignment of Interceptor to Weapons Director Team is compatible with radio channels allocated to Intercept Director in the Weapons Director team. | 3 | 5 | 6 |
| (j) Drops a track or raid which is being extrapolated and has been reassigned by a Weapons Director. | 3 | 5 | 6 |
| (k) Drops any unassigned track or raid in the system which is being extrapolated. | 3 | 5 | 6 |
| (2) Exercises control over Anti-Aircraft fire: | | | |
| (a) Is informed, or notices, that an interceptor is in danger of being fired upon. | 3 | 5 | 6 |

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REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)
	Crs (7) Lvl	Sk (7) Lvl	Officer Prof. Level
(b) Makes switch insertion for "Hold Fire" of Anti-Aircraft Artillery.	3	5	6
(c) Chooses "No Nuclear Fire" when appropriate.	3	5	6
(d) Inserts "Release Hold Fire" when appropriate.	3	5	6
(3) Decides weapons alert status desired at airbases.	3	5	6
(4) Calls, or requests that the Weapons Director call, the airbase and place fighters on desired alert status.	3	5	6
b. Allocates, or assists in the allocation of weapons among the Weapons Directors.	3	5	6
(1) Makes necessary switch insertions to allocate weapons among Weapons Directors.	3	5	6
(2) Makes necessary switch insertions to alter any allocations previously made.	3	5	6
c. Assigns tactical frequencies to Intercept Directors.			
(1) Decides how frequencies will be allocated.	3	5	6
(2) Makes necessary switch insertions on tactical channel assignment panel.	3	5	6
d. Supervises, or assists in the supervision of, Weapons Directors.			

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ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL	(2) Crs (7) Lvl	(3) Sk (7) Lvl	(4) Officer Prof. Level
(1) Assigns available Weapons Directors to duty stations, or	3	5	6
(2) Inserts switches placing Weapons Directors on duty.	3	5	6
(3) Specifies that one Weapons Director team will function as recovery team.	3	5	6
(4) Monitors the activities of Weapons Directors.			
(a) Investigates delays in scrambling.	3	5	6
(b) Provides guidance to the Weapons Directors on difficult situations.	3	5	6
(c) Reassigns a target track and/or interceptor to a different Weapons Director.	3	5	6
(d) Makes necessary switch insertions in reassigning of target tracks or interceptors.	3	5	6
(e) Specifies which Weapons Director team (if any) will function as recovery team.	3	5	6
e. Coordinates tactical activities with adjacent Direction Center and Combat Center.			
(1) Deploys aircraft from his subsector.			
(a) Assigns deployment mission to a Weapons Director.	3	5	6
(b) Informs Weapons Director of number of aircraft, destination, and base of origin of			

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REQUIRED KNOWLEDGE OR SKILL	(2)	(3)	(4)
	Crs (7) Lvl	Sk (7) Lvl	Officer Prof. Level
aircraft to be deployed.	3	5	6
(c) Informs receiving subsector when aircraft are airborne.	3	5	6
(2) Supervises, or assists in the supervision of, the disposition of tracks or raids crossfold into the subsector.			
(a) Assigns weapons to incoming raid or track, or	-	-	6
(b) Assists in the assignment of weapons against incoming raid or track.	3	5	-
(c) Accepts handover of presently assigned weapons.	-	-	6
(d) Assists in the acceptance of handovers from other subsector.	3	5	-
f. Coordinates with the Senior Director and Air Tactics Officer regarding which tracks to form into raids.	3	5	6
14. Assumes the duties and responsibilities of Senior Director or Senior Director Technician.			
a. Supervises the operation of the Direction Center.	3	5	6
b. Coordinates his activities with adjacent Direction Center and with the Combat Center.	3	5	6
c. Receives information regarding subsector alert conditions from Subsector Command Post or Combat Center and alerts all concerned, or	3	5	6

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ADCM 30-1

REQUIRED KNOWLEDGE OR SKILL

(2) (3) (4)
Crs Sk Officer
(7) (7) Prof.
Lvl Lvl Level

d. Observes the situation and digital displays and alerts the Senior Director of anything requiring his action.	3	5	6
e. Makes switch actions and insertions required by the Senior Director.	3	5	-
f. Relays by telephone, instructions to Senior Director Subordinates.	3	4	-
g. Evaluates the threat constituted by the air situation and effects necessary action.	3	4	6
h. Ensures that sufficient weapons, if available, are committed to the threat to the Subsector.			
(1) Requests additional aircraft be allocated to him from those in reserve in his Subsector.	-	-	6
(2) Requests aircraft be deployed from another Subsector.	-	-	6
i. Assists Senior Director in obtaining additional weapons	3	5	-
j. Coordinates the functions of raid forming and weapons assignment.	3	5	6

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ANNEX M

C&E OFFICER FACTORY TRAINING REQUIREMENTS

1. Phase I (Factory Training). This training will be conducted at the International Business Machine Corporation at Kingston, New York.
2. Phase II and III. No training in these phases is contemplated.

CODE KEY - PROFICIENCY STANDARD

The Code Key used in the Course Training Standard indicates the standard of proficiency attained by graduates as follows:

- 1 Has demonstrated through projects or tests (Performance, written or oral) a thorough understanding of procedures, job elements or functional knowledge, but has not actually performed the job.
- 2 Has demonstrated through operation of a training device, mock-up or other substitute for actual equipment that he knows how to do the job element.
- 3 Has initially performed the job element on actual equipment, but has not practiced sufficiently to develop operational proficiency.
- 4 Has repeatedly performed the job element as an individual or crew member with an average proficiency, using actual equipment in training situations which closely parallel the operational job.
- 5 Has fully qualified at the operational or combat-ready level of proficiency.
- 0 A job element in which training should be accomplished, but is not being accomplished during current course of instruction.

COURSE TRAINING STANDARD

<u>Functional Knowledge or Task</u>	<u>Extent of Formal Training</u>
1. Functions of AN/FS-7	
a. Becomes familiar with the Operational Requirements of SAME	1

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ADCM 30-1

<u>Functional Knowledge or Task</u>	<u>Extent of Formal Training</u>
b. Becomes familiar with the functions of SAGE in the Air Defense Operation	1
c. Becomes familiar with the Organizational concept of SAGE.	1
d. Becomes familiar with the operation of the SAGE System and the jobs of SAGE Operating personnel.	1
e. Becomes familiar with a simplified block diagram of AN/FSQ-7.	1
f. Becomes familiar with the inputs and outputs of AN/FSQ-7.	1
2. Basic Computer Programming.	
a. Becomes familiar with computer instructions.	1
b. Becomes familiar with binary, octal arithmetic problems.	1
(1) Performs simple binary and octal arithmetic problems.	1
(2) Converts numbers from one system to another.	1
c. Prepares simple computer programs.	1
d. Becomes familiar with data flow through central computer.	1
3. Basic AN/FSQ-7 circuits and components.	
a. Becomes familiar with:	
(1) Flip flop circuit.	1
(2) Gate circuit.	1
(3) "And" circuit.	1
(4) "Or" circuit.	1

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<u>Functional Knowledge or Task</u>	<u>ADCM 30-1</u> <u>Extent of</u> <u>Formal Training</u>
(5) Core memory	1
(6) Magnetic drums	1
(7) Tape Recorders	1
(8) Tape core counters	1
(9) Card machines	1
4. AN/FSQ-7 Input-Output System	
a. Becomes familiar with the Input-Output drum system	1
b. Becomes familiar with:	
(1) LRI	1
(2) GPI	1
(3) Manual Inputs	1
c. Becomes familiar with AN/FSQ-7	1
5. AN/FSQ-7 displays	
a. Becomes familiar with the principles of the Charactron and Typotron	1
b. Becomes familiar with AN/FSQ-7 display symbols	1
c. Becomes familiar with presentation of:	
(1) Radar data	1
(2) Track data	1
(3) Digital data	1
6. AN/FSQ-7 Maintenance	
a. Becomes familiar with the layout of the maintenance console	1

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<u>Functional Knowledge or Task</u>	<u>Extent of Formal Training</u>
b. Becomes familiar with the types of AN/FSQ-7 test procedures	1
c. Becomes familiar with the principles of maintenance programming	1

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ORIENTATION COURSE AN/FS1-7 and AN/FS1-8

INSTRUCTIONAL SEQUENCE								DURATION		
1	2	3	4	5	6	7	8	Hours	Days	Weeks
Introduction to SAGE System								60	7 1/2	1
Basic Computer Theory								30	3 3/4	2
Computer Instruction Classes								40	5	3
Misc Power Supplies and Marginal Checking								18	2 1/4	4
Maintenance and Operational Programming								12	1 1/2	
Input-Output System								80	10	5
Totals								240	30	6
Course Duration Six (6) Calendar Weeks (8 Hour Days)										

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ANNEX N

AN/FST-2 Special Training Plan

1. This is a special course to be attended by 5 and 7-skill level airmen, AFSC 30352/72, all grades, which will train these personnel to perform the operation, inspection and field and organizational maintenance of the AN/FST-2 Fine Grain Data equipment. Phase I training will be conducted at the manufacturer's plant and Phase II will be conducted at Keesler Air Force Base.

Code Key - Proficiency Standard

The Code Key used in the Course Training Standard indicates the standard of proficiency attained by graduates as follows:

- No experience or training on this equipment.
- 1 Has only limited knowledge of this subject or task. Has not actually used the information. Cannot be expected to perform the task.
- 2 Has received a complete briefing on the subject or task, but can use the knowledge or skill only if assisted in every step of the operation. Requires much more training and experience.
- 3 Understands the subject or task to be done. Has applied part of the knowledge either on the actual job or on a trainer. Can do the job if closely supervised in the more difficult parts.
- 4 Understands the subject or task to be done and has done the job enough times to make sure he can do it. Needs more practice under limited supervision.
- 5 Has a complete understanding of the subject or task. Can do the task completely and accurately without supervision.
- 6 Has complete understanding of the subject or task, can do the task completely and accurately without supervision, and can apply the techniques and skills to similar equipment or situations.

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COURSE TRAINING STANDARD

<u>1</u> <u>Required Knowledge or Task</u>	<u>2</u> <u>Extent of Training Received</u>	<u>3</u> <u>Recommended Job Proficiency</u>
1. Solve problems dealing with logical diagrams	4	6
a. Trace pulses through various logical components	5	6
2. Convert from binary notation to numerical numbers	5	6
a. Solve logical equations	4	6
3. Interconnect Burroughs Test Rack in accordance with logical diagrams to act as follows:		
a. Serial counters	4	5
b. Shift register	4	5
c. Storage register	4	5
4. Semi-Automatic Height Finder Section		
a. Locate all the SAHF Components in the "Crobar" racks	5	6
b. Knows the over-all logic of the SAHF	4	5
c. Trace the signal sequence through SAHF	4	5
d. Knows the Data Processing Procedure	4	5
e. Test the individual logic cards, such as: diode cards, flip flop cards, and so on	4	5
f. Locate trouble within the components of the logic cards	4	5

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<u>1</u> <u>Required Knowledge or Task</u>	<u>2</u> <u>Extent of</u> <u>Training</u> <u>Received</u>	<u>3</u> <u>Recommended</u> <u>Job</u> <u>Proficiency</u>
g. Align the Radar Indicators	5	6
(1) Adjust linearity	5	6
(2) Adjust size	5	6
5. Fine Grain Data Section		
a. Know relationship between Fine Grain Data Unit, Height Finder and Direction Center	5	6
b. State specifications of FGD, HF and DC	4	6
c. Understand Boolean Equations	4	6
d. Adjust the noise level of the Video Quantizer with the aid of Tektronix scope model 535	4	5
e. Adjust Pulsed Crystal Oscillator to proper frequency with the aid of the Tektronix Scope	4	5
f. Align Azimuth pulse generator to site coordinates of the AN/FST-2	5	6
g. Adjust control counter oscillator to proper operating frequency	4	5
h. Adjust the modulator bias for optimum performance	4	6
i. Adjust servo delay to minimize precession	4	6
j. Adjust chopper reference bias	4	6
k. Adjust read amplifier for proper operation of servo	4	6

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<u>1</u> <u>Required Knowledge or Task</u>	<u>2</u> <u>Extent of Training Received</u>	<u>3</u> <u>Recommended Job Proficiency</u>
l. Adjust spacing between write head and drum	4	5
m. Adjust spacing between read head and drum	4	5
n. Adjust long channels to equalize storage time	4	5
o. Adjust short channels to time between radar bangs	4	5
p. Adjust long channels to three times length of short channels	4	5
q. Adjust short channels to equalize storage time	4	5
5. Power Supply		
a. Adjust Simpletrol meter for over-load	5	6
b. Adjust Simpletrol meter for under-load	5	6
c. Adjust Simpletrol meter for optimum heater voltage	5	6
d. Adjust Voltage Regulator in Inductrol for proper voltage	5	6
e. Adjust bleeder resistors within the proper tolerances	5	6
f. Adjust bias for alternator supply	5	6
g. Adjust current limiting potentiometer	5	6

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[REDACTED]		
ADCM 30-1		
1 <u>Required Knowledge or Task</u>	2 <u>Extent of Training Received</u>	3 <u>Recommended Job Proficiency</u>
h. Adjust regulator potentiometer for proper output voltage to drum drive motor	4	6
i. Adjust bias potentiometer for magnetic regulators in armature supply of drive motor	4	6
j. Dial package desired to perform marginal checks	4	5
. Maintenance and Troubleshooting		
a. Perform automatic checks on the following units:		
(1) Range counter	4	6
(2) Azimuth counter	4	6
(3) Range write	4	6
(4) Continuous B channel	4	6
(5) V Channel	4	6
(6) L Channel	4	6
(7) Phone counters	4	6
(8) Automatic test target	4	6
b. Correct malfunctions disclosed by analyzing data obtained from performing automatic checks.	4	5
c. By use of the Tektronix scopes, pulse rack, logical and waveform diagrams, built-in test circuits and external test simulators, isolate the malfunctions in the individual circuit cards used in		

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<u>Required Knowledge or Task</u>	<u>2 Extent of Training Received</u>	<u>3 Recommended Job Proficiency</u>
this equipment and make proper corrections.	4	5
8. Test Equipment		
a. Uses the Tektronix scope proficiently for signal tracing, timing pulse observations, troubleshooting and adjustments on the AN/FST-2 equipment.	5	6
b. Uses complete test rack for the necessary testing purposes.	4	6
(1) Standard interconnections	4	6
(2) Original logical arrangements	4	5
c. Uses multimeters, VTMS, and Scopes proficiently in making tests and adjustments.		
d. Determines whether test equipment is operating properly.	4	5
e. Sets up, uses and repairs antenna simulator test units for the SAHF and FGD.	4	5
9. Testing Circuits		
a. Performs marginal checks on the power supply.	4	6
(1) Interprets results	4	6
(2) Records results in log	4	6
(3) Replaces or repairs defective cards	4	6
b. Performs MSR Data substitution tests on the SAHF.	4	6

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<u>Required Knowledge or Task</u>	<u>2 Extent of Training Received</u>	<u>3 Recommended Job Proficiency</u>
(1) Analyzes the results	4	5
(2) Makes repairs or replacements	4	6
c. Performs the Target Simulator tests on the FGD Equipment	4	6
(1) Analyzes the results	4	5
(2) Makes repair or replacement	4	5
d. Performs the Sequential Test on the S and B Channels of the FGD	4	6
(1) Analyzes the results	4	5
(2) Makes repair or replacement	4	5
e. Sets up the test rack to produce simulated trigger and pre-trigger pulses for the AN/FST-2	4	6
f. Sets up the test rack to produce simulated angle of elevation, Range markers for the RHI and Video for the FSI, for the SAMF	4	6
g. Sets up test rack to produce simulated antenna azimuth signal for the FGD	4	6
h. Sets up the logical units required for check and adjustment of the drum and associated circuitry	4	5
i. Performs mechanical adjustments on the drum	4	5
(1) Precisely sets head to proper drum spacing	4	5
10. Maintenance Diagrams		

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<u>Required Knowledge or Task</u>	<u>2 Extent of Training Received</u>	<u>3 Recommended Job Proficiency</u>
a. Selects appropriate logical diagrams and uses these to trace and isolate circuit malfunctions	5	6
b. Uses interconnection block diagrams to determine interrelation between units of AN/FST-2 equipment	5	6
c. Uses equipment equations to trace and isolate circuit malfunctions	4	5
d. Uses waveshape diagrams and Tektronix scope to determine equipment operation at key test points	4	6
e. Uses engineering drawings and terminology in order to identify component location	5	6

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ADCF 30-1

COURSE CHART
 FOR
 SPECIAL FACTORY TRAINING PHASE I
 ON THE
 FINE GRAIN DATA EQUIPMENT, AN/FST-2

INSTRUCTIONAL AREAS								DURATION		
1	2	3	4	5	6	7	8	Hours	Days	Weeks
Introduction to the "Crober" System and Digital Techniques								72	9	1
Semi-Automatic Height Finder Section								120	15	2
Semi-Automatic Height Finder Section										3
Semi-Automatic Height Finder Section										4
Fine Grain Data Section								168	23	5
Fine Grain Data Section										6
Fine Grain Data Section										7
Fine Grain Data Section										8
Fine Grain Data Section										9
Power Supplies								40	5	10
Power Supplies										11
Maintenance and Troubleshooting								40	5	12
Maintenance and Troubleshooting										13
Test Equipment								40	5	14
Test Equipment										15
Testing Circuits								104	13	16
Testing Circuits										17
Maintenance Diagrams								40	5	18
Maintenance Diagrams										19
Totals								640	80	16
Course Duration Sixteen (16) Weeks										

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Annex N

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COURSE CHART
 FOR
 SPECIAL TRAINING PHASE II (ATC)
 ON THE
 FINE GRAIN DATA EQUIPMENT, AN/FSI-2

INSTRUCTIONAL AREAS						DURATION		
1	2	3	4	5	6	Hours	Days	Weeks
Introduction to the "Crobar" System and Digital Techniques						54	9	1
Semi-Automatic Height Finder Section						90	15	2
								3
								4
								5
Fine Grain Data Section						138	23	6
								7
								8
								9
								10
Power Supplies						30	5	11
Maintenance and Troubleshooting						30	5	12
Test Equipment						30	5	13
Testing Circuits						78	13	14
								15
Maintenance Diagrams						30	5	16
Totals						480	80	16
Course Duration Sixteen (16) Calendar Weeks								

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Annex N

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ANNEX O

OFFICER OPERATIONS TRAINING REQUIREMENTS

<u>NR</u>	<u>RQR ON-SITE</u>	<u>SITE</u>
3	1 Jul 57	IC New York ADS
8	15 Oct 57	BNL New York ADS
3	15 Nov 57	IC Boston ADS
8	15 Feb 58	BNL Boston ADS
44	1 Mar 58	RC New York ADS
3	15 Apr 58	IC Syracuse ADS
47	15 May 58	IC Washington ADS; RC Boston ADS
3	1 Jun 58	IC Bangor ADS
11	1 Jul 58	FL 26th AD
11	15 Jul 58	IC Detroit ADS; BNL Syracuse ADS
8	15 Aug 58	BNL Washington ADS
8	1 Sep 58	BNL Bangor ADS
47	15 Sep 58	IC Chicago ADS; RC Syracuse ADS
3	1 Oct 58	IC Kansas City ADS
52	15 Oct 58	BNL Detroit ADS; RC Washington ADS
44	15 Nov 58	RC Bangor ADS
60	15 Dec 58	BNL Chicago ADS; BNL Kansas City ADS; RC Detroit ADS
14	1 Jan 59	IC Montgomery ADS; FL 30th AD
9	15 Jan 59	RC 26th AD
47	15 Feb 59	IC Duluth ADS; RC Chicago ADS
3	15 Mar 59	IC Grand Forks ADS
8	1 Apr 59	BNL Montgomery ADS
8	15 May 59	BNL Duluth ADS
44	1 Jun 59	RC Montgomery ADS
8	15 Jun 59	BNL Grand Forks ADS
3	1 Jul 59	IC Seattle ADS
53	15 Jul 59	RC 30th AD; RC Duluth ADS
44	15 Aug 59	RC Grand Forks ADS
11	1 Sep 59	IC Portland ADS; BNL Seattle ADS
11	15 Oct 59	FL 25th AD
11	1 Nov 59	IC Sault St Marie ADS; BNL Portland ADS
44	15 Nov 59	RC Seattle ADS
9	1 Dec 59	RC 25th AD
8	15 Dec 59	BNL Sault St Marie ADS
47	1 Jan 60	IC Spokane ADS; RC Portland ADS
55	15 Feb 60	IC Pendleton ADS; BNL Spokane ADS; RC Sault St Marie ADS
8	1 Apr 60	BNL Pendleton ADS
47	15 Apr 60	IC Los Angeles ADS; RC Spokane ADS
52	1 Jun 60	BNL Los Angeles ADS; RC Pendleton ADS
11	1 Jul 60	FL 28th AD

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56	1 Aug 60	IC San Francisco ADS; RC 28th AD; RC Los Angeles ADS
11	15 Sep 60	IC San Bernardino ADS; BNL San Francisco ADS
11	1 Nov 60	IC Reno ADS; BNL San Bernardino ADS
44	15 Nov 60	RC San Francisco ADS
8	15 Dec 60	BNL Reno ADS
55	1 Jan 61	FL 29th AD; RC San Bernardino ADS
3	15 Jan 61	IC Minot ADS
9	1 Feb 61	RC 29th AD
47	15 Feb 61	IC Great Falls ADS; RC Reno ADS
8	1 Mar 61	BNL Minot ADS
3	15 Mar 61	IC Sioux City ADS
8	1 Apr 61	BNL Great Falls ADS
3	15 Apr 61	IC Raleigh ADS
52	1 May 61	BNL Sioux City ADS; RC Minot A
3	15 May 61	IC Ft Knox ADS
52	1 Jun 61	BNL Raleigh ADS; RC Great Falls ADS
63	1 Jul 61	FL 32nd AD; BNL Ft Knox ADS; RC Sioux City ADS
3	15 Jul 61	IC Atlanta ADS
53	1 Aug 61	RC Raleigh ADS; RC 32nd AD
3	15 Aug 61	IC Phoenix ADS
52	1 Sep 61	BNL Atlanta ADS; RC Ft Knox ADS
8	1 Oct 61	BNL Phoenix ADS
3	15 Oct 61	IC Albuquerque ADS
55	1 Nov 61	FL 34th AD; RC Atlanta ADS
3	15 Nov 61	IC San Angelo ADS
61	1 Dec 61	BNL Albuquerque ADS; RC Phoenix ADS; RC 34th AD
3	15 Dec 61	IC San Antonio ADS
8	1 Jan 62	BNL San Angelo ADS
3	15 Jan 62	IC Shreveport ADS
52	1 Feb 62	BNL San Antonio ADS; RC Albuquerque ADS
52	1 Mar 62	BNL Shreveport ADS; RC San Angelo ADS
3	15 Mar 62	IC St Louis ADS
55	1 Apr 62	FL 33rd AD; RC San Antonio ADS
52	1 May 62	BNL St Louis ADS; RC Shreveport ADS
53	1 Jun 62	RC Kansas City ADS; RC 33rd AD
44	1 Jul 62	RC St Louis ADS

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2. Position Breakdowna. Initial Complement (IC) for Direction Centers

<u>TITLE</u>	<u>AFSC</u>	<u>NUMBER</u>
Senior Director (DD)	1515	-

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Air Surveillance Officer (ASO)	1644	1
Tracking Officer (TO)	27300(W/O)	1
Total		3

b. Balance of Normal Load (BNL) for Direction Centers

Air Tactics Officer (ATO)	27300(W/O)	1
Identification Officer (IDO)	27300(W/O)	1
Weapons Director (WD)	1616	1
Intercept Director (IND)	1644	5
Total		8

c. Remaining Complement (RC) for Direction Centers

Senior Director (SD)	1616	4
Air Surveillance Officer (ASO)	1644	4
Air Tactics Officer (ATO)	27300(W/O)	4
Tracking Officer (TO)	27300(W/O)	4
Identification Officer (IDO)	27300(W/O)	4
Weapons Director (WD)	1616	4
Intercept Director (IND)	1644	20
Total		44

d. Full Load (FL) for Combat Centers

Chief Controller (CCNT)	1616	2
Air Surveillance Officer (ASO)	1616	3
Controller (CNT)	1616	6
Total		11

e. Remaining Complement (RC) for Combat Centers

Chief Controller (CCNT)	1616	3
Air Surveillance Officer (ASO)	1616	2
Controller (CNT)	1616	4
Total		9

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AIRMAN OPERATIONS TRAINING REQUIREMENTS

FIRST MODULE

1. Training Schedule

<u>NR</u>	<u>R/R ON-SITE</u>	<u>SITE</u>
15	1 Jul 57	IC New York ADS
25	15 Oct 57	BNL New York ADS
15	15 Nov 57	IC Boston ADS
25	15 Feb 57	BNL Boston ADS
134	1 Mar 58	RC New York ADS
134	15 May 58	RC Boston ADS
16	1 Jul 58	FL 26th AD
19	15 Jan 59	RC 26th AD
<u>383</u>		

2. Position Breakdown

a. Initial Complement (IC) for Direction Centers

<u>TITLE</u>	<u>AFSC</u>	<u>NUMBER</u>
Senior Director Technician (SDT)	27370	1
Air Surveillance Technician (AST)	27370	1
Tracking Technician (TT)	27370	1
Manual Inputs Supervisor (MIS)	27370	1
Manual Inputs Technician (MIT)	27370	2
Height Supervisor (HS)	27370	1
Height Technician (HT)	27350	1
Height Technician (HT)	27330	1
Initiation Supervisor (IS)	27370	1
Track Initiator (TI)	27350	1
Tracking Supervisor (TS)	27370	1
Track Monitor (TM)	27350	1
Mapping Supervisor (MS)	27370	1
Radar Mapper (RM)	27350	1
	Total	<u>15</u>

b. Balance of Normal Load (BNL) for Direction Centers

Air Tactics Technician (ATT)	27370	1
Manual Inputs Technician (MIT)	27350	2
Manual Inputs Technician (MIT)	27330	3
Track Initiator (TI)	27350	2
Overlap Technician (OT)	27370	1

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Overlapping Technician (OT)	27350	1
Track Monitor (TM)	27330	4
Track Monitor (TM)	27330	2
Radar Mapper (RM)	27350	1
Radar Mapper (RM)	27330	1
Identification Technician (IDT)	27370	1
Weapons Director Technician (WDT)	27370	1
Intercept Director Technician (INT)	27370	2
Intercept Director Technician (INT)	27350	3
Total		25

c. Remaining Complement (RC) for Direction Centers

Senior Director Technician (SDT)	27370	4
Air Surveillance Technician (AST)	27370	4
Air Tactics Technician (ATT)	27370	1
Air Tactics Technician (ATT)	27350	3
Tracking Technician (TT)	27350	4
Manual Inputs Supervisor (MIS)	27370	4
Manual Inputs Technician (MIT)	27350	12
Manual Inputs Technician (MIT)	27330	8
Height Supervisor (HS)	27370	2
Height Supervisor (HS)	27350	2
Height Technician (HT)	27350	4
Height Technician (HT)	27330	1
Initiation Supervisor (IS)	27370	4
Track Initiator (TI)	27350	7
Overlap Technician (OT)	27370	1
Overlap Technician (OT)	27350	7
Tracking Supervisor (TS)	27370	4
Track Monitor (TM-IMS)	27350	17
Track Monitor (TM)	27330	3
Mapping Supervisor (MS)	27370	4
Radar Mapper (RM)	27350	4
Radar Mapper (RM)	27330	6
Identification Technician (IDT)	27370	2
Identification Technician (IDT)	27350	2
Weapons Director Technician (WDT)	27370	4
Intercept Director Technician (INT)	27370	7
Intercept Director Technician (INT)	27350	13
Total		134

d. Full Load (FL) for Combat Centers

Chief Controller Technician (CCNTT)	27370	2
Air Surveillance Technician (AST)	27370	3
Controller Technician (CNTT)	27370	6

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Manual Inputs Supervisor (MIS)	27370	1
Manual Inputs Technician (MIT)	27350	3
Manual Inputs Technician (MIT)	27330	1
	Total	<u>16</u>

e. Remaining Complement (RC) for Combat Centers

Chief Controller Technician (CCNTT)	27370	3
Air Surveillance Technician (AST)	27370	2
Controller Technician (CNTT)	27370	4
Manual Inputs Technician (MIT)	27350	6
Manual Inputs Technician (MIT)	27330	4
	Total	<u>19</u>

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APPENDIX I

<u>NR</u>	<u>RQR ON-SITE</u>	<u>SITE</u>
7	15 Apr 58	IC Syracuse ADS
7	15 May 58	IC Washington ADS
7	1 Jun 58	IC Bangor ADS
24	15 Jul 58	IC Detroit ADS; BNL Syracuse ADS
17	15 Aug 58	BNL Washington
17	1 Sep 58	BNL Bangor ADS
77	15 Sep 58	IC Chicago ADS; RC Syracuse ADS
7	1 Oct 58	IC Kansas City ADS
87	15 Oct 58	BNL Detroit ADS; RC Washington ADS
70	15 Nov 58	RC Bangor ADS
104	15 Dec 58	BNL Chicago ADS; BNL Kansas City ADS; RC Detroit ADS
11	1 Jan 59	IC Montgomery ADS; FL 30th AD
77	15 Feb 59	IC Duluth ADS; RC Chicago ADS
7	15 Mar 59	IC Grand Forks ADS
17	1 Apr 59	BNL Montgomery ADS
17	15 May 59	BNL Duluth ADS
70	1 Jun 59	RC Montgomery ADS
17	15 Jun 59	BNL Grand Forks ADS
7	1 Jul 59	IC Seattle ADS
80	15 Jul 59	RC 30th AD; RC Duluth ADS
70	15 Aug 59	RC Grand Forks ADS
24	1 Sep 59	IC Portland ADS; BNL Seattle ADS
4	15 Oct 59	FL 25th AD
24	1 Nov 59	IC Sault St Marie ADS; BNL Portland ADS
70	15 Nov 59	RC Seattle ADS
10	1 Dec 59	RC 25th AD
17	15 Dec 59	BNL Sault St Marie ADS
77	1 Jan 60	IC Spokane ADS; RC Portland ADS
94	15 Feb 60	IC Pendleton ADS; BNL Spokane ADS; RC Sault St Marie ADS
17	1 Apr 60	BNL Pendleton ADS
77	15 Apr 60	IC Los Angeles ADS; RC Spokane ADS
87	1 Jun 60	BNL Los Angeles ADS; RC Pendleton ADS
4	1 Jul 60	FL 28th AD
87	1 Aug 60	IC San Francisco ADS; RC 28th AD; RC Los Angeles ADS
24	15 Sep 60	IC San Bernardino ADS; BNL San Francisco ADS
24	1 Nov 60	IC Reno ADS; BNL San Bernardino ADS
70	15 Nov 60	RC San Francisco ADS
17	15 Dec 60	BNL Reno ADS
74	1 Jan 61	FL 29th AD; RC San Bernardino ADS
7	15 Jan 61	IC Minot ADS
10	1 Feb 61	RC 29th AD
77	15 Feb 61	IC Great Falls ADS; RC Reno ADS

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<u>NR</u>	<u>NR ON-SITE</u>	<u>SITE</u>
17	1 Mar 61	BNL Minot ADS
7	15 Mar 61	IC Sioux City ADS
17	1 Apr 61	BNL Great Falls ADS
7	15 Apr 61	IC Raleigh ADS
87	1 May 61	BNL Sioux City ADS; RC Minot ADS
7	15 May 61	IC Ft Knox ADS
87	1 Jun 61	BNL Raleigh ADS; RC Great Falls ADS
91	1 Jul 61	FL 32nd AD; BNL Ft Knox ADS; RC Sioux City ADS
7	15 Jul 61	IC Atlanta ADS
80	1 Aug 61	RC Raleigh ADS; RC 32nd AD
7	15 Aug 61	IC Phoenix ADS
87	1 Sep 61	BNL Atlanta ADS; RC Ft Knox ADS
17	1 Oct 61	BNL Phoenix ADS
7	15 Oct 61	IC Albuquerque ADS
74	1 Nov 61	FL 34th AD; RC Atlanta ADS
7	15 Nov 61	IC San Angelo ADS
97	1 Dec 61	BNL Albuquerque ADS; RC Phoenix ADS; RC 34th AD
7	15 Dec 61	IC San Antonio ADS
17	1 Jan 62	BNL San Angelo ADS
7	15 Jan 62	IC Shreveport ADS
87	1 Feb 62	BNL San Antonio ADS; RC Albuquerque ADS
87	1 Mar 62	BNL Shreveport ADS; RC San Angelo ADS
7	15 Mar 62	IC St Louis ADS
74	1 Apr 62	FL 33rd AD; RC San Antonio ADS
87	1 May 62	BNL St Louis ADS; RC Shreveport ADS
80	1 Jun 62	RC Kansas City ADS; RC 33rd AD
70	1 Jul 62	RC St Louis ADS
2911		

2. Position Breakdowna. Initial Complement (IC) for Direction Centers

<u>TITLE</u>	<u>AFSC</u>	<u>NUMBER</u>
Manual Inputs Technician (MIT)	27370	2
Height Technician (HT)	27350	1
Height Technician (HT)	27330	1
Track Initiator (TI)	27350	1
Track Monitor (TM)	27350	1
Radar Mapper (RM)	27350	1
		<u>7</u>
	Total	7

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b. Balance of Normal Load (BNL) for Direction Centers.

Manual Inputs Technician (MIT)	27350	2
Manual Inputs Technician (MIT)	27330	3
Track Initiator (TI)	27350	2
Overlap Technician (OT)	27370	1
Overlap Technician (OT)	27350	1
Track Monitor (TM)	27350	4
Track Monitor (TM)	27330	2
Radar Mapper (RM)	27350	1
Radar Mapper (RM)	27330	1
	Total	<u>17</u>

c. Remaining Complement (RC) for Direction Centers.

Manual Inputs Technician (MIT)	27350	12
Manual Inputs Technician (MIT)	27330	8
Height Technician (HT)	27350	4
Height Technician (HT)	27330	1
Track Initiator (TI)	27350	7
Overlap Technician (OT)	27370	1
Overlap Technician (OT)	27350	7
Track Monitor (TM-TMS)	27350	17
Track Monitor (TM)	27330	3
Radar Mapper (RM)	27350	4
Radar Mapper (RM)	27330	6
	Total	<u>70</u>

d. Full Load (FL) for Combat Centers.

Manual Inputs Technician (MIT)	27350	3
Manual Inputs Technician (MIT)	27330	1
	Total	<u>4</u>

e. Remaining Complement (RC) for Combat Center

Manual Inputs Technician (MIT)	27350	6
Manual Inputs Technician (MIT)	27330	4
	Total	<u>10</u>

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CATEGORY II

1. Training Schedule

<u>NR</u>	<u>RJR ON-SITE</u>	<u>SITE</u>
8	15 Apr 58	IC Syracuse ADS
8	15 May 58	IC Washington ADS
8	1 Jun 58	IC Bangor ADS
16	15 Jul 58	IC Detroit ADS; BNL Syracuse ADS
8	15 Aug 58	BNL Washington
8	1 Sep 58	BNL Bangor ADS
72	15 Sep 58	IC Chicago ADS; RC Syracuse ADS
8	1 Oct 58	IC Kansas City ADS
72	15 Oct 58	BNL Detroit ADS; RC Washington ADS
64	15 Nov 58	RC Bangor ADS
80	15 Dec 58	BNL Chicago ADS; BNL Kansas City ADS; RC Detroit ADS
20	1 Jan 59	IC Montgomery ADS; FL 30th AD
72	15 Feb 59	IC Duluth ADS; RC Chicago ADS
8	15 Mar 59	IC Grand Forks ADS
8	1 Apr 59	BNL Montgomery ADS
8	15 May 59	BNL Duluth ADS
64	1 Jun 59	RC Montgomery ADS
8	15 Jun 59	BNL Grand Forks ADS
8	1 Jul 59	IC Seattle ADS
73	15 Jul 59	RC 30th AD; RC Duluth ADS
64	15 Aug 59	RC Grand Forks ADS
16	1 Sep 59	IC Portland ADS; BNL Seattle ADS
12	15 Oct 59	FL 25th AD
16	1 Nov 59	IC Sault St Marie ADS; BNL Portland ADS
64	15 Nov 59	RC Seattle ADS
9	1 Dec 59	RC 25th AD
8	15 Dec 59	BNL Sault St Marie ADS
72	1 Jan 60	IC Spokane ADS; RC Portland ADS
80	15 Feb 60	IC Pendleton ADS; BNL Spokane ADS; RC Sault St Marie ADS
8	1 Apr 60	BNL Pendleton ADS
72	15 Apr 60	IC Los Angeles ADS; RC Spokane ADS
72	1 Jun 60	BNL Los Angeles ADS; RC Pendleton ADS
12	1 Jul 60	FL 28th AD
81	1 Aug 60	IC San Francisco ADS; RC 28th AD; RC Los Angeles ADS
16	15 Sep 60	IC San Bernardino ADS; BNL San Francisco ADS
16	1 Nov 60	IC Reno ADS; BNL San Bernardino ADS
64	15 Nov 60	RC San Francisco ADS

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8	15 Dec 60	BNL Reno ADS
76	1 Jan 61	FL 29th AD; RC San Bernardino ADS
8	15 Jan 61	IC Minot ADS
9	1 Feb 61	RC 29th AD
72	15 Feb 61	IC Great Falls ADS; RC Reno ADS
8	1 Mar 61	BNL Minot ADS
8	15 Mar 61	IC Sioux City ADS
8	1 Apr 61	BNL Great Falls ADS
8	15 Apr 61	IC Raleigh ADS
72	1 May 61	BNL Sioux City ADS; RC Minot ADS
8	15 May 61	IC Ft Knox ADS
72	1 Jun 61	BNL Raleigh ADS; RC Great Falls ADS
84	1 Jul 61	FL 32nd AD; BNL Ft Knox ADS; RC Sioux City ADS
8	15 Jul 61	IC Atlanta ADS
73	1 Aug 61	RC Raleigh ADS; RC 32nd AD
8	15 Aug 61	IC Phoenix ADS
72	1 Sep 61	BNL Atlanta ADS; RC Ft Knox ADS
8	1 Oct 61	BNL Phoenix ADS
8	15 Oct 61	IC Albuquerque ADS
76	1 Nov 61	FL 34th AD; RC Atlanta ADS
8	15 Nov 61	IC San Angelo ADS
81	1 Dec 61	BNL Albuquerque ADS; RC Phoenix ADS; RC 34th AD
8	15 Dec 61	IC San Antonio ADS
8	1 Jan 62	BNL San Angelo ADS
8	15 Jan 62	IC Shreveport ADS
72	1 Feb 62	BNL San Antonio ADS; RC Albuquerque ADS
72	1 Mar 62	BNL Shreveport ADS; RC San Angelo ADS
8	15 Mar 62	IC St Louis ADS
76	1 Apr 62	FL 33rd AD; RC San Antonio ADS
72	1 May 62	BNL St Louis ADS; RC Shreveport ADS
73	1 Jun 62	RC Kansas City ADS; RC 33rd AD
64	1 Jul 62	RC St Louis ADS
2547		

2. Position Breakdown

a. Initial Complement (IC) for Direction Centers

<u>TITLE</u>	<u>AFSC</u>	<u>NUMBER</u>
Senior Director Technician (SDT)	27370	1
Air Surveillance Technician (AST)	27370	1
Tracking Technician (TT)	27370	1
Manual Inputs Supervisor (MIS)	27370	1
Weight Supervisor (WS)	27370	1

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Initiation Supervisor (IS)	27370	1
Tracking Supervisor (TS)	27370	1
Mapping Supervisor (MS)	27370	1
	Total	8

b. Balance of Normal Load (BNL) for Direction Centers

Air Tactics Technician (ATT)	27370	1
Identification Technician (IDT)	27370	1
Weapons Director Technician (WDT)	27370	1
Intercept Director Technician (IDT)	27370	2
Intercept Director Technician (IDT)	27350	3
	Total	8

c. Remaining Complement (RC) for Direction Centers

Senior Director Technician (SDT)	27370	4
Air Surveillance Technician (AST)	27370	4
Air Tactics Technician (ATT)	27370	1
Air Tactics Technician (ATT)	27350	3
Tracking Technician (TT)	27350	4
Manual Inputs Supervisor (MIS)	27370	4
Height Supervisor (HS)	27370	2
Height Supervisor (HS)	27350	2
Initiation Supervisor (IS)	27370	4
Tracking Supervisor (TS)	27370	4
Mapping Supervisor (MS)	27370	4
Identification Technician (IDT)	27370	2
Identification Technician (IDT)	27350	2
Weapons Director Technician (WDT)	27370	4
Intercept Director Technician (INT)	27370	7
Intercept Director Technician (INT)	27350	12
	Total	64

d. Full Load (FL) for Combat Centers

Chief Controller Technician (CCNTT)	27370	2
Air Surveillance Technician (AST)	27370	3
Controller Technician (CNTT)	27370	6
Manual Inputs Supervisor (MIS)	27370	1
	Total	12

e. Remaining Complement (RC) for Combat Centers

Chief Controller Technician (CCNTT)	27370	3
Air Surveillance Technician (AST)	27370	2
Controller Technician (CNTT)	27370	4
	Total	9

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ANNEX Q

C&E OFFICER
SPECIAL TRAINING REQUIREMENTS

The following represents the initial special training requirements for the C&E staff and duty officers for both Direction Centers and Combat Centers. The requirements include a limited amount of headquarters staff personnel. The first two requirements have already been allocated.

<u>NUMBER</u>	<u>REQUIRED ON-SITE BY</u>
6	15 Nov 1956
6	15 Feb 1957
6	15 Nov 1957
5	15 Jan 1958
6	15 Feb 1958
5	15 May 1958
7	1 Jul 1959

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ANNEX RAN/FST-2 AIRMAN
SPECIAL TRAINING REQUIREMENTS

The following represents the initial Phase I and Phase II Field and Organization Maintenance Training requirements. These were forwarded to Headquarters Technical Training Air Force on 16 October 1956. The phasing is in accordance with the latest operational dates of the AN/FST-2 equipment.

<u>NUMBER</u>	<u>REQUIRED ON-SITE BY</u>
2	1 Jul 1957
3	1 Aug 1957
1	1 Sep 1957
1	1 Oct 1957
1	1 Nov 1957
4	1 Dec 1957
6	1 Jan 1958
2	1 Feb 1958
2	1 Mar 1958
4	1 Apr 1958
5	1 May 1958
13	1 Jun 1958
6	1 Jul 1958
8	1 Aug 1958
5	1 Sep 1958
12	1 Oct 1958
25	1 Nov 1958
22	1 Dec 1958
24	1 Jan 1959
12	1 Feb 1959
14	1 Mar 1959
12	1 Apr 1959
22	1 May 1959
16	1 Jun 1959
18	1 Jul 1959

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DOC 346 57A

ADPRT-PA

18 Apr 1957

SUBJECT: (U) SAGE Personnel Plan (ADCM 30-1)

TO: Director of Personnel Planning
Headquarters United States Air Force
Washington 25, D. C.

1. Attached are fifteen copies of the SAGE Personnel Plan (ADCM-30-1), revised to include the phased personnel requirements in accordance with Schedule #6.
2. Reflected in the Plan is the decision by the Commander to contract for operation and maintenance of SAGE Direction Center power plants. This decision was recently concurred in by your headquarters. The requirements for refrigeration and power production personnel for these facilities have been deleted from the Plan. As your concurrence in this matter indicated that contract operation and maintenance should be considered an interim measure, we are studying the feasibility of retaining a small number of military spaces at SAGE Direction Centers with a view toward fostering increased development of military personnel resources in the refrigeration and power production career fields. Our position in this matter will be forwarded to you prior to 22 April 1957.
3. The SAGE Personnel Plan also reflects the decision by the Commander to retain a manual operational back-up capability for specified periods after scheduled SAGE operations dates. These periods are: three months each in the New York and Boston Air Defense Sectors; two months each in the Washington, Bangor and Detroit Air Defense Sectors; and one month each in all subsequent Air Defense Sectors. One month following each back-up period will be utilized to phase out AC&W Squadrons personnel not authorized in Radar Squadron (SAGE) organization tables. For example, the scheduled operations date for the New York Air Defense Sector Direction Center is 1 July 1958. At this time the SAGE Direction Center will assume full air defense responsibility. The ACW Squadrons in this sector will remain fully manned during the months of July, August and September 1958 to provide an operational back-up capability. The month of October will be utilized to phase out ACW Squadron personnel not required to support SAGE. Input of personnel from the manual system to SAGE commences on 1 November 1958 and continues progressively thereafter.
4. The SAGE personnel plan represents the first approach to finalizing personnel requirements for implementation of the entire SAGE System. Heretofore we have dealt with SAGE personnel problem areas on a piecemeal

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ADPRT-PA, Hq ADC, Subj: SAGE Personnel Plan (ADCM 30-1).

basis, due largely to the lack of a firm schedule upon which we could base long-range personnel planning. It is felt that this Plan will prove to be a useful instrument in accomplishing our goal, namely, priority manning of the SAGE System with adequately trained personnel.

5. This Plan represents current ADC policy and personnel requirements for implementation of the SAGE Program. Although it does not require overall approval by Headquarters USAF, your response with regard to the quantitative and qualitative personnel support which can be generated within overall Air Force resources is requested.

FOR THE COMMANDER:

1 Incl (SECRET)
a/s (15 copies)

MARSHALL S. ROTH
Major General, USAF
Chief of Staff

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H. A. BOSS
Capt USAF
Asst Commanding

per para **300** AFR 205-1, or for reason(s) stated.

OFFICE CODE:	DATE:	TEL NO:	PARFOLE NUMBER AND SUSPENSE DATE:
ADOC-ER	1967		10 May 67

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//CONFIDENTIAL//FROM (AFOAC-E/A 55795)
REFERENCE YOUR MESSAGE ADOCE-ER 01198 DATED 29 APRIL 1957. THE
LATEST ESTIMATES ON EQUIPMENT AVAILABILITY FOR TIME DIVISION DATA
LINK IS CONTAINED IN THE 8 MARCH 1957 MINUTES OF THE GROUND/AIR
DATA LINK COORDINATING COMMITTEE. AUTHORITY IS GRANTED TO PROGRAM
THIS EQUIPMENT IN THE P.C. ACTION UNDER THE PROVISIONS OF AFR 100-46
MAY BE ACCOMPLISHED BY THE SUBMISSION OF ONE (1) EACH AF FORM 1295
AND THE NECESSARY NUMBER OF AF FORMS 1295A FOR EACH OF THE EIGHT
AIR MATERELS AREAS. AMA COORDINATION WILL BE REQUIRED.
BT
07/2025Z MAY RJEPHQ

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ADWEP

NOV 348

ADWEP 57M

10 May 1957

SUBJECT: (O) Manpower Requirements for SAGE Computer Programming

TO: Commander
Air Defense Command
Bnt Air Force Base
Colorado Springs, Colorado

1. Reference our message ADWEP-5-1-3 and letter your Headquarters, dated 5 March 1957, Subj: Manpower Requirements for SAGE Computer Programming. Time-phasing of the movement of instruments of this organization to other locations was based on the situation as it could be anticipated in March, 1956. The situation that now prevails and its impact on future time-phasing alters the time-phasing contained in the above cited letter. It is the purpose of this letter to advise your Headquarters the changes that are needed and the reasons for them.

2. Although it was known in March of 1956 that the operationally ready date of McGuire would be delayed, the amount and kind of work that would be required to meet the new later date was not known. Later developments which directly affected the time-phasing of the movement of this organization to Santa Monica are as follows:

a. The programming task to provide operational computer programs for the direction center and combat center is roughly twice that originally anticipated.

b. Lincoln Laboratory responsibility in development of programs will continue past the operationally ready date for the first SAGE models.

c. Acceptance by RAND of all operational programming responsibility as of a given time was, therefore, changed to their accepting it on a phased basis as Lincoln Laboratory completes the development.

d. RAND will be required to work on several programs at the same time instead of confining their effort to writing a single operational program, writing, and installing it in each SAGE sector. These programs are:

(1) Adaptation of the 58 program to computers with the small memory.

(2) Adaptation of the 58 program to computers with the new larger memory.

(3) Development of the program with additional capability not included in the 58 program for computers with the larger memory.

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AMSP, 24 4600th 4600th, 24 May 57, Subj: Progress Report for ACR
Computer Programming

f. The unexpectedly heavy work load in accomplishing the above-mentioned programming tasks has resulted in a requirement to write the combat center program in three parts. The first part gives minimum operational capability acceptable to meet currently scheduled operationally ready date for the combat center at Syracuse, New York. Parts two and three are for the purpose of increasing the initial capability to as nearly optimum as possible. It is expected that all three parts will not be available until after the operationally ready date of the second combat center.

g. Delay in the test program at HSS has reduced the time available to perform all tests originally planned to be completed before the first direction center becomes operational.

h. The manner in which these developments have affected the time-phasing of this organization's move to Santa Monica can be summarized as follows:

a. The requirement for providing operational guidance to the Lincoln Laboratory now extends through and for a short time following the scheduled operationally ready date for the second combat center.

b. The programming activity, especially as it pertains to program development, will be divided between Lincoln Laboratory and RAND at Santa Monica, California, until about the end of calendar year 1959. At that time RAND will assume all but the continuing ARDC research in this activity at Santa Monica.

c. Revision of operational specifications for the additional capability of the computer with the new memory is a continuing function conducted by Lincoln Laboratory and the 4600th Wing until this program is shaken down, tested and finally installed at McGuire.

d. Development of the Combat Center program in three parts requires the development of revisions to the operational specifications in correlated parts. This will be a Lincoln Laboratory and 4600th Wing joint effort.

4. Since this organization is directly concerned with the above activities in either an advisory or supervisory capacity, it is necessary to assure that the personnel who must perform these services are located where they are needed. The following tabulation starting with the first quarter FY 58 provides for the personnel now at Santa Monica, California, and those who will arrive there during July and August of this year. The balance of the tabulation reflects the movement of the Programming Division to Santa Monica. This movement is synchronized with the expected phased movement of RAND personnel and their programming activity to Santa Monica.

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ADWP, 24 4680th Amdt, 14 May 57, Subj: Manpower Requirements for SACR
Computer Programming

Total Wing Auth Strength - 30 Officers 7 Airmen 4 Civilians

	Residence at Lexington			Residence at Santa Monica		
	OFF	ARM	CIV	OFF	ARM	CIV
1Q58	30	6	4	6	1	0
2Q58	30	6	4	8	1	0
3Q58	29	6	4	15	1	0

5. For reasons indicated above, it is proposed to start the movement of the Wing Headquarters during the second or third quarter of FY 1967 and complete it over a three-month period of time. The balance of the phasing would then be as indicated below:

<u>VELT</u>	<u>LOCATION</u>	<u>OFF</u>	<u>ARM</u>	<u>CIV</u>	<u>TOTAL</u>
2Q/59	4680th Det. 2 Gunter AFB	5	-	-	5
3Q/59	4680th ADWOP Richardson-Gessner AFB	44	206	26	276
3Q/60	4680th Wg. Hqs. Santa Monica	30	7	4	49
3Q/60	4680th Det. 1 Lexington	5	-	-	5

6. It is requested that Paragraph 5, letter your Headquarters, dated 5 March 1957, Subj: Manpower Requirements for SACR Computer Programming, be changed to reflect the above time-phasing for this organization.

JORTR
Colonel USAF
Commander

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