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HISTORY

of the

DIRECTORATE OF COMMUNICATIONS

DEPUTY CHIEF OF STAFF, OPERATIONS

1 July 1954 to 31 December 1954

5-3507-4

BRIEF RESUME OF THE HISTORY OF THE DIRECTORATE OF COMMUNICATIONS

Following, broken down by Divisions, is the History of the Directorate of Communications, DCS/Operations, Hq USAF, for the period 1 July 1954 through 31 December 1954. (UNCLASSIFIED)

Personnel authorizations for this directorate were increased by five spaces during this period. These spaces were allocated as follows:

a. A Major space was allocated to the Programs and Standards Branch, Plans and Policies Division, for the purpose of coordination on construction matters, acting as the authority, advisor and responsible officer for all construction matters for the directorate. (UNCLASSIFIED)

b. Two Major spaces were allocated to the Electronic Warfare Branch, Electronic Systems Division for officers to be assigned as Combat Command Unit Assistant and Electronic Warfare Equipment Unit Assistant. (UNCLASSIFIED)

c. A Lt Colonel space was allocated to the Office of the Chief, Plans and Policies Division, to provide for a full time Assistant Air Force Coordinator for JCEC matters. (UNCLASSIFIED)

d. A civilian space was allocated to the Office of the Chief, Plans and Policies Division. The primary purpose of this space is to provide clerical assistance to the Secretaries to the Division Chief and the Air Force Coordinator for JCEC matters. (UNCLASSIFIED)

A T/Sgt allocation within the Executive Office of the directorate was converted to that of a Warrant Officer. This conversion was necessitated by strict regulations with regard to safeguarding of Top Secret material, which precluded airmen or civilian personnel from

performing many duties regarding the pickup, delivery and control of Top Secret material. (UNCLASSIFIED)

Personnel assigned to the Office of the Director and Executive remained as last reported; however, there were several changes in key personnel within each Division, as indicated in the histories immediately following. (UNCLASSIFIED)

During the period of this report, Major General Blake made routine staff visits to various Air Force Bases for the purpose of inspecting communications and electronics facilities. (UNCLASSIFIED)

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HISTORY
OF
PLANS AND POLICIES DIVISION
for period of
1 July 1954 through 31 December 1954

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HISTORY
of
OFFICE OF THE DIVISION CHIEF
PLANS AND POLICIES DIVISION
For Period of
1 July 1954 - 31 December 1954

HISTORY
PLANS AND POLICIES DIVISION
OFFICE OF THE DIVISION CHIEF
CHAPTER I
ORGANIZATION AND FUNCTIONS

During the period 1 July through 31 December 1954, two (2) additional space authorizations were allocated the Office of the Division Chief. The first provides the Air Force Coordinator, JCEC, with a full time assistant in the grade of Lt Colonel. The second provides the office with a civilian personnel space (GS-3) for the task of routing correspondence, filing, typing, and general administrative work. (UNCLASSIFIED)

Two (2) personnel changes marked the period under report. They were as follows:

On 9 August 1954, Lt Colonel Howard E. McCormick replaced Lt Colonel Robert J. Hennessy as Executive of the Plans and Policies Division. Lt Colonel Hennessy was reassigned as Assistant JCEC Coordinator. (UNCLASSIFIED)

On 27 November 1954, Lt Colonel Paul E. Long was assigned to the Division. He will replace Lt Colonel Hennessy as Assistant JCEC Coordinator upon his reassignment on or about 26 January 1955.

(UNCLASSIFIED)

CHAPTER II

ACTIVITIES

The historical record of the Division Chief's Office is best couched in the terms of staff supervision, staff monitorship and direction, and staff coordination of the division and directorate effort. This embraces the management of men, material and frequencies for USAF C-E. It extends across a spectrum which reaches from intra-Air Force, through joint and combined effort, and on to national and international areas of interest. It includes budgetary defense, programming, planning, allocations, authorizations and negotiation. These are continuing activities representing the long term investment of the USAF in the C-E field. They are designed toward an overall objective of better support to the aircraft we launch, through a sound, thorough, well considered approach to the plans and policies we create. (UNCLASSIFIED)

HISTORY
OF
PROGRAMS AND STANDARDS BRANCH
For Period of
1 July 1954 - 31 December 1954

CHAPTER I
ORGANIZATION AND FUNCTIONS

There were no changes of organization or functions in the Programs and Standards Branch during the period 1 July 1954 to 31 December 1954. (UNCLASSIFIED)

Personnel changes and additions during this period were as follows: (UNCLASSIFIED)

Major Edward M. Vaughn, AO 405910 was assigned to the Branch on 2 July 1954. He replaced Captain Gene W. Redden who had been reassigned from this Headquarters on 5 March 1954 after completion of his tour of duty. (UNCLASSIFIED)

Mr. Bernard J. Cross, GS-11, left this Branch and was reassigned to the Plans Branch on 1 August 1954. The reassignment was brought about as a result of a vacancy for an Electronics Engineer, GS-12 in the MDAP Team of the Plans Branch, this Division. (UNCLASSIFIED)

The following appointments on the Deputy Chief of Staff, Operations, Weapon Systems Phasing Team were made on 16 December 1954. (UNCLASSIFIED)

Mr. Thomas B. Crigler, Member.

Lt Col M. E. Niccolini, Alternate.

Mr. Nelson H. Cator, GS-11 was assigned to this Branch on 5 December 1954. Prior to his assignment to this Branch he was

assigned in the Directorate of Requirements as a GS-9. This position was vacant as a result of the reassignment of Mr. William B. Pickering to Spain on 29 October 1954. (UNCLASSIFIED)

Two GS-9 Program Analyst positions were upgraded to GS-11 positions on 5 December 1954. This action was a result of the annual review of all civilian positions in this Branch by civilian personnel office, Secretary of the Air Staff. (UNCLASSIFIED)

One additional officer space in the grade of Major was authorized this Branch on 1 July 1954. To date this authorization has not been filled. (UNCLASSIFIED)

Two secretarial type positions became vacant during this period. One position was filled 30 August 1954 and the other was filled on 28 September 1954. (UNCLASSIFIED)

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CHAPTER II

ACTIVITIES

USAF COMMUNICATIONS-ELECTRONICS INSTRUCTIONS (CEI) REVISION

LETTERS. Revision Letters Nos. 11, 12 and 13 were reviewed by the CEI Review Board, printed and distributed during this period. The CEI is a standard Air Force publication which provides USAF Communications-Electronics staff officers with a single reference source for information and directive material. Revision Letter No. 11 was distributed on 2 July 1954 and contained new page inserts for the CEI Contents pamphlet and Chapters 2, 8 and 12. Revision Letter No. 12 was distributed 10 August 1954 and contained new page inserts for the CEI Contents pamphlet, the CEI Index and Chapters 3, 11 and 31. Revision Letter No. 13 was distributed on 21 September 1954 and contained new page inserts for the CEI Contents pamphlet and Chapters 10, 11, 12, 31, 39 and 41. In addition, the CEI Review Board reviewed material for Revision Letter No. 14. (UNCLASSIFIED)

PRINTING OF CEI MATERIAL. Action was initiated to print revisions of the CEI at the Kelly Field Printing Plant. In the past this printing was done at the Government Printing Office in Washington, D. C. This necessitated the placing of two men from the USAF Security Service on TDY for a period of approximately

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seven days each time a revision was published. Printing of revisions at Kelly AFB, Texas, eliminated the need for TDY and travel expenditures. One of the problems in obtaining authority to transfer printing activities from the Government Printing Office to the Kelly Field Printing Plant was the approval of this procedure by the AAG. Printing of Air Force wide publications by a Field Printing Plant is normally contrary to the policies established by the Joint Committee on Printing. However, in view of the circumstances involved in this case approval was granted on 22 December 1954. (UNCLASSIFIED)

CHANGES IN MEMBERSHIP OF CEI REVIEW BOARD. As a result of reassignment of personnel the CEI Review Board was reconstituted, as shown below. The new members are Colonel C. W. Gordon vice Colonel G. M. Higginson and Lt Colonel C. R. Gajan vice Lt Colonel S. J. Whitsitt. (UNCLASSIFIED)

Colonel C. W. Gordon, Chairman

Colonel W. H. Lyle

Lt Colonel C. R. Gajan

Lt Colonel W. J. Retzbach

Lt Colonel M. E. Niccolini (Secretary)

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REORGANIZATION OF 49TH AIR DIVISION ORGANIZATIONS. The 20th, and 81st Fighter Bomber Wings, and 47th Bomb Wing, Light, along with all associated support units will be inactivated as T/O units effective 8 February 1955. Concurrent with inactivation as T/O units they will be reorganized as TD units. This action was taken to permit the 49th Air Division to organize its units commensurate with its assigned mission. As soon as more appropriate T/O's can be developed all units will be reorganized again as T/O units. This office concurred with this action for the three like numbered wing-base communications squadrons. As soon as the revision to T/O 1-2233 is published these three communications squadrons will be reorganized as T/O units. (CONFIDENTIAL)

ORGANIZATION OF RADIO RELAY SQUADRON FOR NEAC. The 6631st Radio Relay Squadron was organized effective 1 December 1954 in NEAC. This is a TD organization designed to operate and maintain the POLE VAULT facilities between Newfoundland and Frobisher Bay. Concurrent with organization of the 6631st Radio Relay Squadron the 6th Radio Relay Squadron was removed from the Air Force Program. The 6th Radio Relay Squadron was originally programmed to provide a microwave system from Newfoundland to Frobisher Bay. (CONFIDENTIAL)

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ACTIVATION OF COMMUNICATIONS SQUADRON IN SUPPORT OF SAC 3RD AIR DIVISION. The 27th Communications Squadron, Division was activated effective 8 October 1954 on Guam. This squadron supports SAC's 3rd Air Division. In view of an immediate requirement for this organization, activation in the theater was approved with the understanding that SAC would take care of the initial manning and equipping from within their own resources. (CONFIDENTIAL)

ACTIVATION OF COMMUNICATIONS SQUADRON IN SUPPORT OF 7TH AIR FORCE. The 12th Communications Squadron, Air Force was recently programmed for activation in May of 1955 at Hickam AFB, T. H. This Squadron will later be deployed to Wheeler Field, T. H. in support of the recently activated 7th Air Force Headquarters. (CONFIDENTIAL)

REORGANIZATION OF MICROWAVE RELAY SQUADRONS. Proposed reorganization of the 7th and 8th Radio Relay Squadrons has received Air Staff approval and will be scheduled for reorganization in the near future. Concurrent with reorganization of the 7th and 8th Radio Relay Squadrons the 15th Communications Squadron, Air Force will be inactivated. This action will increase the authorized troop strength of the 7th and 8th Radio Relay Squadrons by one (1) Officer, and one hundred thirty-five (135) Airmen. The troop space authorizations of the 15th

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Communications Squadron, Air Force amounting to eight (8) Officers and one hundred ten (110) Airmen will be credited to this increased requirement. The overall adjustment will result in a savings of seven (7) Officers and a cost of twenty-five (25) Airmen. The 7th and 8th Radio Relay Squadrons are charged with operating and maintaining the Air Force portion of the joint Air Force-Army microwave system in Europe. (UNCLASSIFIED)

ACTIVATION OF ORGANIZED RESERVE UNITS. During the period June 1954 to December 1954, two (2) AACS Mobile Squadrons, one (1) AACS I & M Squadron, and one (1) AACS Facility Checking Squadron were activated in the Organized Reserve. One additional AACS Mobile Squadron, and two AACS Facility Checking Squadrons are scheduled for activation in the near future. (UNCLASSIFIED)

T/A 1-1 COMM: Table of Allowances 1-1 COMM was rescinded 23 November 1954. The action was initiated as a result of a routine review which disclosed that many of the items allowed were properly fixed facilities within the scope of AFR 100-46. Deleting the fixed type items left so few equipment in the document that it was considered impractical to maintain a separate T/A for the communications requirements. Accordingly, the remaining items of a base support nature were transferred to T/A 1-1. Items of a training nature were included in T/A 1-2. Test Set, electron tube, TV-7() was dropped from T/A's since it

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duplicated allowances in ECL 20-30-10. An interesting aspect of these actions was that vehicular radio set AN/VRC-19 allowances (formerly authorized by T/A 1-1 COMM) were identified with appropriate base radio systems. They will now be programmed in the PC with the associated fixed radio sets AN/FRC-27.

(UNCLASSIFIED)

COMMUNICATIONS EQUIPMENT FOR RESERVE FORCES TRAINING: Early in this period, our attention was directed to a deficiency in providing C-E equipment to Continental Air Command and to Reserve communications organizations for the training of Reserve Force personnel. We received several requests from CONAC in the form of proposed T/A 1-85 revisions, special authorization and issue requests, and proposed ECL changes to obtain the necessary equipment. Many of the items requested appeared to duplicate existing allowances. Others seemed to fall into the category of fixed facilities within the purview of AFR 100-46. Justification seemed ample for the equipment needed, but did not show why the conventional allowances and methods of authorization (MEAL and PC) were inadequate. For this reason we were unable to establish the propriety of the requests. CONAC was then directed to prepare a communications plan, which would present their entire command C-E requirements. The plan was submitted for Air Staff review and approval on 16 August. During the review of the CONAC plan, it was compared with previous

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requests for equipment, and with existing allowance documents and authorizing procedures. From the review, it was developed that the probable reasons for CONAC's reluctance to use conventional equipping procedures were:

1. Fear that excessive delay would result from the programming action under AFR 100-46.

2. They had the mistaken understanding that a T/O unit which drew any part of its organizational equipment had to take the entire amount authorized. They had therefore established a command policy that the unit authorization list (then called UPREAL) of Reserve units would not be activated until the organization was 50 percent manned.

The effect of these deviations was that CONAC's equipment needs were excluded from any automatic requirements computations; their requirements were submitted as gross quantities, with little or no justification, and were accordingly rejected from budget and buying programs.

A conference was held with representatives from CONAC on 30 September. It was determined at this time that our estimate of probable reasons for deviating was accurate. Decisions were then made as follows:

1. CONAC shall follow conventional UAL (AFR 67-83) procedures in equipping Reserve T/O communications organizations.

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2. C-E requirements of CONAC's regular Air Force communications organizations, Air Reserve Centers, and Air Reserve T/D units are essentially fixed-plant in nature; they will be programmed in accordance with AFR 100-46.

These decisions were transmitted by letter to Hq CONAC, and were subsequently incorporated in Material Guidance (1956 Buying, 1957 Budget). (UNCLASSIFIED)

TYPE CLASSIFICATION OF MAJOR END ITEMS OF C-E EQUIPMENT.

During the past six months some progress has been made in this area. As of 18 August 1954 approximately 174 items of C-E equipment were authorized in the MEAL but had not been type classified in accordance with AFR 80-6. ARDC's review of these items indicated that 41 were minor items for which approval could be furnished direct to AMC by ARDC. 43 were Air Force items and type classification for all of these items have been completed by ARDC. The remaining 90 items were Signal Corps items. ARDC was unsuccessful in obtaining functional test reports for these items for evaluation of the equipment. ARDC was therefore obliged to prepare their own engineering analysis and functional test reports. Initiation of type classification action for these 90 Signal Corps items will be accomplished prior to 15 March 1955. In the meantime continuing action was taken to insure that ARDC take joint type classification action

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with the Signal Corps on all items listed in the Signal Corps Technical Committee's agenda in which the Air Force professes an interest. (UNCLASSIFIED)

PRIMARY AND SECONDARY LISTINGS OF C-E EQUIPMENT. Action had been initiated on 1 April 1954 to provide a means whereby operational and logistical activities could obtain information pertaining to acceptable substitutes for primary C-E items. Due to the absence of such information:

a. AMC is unable to factually determine the assets to be applied against quantitative requirements for the primary C-E items during the buying and budget cycle.

b. Supply personnel at all echelons of command were unable to determine appropriate items to be issued in lieu of unavailable authorized primary C-E items.

c. Operational activities were unable to evaluate for possible use all C-E items immediately available in local supply depots to satisfy, on a crash basis, unexpected operational requirements. Since too little progress appeared to have been made, this office, in a memo to AFDDP redefined our objectives and requested that all possible efforts be exerted to insure that the required information is assembled and published at an early date. It was further suggested that this be done by a commercial agency if the Air Force is unable to accomplish this task due to work load in other areas. (UNCLASSIFIED)

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TACTICAL AIR COMMAND C-E MANEUVER STOCKPILE. A detailed review was made in August 1954 of past TAC correspondence dealing with the C-E maneuver stockpile. The review indicated that numerous deletions and additions of equipment had created many problems in funding, procurement and allocation. TAC was therefore requested to re-examine the basic concepts upon which the C-E maneuver stockpile was originally established and forward to this Headquarters their firm requirements. The study was conducted and forwarded by TAC as requested. Analysis of the study revealed that the quantities of equipment requested would more than satisfy maneuver requirements. It was then determined that TAC was using the maneuver stockpile as a means of obtaining expeditious supply action not only for the equipment actually required in the maneuver stockpile, but also for equipment presently authorized in the MEAL but not on hand, and additional non-authorized items required by their units. No justification had been furnished for the requested non-authorized items. A series of telephone conferences resolved most of the points of differences. A memorandum has been prepared to AFMSS recommending they:

- a. Take action to obtain the quantities of equipment required for the C-E maneuver stockpile, and

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b. Obtain and supply the quantities of non-authorized equipment required by TAC units as special issue.

The memorandum was informally coordinated with AFMS personnel. However it will not be dispatched until TAC furnishes proper justification for the non-authorized equipment. As soon as the revised T/O 1-2233 is published, TAC will process changes and revisions to the MEAL to provide permanent type authorization for the presently non-authorized equipment to be furnished under special issue authority. (UNCLASSIFIED)

TACTICAL G-E AIR TRANSPORTABLE ENGINE GENERATORS. In the Historical Report for the period January to June 1954 mention was made of a staff study prepared by this Branch relative to the deficiencies of present engine generators and recommended corrective action that must be taken to affect improvement. ARDC forwarded our staff study to the Wright Air Development Center for evaluation and initiation of development action if required. A report was to be furnished this Headquarters in August 1954. This date was changed to October 1954 and subsequently slipped to the first part of January 1955. No information is therefore available at this time as to the result of WADC's evaluation. (UNCLASSIFIED)

COMMERCIAL AND INDUSTRIAL FACILITIES. The programs to get the government out of competition with private enterprise continued

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during this period. Many other commercial and industrial facilities were selected for survey and determination of the desirability of government ownership. Communications-electronics has not as yet been included except for base telephone systems. Telephones are included because of a prior DOD program. The Communications System Division is carrying the project to secure final approval of government ownership of a select number of systems. (UNCLASSIFIED)

COMMUNICATIONS-ELECTRONICS PERSONNEL. The status of C-E officer personnel remains rather cloudy. Authorisations continue to drop yet the actual need appears to rise. For example, almost 2,000 officer spaces were lost in the period January 53 - January 55. The assigned strength was fairly constant at between 6,200 - 6,500 officers. However, many cases of the need of C-E Officers in other areas has arisen. For example, Supply Officers with C-E experience are requisitioned. We believe that a C-E Officer should be authorized in such cases rather than a Supply Officer. If proper identification existed, then a true training requirement for C-E Officers would exist. This Directorate is continuing to try to improve the identification of the C-E Officer requirement. However, the problem will be complicated early next year by the Director of Military Personnel removing AFSC's 3016 and 3034 from

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the list of "Limited Resource" specialties. This will leave only AFSC 3044 on the list. The basis for removing the AFSC's is that they are over 90 percent manned. This new height of manning is not because of a large gain in personnel but is primarily due to the decreased authorization noted above.

In the case of airmen, we continue in fair shape, numbers wise. Our skill level is beginning to drop off because of the exodus of large numbers of skilled airmen. Re-enlistments in the C-E area are continuing low and no great improvement can be anticipated for some time. The result is more emphasis on contractual maintenance such as the ADC program. Of course, the ADC program is primarily to replace contractor technicians. It also recognizes the poor personnel conditions. On the operations side, 15 CAA technicians are being integrated into the AACS air traffic control system on an experimental basis. If this program appears successful, it will probably be expanded.

(UNCLASSIFIED)

NEW AIRMAN RADIO-RADAR SYSTEMS CAREER FIELD. Advance copies of the Airman Radio-Radar Systems Career Field have been forwarded to all commands. This new field was finalized at the 17 - 20 August 1954 conference at Keesler Air Force Base.

The new career field is the same as the present at the Warrant Officer level. The 7 level is similar except in the

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ground radio area. There are four 7 level specialties in this area where only one existed before. However, one 7 level specialty will be deleted from the 36 career field when the new 30 field is implemented. There are twelve 7 level specialties in the new 30 field compared with eleven in the present field and one in the 36 field.

The big change occurs in the 3 and 5 level skills. There are thirty-two specialties, with eleven in the present 30 and one in the 36 field. Obviously, these more specialized airmen can be trained in less time, thus saving money. The greatest advantage appears to be that these airmen can start producing in much less time since they will be better trained.

We must insure that these airmen receive the broad training needed to qualify them at the 7 level. This specialization at the 3 and 5 level is a recognition of present conditions. Airmen with broad ability are still the desired goal as represented by the 7 level. (UNCLASSIFIED)

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FY 56 C-E BUDGET ESTIMATE. The FY 1956 Budget Estimate for P 230, Electronics & Communications Equipment, amounting to \$436.9 million, was cleared by OSD and forwarded for inclusion in the President's Budget. (CONFIDENTIAL)

PC-56-1. PC-56-1, based on PD-56-1, was published in August 1954. The system of monthly revisions to the document continues. (UNCLASSIFIED)

USAF-AMC CONFERENCE. A conference was held at Hq USAF on 22-23 September 1954 between Major General C. S. Irvine, Deputy Commander, AMC, with members of his staff, and Major General G. A. Blake, Director of Communications, Hq USAF, with members of his staff and other Air Staff offices. The purpose of the conference was a presentation by AMC of the problems facing them in meeting their responsibilities in C-E programming and implementation. AMC proposed that some form of "logistic feasibility testing" be established to assure that the program could be implemented as stated. This was approved in principle, subject to detailed procedures and policies being submitted by AMC for approval by Hq USAF. (UNCLASSIFIED)

REVISION OF AFR 100-46. A revised AFR 100-46 was forwarded to the AAG for publication. It supersedes AFR 66-24 and AFR 102-18. The purposes of this revision were:

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a. To eliminate the separate procedures and policies for programming base wire and telephone system requirements, and intercommunications systems.

b. To comply with DOD Directive No. 4630.1, 29 October 1954.

c. To prescribe the use of AF Forms 1295 and 1295A in the programming of fixed C-E facilities.

d. To refine and clarify procedures and responsibilities for coordination of fixed C-E requirements between all agencies concerned with the program. (UNCLASSIFIED)

WORLD-WIDE C-E PROGRAMMING CONFERENCE. A conference was held at Hq USAF and 29-30 November 1954, attended by representatives from all major commands and the engineering-installing activities of ANC and AACS, for the purposes of:

a. Presenting AF Form 1295, and issuing detailed instructions on its preparation.

b. Discussing the final draft of the proposed revision of AFR 100-46 (since published), and presenting the Hq interpretation of the regulation.

c. Discussing general problems related to C-E programming, the PC document, and the several implementing documents.

(UNCLASSIFIED)

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DOD DIRECTIVE 4630.1 "REPORT ON COMMUNICATIONS PROJECTS".

The Department of Defense issued on 29 October 1954, Directive No. 4630.1, "Report on Communications Projects". This directive requires that certain point-to-point communications projects, costing in excess of \$50,000, be submitted to them for approval prior to implementation by the military departments. It also requires that certain projects having joint or strategic implications be submitted to the Joint Chiefs of Staff (JCEC) for approval. (UNCLASSIFIED)

C-E BROCHURE. The Evaluation Section began operations with respect to preparing plans in the newly-proposed brochure form. Two brochures were completed as samples to indicate the scope and type of this new planning media. One covers the Gap-Filler and one covers Tacan. These plans are intended to close the gap between airborne planning and ground planning, and to collect background for a given program of a type never heretofore assembled and published under one cover. These plans are intended as a guidance throughout the Air Force. (CONFIDENTIAL)

WEAPONS SYSTEM. A Weapons System Phasing Team was organized for DCS/C on 24 September 1954, with Colonel W. M. Banks as chairman. This team, along with teams from the other Deputy Chiefs of Staff, report weekly to the Weapons System Committee under Colonel J. P. Hines. Colonel Hines' committee is made

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up of the chairmen of each of the DCS teams. The reporting will concern the progress toward implementation of 22 new type aircraft and missiles. This involves systemitized reporting from the Directorate of Communications. The chairmanship was transferred on 23 November from Colonel Banks to Colonel S. D. Kelsey of the Operational Plans Division of the Operations Directorate. Directorate of Communications members on the DCS/O Weapons System Phasing Team are Mr. T. Crigler, primary representative and Lt Colonel M. E. Niscolini, alternate. (UNCLASSIFIED)

PRESENTATION ON LINCOLN. A presentation on plans and progress on the Lincoln Defense System (SAGE) was made on 13 October to the Program Status Committee of the Air Council, and to OSD and Budget Bureau officials. The presentation was made by the Joint Project Office of New York City, by ARDC and by the Assistant Chief of Staff for Installations. The joining together of this presentation as a joint project was accomplished by the Evaluation Section of the Branch. (UNCLASSIFIED)

WEAPONS PLANS AND CONCEPTS. Planning for new aircraft in the Air Force will be done by means of 8 plans for each aircraft, in addition to existing programming data. These are titled: (1) Operational Concept and (2) Plan, (3) Logistics concept and

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(4) Plan, (5) Personnel Concept and (6) Plan, (7) Installations Concept and (8) Plan. Although operational plans have been used for years, the bulk of this work was initiated since 30 June 1954 as it effects the Communications Directorate. These plans, as received, made little or no mention of electronics items or considerations, either airborne or ground. After a long period of protest in this connection, we were able in December to secure permission from the Directorate of Operations to insert electronics into the operational concept and plan. As of 31 December, however, we were still unsuccessful in having it inserted in any of the other 6 plans and concepts. World wide air-ground C-E relations are apt to be handicapped by this omission. (CONFIDENTIAL)

REVIEW OF C-E TYPE TECHNICAL ORDERS AND AIR FORCE MANUALS.

Studies were initiated to review existing Technical Orders of the 16 series and AFM of the 100 and 101 series to determine their adequacy and current status. It was found that many Technical Orders were no longer required by the Air Force and that certain other Technical Orders required revision. The Directorate of Maintenance-Engineering was informed of the result of these studies and requested to take corrective action. (CONFIDENTIAL)

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HISTORY
of
FREQUENCY BRANCH
for period of
1 July 1954 through 31 December 1954.

CHAPTER IORGANIZATION AND FUNCTIONS

A. ORGANIZATION:

The following major changes occurred during the period.

Major V. McQueen replaced Mr. L. S. F. Meaker as Chief of the HF Section on 5 July 1954.

The organization of the Branch as of 31 December 1954 is shown in appendix I.

B. FUNCTIONS:

The functions of the Branch remain unchanged since submission of the January to June 1954 history.

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CHAPTER II

ACTIVITIES

A. HF (3000 kc/s to 30,000 kc/s)

FREQUENCY PROPAGATION BY IONOSPHERIC SCATTER (FPIS). VHF frequencies were cleared and assigned to the FPIS circuit between Goose Bay and BW-1, and to an experimental one-way circuit from Newfoundland to the Azores. As of 31 December 1954 there were a total of ten FPIS frequencies assigned to seven USAF circuits in the North Atlantic area. A very considerable amount of time and effort was expended, in association with Army, Navy and other Government agencies, in an accelerated program to assess the national and international impact of FPIS operations with respect to allocations and potential interference to existing services. (CONFIDENTIAL)

OUT OF BAND FREQUENCIES. The HF Section of the Branch has been engaged in moving USAF operations out of bands which have been allocated to other types of services by the Atlantic City Table of Allocations. Operations are being moved for implementation of the following:

- a. Cargo Ship Telegraph Working Bands
- b. Passenger Ship Radiotelegraph Bands
- c. Pacific Area Aeromobile (R) Frequencies
- d. Ship Radiotelephone Bands

This has been a most difficult task due to the insufficient number of replacement frequencies available. (UNCLASSIFIED)

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GLOBECON SUMMARY. The Globecon frequency assignments for the Atlantic, European, and African areas are a particularly tough job. The main reasons for this difficulty are:

a. These areas represent interests of many countries which are crowded in comparatively small regions, and whose communication political interests are mostly predominant over those of collective security. Therefore, they are reluctant to agree to any assignments made by foreign nations, which might interfere with their own possible future plans, particularly if the foreign transmitting stations are established in their territories.

b. Many Globecon circuits require high-power wide-band emission for rather short distances which, in spite of using directive antennas, may cause considerable interference to services in remote locations.

c. Networks causing harmful interference by virtue of their non-directive emissions.

d. The same applies to the facsimile broadcasts addressed to certain fixed stations.

e. Collision of interests of other Governmental services. The Atlantic networks may easily get into conflict with Naval services, while the European-African networks may interfere with the Army stations in the same region.

Today the HF spectrum is almost saturated in European, African and Middle East regions, and when we succeed in getting our proposals approved with the Army and Navy, we usually lose our battle in the coordination with ERFA or BJCEB, when the remaining frequencies are

knocked out by France, Portugal, or some other nation. And then the only thing we can do is to try to find some new frequencies. This procedure is sometimes repeated several times, and as a complete coordination often lasts three to six months, or even longer, at times it takes a year or more to complete the assignment of a frequency. Therefore, we must plan the future needs well before the time of their implementation. Headquarters, Airways and Air Communications Service has presented their request for Globecom frequencies as they will be required from the present time up to the 31 July 1957. These requirements represent frequencies for new circuits as well as those which are to replace those frequencies which proved unsatisfactory in their operation. Then, there are still a few frequencies used that are not in the fixed bands, and the replacement of which still resists all our efforts.

In the European/African and Atlantic regions we have assigned more than 76 Globecom frequencies that are in operation at the present time. Beside assignment of frequencies we are very much concerned with the expansion of emission for circuits from CW to radioteletype, from simplex to multiplex, or to single side-band emission. At the same time there is a requirement for increased power. Both these changes usually increase the probability of interference, and so we are often compelled to look for another frequency. (CONFIDENTIAL)

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WEATHER RECONNAISSANCE AIR/GROUND FREQUENCIES. Frequencies are now available for all of the stations in the program. Tokyo, Guam, Hickam, Elmendorf, McClellan, and London are assigned "Off-Route" (OR) frequencies. London was assigned 4 frequencies on 9 December 1954, the last station to receive an assignment. Kindley AFB, Bermuda, is operating on "Route" (R) frequencies originally set up for International Civil Aeronautics Organization, ICAO, North Atlantic CW operations. The same (R) frequencies are used also at Miami and San Juan by the Civil Aeronautics Administration (CAA) in coordination with Kindley AFB. No action to establish (OR) frequencies for Kindley AFB has been taken because it is considered best to stay on the (R) frequencies until the problems at Kindley AFB are given further consideration. As an aid in solving these problems, AACS has been requested to conduct a survey of the Kindley AFB (R) frequencies. (CONFIDENTIAL)

TAC FREQUENCY PLAN. The high frequency point-to-point communications plan for Tactical Air Command has undergone complete overhaul. In the past, frequencies were assigned to TAC for use within a 440 mile radius around four TAC bases within the EI. This was unsatisfactory because it restricted point-to-point communications. In response to our request, TAC submitted an overall circuit requirement with justification. TAC requested duplex operation, day and night, for each circuit. In revising the Frequency Plan, the main objective was to permit greater flexibility of the frequencies available. The

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Frequency Branch obtained this flexibility by giving TAC duplex operation for day use and simplex operation for night use at their bases and simplex operation for day and night use within their maneuver areas. The new plan was due to be placed in effect 1 January 1955.

(UNCLASSIFIED)

FREQUENCIES FOR SAC'S VIP AIR/GROUND SYSTEM. A family of five (5) HF frequencies were cleared and assigned to SAC's VIP air/ground radio-teletype system on 26 August 1954. (UNCLASSIFIED)

FREQUENCIES FOR PICKET OPERATIONS. A very challenging problem has arisen with the requirement for additional frequencies for picket operations. There are just not enough frequencies available to USAF to satisfy this requirement and maintain our present operations on assigned frequencies at the same time. There are three possible solutions to the problem of finding usable frequencies for picket operations:

- a. Discontinue or move present USAF assignments to make a given frequency available.
- b. Request Army and Navy to move their assignments to make new frequencies available.
- c. Obtain a new band of frequencies, not presently authorized, for military use.

Present assignments can be discontinued only by cancelling or indefinitely deferring the requirement for circuits. Some assignments can be moved to other frequencies, but nearly all such moves will

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result in a less desirable operation. The Army and Navy would probably react violently to any suggestion that they give up frequencies to USAF, even for picket operations.

This problem was given continued study by this Branch. (CONFIDENTIAL)

SAC PLAN 1000. The scheduled move of the 8th Air Force from Carswell AFB to Westover AFB involves approximately seventy-four changes in Radio Frequency Authorizations. This is due to re-netting of SAC Plan 1000. Because of location changes and increasing concentration of circuitry in the eastern part of the United States, complete clearance proceedings (through FAS) have to be followed for each frequency requirement. As an interim measure, until all required frequencies have been cleared and assigned, the SAC command net is to be utilized. Eleven frequencies for SAC Plan 1000 were cleared and assigned as of 31 December 1954. (CONFIDENTIAL)

FREQUENCY UTILIZATION SURVEY. Due to the limited number of frequencies available, a continuing survey of frequency utilization has been established in the HF Section of the Frequency Branch. This is accomplished by checking all Frequency Utilization Reports received by this headquarters. If a report indicates no usage on a certain frequency, the command concerned is advised of the fact coupled with a proposal to delete the frequency. Upon the agreement of the Command, the frequency is deleted and reassigned to meet other outstanding requirements. (UNCLASSIFIED)

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USE OF HF RADIO PROPAGATION CHARTS. Mr. L. S. F. Meaker visited MacDill AFB, Florida on 13-14 October 1954 to observe the method of use of the HF radio propagation charts in B47 operations, and to study methods for better fulfilling SAC requirements for this information. On 28-29 October 1954, Mr. Meaker visited the Signal Corps Radio Propagation Agency, Fort Monmouth, where these charts are prepared, to acquaint the Agency with USAF requirements and to discuss improved methods of presentation. (UNCLASSIFIED)

FREQUENCY ALLOCATION PANEL (FAP) MESSAGES. A study was made during the period 11 October - 11 November 1954 to determine the amount of workload caused by handling FAP messages in the HF Section of the Frequency Branch. A summary of the results appears in Appendix II.

Each message originated by FAP requires USAF coordination by the Frequency Branch. Each FAP message requires research in the form of reference to previous messages, posting of records, or coordination of new frequencies.

Although the Air Force is executive agent for only CINCAL, CINCNE, and FAWPSC (Frequency Allocation and Wave Propagation Subcommittee) it is responsible for protecting USAF interests in all parts of the world. Therefore, every FAP message must be treated as though it were an Air Force matter, even though the Army or Navy may be charged with direct responsibility for action.

Approximately 218 of the outgoing FAP messages were sent through Army or Navy channels. In effect, this means that the HF Section originates 218 outgoing messages per month in addition to normal USAF

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traffic. The GAC memorandum for Division Chiefs, dated 9 November 1954, subject: "Electrically Transmitted Messages" showed that the monthly average of outgoing messages for the entire Plans and Policies Division was only 94.

Eighty percent of the messages handled by the HF section were classified. This was largely due to FAP traffic, which was nearly all of a classified nature. The large volume of classified messages required more care and time than an equal volume of unclassified matter.

It was difficult to compute the actual time spent on the handling of FAP messages because FAP matters are integrated with AF business. However, a poll of the seven people in the HF Section revealed that the approximate total time is 110 hours per week:

Major McQueen	5 hours
Mr. Meaker	5 hours
Mr. McCarley	5 hours
Mr. Simmons	20 hours
Mr. Dvorsky	20 hours
Captain River	20 hours
Secretary	25 hours

Conclusions:

- a. The Frequency Branch is carrying a hidden work-load which is not apparent at Division and Directorate level.
- b. The work generated by FAP messages is at least ten times as great as that generated by purely Air Force messages handled by the Frequency Branch.
- c. The Frequency Branch should continue to protect USAF interests through direct coordination with Army and Navy on all FAP messages. The FAP function of the Branch must, however, be recognized as an additional burden which requires additional time and personnel. (UNCL)

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B. UHF (300 Mc/s to 3000 Mc/s)

FREQUENCY PROBLEM WITH THE NEW MOD II SHORAN EQUIPMENT. The new Shoran equipment has been designed to operate in the band 525-705 Mc/s, which is allocated within the US for UHF television broadcasting. The FCC has in the past expressed opposition to the use of this band for Shoran purposes. In order to explain the scope and nature of the Shoran bombing operations, the Federal Communications Commission (FCC) was informed of the need for this band. It was pointed out that the primary use of this equipment would be over enemy territory in time of war and that peace-time use would be for the most part confined to established bombing ranges. The FCC was further informed that in the opinion of this headquarters, Shoran operation could be performed by selecting frequencies which were not in use in the area concerned by the television service. In order to select frequencies for Shoran operations which would not cause interference to television, the FCC was requested to give USAF requests for frequencies in this band the same type coordination as on other frequency matters.

(CONFIDENTIAL)

REQUEST FOR 10 UHF CHANNELS. Air Defense Command requested an allocation of 10 channels in the 380-400 Mc/s band for use by data link 1 kw transmitters. These 10 channels would have been in addition to the 114 channels now allocated to ADC. The request could not be satisfied because the Joint Frequency Allocation Plan allocated 380-385.7 Mc/s in small blocks to Air Force, Army and Navy and joint

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use. The band 385.8-400 Mc/s allocated exclusive use of radio relay and is reserved for use by the AN/TEC-24. All USAF frequencies in the 380-385.7 Mc/s band have been assigned to a specific function and were not available for assignment to ADC. ADC was informed of the inability to fulfill their request. Future developments as concerns the Joint Frequency Allocation Plan may make an assignment of this type possible. (CONFIDENTIAL)

USAF GCA FREQUENCIES AUTHORIZED TO NAVY GCA UNITS. ADC jet aircraft returning to O'Hare Airport, Chicago, Illinois, during bad weather were often delayed in making approaches due to high density of air traffic in the Chicago area. To offset these delays, which often created emergencies due to low fuel reserve, ADC aircraft were often diverted to Glenview Naval Air Station. USAF GCA frequencies 289.4 and 335.8 Mc/s were authorized for Navy use at Glenview NAS to facilitate GCA approaches for the diverted aircraft. (UNCLASSIFIED)

INTERFERENCE ON EMERGENCY FREQUENCY 243.0 MC/S. Headquarters USAF continued to receive complaints of interference on UHF Emergency Frequency 243.0 Mc/s by routine and/or tactical communications. A message was sent to all major commands pointing out the serious consequences which could result if this practice were allowed to continue. In addition, the message stated that until an AFR was published regarding proper use of UHF Emergency Frequency 243.0 Mc/s, major commands should consider restrictions to use of 121.5 Mc/s, as contained in AFR 100-20 as also applying to the UHF Emergency Frequency 243.0 Mc/s. (UNCLASSIFIED)

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C. RECORDS

DATA FOR CRYSTAL PROGRAM. One of the chain reactions of assigning a frequency is the crystal requirement. AMC requested assistance in programming for the FY 57 Budget Estimate for crystals. From records available in the Frequency Branch, a summary of frequency changes and assignments, covering the period 1 August 1953 to 31 July 1954, was compiled and forwarded to AMC. A copy of this summary appears in appendix III. (UNCLASSIFIED)

FREQUENCY ALLOCATION SUBCOMMITTEE (FAS) APPLICATIONS. A comparison survey was made by the HF Section, Frequency Branch, of the total number of FAS applications submitted by USAF, Army and Navy for the years 1953 and 1954:

	<u>1953</u>	<u>1954</u>
USAF	808	955
Army	567	607
Navy	505	336

It is interesting to note that for the year 1954, the number of USAF applications exceeded the combined total of Army and Navy by 12 applications. (UNCLASSIFIED)

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D. MISCELLANEOUS

EXECUTIVE COUNCIL-CENTRAL RADIO PROPAGATION LABORATORY, (CRPL).

Mr. L. S. F. Meaker of this branch represented the Directorate at an Executive Council meeting of the Central Radio Propagation Laboratory held on 4 November 1954. Dr. A. V. Astin, Director of the National Bureau of Standards, President Pro Tem, opened the meeting. Representatives of the three military departments, FCC, CAA and ODM participated. Mr. L. S. F. Meaker was elected Vice Chairman of the council.

Two major items of discussion were:

a. Status of CRPL studies on ionospheric forward scatter (FFIS) interference. For more than two years, the military departments, the FCC and the Department of State have been pressing the CRPL for answers to certain fundamental questions on interference aspects of FFIS transmissions. CRPL claims that most of these answers are already contained in existing literature on the subject, whereas the requesting agencies maintain that insufficient data is available to permit early production of a realistic scatter frequency allocation plan. After much discussion, Dr. Astin directed the CRPL to issue a report, prior to 1 January 1955, using all available theoretical and operational data, specifically covering the following fine points:

(1) Optimum co-channel and adjacent channel separations between scatter facilities, and between scatter facilities and other users of the same frequencies.

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(2) Optimum parameters such as power, path length and frequency, including changes arising from changing sunspot activity.

(3) Minimum frequency requirements for operation of a chain of FPIS stations.

(4) Immunity of jamming and interception of FPIS systems.

(5) Reliability of FPIS systems in the presence of interference from noise and other stations.

b. Future status of the Executive Council. In view of increasing dissatisfaction with the stature and effectiveness of the CRPL Executive Council, an ad hoc group of government agency representatives was appointed to draft a new and more specific charter for the council, defining its membership, responsibilities, executive or advisory functions, and its relationship to other groups serving in advisory capacity to the National Bureau of Standards. (CONFIDENTIAL)

DEDICATION OF NATIONAL BUREAU OF STANDARDS COLORADO LABORATORIES.

Mr. L. S. Meaker of this branch represented the Directorate at a technical symposium on Radio Propagation and Standards held on 8-11 September 1954. This was in connection with dedication of the new National Bureau of Standards Laboratories at Boulder, Colorado. The new facilities, located on 217 acres of land house the Central Radio Propagation Laboratory (CRPL) which formerly occupied overcrowded and dispersed quarters in the Washington area. Relative freedom from atmospheric and man-made radio noise was one of the determining factors in selecting the Boulder location.

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Among the 83 papers presented before 392 conferees were reports of USAF theoretical and practical work in the field of radio propagation, given by representatives of Wright Air Development Center, Rome Air Development Center, and the Air Force Cambridge Research Center. (UNCLASSIFIED)

THE 1954 SYMPOSIUM ON INFORMATION THEORY. Mr. Frank C. Dvorsky of this branch represented the Directorate at the 1954 Symposium on Information Theory held at Massachusetts Institute of Technology, Cambridge, Massachusetts. The Symposium was held from 15 to 17 September 1954. It was organized by the Professional Group on Information Theory in cooperation with the Research Laboratory of Electronics at MIT, and was also sponsored by the American Institute of Electrical Engineers, the International Scientific Radio Union (URSI), the Office of Naval Research, the Air Research and Development Command and the Signal Corps Engineering Laboratories.

The meeting was attended by 334 representatives of scientific and other institutions directly or indirectly concerned with the information theory.

The lectures, as well as discussions, revealed laborious efforts, particularly to eliminate or overcome the effects of harmful interference, which is always present to a certain degree between the transmitter and the receiver.

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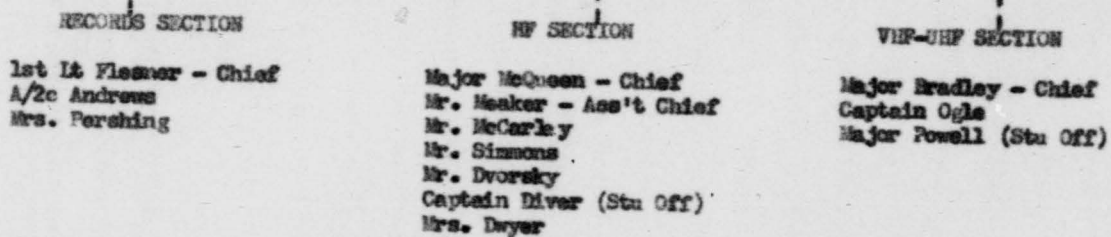
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The subject matter encompassed various fields, of which contribution to the possible solution of the problem is expected, like coding, information and organization, analysis of retrieval of information, detection and prediction, and also the human use of information. (UNCLASSIFIED)

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FREQUENCY BRANCH

Lt Col Weigel - Chief
 Mr. Corley - Chief Engineer
 Mrs. Lewis - Steno



Organisation Chart as of 31 December 1954

QUANTITY AND TYPE OF MESSAGES PROCESSED
BY HF SECTION OF APOAC-P/P

	30-day month (23 work days) (Not including Saturdays and Holidays)	Per Centage	Average per working day
A. Total messages	525	100%	23
B. FAP messages	492	94%	21
C. AF messages	33	6%	1½
D. Classified messages	423	80%	18

NOTES:

- 56 (or 11%) of the FAP messages (CINCAL, CINCPAC, and FARPOC) were processed through APOAC. The remainder (89%) were processed through Army or Navy.
- The tabulation includes both incoming (approximately 50%) and outgoing (approximately 50%) messages from FAP.
- AF messages are incoming messages only.
- This study pertains to FAP matters only, and does not include regular USAF correspondence and committee work.

NUMBER OF FREQUENCY CHANGES AND ASSIGNMENTS
1 August 1953-31 July 1954

<u>Bands</u>	<u>Changes/Assignments</u>
0-300 kc/s	32
300-3000 kc/s	243
3-30 Mc/s	911
30-300 Mc/s	948
300-600 Mc/s	92
	2226 TOTAL

HISTORY
OF
PLANS BRANCH
For Period of
1 July 1954 - 31 December 1954

CHAPTER I
ORGANIZATION AND FUNCTIONS

The Plans Branch of the Plans and Policies Division, is organized into the following general groupings:

- a. Liaison
- b. Long Range Plans
- c. Command Plans
- d. Special Projects
- e. MDAP

In addition, personnel of this Branch provide USAF representation on various joint and inter-departmental committees and bodies. (UNCLASSIFIED)

Basically, the function of this Branch is to formulate USAF CE policies and plans as guidance for other activities in the Air Staff and for subordinate commands; review similar plans of subordinate commands; participate in joint, inter-departmental and international activities involving CE plans, doctrine and operations; and approve and monitor the development and implementation of the CE portion of the MDA program. (UNCLASSIFIED)

Attached is Appendix I reflecting the organizational and functional division within the Plans Branch. (UNCLASSIFIED)

During the reporting period the following personnel changes have occurred:

a. Arrivals

- (1) Lt Col Robert Shafer
- (2) Mr. Wenzel Austin
- (3) Flt. Lt. A. Robinson (Canadian Exchange Officer)
- (4) Major G. B. Hilton
- (5) Mr. E. J. Cross

b. Departures

- (1) Lt Col Walter Coss

(UNCLASSIFIED)

Several changes in representatives of various panels and committees have occurred:

a. Joint Strategic Communications Plans Panel, JCEC:

Lt Col Robert Shafer replaced Lt Col Walter Coss;

b. Joint Tactical Communications Plans Panel, JCEC:

Lt Col Robert Shafer replaced Lt Col Walter Coss;

c. Lt Col Robert Shafer assigned to the Air Staff Canada

Committee. (UNCLASSIFIED)

CHAPTER II
ACTIVITIES

HF/DF NETWORK ESTABLISHED IN ZI. The transfer to AACS of the HF/DF network originally established in the ZI by ARDC was completed on 1 September 1954.

On 27 October 1954, AACS was directed to take immediate action to replace the existing non-standard HF/DF equipment was necessary to complete high priority Project 119L tests being conducted by ARDC in connection with Project (c) "GRAYBACK", and was completed by 1 December 1954. (CONFIDENTIAL)

AACS MOBILE COMMUNICATIONS SQUADRONS. Recent USAF policy decisions concerning AACS Mobile Communications Squadrons were published during the period covered by this history:

a. AFR 23-5, dated 12 November 1954 prescribes the mission of AACS Mobile Communications Squadrons and the basis for their authorization and assignment, and provides certain information concerning their capabilities and support.

b. Air Force Letter No. 23-3, dated 22 December 1954 establishes the policies and procedures for the use of AACS mobile communications and navigational aids facilities within the continental United States.
(UNCLASSIFIED)

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FORWARD SCATTER PLAN. Airways and Air Communications Service prepared a plan for early realization of a number of ionospheric forward scatter circuits in the USAF Strategic Communications System. The plan was approved in part and several implementing actions taken which included:

a. A memorandum to JCEC to secure revision of the Defense Department position on FPIS.

b. A memorandum to AFRD to obtain validation of QOR's on mobile FPIS and FPIS equipment.

c. AACS was directed to plan site surveys at the approved locations. (CONFIDENTIAL)

VULNERABILITY OF "GATEWAY" STATIONS. Concern has been felt for some time over the vulnerability of our Strategic Communications System through loss of our "Gateway" stations to atomic or TN attack. AACS was asked to make studies of providing an immediate minimum relay capability at the "Gateway" receiver sites to cover loss of the on-base relay centers and ultimate duplicate "Gateway" stations. (CONFIDENTIAL)

ALTERNATE JOINT COMMUNICATIONS CENTER (AJCC). Stand-by utilization of AJCC facilities has developed to some extent during this period. AACS has conducted several tests with the AJCC on cooperative

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use of facilities. Further tests are scheduled, wherein the AJCC will temporarily "take over" Air Force circuits, i.e. supply the transmitting and receiving facilities. (CONFIDENTIAL)

HAWAII GLOBECOM CIRCUITS. Memoranda were sent to the Assistant Secretary of Defense (Supply and Logistics) and to the Director, Communications Electronics, JCS outlining Air Force channel and circuit requirements at Oahu, Territory of Hawaii. (UNCLASSIFIED)

NAVY UTILIZATION OF USAF AIR/GROUND FACILITIES. The Department of Navy was asked to provide the Air Force with a statement of their requirements for service from USAF Air/Ground facilities on a worldwide basis. (UNCLASSIFIED)

NAVY SUPPORT OF GLOBECOM INSTALLATION AT KWAJALEIN. The Department of Navy was asked to determine if special purpose vehicles and other logistic support could be made available to the GLOBECOM Installation Team at Kwajalein during 1956. The Navy's answer was that all normal support could be provided. (UNCLASSIFIED)

REVIEW OF COMMAND PLANS. AACS EWP 581-54, TAC Opns Plan 8-54, CAN-US Air Defense Plan 2-54 and NEAC EWP 1-54 were reviewed and pertinent comments furnished to the Directorate of Plans. (UNCLASSIFIED)

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SAC REQUIREMENTS AT SHAPE AIR INFORMATION CENTERS. Strategic Air Command's plan for coordination with SHAPE Air Information Centers was approved and forwarded to SACEUR for implementation. (CONFIDENTIAL)

WPM-57. A C-E annex for WPM-57 was forwarded to AFOPD. Deployment of C-E support units for WPM-57 was forwarded to AFOMO.

(UNCLASSIFIED)

18TH AIR FORCE PLAN 1-53-B. One channel of the Andrews-Ramey multiplex circuit was allocated for use of Tactical Air Command in support of the above plan. Action was taken to stockpile the C-E items required at Ramey under project AF-GEN. (UNCLASSIFIED)

MUTUAL DEFENSE ASSISTANCE PROGRAM.

1. Deliveries of Communications and Electronics Equipment.

a. Deliveries of major end items of equipment, as a whole, continued at a rate higher than most country installation capabilities. Although some shortages in spares and minor components still exist, relatively few complaints of non-delivery were voiced by the Military Assistance Advisory Groups. Mobile equipment for tactical operations continued in short supply. (CONFIDENTIAL)

2. Programming.

a. A lack of funds for Communications and Electronics equipment exists (in order to retrofit USAF and Foreign indigenous types of aircraft) in relation to allied Air Forces projected inventories. The

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proposed (Illustrative) MDA FY-55-56 Program presented to the Bureau of the Budget in November included funds for partial airborne requirements of the RAF. It is estimated that some 150 million dollars, yet unprogrammed, is necessary in order to meet European needs for airborne and ground equipment in order to effect a UHF conversion, TACAN implementation and provide the Selective Identification Feature for IFF Mark X. (SECRET)

3. Requirements and Planning.

a. Indo China

(1) Upon termination of hostilities in Indo China, action was taken to delete and reallocate to other MDA Countries undelivered equipment. (CONFIDENTIAL)

b. German Air Force.

(1) A phased build-up, over a three year period, was developed to provide C&E equipment to the German Air Force under MDAP. (CONFIDENTIAL)

c. Significant developments in the field of planning and determination of requirements were initiated in the European area. These actions came about in part, through the efforts of this Directorate, and are as follows: (CONFIDENTIAL)

(1) A full time Communications and Electronics Working Group was established in US CINCEUR in order to correlate plans and in order to screen country requirements. (CONFIDENTIAL)

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(2) Funds for the establishment of an Electronics Center, to afford technical advice and assistance to SHAPE with an initial emphasis on aircraft control and warning, was made available through an Executive Order. Foreign aid funds were utilized. (SECRET)

(3) Approval of personnel requirements in SHAPE in order to form an air defense section of that headquarters was announced. (SECRET)

(4) No conclusions or guidance as a result of operations of the above listed groups has yet been made available, therefore there has been no effect upon the MDA Program up to this time. (CONFIDENTIAL)

d. There has been relatively little activity in the Far East area (CINCPAC) or in South America (CAIRC). Representatives of these commands and U. S. CINCEUR have been invited to a conference in February 1955 at Rome, N. Y., in which representatives of this headquarters and the Air Materiel Command will review all communications and electronics materiel in the MDA Program, requirements, programming and projected deliveries of equipment. (CONFIDENTIAL)

e. Cancellations of end item equipment in the European area accelerated through continuing MAAG studies of country capability to absorb and willingness to utilize equipment. A study is being made of equipment thus becoming excess to the European area for possible redistribution in the Far East and to South America. The redistribution of equipment will represent a prevention of waste, but does

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not provide a solution to tactical deficiencies created in Europe.

(CONFIDENTIAL)

ARMY-AIR FORCE COMMUNICATION FACILITY-LEGHORN, ITALY. Joint site surveys were concluded and U.S.-Italian negotiations were completed to permit early action and construction of this facility.

(CONFIDENTIAL)

GLOBECOM STATION, ADANA, TURKEY. The U.S. Navy indicated an extensive requirement for communication facilities at this location. Accordingly, the circuit plans, design and siting have been changed to accommodate the requirements of both the USAF and the USN. This arrangement has been approved by JCEC; negotiations are completed; and construction should commence in next couple months. (SECRET)

GLOBECOM STATION, MADRID, SPAIN. A circuit plan was developed and CMDRAACS was instructed to develop the plans and select sites for a GLOBECOM station in the Madrid area. On 19 August 1954 the Chief JUSMG (Spain) and COMDT AACS were instructed to procure the necessary sites, finalize the engineering and determine the construction requirements for this station. (CONFIDENTIAL)

LANDLINE COMMUNICATIONS IN SPAIN. On 26 July 1954, the Chief JUSMG (Spain) submitted a proposal by the Spanish telephone company (CTNE) whereby they would expand their facilities to accommodate the

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USAF landline circuit requirements in Spain if we assist them in the \$12,000,000 financing. This proposal is in line with our suggestion of 6 August 1953 and 25 September 1953. It should reduce or eliminate the requirement for a USAF owned and operated microwave relay system costing \$10,000,000 initially and \$3,779,000 per year (including 600 military personnel). This proposal was accepted by the Air Staff and the Chief JUSMG (Spain) was requested to initiate contract negotiations. (UNCLASSIFIED)

ESCAPE AND EVASION COMMUNICATIONS. CMDR AACS was requested on 23 July 1954 to develop a plan to communicate with SAC crews downed behind enemy lines during wartime. AACS submitted a plan for installation of additional facilities at Thule, Uk, Morocco, Tripoli and Dhahran. Except for the Thule portion, this plan was approved and on 28 December 1954, CINCUSAFE was requested to assist AACS in establishing the needed facilities. (SECRET)

SECRET

DIVISION OFFICE
ELECTRONIC SYSTEMS DIVISION
HISTORICAL REPORT
COVERING THE PERIOD
1 JUL - 31 DEC 1954

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SECTION IA. ORGANIZATION

The Electronic Systems Division is organized with a division office and three branches: Aircraft Control and Warning Branch, Navigational and Air Traffic Control Aids Branch, and Electronic Warfare Branch.

The personnel assigned to the division office as of 31 Dec 1954 are as follows:

Colonel Harry A. French

Lt Colonel William J. Retzbach

Lt Colonel James B. McKenzie

B. FUNCTIONS

The functions of the Electronic Systems Division are as follows:

Provides technical guidance and advice for the planning and operation of Navigational and Air Traffic Control Aids, Aircraft Control and Warning, Tactical Air Control, and Electronic Warfare Systems.

Establishes requirements for Air Force participation in the Common System Air Traffic Control and Navigation program.

Determines the need for control and controls the issue of critical items required for specific electronic systems.

Formulates and participates in determining doctrine for the utilization of electronic systems equipment.

SECTION IIACTIVITIES

Colonel Harry A. French was the Air Force representative on the VORTAC Evaluation Committee of the Air Navigation Development Board. On 29 December 1954, the Committee submitted a split report, and the subject is now under review by the ANDB. (UNCLASSIFIED)

AIRCRAFT CONTROL AND WARNING BRANCH

HISTORICAL REPORT

COVERING THE PERIOD

1 JUL - 31 DEC 1954

SECTION I

A. Organization

The Aircraft Control & Warning Branch is sub-divided into two (2) sections, Plans and Radar Equipment. The personnel assigned as of 31 December 1954 to the Aircraft Control & Warning Branch were as follows:

Colonel J. a. Bennett, Chief of Branch
Major R. G. Rushforth, Plans Section
Major H. T. Eldridge, Plans Section
Major R. O. Voight, Plans Section
Major L. D. King, Radar Equipment Section
Major T. F. Meehan, Radar Equipment Section
Major C. M. Thompson, Radar Equipment Section
Captain R. L. Brouillard, Radar Equipment Section

During the period covered by this history, the following personnel departed this branch with assignments as follows:

Major E. R. Dickey reassigned 9 August 1954 to Operation Bootstrap, University of Maryland.

Flight Lieutenant A. Robinson, RCAF, reassigned in August 1954 to Plans and Policies Division within the Directorate of Communications.

The following personnel were gained:

Colonel Joe a Bennett assigned 23 November 1954 from Headquarters Far East Air Forces to AFGAC-E/A, as Chief of Branch.

Major R. O. Voight assigned 2 August 1954 from 12th Air Force, United States Air Forces in Europe, to AFGAC-E/A, Plans Section.

B. Functions

The mission of the Aircraft Control & Warning Branch is to:

Provide technical guidance and advice for the planning and implementation of aircraft control and warning systems, tactical air control systems, and short range electronic reconnaissance systems.

Prepares quantitative requirements for and controls the issue of critical electronic equipment required for AC&W and Tactical Air Control systems.

Assists in the preparation of T/O&E's, manning documents, JANAP's, and other publications pertaining to Aircraft Control and Warning and Tactical Air Control Systems.

Represents the USAF on Joint and Combined Warning and Target Information panels of the U.S. and Combined Joint Communications-Electronics Committees, and on the Joint CAA-USAF Air Defense Planning Board.

Formulates USAF policy in the use of Identification Friend or Foe systems.

Reviews, coordinates, and/or prepares and recommends military characteristics for electronics systems and equipment for Aircraft Control and Warning and Tactical Air Control Systems.

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SECTION II

ACTIVITIES

Texas Towers

During the period of this report, considerable strides have been made in the Texas Tower Program. On 12 October 1954, a conference was called by the Directorate of Installations, USAF, at the First Naval District, Boston, Massachusetts, for the purpose of reviewing and approving final construction design for the Texas Towers. The Air Defense Command, at this meeting, disclosed significant changes in operational philosophy which required considerable reallocation of space on the Texas Towers. This change of philosophy resulted in the Air Defense Command determination that remoting radar data via Slowed Down Video techniques to the nearest land based air defense station would be too inaccurate for GCI operation. In view of these inaccuracies, inherent in the SDV technique, the Air Defense Command stated that present plans were to operate the Texas Towers under a manual condition in the same manner as the present land based radar system. This means additional operational personnel and additional equipment comparable to a land based radar station. At such time as the Semi-Automatic Ground Environment System is ready, timewise, to accept the input of Texas Towers, techniques will be changed to permit information from the Texas Towers to be processed into the appropriate sub-sector in the same manner as land based radar stations.

(CONFIDENTIAL)

At the 1 December 1954, AMC-AC&W Phasing Group Meeting held at Rome, New York, AMC personnel stressed concern in that they had received a TWX

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from Headquarters USAF (AFMHE) to the effect that in view of certain OSD decisions in the Texas Tower Program, AMC actions would proceed to the point of supply action and await further instructions from Headquarters USAF. This OSD reference related to discussions between the Air Force and the Navy on installation phasing. This situation has recently been resolved and the Air Force program is to install one (1) Texas Tower in Calendar Year 1955, with an operational date of 30 June 1956. The additional four (4) have an operational date of 30 June 1957. To clarify the above, action was taken to direct AMC to proceed with supply and engineering installation actions required to meet the operational dates outlined above. Further, ARDC has been directed to furnish all required R&D support to AMC to insure appropriate and timely action in the Texas Tower Program.¹ (SECRET)

Tactical Air Control Shelters

Action was taken by AFOAC-E/A thru AFMPE and AFMSS to cancel the requirement for TAC shelters and air conditioning equipment originally on procurement for the TAC Control and Mobile AC&W Groups. The TAC shelter requirement is now to be met by utilizing AN/MPS-7 shelters originally programmed for the ADC mobile radar stations. All AN/MPS-7 radars programmed within ADC are to be installed at permanent type installations, therefore, shelters are no longer required. The air conditioning equipment for TAC units is authorized in the MEAL. Cancellation of these shelters and air conditioning equipment saved approximately 2.2 million dollars.² (SECRET)

1. Trip Reports "Texas Towers", filed AFOAC-E/A.
2. "TAC Control Shelters", filed AFOAC, dated September 1954.

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AN/MPS-11 and AN/MPS-14 Radars to Canada

Action was taken by AFCAC to defer one (1) AN/MPS-11 and three (3) AN/MPS-14 radar sets from USAF delivery to Canada. The above equipment will enable the Canadian government to evaluate the above equipment within their own TAC system. These radar sets are to be replaced in kind by Canada by providing funds to USAF for extension of the present contracts.³ (SECRET)

Deletion of AN/MPS-11 Maintenance and Operations Shelters

The Directorate of Procurement & Production Engineering was requested to delete twenty-six (26) maintenance and operations shelters for the AN/MPS-11 and twenty-six (26) AN/MPS-14 maintenance shelters. These shelters were deleted since ADC is constructing permanent buildings at all their proposed radar stations.

Termination charges were estimated to be negligible in lieu of the contractor's difficulties in submitting acceptable shelter specifications. (CONFIDENTIAL)

AC&W Requirement for Clark Air Force Base, Philippines

FEAF submitted a PC request for new radar equipment at Clark AFB, Philippines, during September 1954. Prior to including the new equipment in the PC, the Director of Operations, DCS/O, was requested to approve Clark AFB as an AC&W station so that necessary programming could be taken. This request was disapproved by AFOOP, therefore, the AC&W requirement was not included in the PC.⁴ (CONFIDENTIAL)

3. Loan of MPS-11 and MPS-14 radars to Canada, filed AFCAC-E/A, dated September 1954.
4. "PC Request for AC&W Installation Clark AFB, Philippines", filed AFCAC-E/A, dated August 1954.

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Improved Program for Tactical Air Control System

A USAF position incorporating the major features agreed upon at the World-Wide TAC Conference in February of 1954 was prepared in August. This position was built around the Phase I and Phase II TAC Systems, and established a continuous program beginning in FY-1955. This program was approved by the Chief of Staff on 15 October 1954. This headquarters has taken the necessary action for the items in this program.⁵

Phase I of this program includes Mink-Rafax equipment, improved MPS-7, additional TPS-1D's, cosecant squared antenna for AN/TPS-1D, AN/TRC-24 equipment and on-line crypto equipment.

Phase II incorporates the AN/TSC-10, 11 and 12. The first of this equipment for one (1) tactical control group has been placed under procurement and is expected to be delivered in January 1957. (SECRET)

Joint USAF-CAA Air Traffic Control Facility

In November the USAF and CAA agreed to the joint installation and operation of a radar air traffic control facility at Mitchel Air Force Base, New York. This project was established to meet Instrument Flight conditions that are anticipated during the spring of 1955 in the New York area. The Air Force loaned to CAA an AN/FPS-8 radar and the necessary building space at Mitchel Air Force Base. This project exemplifies the present cooperation between the Air Force and CAA to resolve the air traffic control problem for both military and civilian aircraft.⁶ (SECRET)

5. Memorandum for Chief of Staff, subject: Improvement Program for Tactical Control Groups, dated 8 October 1954.
6. Letter to Mr. Fred B. Lee, Administrator, CAA, dated 11 November 1954, signed by General Blake.

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Long Range Tactical Radar

Representatives of this branch along with representatives of the Directorate of Requirements and the Directorate of Research & Development initiated a project within ARDC for an early warning tactical radar capable of detecting a one meter target at 300 miles. This radar utilizes the inherent advantages of low frequency radars (400 to 600 mcs). ARDC has initiated what appears to be a successful technical development program. Information on the status of this radar has been forwarded to FEAF and USAFE requesting them to establish requirements if they have a need for this type radar.⁷ (SECRET)

High Power Long Range Radar

Representatives of this branch have participated in the development and procurement of a high power long range radar capable of detecting a tenth of the squared meter target at 2,000 miles.⁸ (SECRET)

USAFE Audio Detection System (12th Air Force)

USAFE submitted a letter to this headquarters requesting concurrence in principal with the procurement and installation of the German manufactured audio detection system in the 12th Air Force area. The letter suggested that the program be established in three (3) phases:

- a. Further testing and improvement of the present ten-mile system.
- b. Installation and testing of a 120 mile system.
- c. Installation of a complete system in depth along the Iron Curtain.

7. Westinghouse Proposal for Long Range Low Frequency Tactical Radar.
8. HPLR Steering Committee Minutes, October thru December.

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This headquarters approved the plan in principal and gave authority to go ahead with Phase A. Phase B and C were to be held in abeyance pending reports to this headquarters on the success of all tests.⁹ (CONF)

Production of AN/APX-25 Manual Coded Selective Identification Feature

Production release of the components which modify the AN/APX-6 to the AN/APX-25 Manual Coded Selective Identification Feature (MK-102 and OA-410) was approved in October 1954 for a quantity of approximately 3500 equipments. This amount was based upon the parts and components which were in inventory at the contractor's plant. The KY-95 coder unit on this limited production is known as "Fix 1". A KY-95A known as "Fix 2" will be the final approved unit. This latter unit complies with all applicable specifications and will be the model included in the remaining equipments to be procured.¹⁰ (CONFIDENTIAL)

Omission of Destructors in IFF Mark X Equipment

On 1 November 1954, the Canada-United Kingdom-United States Joint Communications-Electronics Committees approved the following policy relative to the omission of destructors from IFF Mark X equipment.¹¹

a. The provision for destructors in the AN/APX-6, AN/APX-6A and AN/APX-25 are no longer required.

b. The fitting of destructors in future IFF equipment that will supplement the basic system on the Manual SIF will be considered on an individual basis. (SECRET)

9. Basic correspondence from USAFE, subj: Audio Detection System 12th Air Force, filed AFMAG-E/A.
10. Reference Memo from R&D, subj: (C) Selective Identification Feature for IFF Mark X, States, dated 29 October 1954.
11. Reference CCB 29/25, dated 3 November 1954.

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Use of IFF Mark X by Mutual Defense Assistance Program Student Pilots

Action was initiated to the JCEC to authorize Air Training Command to establish a policy that all MDAP student pilots will receive sufficient IFF Mark X information to use the equipment as a navigational facility during in-flight emergencies. The approval of this policy would provide an extra precaution which may in time save several pilots and the recovery of many aircraft.¹² (CONFIDENTIAL)

IFF Mark X Capability for NATO

In an effort to give NATO nations some IFF Mark X capability prior to the time they will receive equipments from normal production, permission was granted to modify a sufficient number of AN/APX-6's for use as ground interrogators. This type of installation will give a limited IFF Mark X operation. The standard equipment is expected to be delivered by the end of Calendar Year 1955.¹³ (SECRET)

Semi-Automatic Ground Environment System

Formerly known as "Lincoln Transition System" or "Semi-Automatic Direction Center System", the name "Semi-Automatic Ground Environment (SAGE) System" has been adopted for the air defense program scheduled for implementation in the period 1957 thru 1961. Air Defense Command and the Air Defense Engineering Services (ADES) Project Office for the SAGE System have adopted the following definition:

"The SAGE System is defined as that portion of the air defense system that provides the means for the semi-automatic processing of data and weapons control, and consists of:

12. Reference COMATRC XOCCE 1406, dated 5 October 1954.

13. Reference J/WI 23/27/D, Agenda Item No. 72, 13 September 1954.

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- (1) Those facilities required to process and transmit Air Surveillance data from existing and planned data gathering sources to Direction Centers.
- (2) The Direction Centers where Air Surveillance data, by means of electronic computers, is processed, evaluated and developed into Air Situations at sub-sector level from which threat evaluation, weapon assignment and appropriate weapons guidance orders are generated.
- (3) Those facilities required to transmit situation data from Direction Centers to Combat Centers.
- (4) The Combat Center, where situation data from the Direction Centers, by means of electronic computers is processed, evaluated and developed into sector level Air Situations from which the utilization of weapon resources can be monitored and directed.
- (5) Those facilities required to transmit instructions from Combat Centers to Direction Centers.
- (6) Those facilities required to transmit the output data from the Direction Center to the input of the appropriate user's equipment, such as adjacent Direction Centers, Combat Centers, data link transmitters, CAA and AAA facilities.

The ADES Project Office and Western Electric Company have developed a phased implementation schedule for the SAGE System and will continue to monitor the program.¹⁴ (CONFIDENTIAL)

14. ADES Project Reports, filed AFOAC-E/A, dated July thru December 1954.

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NAVIGATIONAL AIR TRAFFIC CONTROL AIDS BRANCH
HISTORICAL REPORT
COVERING THE PERIOD
1 JULY - 31 DEC 1954

SECTION IA. ORGANIZATION

The Navigational Air Traffic Control Aids Branch is organized with a Branch Chief and four (4) Sections: Long Distance Section, Terminal Section, Short Range Section and Communications Section. The personnel assigned to this branch as of 31 December 1954 are as follows:

Colonel John E. Frizen
Lt Colonel Fred K. Durni
Lt Colonel Darral J. Freund
Lt Colonel David E. Myers
Lt Colonel Charles K. Swanson
Major Alva L. Conner
Major George L. Madara
Major Royce E. Van Gorden
Captain John G. Woodward

Lt Colonel Eyer, formerly Branch Chief, was reassigned on 26 December 1954.

B. FUNCTIONS

The functions of the Navigational Air Traffic Control Aids Branch are as follows:

Provides technical guidance and advice for the planning and implementation of Navigation and Air Traffic Control Aids.

Exercises staff surveillance; initiates requests for procurement, installation, and operation; formulates and coordinates operational plans and policies; maintains liaison with developmental, engineering, and testing agencies; and programs, allocates, and controls the installation of

Navigation and Air Traffic Control Aids.

Establishes requirements for Air Force participation in the Common Systems Air Traffic Control and Navigational Program.

Participates in civil and military committees as necessary to insure coordination on Navigation and Air Traffic Control Aids.

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SECTION II

ACTIVITIES

REIMBURSEMENT TO THE CIVIL AERONAUTICS ADMINISTRATION: The Deputy Chief of Staff Operations, assigned monitorship of Air Force reimbursement to the CAA for Air Traffic Control Services to the Director of Communications. This function, in turn, was made a responsibility of this branch. In collaboration with representatives of the Director of the Budget and the Director of Operations, a list of Air Force requirements was furnished the Department of Commerce early in Fiscal Year 1956, over the signature of the Secretary of the Air Force. The Secretary of Commerce approved the list, as amended, thus establishing a firm agreement. Indications are that an annual budget of approximately \$7,000,000.00 will be required for this purpose. (UNCLASSIFIED)

MOBILE HIGHWAY CONTROL TOWERS: A letter to all major commands, dated 3 November, approved the AN/MRN-15 Air Traffic Control Set, for general Air Force use. This set, housed in a $\frac{1}{2}$ ton trailer, provides mobile control tower facilities, performing all functions of a fixed control tower. It is used for monitoring and controlling all air traffic when normal facilities are inoperative, during an emergency, for training or when building new facilities.

The letter also authorized the AN/MRN-12 Air Traffic Control Central which is a mobile air transportable control tower housed in a $1\frac{1}{2}$ ton trailer. It provides a complete packaged communication and navigational aid facility readily adapted for storage or pre-positioning

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at pre-determined forward bases. (UNCLASSIFIED)

ACCELERATED OPERATIONAL SUITABILITY TEST OF AN/ARC-21: An OST, known as "Big Eva" of the improved production model AN/ARC-21 was conducted using twelve (12) B-35's at Carswell Air Force Base, fifteen (15) B-47's at MacDill Air Force Base and three (3) sets at Eglin Air Force Base (AFGG).

The purpose of this test was to determine the reliability of the AN/ARC-21 under normal operational environment, determine logistical requirements and to determine the feasibility of the maintenance concept for which the set was designed. This concept is: change only complete sets at organizational level; change complete subassemblies and plug-in items (including tubes) at field level; and make any repairs requiring soldering operations, major adjustments etc., at major base shop or depot level. This method of maintenance takes full advantage of the AN/ARC-21 modularized construction and allows employment, at the squadron level, of airmen mechanics with a minimum of training.

Testing criteria called for 100 hours flight time per set. The test at Carswell Air Force Base was completed on 15 December 1954, and termination at MacDill is expected on 1 February 1955. Interim reports received during the "Big Eva" accelerated operational tests are encouraging and indicate an overall improvement in the reliability and general operation of the late production model AN/ARC-21 has taken place.

As a result of this test, timely and corrective action was taken to eliminate some of the faults. Many of the early reports arriving from the field indicated that some of the troubles experienced with the new installations were chargeable to the aircraft manufacturer.

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Studies were made of these faults, and the findings and recommended corrective actions were forwarded to the appropriate agencies for action.

Tube troubles were brought to the attention of the manufacturers during a meeting held at Wright Air Development Center on 16 September. This meeting was held to discuss a means of obtaining more dependable and longer life tubes. An overall improvement in the reliability of subminiature type tubes should be obtained as a result of the coordinated action taken by the tube manufacturers and RCA.

The Electronics Research Associates (ERA) antenna coupler, while not a part of the AN/ARC-21, is vital to its successful operation as it connects the transceiver to the antenna proper. During the early stages of testing, some difficulty was experienced by maintenance personnel in determining if the coupler or transceiver was malfunctioning. ERA test representatives were brought into the program to devise methods for determining which component needed replacement. (UNCLASSIFIED)

ACCELERATED OBT OF AN/ARC-34: On 13 September an OBT of the improved production model AN/ARC-34 was started at the 5th Fighter Interceptor Squadron, McGuire Air Force Base, Ft. Dix, New Jersey. The purpose of this test was to determine the reliability of AN/ARC-34 under normal operational environment, adequacy of training of maintenance personnel, maintenance procedures and test equipment, and to determine logistical support requirements. The value of conducting this type of testing on new equipment was proved in the early stages of the test. A malfunction of the automatic tuning mechanism, which caused the set to cycle out was discovered. The manufacturer was able to come up with a "fix" which

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was immediately installed in the test sets and incorporated into the production line. Had this malfunction not been discovered early and prior to distribution of a large number of these sets to the field the correction of this fault would have proved extremely costly. The testing was completed on 16 December. Final APGC report has not been received as yet. (UNCLASSIFIED)

ULTRA HIGH FREQUENCY PROGRAM: The last six months of 1954 saw a decided improvement in the UHF program. During this period the aircraft UHF program progressed to the point where approximately fifty percent of the active inventory aircraft are UHF equipped.

The ground UHF program has also shown satisfactory progress. All of the 210 AACS operated control towers have a UHF capability, and 52 of these have their full complement of UHF equipment. Of the 151 active Ground Controlled Approach facilities, all have UHF capability and 114 have their full complement of equipment. Airways and Air Communications Service is also operating 72 UHF/ Direction finding facilities, with installation of additional sites progressing satisfactorily. In addition, US Navy and US Marine Corps operate 30 and CAA, 9 UHF/DF facilities.

Installation of UHF equipment by CAA has progressed according to schedule. Of 167 control towers 100 have a UHF capability. 25 of 26 Air Route Traffic Control Centers have a UHF capability and of 405 Interstate Airways Communications Stations 164 have both a receive and transmit capability and 225 have receive only.

All active AGSM fixed and mobile sites now have an UHF capability and 80% of the authorized program has been completed. (UNCLASSIFIED)

MOBILE GROUND CONTROLLED APPROACH: Despite continued shortages of

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Delivery of the AN/TSA-4A communications control consoles has again been delayed. This equipment must be installed before any RAPCON becomes fully commissioned. Action was taken to resolve engineering and production problems to insure delivery in quantity during 1955. (UNCLASSIFIED)

STATUS OF USAF AN/GPN-4 MOBILE GROUND CONTROLLED APPROACH (GCA) PROGRAM. 78 AN/GPN-4's have been delivered to the USAF. Of the additional 35 mobile GCA equipment on procurement, 31 have been delivered. These latest models are designated the AN/MFN-11B. In addition, a procurement authorization for 50 new AN/MFN-11B's has been let to AMG. Delivery of these equipments will begin in October 1955. These 50 equipments are required to support GCA operations at new bases and to replace old type AN/MFN-1 GCA sets at jet bases. Total GPN-4/MFN-11B equipment programmed is 163. The following is a breakdown of the equipment assignment by status, by theater:

<u>THEATER</u>	<u>OPERATING</u>	<u>OTHER</u>
21	33	10 (ATC Schools) 7 (Special Projects and Test)
EUROPE	17	
FEAF	2	
ALASKA	5	
NEAC	5	
KORSA	<u>6</u>	<u>17</u>
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The remaining 78 sets were authorized for individual locations throughout the world and will be activated as the personnel and equipment become available in accordance with assigned PG operating dates. Action was initiated to have the 50 new sets equipped with the latest

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modifications to include new type power units and a new air conditioner.

(CONFIDENTIAL)

INSTRUMENT LOW APPROACH SYSTEM (ILAS) PROGRAM. There are two types of ILAS systems in the current USAF Program.

SCS-51. This is the old type World War II system which has been programmed for operation at 16 locations. The Airways and Air Communications Service experienced difficulties in installing these systems because of worn-out equipment components and lack of supply support. A concerted effort was put forth during 1954 to complete these facilities; however, AMC depots have not yet completed overhaul of the major SCS-51 components and to date none are in operation. In view of the difficulties involved, this office has programmed MKN-7/8 equipment to replace the old type SCS-51.

MKN-7/8. This is the new type ILAS equipment. Delivery of this equipment was scheduled during 1954; however, technical and production difficulties have delayed delivery until April 1955. The present complete MKN-7/8 ILAS program includes 121 worldwide installations plus 2 sets for training or 123 sets. 62 were placed on procurement with one contractor, 10 sets with another for a total of 72 sets. FY-1955 funds were made available for the remaining 51 sets. However, these will not be placed on procurement until the first production equipment prove satisfactory. It appears that the technical difficulties have been resolved and quantity deliveries are expected during 1955. The total of 12 programmed operational MKN-7/8 ILAS equipments includes replacement sets for the 16 SCS-51 equipments (UNCLASSIFIED)

BROADBAND MICROWAVE SYSTEMS FOR REMOTING LONG RANGE RADAR INFORMATION FROM ACGM RADAR SETS TO AIR TRAFFIC CONTROL FACILITIES. This headquarters

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established a project in August 1954 to install a microwave system to remote long range radar information from the Cape Charles, Virginia ACGW site to the CAA Air Route Traffic Control Center, Norfolk Municipal Airport, Virginia. The purpose of the project was to test the technique of utilizing long range radar information from existing ACGW radars at CAA (ARTC) centers for more efficient control of civil and military air traffic. The Motorola Corporation has developed a microwave system for this purpose, designated the MRR-3, and funds were made available for the procurement. It was decided by the CAA and Air Defense Command during December 1954 that the Cape Charles ACGW facility should not be used for these tests and that a new site would be selected. The microwave equipment originally scheduled for use with the Cape Charles/Norfolk project will be made available to the new location.

The Motorola Corporation through a development contract with Rome Air Development Center developed a standard USAF microwave system designated the AN/TRQ-10. Procurement was directed for 6 each of these systems. One system each will be supplied for remoting long range radar data from ACGW sites to Radar Air Traffic Centers at Goose Bay, Thule, Ernest Harmon, and Johnson Air Force Base, Japan. In addition 2 sets will be used to remote the long range radar data from remote ACGW sites to the ACGW ground control intercept stations. (CONFIDENTIAL)

AIRBORNE INSTRUMENT LOW APPROACH SYSTEM (ILAS) EQUIPMENT. The USAF is currently using varied types of ILAS equipment in aircraft. A study was made to determine the most economical method of providing all USAF aircraft with the capability of receiving at least six channels of ILAS frequencies in accordance with the latest International Civil Aviation Organization (ICAO) localizer and glideslope standard frequency pairings.

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This action was necessary since certain USAF airborne equipments are limited to operation on only six different ILAS channels. The results of the study were used to formulate plans to enable USAF aircraft with a capability to operate on the first six standard ICAO frequencies assigned to ILAS facilities by CAA. This will enable USAF aircraft to use any civil or military ILAS. (UNCLASSIFIED)

LIGHTWEIGHT TACTICAL GROUND CONTROLLED APPROACH UNITS (GCA): During June - December 1954, two civilian manufacturers produced commercial versions of lightweight tactical GCA sets. Each set weights approximately 1800 lbs, is easily transportable, and can be operated by one GCA controller. The traffic handling capacity is, therefore, limited to one aircraft at a time. The GCA sets do not include communications or power equipment. These must be furnished as separate items. Approximate cost of each set is \$50,000. The USAF is conducting evaluation of each equipment to determine which set will best serve our needs. The principal difference between the "SPAR" manufactured by Laboratory for Electronics and the "QUADRADAR" manufactured by Gilfillan Brothers is that the "SPAR" has only precision or final approach capability. The "QUADRADAR" has a radar search, height-finder and taxi, as well as precision capability. However, only one of these operations can be performed at a time by switching from one to another. Each set has merit, and USAF has made plans to base utilization of one or both of the sets on the results of engineering and operational tests. (UNCLASSIFIED)

TACAN AS A COMMON SYSTEM ELEMENT: Advisory Committee No. 1 of the Air Navigation Development Board (VOREAG) continued its efforts to determine the acceptability of TACAN as a common system element. Its final report was originally scheduled for end July but was not actually produced

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until end December. The outcome of the committee's efforts was expected to have a great effect on the siting, installation and operation of programmed 21 TACAN ground facilities because of their probable impact on air traffic procedures applicable to Federal Airways. Release to implement the program had been withheld pending the committee's report and the fact that it was delayed and did not result in usable conclusions was a bitter disappointment to this Directorate. Unnumbered man hours of work were spent in assembling data, establishing Air Staff positions and contributing effort to the project. At this writing the ANDB is still endeavoring to reach a satisfactory solution to the air navigation and traffic control problem. (UNCLASSIFIED)

REVIEW OF FY-56 BUYING PROGRAM - F-230: A formal briefing was given to Mr. Roger Lewis, Ass't Secretary Air Force for Materiel, by representatives of the Directorate in August. The purpose was to review buying plans for high cost F-230 programs. One of these was TACAN, both ground and airborne aspects. As a result of conclusions drawn from the meetings, Mr. Lewis' recommendations were that procurement of the AN/ARN-21 (airborne TACAN) should be deferred and caution exercised in connection with program implementation. (SECRET)

RELIABILITY TESTING OF AN/ARN-21: Initial operational testing of the TACAN system was decided to be performed in the Alaskan Air Command. This decision was made early in 1954 first because of the severe and dangerous limitations of the available navigational systems in that area, and second because tactical aircraft assigned that command were capable of carrying the L/F-M/F navigational gear in addition to the TACAN thus not reducing their then current navigating ability.

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The operational tests have since been expanded in line with USAF policies, stated in the topic above, to include reliability testing as a major area of investigation. The methods and procedures for testing reliability were developed by the USAF commands primarily interested in that phase of the TACAN program - ARDC, APOG, and Hq USAF. A similar reliability testing program was instituted by the U. S. Navy at the Atlantic City Naval Air Station. The Federal Telephone and Radio Corporation, prime manufacturer of TACAN equipment, augmented these tests by providing factory engineers to assist in collection of performance data, assistance in equipment maintenance, and by feedback of necessary corrective measures to the plant to eliminate repetitive failures. These tests were designed to rapidly accumulate reliability and operational data on the TACAN system to permit the earliest possible implementation of the system. (CONFIDENTIAL)

TACAN GROUND PROGRAM: Release to site and carry out supporting PWP activity for all overseas ground TACAN facilities was given in August. This action had been delayed in the hope that important siting and operational employment guidance might result from the ANDB VORTAC committee studies. 14 EI locations, presumed to have no effect on ATC procedures involving Federal Airways, were also released. (CONFIDENTIAL)

AIR COORDINATING COMMITTEE SWG-13 ACTIVITIES: In February 1954 the Air Traffic Control and Navigation Panel of the Air Coordinating Committee formed Special Working Group No. 13 to review the status of common system implementation and make recommendations pertaining thereto. Thorough study of the work of Special Committee 21 (of RTCA) and SWG-5 (ACC) was made and a series of papers begun on all major aspects of the problem with members of this branch participating.

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Work on this important project has continued throughout this period.

(UNCLASSIFIED)

GROUND SUPPORT OF VOR EQUIPPED AIRCRAFT: A requirement was stated by SAC for ground support of VOR equipped B-47 aircraft in overseas areas. Eight 50 watt Collins VOR transmitters were procured to provide terminal navigational assistance at key SAC bases.

Additional requirements were later approved for 18 50 watt VOR transmitters for use by the AACS mobile squadrons for support of emergency requirements that might arise prior to implementation of the TACAN program. Procurement of the 50 watt VOR transmitters was made from commercially available sources. (CONFIDENTIAL)

PROCUREMENT OF DUAL AN/ARN-6 FOR RETROFIT: The requirement for dual radio compass installation (AN/ARN-6) in transport type aircraft operating in overseas areas was a result of aircraft accidents, particularly in the Alaskan area during prior months. In response to a query from this headquarters, AMC reported that current stocks and existing procurement were not adequate to meet the requirement.

To meet this requirement Project 230 funds in the amount \$5,037,000 had to be released for immediate procurement of a sufficient quantity of equipment. On availability of necessary parts AMC began distribution in accordance with established priorities for installation at field level. The equipment was procured for all C-54, C-74, C-97, C-119, C-124 and overseas C-47 aircraft. (UNCLASSIFIED)

NAVAREO: Under the US policy on long distance aids to navigation (ACC 58/9), NAVAREO has been accepted as the system which offers greatest promise for world wide standardization. During the period 1 July to 31 December 1954 definite progress was made. Prototype airborne receivers

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of the Navaglobe portion of the system were received by RADC. The HRO portion is still not completely developed, but crystals to the required accuracy of one part in 10^9 , which is the heart of unit, were successfully tested. In October 1954, a site was selected for the experimental ground station and it is expected to be completed by July 1955. At that time the schedule calls for tests to start which will encompass and evaluate all air and ground components of the NAVARHO system. (UNCLASSIFIED)

CONSOLAN: CONSOLAN is the interim long distance navigational aid which will be used by Air Defense Command to provide the means for aircraft to navigate in the corridors of the Multiple Corridor Identification System. Between August and December of 1954 all four sites were selected and approved; construction plans were completed; and equipment was stockpiled. Funding action was started which, when approved, will enable CAA to start immediate construction. (UNCLASSIFIED)

LORAN: In December of 1954 plans were finalized to transfer the last LORAN chain operated by the USAF to the US Coast Guard. Agreement for the transfer had been reached between the USCG and the USAF. Inventories and staff visits to the sites were made by Coast Guard Officers. The only action remaining before transfer can actually be started is approval of the funding procedures. Since the USCG budget had been reduced by the Bureau of the Budget the USAF will have to reimburse the USCG for operating expenses. (UNCLASSIFIED)

AN/APS-42A LIGHTWEIGHT AIRBORNE RADAR: In July 1954 the AFGC issued an "Unsatisfactory" OST on the APS-42A. A concurrent OST on the AFE-59 was "Satisfactory" and recommendations were made to replace the APS-42A with the AFE-59 in future buying programs. Based on this information

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procurement action on APS-42's was curtailed. An immediate reaction was received from several commands which indicated that the APS-42A was satisfactory and that the retrofit program should be continued especially since the APS-59 would not be available for this purpose for at least two years. After a thorough study and research the Air Staff decided to reinstate the APS-42A in the retrofit program. (CONFIDENTIAL)

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ELECTRONIC WARFARE BRANCH
HISTORICAL REPORT
COVERING THE PERIOD
1 JUL 1954 TO 31 DEC 1954

SECTION IORGANIZATION

The personnel assigned to the Electronic Warfare Branch as of 31 December 1954 are as follows:

Lt Colonel John M. Van Arsdell

Major James A. Trutter

Major Frank Witry, Jr.

Major John F. Floyd

Captain Robert E. Holmes

Major John F. Floyd was assigned to this branch on 16 November 1954 upon his return from duty in Korea.

FUNCTIONS

The functions of the Electronic Warfare Branch are as follows:

1. Provides technical guidance and advice for the planning and implementation of electronic warfare systems.
2. Formulates and submits to the Air Staff, electronic warfare plans and policies, and reviews existing plans and policies for adequacy and applicability.
3. Furnishes personnel for Joint and Combined Electronic Warfare Boards and Committees.

4. Establishes and monitors quantitative Air Force electronic warfare equipment needs and controls the issue of critical items.
5. Maintains close liaison with electronic warfare development, procurement, and intelligence activities in order to provide consonance of electronic warfare systems with the Air Force mission.
6. Assists in the determination of electronic warfare personnel requirements and assignments, and in the preparation of programs for the training and utilization of electronic warfare personnel.

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SECTION II

ACTIVITIES

CHAFF

During the past few months it has been established that RR-44/AL and RR-39/AL reflectors are adequate to cover all frequencies from approximately 30 megacycles to 11,000 megacycles. Therefore, all other types of reflector, such as RR-6AU, RR-12AU, RR-20AU, etc., have been earmarked for training purposes.

In November, a directive was issued to all major commands utilizing chaff, requesting that excessively long reflector material such as Rope, not be dropped from aircraft over the U. S. mainland. This action was necessary due to the potential danger of causing electrical shorts in power lines.

This directive created a problem in dropping RR-44/AL which includes a roll of rope in each package of chaff. The advisability of having the manufacturer eliminate the rope from certain packages for training purposes is being considered.

A conference on chaff requirements was held at this headquarters in August to determine the annual chaff requirements and resolve problems relative to chaff allocation. Attachment #1 gives the annual requirements by command for training purposes. (CONFIDENTIAL)

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CANCELLATION OF "L" BAND JAMMER (AN/ALT-5)

Development and production of the "L" Band Jammer AN/ALT-5 (300-1100 mc) has been cancelled. This action was considered advisable due to the "Universal Jammer" concept which allows the AN/ALT-6 and ALT-8 to operate from 300 to 11,000 megacycles through the use of frequency extension kits. (CONFIDENTIAL)

COORDINATION OF JAMMING MISSIONS WITH THE NAVY

Due to interference caused by USAF Jamming Training at Naval Testing Stations on the East and West Coast, the Navy Department requested that the Air Force coordinate all jamming training with Navy Test Sites which might be affected. This, in effect, meant that before Air Force units could jam in certain areas, approval of the Navy would have to be obtained. This procedure did not prove satisfactory to the Air Force units and a more desirable system of keeping the Navy advised was proposed. (See Attachment #2).

(CONFIDENTIAL)

BRIEFING OF ASSISTANT SECRETARY OF DEFENSE ON ECM MATTERS

On 1 October, the Honorable Thomas F. Pike and other representatives of the Office of Secretary Defense were briefed by Lt Col Van Arsdell on Electronic Countermeasures. The briefing included summaries on ECM intelligence activities, electronic reconnaissance, QRC (quick reaction capability) and a film on typical ECM operation. (CONFIDENTIAL)

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PROGRESS OF THE AIR FORCE GROUND BASED JAMMING PROGRAM

The operational effectiveness of the Air Force Ground Based Jamming Program and the current development program is as summarized below:

- a. The AN/TPQ-8 has limited usefulness as a jammer directed against airborne blind bombing radars. It has some value to the Air Force as an airborne radar anti-jamming training device.
- b. Due to pronounced directivity of the jamming antenna array, the jammer is limited in effectiveness to single aircraft unless several aircraft are flying in close formation. In general, one jammer per victim aircraft must be employed.
- c. The jammer requires auxiliary ground radar assistance to align its beam accurately upon the victim aircraft.
- d. Airborne radar tactics which employ offset bombing techniques seriously limit the effectiveness of this type of ground-based jammer. Furthermore, the reduced bombing accuracy requirements associated with atomic and TE weapons, places additional limits on the usefulness of the AN/TPQ-8 type.
- e. The AFGC tests established that the AN/TPQ-8 is ineffective if offset points removed 40 miles or more from the target are employed. If the course to the target can be maintained up to within 40 miles of the target, pilotage alone would insure the success of the atomic or TE bombing.

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f. It was determined that more promising developments should be pursued by the Air Force to produce a more effective and more economical ground-based jamming capability. Distributed area jamming is one such item. It employs a relatively large number of low-powered, non-directional jammers distributed over a relatively wide area. Such a system promises to be effective against any number of aircraft flying over or near the protected area, providing the jammers are on the proper frequencies.

g. The AN/MLQ-2 and AN/MLQ-7 engineering models being produced by Gilfillan Brothers under a development contract jointly sponsored by the Air Force and Army, neared completion during the past few months. These sets operate on the principle of completely blanking the airborne bombing navigational radar scope at ranges of 100 nautical miles. This equipment can handle only one aircraft at a time. Anti-jamming measures such as intermittent airborne radar operation have proved successful against equipment of this type in controlled tests. Intermittent operation plus the use of 1000 mc tunable magnetrons in such equipment as the AN/APS-64 should prove effective against the enemy ground based jammers. No evidence exists that the enemy has any operational ground based jammers for use against our airborne radars.

h. The control of ground based jammers and possible interference with friendly electromagnetic radiation devices have not been resolved. Progress in this area can be expected when operational

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devices are available and actual testing of ground based jammers reveals the type of interference to other devices that can be expected.

(SECRET)

PROGRESS ON RB-26 FERRETS

Action was taken to direct AMC to ship Group B ECM Components to units scheduled to receive RB-26 Ferret aircraft. These aircraft are expected to be delivered to operational units without most of the Group B ECM equipments. These aircraft are to serve in reconnaissance units of FMAF, USAF, and TAC as interim electronic reconnaissance aircraft pending availability of RB-66C ferrets. Present modification schedule calls for delivery of the RB-26's to all using agencies by March 1955. (SECRET)

ECM CAPABILITY IN RB-45's

The office agreed to schedule ECM equipment for 14 RB-45 ECM "cradles" to be used by the 49th Air Division. These "cradles" will be carried in the bomb-bay of RB-45C aircraft, providing an active countermeasures capability for support of 49th Air Division bomber strikes. AMC is to build the cradles in the ZI, with necessary modifications to the aircraft to be accomplished in the theater with the assistance of an AMC installation team. (SECRET)

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AUTOMATIC LOGGING OF FERRET EQUIPMENT

The office assisted the Directorate of Requirements and Directorate of Development in establishing a development contract for a system of automatically logging ferret information. The system, if developed successfully, is expected to be used in the EB-66C and other manned ferret aircraft. The automatic logging will be accomplished by attaching digital computers to conventional ferret receivers, analyzers, and D/F equipment, and recording the computer output on tape. The ferret operator will operate the equipment as in the past, but instead of writing the signal characteristics in a log, he will record them on tape by simply pressing a button switch. It has been estimated that the system would increase the traffic-handling capability of manned ferrets by a factor of 3 to 5. By the end of the reporting period, R&D money had been earmarked for this project, and a development contract was expected shortly. (SECRET)

PROGRESS ON ORC-13

The office continued to monitor work by Rome Air Development Center on TAC's Electronic Warfare Units (ORC-13). Latest information is that the first of the three units will be delivered to TAC in March 1955. These units will be used by TAC for field testing of the concept of ground based electronic warfare. (SECRET)

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ANTI-JAMMING STUDY BY BRIGADIER GENERAL SANDRETTO

The office reviewed and commented on an Anti-Jamming Study prepared by Brigadier General P. C. Sandretto (USAFR) during an annual active duty training tour. The study was prepared for Headquarters ARDC and was limited to ARDC activities and responsibilities. This office concurred in general with the recommendations of the study and expects to monitor, through the Directorate of Research and Development, ARDC's action on the study. (CONFIDENTIAL)

ECM CAPABILITY IN FIGHTER-BOMBER AIRCRAFT

The office participated in discussions leading to a decision to procure and install the AN/ARD-9 Homing Device in certain fighter-bomber aircraft. The AN/ARD-9 is considered an interim equipment pending final development of the AN/ARD-10 Homing Device. In addition, to the Homing Device, fighter-bomber aircraft will be equipped with the AN/APS-54 Warning Receiver and the AN/ALE-2 External Chaff Dispenser. Toward the end of the reporting period, action was pending which would initiate the development of light-weight electronic jammers packaged in externally carried tanks for use on fighter-bombers. (SECRET)

NEW ECM RECONNAISSANCE LOG

In October, a conference was held at this headquarters for the purpose of agreeing upon an Air Force Form which would be acceptable to all commands as an Electronic Reconnaissance log. A copy of this

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new log (still under test) is attached (Attachment #3). An Air Force letter explaining the use of the log was prepared and distributed with copies of the log to all commands concerned. After the new log has been service-tested, all users are to forward comments and recommendations to this headquarters. (UNCLASSIFIED)

ECM TRAINING

Considerable study was given to the ECM Training Program during the past six months by the major commands. A formal study was made on this subject by the Air University. This office has given support to the proposition that the Officer ECM Course is too long and too technical. (UNCLASSIFIED)

ELECTRONIC COUNTERMEASURES GLOSSARY OF TERMS

This office continued to meet with Army, Navy, British and Canadian representatives for the purpose of compiling a joint publication which is to give definitions of terms common to ECM. It has been determined that American, Canadian and British definitions will not be the same for all terms; therefore, the publication will denote these variations. (UNCLASSIFIED)

AIR DEFENSE ESTIMATE (EFFECTIVENESS OF PROBABLE ENEMY ECM)

In September this office assisted the Directorate of Plans in preparing a paper on certain aspects of Air Defense. The basic problem

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was to provide an authoritative estimate of the effectiveness of Air Defense fighter aircraft during the mid-1957 period. The office contributed advice regarding the extent to which ECM efforts would degrade the kill effectiveness of the interceptor aircraft. The degradation factor arrived at was approximately .5; that is, the employment of ECM by the enemy could be expected to reduce by approximately one-half the kill effectiveness of the Air Defense System. (SECRET)

LIMITATIONS OF AIR PROVING GROUND COMMAND ELECTRONIC WARFARE COMMITTEE

The AFGC Electronic Warfare Committee was originally organized to monitor and make recommendations on matters pertaining to Air Proving Ground Command. However, due to invitations to other commands to appoint members and zeal to further the cause of ECM in general, this committee began to spend considerable time on problems other than those of AFGC. This office assisted in the preparation of correspondence to AFGC which delineated the responsibility of the committee. The following is an excerpt from this correspondence:

"a. The committee should be sponsored and administered by the Commander, AFGC.

b. The committee activities should be limited in scope to furthering the effectiveness of the tests and evaluations of electronic countermeasures equipments, tactics, and techniques for which the AFGC is responsible.

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c. The Committee should limit its deliberations to specific items which are of primary concern to APGC, and should restrict attendance at its meeting to those individuals who have definite need-to-know and who have a definite contribution to make." (UNCLASSIFIED)

MEETING WITH FCC AND OTHER INTERESTED AGENCIES ON FREQUENCY CLEARANCE FOR ECM TRAINER

A meeting was held 18-19 August 1954 in the Air Staff with FCC, GAA, SAC, TAC and other interested agencies to discuss the technical characteristics of an ECM trainer and the associated frequency clearance problems. The first objective of the meeting was to familiarize those in attendance with the technical characteristics of the AN/GPQ-T1 ECM Trainer and the proposed plan of operation by the using commands, SAC and TAC. The second objective of the meeting was to discuss the various means by which frequencies could be selected by operating personnel for the operation of the ECM trainer and the airborne jamming equipment, and the methods by which this coordination could be accomplished. The technical characteristics of the ECM trainer were distributed to all those in attendance in the form of a handout. Due to the large number of locations involved and the requirements for frequencies from five (5) different bands, it was determined that local clearances by the interested agencies were the only feasible solutions. The five (5) frequency bands within which operations must be conducted are as follows:

60-100 mcs 150-250 mcs 400-700 mcs 1000-1500 mcs 2700-3100 mcs

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In addition, SAC has been conducting coordinated tests in conjunction with the FCC to determine possible detrimental effects of accidental jamming of civil radio and navigation aids facilities which might occur during training operations. Frequency allocations lists in non-government frequency bands have been furnished SAC to aid in coordinating their training periods and frequencies with local FCC agencies. These actions should satisfactorily solve the problem of permitting ECM training in non-government frequency bands without harmful interference to non-government agencies. (CONFIDENTIAL)

US-UK ECM DISCUSSIONS

The meetings of the US-UK ECM discussions held in the UK during May and June 1954 were reviewed by this office as a part of determining US agreement to these meetings. In addition, a Joint position was established for the frequency of the future US-UK discussions. The date of the next, April 1956, was agreed upon by the JCEC and was to be submitted to the UK. In general, the visits are to be on a bi-annual basis. (UNCLASSIFIED)

EXTENSION KITS FOR THE AN/ALT-6/ALT-8

As a part of the so-called Universal Jamming System, extension kits for both ALT-6 and ALT-8 covering from 350 to 10,500 mcs have been placed on procurement during the FY-55 Buying Program. This also includes initial quantities of automatic receiver set-on device to

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make possible a search and jam capability for both these systems. It is expected that additional procurement of extension kits and automatic receivers will continue through FY-56 and FY-57 in order to meet the 137 Wing Program. Extension Kits for the ALT-6 to cover the S and X bands are programmed in FY-55 and 56 respectively. Extension kits for these 2 bands in the ALT-8 are programmed in FY-55 in the case of S-Band, and will probably involve FY-57 for the X-Band. (CONFIDENTIAL)

ANTENNA SYSTEMS FOR PASSIVE DETECTION

This office forwarded to the Director of Research and Development, and the Director of Requirements, the technical characteristics of a Parabolic Antenna System that may have application to the present Passive Detection System under development at Rome Air Development Center. This office believes that these antennas, Parabolic Antenna System, which have an overall gain of approximately 20 db over a dipole, when used in conjunction with the AN/APR-9 receivers could improve the detection range of our present Passive Detection equipment. (UNCLASSIFIED)

AIRBORNE TAPE RECORDER PROGRAM

In September, this office established the quantitative requirements for the new tape recorder equipment (AN/ALE-2 and AN/GLQ-2) which is to replace the old World War Wire Recorders. The AN/ALE-2 requirements are as follows:

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137 RB-36 aircraft at 4 per aircraft	548
30 RB-47 aircraft at 3 per aircraft	90
17 RB-52 capsules at 2 per aircraft	34
27 RB-66C aircraft at 4 per aircraft	<u>108</u>
TOTAL	780

The AN/CLC-2 (Ground playback equipment) requirements are as follows:

Eight (8) wing level Reconnaissance Technical units at 2 each	16
Three (3) Air Force level Reconnaissance Technical units at 4 each	12
The 544th Reconnaissance Technical Squadron	4
Three (3) Tactical Reconnaissance Technical Units at 2 each	6
Air Technical Intelligence Center	<u>3</u>
TOTAL	41

Magazines for the AN/ALH-2 will be procured on the basis of 10 per recorder, or 7800 magazines. (CONFIDENTIAL)

DISPOSITION OF PROXIMITY FUSE JAMMER, AN/APT-13

It has been determined that the 200 AN/APT-13 Jammers will be held in AMC stock pending actual military need. Consequently, both formal and informal training on the equipment is being withheld. (CONFIDENTIAL)

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ECM EQUIPMENT FOR U.K. (MDAP)

It was determined in August by U. S. Commander-in-Chief in Europe and this headquarters that the only country which should receive ECM equipment through MDAP would be U. K. (CONFIDENTIAL)

STATUS OF AN/APT-9 ("L" BAND JAMMER)

Correspondence from Commander, Far East Air Force, revealed that the AN/APT-9 is not a satisfactory replacement for the AN/APT-5A "L" Band Jammer. This report was based on operations during and since the Korean War. Insufficient power output was the chief complaint. This office advised FEAF that the AN/APT-9 would continue to be standard authorized equipment for "L" band jamming until the AN/ALT-6 and ALT-8 jammers with necessary frequency extension kits are available as replacements. (CONFIDENTIAL)

FB-26 AIRCRAFT MODIFICATION FOR USAFE

The project for modifying three FB-26 aircraft for ECM training in USAFE has not yet been completed. The reason this modification has been delayed is the change in jamming equipment required. The original configuration called for AN/APT-16's and AN/APT-6's. These equipments have been superseded by the AN/APT-16A and AN/ALT-7 respectively which have not become available. (CONFIDENTIAL)

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B/B-66 CONFIGURATION

Douglas Aircraft Corporation has been authorized to make provisions in the B-66 series aircraft for ECM configuration as follows:

B-66B

One (1) Tail warning radar receiver (AN/APS-54)

Two (2) Jammers (AN/ALT-6 and/or AN/ALT-7)

Two (2) External chaff dispensers (AN/ALE-2)

In addition to the above normal ECM capability, there will be one "Brown Cradle" provided for each four B-66B's and one ECM Tail Cone for each two B-66B's. The cradle, which fits into the bomb bay, will carry four (4) jammers and four (4) internal chaff dispensers (AN/ALE-1). The ECM Tail Cone, which is interchangeable with the regular Tail Cone, will accommodate two jammers and two internal chaff dispensers. The quantity and type of equipment will be the prerogative of commanders concerned.

B-66B

One (1) Tail warning radar receiver (AN/APS-54)

Two (2) Jammers (Same as B-66B)

Two (2) External chaff dispensers (Same as B-66B)

In addition to the above normal ECM capability, the same ECM Tail Cone capability will be provided as for the B-66B. No cradles are provided.

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RB-66C

Same as RB-66B, with the exception of four ECM Ferret positions in the Bomb Bay area of the aircraft. (SECRET)

LIGHT WEIGHT JAMMER REQUIREMENT

At a conference at Wright-Patterson Air Force Base in October, a requirement was tentatively established for a light weight jammer with similar characteristics of the AN/ALT-6. It would be referred to as the "ALT-6 Junior". It would weigh approximately 100 pounds less than its heavier counterpart and would be especially suitable for installation in fighter-bombers and tactical bombers. (CONFIDENTIAL)

SECURITY CLASSIFICATION OF AN/APR-9

When the AN/APR-9 receiver was released to the field in 1948, the Security Classification was CONFIDENTIAL but was later downgraded to RESTRICTED. When the Restricted Classification was abandoned by the Department of Defense in December 1953, the Navy insisted that the AN/APR-9 should be reclassified to CONFIDENTIAL and so it was. During the past months, this office has had several complaints from the field that this equipment is overclassified and that such classification is a stumbling block to training. This office concurs with the latter and has taken steps to coordinate the matter with the Navy, through an Air Force Security representative. (UNCLASSIFIED)

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ECL'S (EQUIPMENT COMPONENT LISTS)

This office monitored and approved ECM ECL's of major commands and coordinated matters pertaining to the ECL's with Directorate of Supply and Services. (UNCLASSIFIED)

AN/ARR-8B (PANORAMIC RECEIVER)

This receiver is composed of four units: R-553, R-356, R-357 and R-358. These four units cover 70-1000 mcs. Progress in developing a satisfactory first article (AN/ARR-8B) has been extremely slow. In fact, by October 1954, no first article had been delivered; consequently, the 1954 funds which were set aside for buying this article were transferred to the AN/ALT-6 extension kit program. However, recent unofficial information indicates that the R-553 unit has passed satisfactory tests and it is believed that development and production will improve during the next year. (CONFIDENTIAL)

FEDERAL SUPPLY CLASSIFICATION SYSTEM

This office received the New Federal Supply Classification System which was prepared by Office of Secretary of Defense and which will eventually replace the present Air Force, Army and Navy stock numbers and supply procedures in general. It was noted that Chaff was omitted from the equipment lists and that ECM equipment was listed as "miscellaneous". It was recommended that Chaff be added to the equipment list and that ECM equipment be listed in a special category in the same manner as Communications equipment or radar equipment. (UNCLASSIFIED)

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JOINT AND COMBINED ACTIVITIES

In September, Lt Colonel Van Arsdell was elected Chairman of the Joint Electronic Warfare Panel of the JCEC. The Chairman of the Joint Electronic Warfare Panel also serves as Chairman of the Combined Electronic (Radio) Warfare Panel of the Canadian-United Kingdom JCECS.
(UNCLASSIFIED)

INTRAGOVERNMENTAL ACTIVITIES

In December, Lt Colonel Van Arsdell was elected vice-chairman of Panel #3 of the Telecommunications Planning Committee. He was detailed as alternate USAF member of Panel #3 in 1952, and became the Air Force member during the Spring of this year. (CONFIDENTIAL)

LAMPLIGHT ECM BRIEFING

In October, Lt Colonel Van Arsdell gave a resume of ECM in the USAF to the Massachusetts Institute of Technology Lamplight project personnel at Lincoln Laboratories, Cambridge Air Force Research Center. The Lamplight Project is concerned with the seaward extension of air defense. (SECRET)

3 Attachments

1. Chaff Eng Repts
2. Copy of Memo to CWO
3. Proposed Elec Recon Log

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CHAFF TRAINING REQUIREMENTS

Type Aircraft And Unit	No. Aircraft	Sorties Per Quarter Per Aircraft	Total Sorties Per Quarter	Total Sorties Per Year	Chaff Load Per Sortie (WFF)	Total Chaff Requirement Per Year (In Cartons)
B-29 Radar Evaluation (Total Air Force)	36	$\frac{*120 \text{ Hrs/Q}}{12 \text{ Hrs/S}} = 10$	360	1440	19	27,360
B-25 ADC ECM Training	**8	$\frac{*102 \text{ Hrs/Q}}{6 \text{ Hrs/S}} = 17$	136	544	10	5,440
B/RB-36 SAC (11 Wings)	330	*** 1 Simulated Combat Mission Per Qtr. 70% Assigned Acft	330x70%	884	18*****	16,012
B/RB-47 (28 Wgs) SAC	1260	"	126x70% = 882	3528	10*****	35,280
F-84 Fighter-Bomber TAC (21 Wings)	1575	"	1575x70% =	4408	3*****	13,224
TC-54 ATC ECM Training	4	**** 18	72	288	10	<u>2,880</u>
TOTAL						100,196

* Quarterly flying hours from PHF.

** These 8 aircraft are ADC support B-25's locally modified

*** SAC Reg training requirement

**** ATC experience factor

***** 50% of full load authorized for SAC - TAC simulated combat missions.

Attachment # 1

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AFOAC-E/T

MEMORANDUM FOR THE CHIEF OF NAVAL OPERATIONS, DEPARTMENT OF THE NAVY

SUBJECT: Coordination of USAF ECM Training Flights with Naval Test Sites

1. Reference Department of the Navy letter OP-303Q, SER 06378P30 of 8 July 1954.

2. To safeguard the operation of Naval Electronic Test Facilities from harmful interference from Electronic jamming done during training flights of the USAF, a directive was issued on 5 August 1954 requiring all USAF units planning jamming training flights to obtain coordination of Commandants of Navy test sites that might be affected. Experience gained in conducting operations under the provisions of this directive during the past two months has produced the following conclusions:

a. The USAF conducts extensive ECM training in the frequency bands listed in paragraph 3a(1) below against Air Defense and Tactical Air Command radar facilities throughout the U.S. All of the Naval test sites mentioned in referenced Navy letter are located in areas where a considerable amount of routine jamming training is conducted. The USAF ECM training program requires a large number of flying hours for each crew to meet training minimums. This fact, together with the problems of scheduling the many aircraft involved, the uncertainty of exact periods that jamming is done, and the need for integrating ECM

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B/Memo to Chief of Naval Operations, subj: "Coordination of USAF ECM Training Flights with Naval Test Sites" (Cont)

training with other crew training requirements, conflicts with the need for prior approval from Navy test sites and hampers our ECM training program.

3. Recognizing the need for safeguarding the functions of Navy test sites, an alternate procedure is proposed as follows:

a. U. S. Navy and U. S. Air Force approve standing clearances for ECM training in military radar operating frequency bands as follows:

- (1) Air Defense and Tactical Air Command ground radars in the 1200 - 1370 mcs and 2700 - 3300 mcs bands, and
- (2) Airborne radars in the 8600 - 9600 mcs band.

b. Control of jamming activity by USAF aircraft within these frequency bands is now the responsibility of the Air Defense Commander. This can be expanded so that a Naval Test Site Commandant could notify a specified USAF Air Defense Command of specific areas, times and frequency bands covered by the standing clearance that would require protection from jamming activities. The Air Defense Commander would advise the USAF unit intending to employ jamming that certain restrictions were in effect and that jamming activities were to be limited accordingly.

- (1) A geographical plan of control covering the concerned Naval sites would be as follows:

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B/Memo to Chief of Naval Operations, subj: "Coordination of USAF ECM Training Flights with Naval Test Sites" (Cont)

Air Defense Coordinating Agency:

Eastern Air Defense Force Headquarters, Stewart Air Force Base, New York, for following Navy test sites:

U. S. Naval Research Laboratory, Bellvue, D. C.

U. S. Naval Aviation Ordnance Test Station,
Chincoteague, Virginia

U. S. Development Center, Johnsville, Pa.

U. S. Naval Ordnance Laboratory, White Oak, Md.

U. S. Navy Underwater Sound Laboratory, Fort
Trumbull, New London, Conn.

Air Defense Coordinating Agency:

Western Air Defense Force Headquarters, Hamilton Air Force Base, Calif., for the following Navy test sites:

U. S. Naval Ordnance Test Station, Inyokern, Calif.

U. S. Navy Air Missile Test Center, Point Mugu,
California

U. S. Navy Electronic Laboratory, San Diego, Calif.

4. If the proposal outlined in paragraph 3 above is acceptable, a directive will be issued to the Air Defense Commander to initiate coordination with concerned Navy test site commandants.

FOR THE CHIEF OF STAFF:

Attachment 2

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INSTRUCTIONS

HEADING: The following entries will be made in the appropriate spaces at the top of this form.

WING NUMBER. The wing to which the aircraft is assigned for the mission.

SQUADRON NUMBER. The squadron to which the aircraft is assigned for the mission.

MISSION NUMBER. Mission or sortie number assigned by briefing agency.

DATE OF MISSION. Date of take-off in Greenwich Mean Time.

PAGE OF PAGES. Enter page number and total number of pages for the entire log.

POSITION OF ELECTRONIC COUNTERMEASURE OBSERVER. Electronic countermeasure position number within the aircraft.

OPERATIONS ORDER NUMBER AND ISSUING HEADQUARTERS. As applicable. On normal training missions this entry is not required.

AIRCRAFT TYPE. Type, model, and series.

AIRCRAFT SERIAL NUMBER. Complete tail number.

ELECTRONIC COUNTERMEASURE OBSERVER. Print the last name, first name, and middle initial of ECM observer using log. (When more than one observer occupies the same ECM position, a new page will be initiated by each observer; however, page numbers will be in chronological order for the entire operation on a mission in each position.)

EQUIPMENT INSTALLED. Enter all installed equipment in the position, including serial number of recorder magazine.

All subsequent pages of the log will include page number, number of pages, mission number, name of ECM observer, and ECM position.

COLUMNAR ENTRIES:

A - TIME OF INTERCEPT. Enter the Greenwich Mean Time at which the signal is intercepted.

B - RECORDER ON. Enter a check mark to indicate that the recording of a signal has started.

C - PULSE DURATION OR MODULATION. Enter the pulse duration measured in micro-seconds for pulse modulated signals. Enter the basic type of modulation of the carrier. (AM or FM, for non-pulsed signals.) (Enter the remark "NO" if carrier is unmodulated.)

PULSE REPETITION FREQUENCY OR MODULATE RATE:

D - ESTIMATE. Enter the estimated pulse recurrence frequency. If the signal is modulated at a regular rate but cannot be measured, enter estimate in cycles per second. If the signal is modulated at an irregular rate or is continuous, enter IRR (irregular) or CONT (continuous).

E - MEASURED PULSE REPETITION FREQUENCY. Enter the sine wave pulse recurrence frequency. (Saw tooth PRF may be entered in this column in lieu of unobtainable sine wave PRF.) If a signal is modulated at a regular rate and can be measured, enter the measurement.

F - SWEEP DURATION. Enter time in seconds between illuminations by major lobe and/or tracking. A tracking signal is determined to be a signal which changed mode, for example, sweeping to tracking; otherwise, it will be logged as steady.

G - FREQUENCY. Enter the observed frequency of the intercepted signal.

DIRECTION FINDING BEARINGS OR ATTENUATION SETTINGS. The lower portion of the log will reflect the following data:

SIGNAL NUMBER. Enter the signal number as in Column L above, which will identify the signal as entered in the body of the log. These columns will be used only after the initial intercept information of a signal has been entered in the body of the log. (A column grouping will be used for

an individual signal, or more columns may be used, if necessary. Be sure to include the signal number if more than one column is used.)

TIME. Enter the Greenwich Mean Time of initial Direction Finding bearing.

BEARING OR ATTENUATION. Enter the initial bearing in degrees, and all subsequent bearings or attenuation settings.

CLASS OF BEARING. Enter the class of Direction Finding bearing as defined below:

Class "A" - Width of lobe on indicator scope plus or minus 2 degrees or less.

Class "B" - Width of lobe on indicator scope more than plus or minus 5 but less than 10 degrees.

Class "C" - Width of lobe on indicator scope more than plus or minus 10 degrees.

UNRELIABLE. Indicate unreliable Direction Finding bearings with an "X".

POLARIZATION. Enter the polarization of the intercepted signal.

H - ATTENUATION. Enter the attenuation setting of the Electronic Countermeasure receiver.

I - IMAGE. Enter the image frequency and/or spurious responses. Designate the image with the letter "I" and spurious response with the letter "S".

J - PULSE SHAPE. Enter a sketch of the pulse shape.

K - IDENTIFY RECORDING. Enter a check mark to indicate that the recording has been properly identified.

L - SIGNAL NUMBER. Enter signal intercepts for a single position in chronological order for the complete mission. For example, 1-4 indicates the fourth signal logged in the number 1 position.

M - REMARKS. Points to be covered in this column will include:

1. Identifying characteristics; such as code letters, call signs, etc.

2. Indication of frequency band searched.

3. Interference caused by other electronic equipment aboard the aircraft and/or weather conditions.

4. Any unusual operations or pertinent remarks which might aid in establishing the identity and location of the source of the transmission, or which might aid in the analysis of the intercept.

SIGNAL LOST:

N - TIME. Enter the Greenwich Mean Time a signal is lost.

O - CONDITION. Enter the way the signal was lost by use of one of the following phrases:

1. F (Faded) - Signal strength diminished gradually.

2. D (Down) - The signal went off the air abruptly while being observed.

3. O (Off) - The signal was no longer present when observer returned to the frequency of a previously intercepted signal.

4. A (Abandoned) - The ONLY time this term will be used will be when the observer ceases observation of an active signal, due to having obtained and logged all required information.

P - ATTENUATION. Enter the attenuation setting of the Electronic Countermeasure receiver when the signal is lost.

CLASSIFICATION: Whenever entries are made in the log, it will be classified commensurate with the security classification of the entries made, or with the classification of the mission. This will be the responsibility of the Electronic Countermeasure Observer.

HISTORY OF COMMUNICATIONS SYSTEMS DIVISION

1 July to 31 December 1954

COLONEL BERNARD M. WOOTTON
Chief
LT COLONEL C. R. GAJAN
Executive

COMMUNICATIONS SYSTEMS DIVISION
DIRECTORATE OF COMMUNICATIONSTABLE OF CONTENTS

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COMMUNICATIONS SYSTEMS DIVISION
DIRECTORATE OF COMMUNICATIONS

SECTION I

ORGANIZATION AND FUNCTIONS

The Communications Systems Division, Directorate of Communications, is divided into three branches: Operations Branch, Systems Engineering Branch, and Security Branch.

The following changes in personnel occurred during the reporting period:

Colonel Bernard M. Wootton replaced Colonel Charles W. Gordon as Chief of the Communications Systems Division. Colonel Gordon assumed duties as Chief, Plans and Policies Division.

Lt Colonel Charles R. Gajan assumed duties as Executive of the Communications Systems Division, position vacated by Lt Colonel Samuel J. Whitsitt who transferred to the Operations Branch.

The functional responsibilities of the Communications Systems Division are as follows:

Determine and review the operational requirements for point-to-point communications systems, tactical and fixed radio and wire systems, and ground/air radio stations, in accordance with current programs and projects. Determines need for control and controls the issue of critical items of communications equipment. Exercises staff supervision over the planning and operation of communications systems. Formulates and prescribes communications doctrine, methods and operating procedures for Air Force communications. Exercises supervision and technical direction over the Air Force Security Service on all

matters pertaining to cryptography and communications security.

Exercises general supervision and policy direction over the Military Affiliate Radio System (MARS). (UNCLASSIFIED)

SECTION II

ACTIVITIES

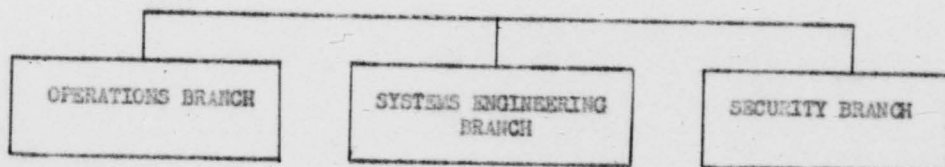
The activities of the division are set forth in detail in the histories of the branches which follow. (UNCLASSIFIED)

Organisation at close of period - 1 July through 31 December 1954

COMMUNICATIONS SYSTEMS DIVISION

Colonel (Chief)..... 1
Lt Colonel (Executive) 1
GS-5 1
Airmen 1

Colonel Bernard M. Wootton
Lt Col Charles R. Gajan
Miss Coletta L. Schulz
A/2c Donna J. Metzberg



HISTORY OF SECURITY BRANCH

1 July 1954 to 31 December 1954

ROBERT C. SEARS, Colonel USAF
FRANCIS A. BRANT, Major USAF
DON D. PERRY, Major USAF

Communications Systems Division
Directorate of Communications

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ACTIVITIES

Review of USAF Security Service Mission. It became apparent during the past six (6) months that the mission letter of the USAF Security Service was inadequate to properly define the functions of that command. The Commander of Security Service, General H. H. Bassett, visited the Director of Communications in December to obtain clarification of his COMSEC mission. As a result of this visit, a study was undertaken by the Security Branch to rewrite the mission letter and to realign the assignment of functions between USAFSS and the Directorate of Communications.

This study resulted in a requirement for a new position within the branch. A GS-13, Communications Engineer, is needed in this branch in order to effect a shift of certain technical functions from USAFSS. The presence of a cryptographic technician in the Security Branch will obviate the necessity to call on USAFSS for representation on numerous joint and combined committees and working groups in the Washington area. It will also permit direct monitoring of the National Security Agency cryptographic development program from this headquarters. (CONFIDENTIAL)

Special Intelligence Clearances for Access to COMINT. This branch was charged with the responsibility for establishing a new system for obtaining special COMINT clearances within the directorate. A Table of Distribution was made up showing the positions within the directorate that require COMINT clearance and giving the justification for each requirement. Requests for clearances for incumbents in these positions, not previously cleared, were processed. (CONFIDENTIAL)

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Cryptographic Planning and Budgeting Program. Preparation and presentation of the cryptologic portion of the Planning Communications and Electronics documents continued during this period. After approved circuit and engineering changes were made to existing documents, appropriate adjustments were made in the allocation and authorization of cryptologic equipment to insure a timely and well balanced USAF world-wide cryptographic program. A number of emergency changes for these documents were processed to provide cryptographic equipment for certain disaster and emergency communications plans. (SECRET)

Cryptologic Budget. The FY 1955 buying program for communications security equipment was prepared, presented, approved by various review agencies and implemented during this period. This buying program was a near parallel of the FY 1955 budget estimate with one major exception. The AFSAM-9 cryptoequipment was not included in the initial program due to a delay in equipment delivery for service acceptance tests. The program will be reviewed again in January 1956 with a view toward including this equipment providing it is acceptable for Air Force use as programmed. Monitoring continued on the progress of the FY 1954 and FY 1955 buying program for Project 236, Communications Security equipment.

Preparation and presentation of the FY 1956 communications security equipment budget estimates for Project 236 continued during this period. These estimates were approved, as presented, by the various Defense Department review agencies. (CONFIDENTIAL)

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Revised Air Force Regulations. AFR 205-31 and AFR 66-21 were rewritten and published during this period. These regulations provide the Air Force policy on command cryptocenter inspections and communications security maintenance. The cryptocenter inspections must be performed by a qualified and crypto cleared officer on a yearly basis and newly activated centers must be inspected within thirty (30) days after activation. Inspection report routing and classification procedures were changed to a more simplified and realistic procedure. Modification and Unsatisfactory Report policy and procedures on communications security equipment was established and included in AFR 66-21. The regulation now contains Air Force policy on maintenance and modification of equipment in this category. The procedures and detailed instructions will be furnished to field units through USAF Security Service technical publications. (UNCLASSIFIED)

AFSAY 806 Program. The wire line tests of the AFSAY 806, high-echelon voice security equipments, begun in April 1954 were completed by the end of the year. These tests were successful, but proved that the circuitry of the equipment was too critical and generally beyond the capability of the average Air Force radio technicians. Plans to conduct further tests of the equipment over radio circuits were therefore cancelled. Instead, modifications were proposed and the National Security Agency recalled all equipments so they could be returned to the contractor for reworking. It is anticipated that four (4) prototypes of the production model of the AFSAY 806 will be provided the Air Force in June 1955 and that radio testing will commence at that time.

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A study project was assigned Air Research and Development Command to determine the security capabilities of a Dictograph shielded cable. If it proves to offer sufficient physical security, this cable may be used to remote subscriber sets from the AFSAY 806 and hence the transmission of all levels of classification through the system will be authorized. (SECRET)

Functional Testing of AFSAX 503. The National Security Agency completed the development of a high-echelon cifax equipment, AFSAX 503. This equipment combines a cryptographic binary key with the on-off pulses of standard facsimile transceiver equipment to produce enciphered facsimile signals, and to decipher these signals at the receive end. Wire line testing of this equipment was conducted between Washington and San Antonio with excellent results obtained. Radio tests were begun at the year's end. When all results are evaluated, NSA will begin final modification work prior to letting production contracts. (SECRET)

Conversion to On-line Operation. By the end of 1955, Air Force communications still had not been converted to on-line synchronous operation. Although it was feasible to conduct point-to-point on-line communications, too many technical problems existed in relay operations to allow the conversion to take place. The time was spent studying the numerous technical problems involved, in modifying ASAM 2-1 and TT-160/FG, and in developing an ancillary equipment known as STAPSOM. The latter device is a prerequisite to the accomplishment of the conversion program. Since Air Force plans call for fully synchronous on-line communications in the near future, continued emphasis will be placed on this program until satisfactory results are achieved. (SECRET)

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Cryptographic Protection for Statistical Data Transmission (IBM).

USAF Security Service completed review of existing cryptographic equipment and principles available for the securing of this system. It was determined that equipment is not available. Cryptographic military characteristics (MC's) based on the requirement and known crypto principles were prepared and forwarded for coordination and approval. (CONFIDENTIAL)

AFSAM-7 Cryptographic Equipment. As a result of the AFSAM-7 operational suitability test, it was determined that this equipment was suitable for Air Force operational use. Approximately one-half of the Air Force total requirements (3055) for this equipment have been delivered from the National Security Agency. Distribution of approximately 1000 of these devices to air units has been accomplished. Field reports indicate that no serious problems have been encountered in the operation and maintenance of this equipment. Personnel requirements on maintenance and operator training have been adequately met by special courses at Air Training Command and Communications Security Squadrons of USAFSS. (CONFIDENTIAL)

Airborne Voice Security System (Ciphony). The National Security Agency is developing a low echelon voice security system designated the AFSAY 808. This system will provide Grade IV, two weeks, security for UHF/VHF air-to-air and air-to-ground communications systems having a 24Kc bandwidth capability. Engineering models of the AFSAY 808 were demonstrated by National Security Agency in September 1954, at Andrews Air Force Base. Representatives of most major Air Force commands were present. The equipment functioned perfectly.

SECRET

HISTORY
of the
COMMUNICATIONS SYSTEMS ENGINEERING BRANCH
30 June 1954 to 1 January 1955

CHIEF
COLONEL JAMES R. McNITT

Communications Systems Division
Directorate of Communications

SYSTEMS ENGINEERING BRANCH
COMMUNICATIONS SYSTEMS DIVISION

SECTION I

ORGANIZATION AND FUNCTIONS

Functional Description, Systems Engineering Branch. The Systems Engineering Branch is the agency within the Communications Systems Division which deals with turning requirements into realities. These requirements include all United States Air Force Government owned fixed point-to-point, ground components of HF (High Frequency) ground to air and base communications. The activities of the Branch include programming, systems engineering, project following and monitoring procurement, Research and Development and installation activities related to the above. As of 1 December 1954, the Branch was organized into two sections: (1) Long Lines Section, and (2) Base Systems Section. The functions and organization of the Branch are shown in Appendix I. (UNCLASSIFIED)

Prior to 1 December 1954, the Branch was organized into two sections called: (1) Programming Section, and (2) Engineering Section. The major functions and organization during this period are shown in Appendix II. In an attempt to lend more emphasis to systems engineering activities and to absorb an increased workload in the Base Systems area, the new organization scheme was adopted. The increased workload was due to a rewrite of AFR 100-46 which places base communications systems in the same category as long lines, from the standpoint of engineering and programming. Previously responsibilities of this type had been handled by Headquarters Air Materiel Command and monitored by the Maintenance Engineering Directorate. (UNCLASSIFIED)

Under the new organizational scheme, programming responsibilities were divided between the two sections. The Long Lines Section doing the long lines programming and the Base Systems Section doing the programming for base systems. Programming actions for the Branch are coordinated by the Chief of the Long Lines Section who acts also as Assistant to the Branch Chief for Programming. (UNCLASSIFIED)

The policy of the Systems Engineering Branch monitoring all Air Staff actions affecting programs within the purview of the Systems Engineering Branch remained in effect. With the exception of the additional workload in the Base Systems area, the scope of activities of the Branch was unchanged. (UNCLASSIFIED)

Changes in Personnel. On 7 September 1954, Colonel James R. McNitt was assigned as Branch Chief, replacing Colonel David S. Woods, who departed in July to attend the Air War College at the Air University. On 21 October 1954, Lt Colonel K. H. Smith was transferred to Headquarters Supreme Headquarters Allied Powers Europe. On 2 August 1954 Major Donald J. Lake was assigned to the Branch and on 1 December 1954 he became Chief of the Base Systems Section. On the same date, Lt Colonel Albert A. Kurs became Chief of the Long Lines Section and Assistant to the Branch Chief for programming. Concurrently, Major F. L. Perra and Mr. Max Lofton were assigned to the Base Systems Section, and Major G. E. Townsend, Major W. J. Fry, Major D. H. Blakley, and Major C. J. Welti were assigned to the Long Lines Section. (UNCLASSIFIED)

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SECTION II

ACTIVITIES

Air Academy Communications Facilities. This project was to determine the communication facilities to meet Air Academy requirements at permanent site, Colorado Springs, Colorado. The strength requirements for the Air Academy were approved by Lt General Hubert R. Harmon, Superintendent of the Air Academy, on 23 August 1954, and Systems Engineering Branch was appointed project office. On 22 October 1954, advance information was furnished Air Materiel Command that navigational aids and telephone central office plant was programmed. Emergency USAF Communications-Electronics Program (PC) action was taken to provide Air Academy Construction Agency with 80 lines of commercial telephone equipment, programmed for P-255. A conference was held at the Air Academy where it was determined Ogden Air Materiel Area would assist the Air Academy in developing future requirements. It was also determined that upon completion (about February 1955) of engineered requirements, they would be forwarded to the Systems Engineering Branch for programming in PC as commercial facilities. (UNCLASSIFIED)

Alaskan Communications Study. Because of the dearth of communications in the areas where the Alaskan Aircraft Control and Warning (AC&W) stations were located it was determined by the Department of Defense to provide an integrated communications system that would serve all agencies in Alaska. A joint communications requirement and

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an engineering planning study was undertaken in January of 1954 to accomplish this purpose. (UNCLASSIFIED)

In August 1954 it became apparent that the American Telephone and Telegraph Company (AT&T) planning study of the Alaskan communications requirements would not be available in time to permit inclusion of these requirements in the Fiscal Year 1956 budget. A series of conferences were held between representatives from the Alaskan Air Command, the Alaskan Communications Study Group, AT&T, the Signal Corps, and the Directorate of Communications to formulate plans for implementing this communications study at the earliest possible date. As a result of these meetings an initial phase for implementing the Alaskan communications study was established. This phase was subsequently nicknamed Project WHITE ALICE and consisted of the basic communications systems need to support those AC&W stations in Alaska that were to become operational through Fiscal Year 1956. (UNCLASSIFIED)

By late October 1954 sufficient detail had been compiled to permit FY 55 reprogramming and FY 56 budget actions. Because the facilities included in the initial phase were primarily for Air Force use, Department of Defense approval was obtained to fund all of these facilities in the Air Force budget. On 19 November 1954, the Assistant Secretary of Defense for Supply and Logistics approved Air Force implementing of facilities under Project WHITE ALICE. After considerable discussion with Air Materiel Command, the Signal

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Corps and various industrial representatives, it was evident that the only feasible means for accomplishing the initial phase in the time required was a sole source package contract with AT&T. This approval was subsequently obtained from the Secretary of Air Force on 23 December 1954 and AMC was directed to contract with AT&T for engineering and installation of the WHITE ALICE communications facilities. (UNCLASSIFIED)

AN/FRC-27/AN/VRC-19 Base Non-Tactical Communication Retrofit Program. Supply action was completed for the initial allocation of AN/FRC-27/VRC-19 base non-tactical radio equipment to Zone of Interior and overseas bases. To conform with agreements with the Civil Aeronautics Administration, 27 each control units C-845/U were shipped to Project Material Depot Oklahoma City, Oklahoma. These units were programmed for CAA operated control towers at locations where a fire crash communications system is operated by the USAF. (UNCLASSIFIED)

Base Wire Systems. When the Air Force became autonomous, it inherited Government owned telephone systems at many of the bases. In order to comply with Department of Defense directive, a world-wide survey was conducted. This directive required maximum use of leased commercial facilities for administrative telephone service at military installations. The world-wide survey provided information used to determine the total number of Zone of Interior bases needed to train overseas replacements. An oral presentation was made to the Office of the Secretary of Defense by the Directorate of Maintenance Engineering requesting that 43 Air Force Bases be approved

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for Government retention of the base wire and telephone systems. Justification was based on the requirement for 1500 technicians to maintain central office equipment at 92 overseas bases. It was also requested that a restudy of 20 of the 43 bases be made to determine if they were best suited to the needs of the Air Force. The 43 bases were approved by OSD on 23 August 1954 and restudy of the 20 bases was also granted. On 1 November 1954 Systems Engineering Branch assumed the responsibility for actions pertaining to ownership of base wire and telephone systems. Previously, this responsibility was charged to the Directorate of Maintenance Engineering, (AFMME). AFMME retained the responsibility of obtaining comparative cost figures and making appropriate recommendations regarding sale or retention of Government owned systems to Systems Engineering Branch. As of 15 December 1954 the appropriate commands had submitted their comments on the 20 bases under restudy. (UNCLASSIFIED)

Conversion of ZI Weather Teletype Communication System to 100 WPM (Words per Minute), AACS Plan 5-52. The change-over date to convert all USAF ZI weather circuits to 100 Words per Minute established for 30 June 1954 was not accomplished. A conference was held on 1 and 2 July 1954 at Rome Air Force Depot, Griffiss Air Force Base, Rome, New York, to establish areas of deficiency and arrive at a new more realistic cut-over date. It was determined that there was a requirement for additional modification kits. Headquarters USAF agreed to expedite processing of additional requirements and allocation of necessary funds. Since the time required to accomplish the new procurement involved could not be accurately estimated the determination of a new cut-over date for the complete system was deferred

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until manufacturers delivery schedule was available. (UNCLASSIFIED)

Graphics Communications System. Proposed system to transmit "exact duplicate of messages or intelligence material as prepared by the originator." Completed system was to be capable of handling pictorial intelligence with a definition sufficient to permit actual resolution of 250 lines per inch and 15 gray shade levels. It was proposed that an interim system of 70 lines per inch for wire circuits and 105 lines per inch on radio would be acceptable. Air Research and Development Center, Baltimore, Maryland, was requested to make a feasibility study and this study was initiated in August 1954. A meeting was held in December where Strategic Air Command representatives pointed out that an urgent need for the system existed. The recommendation was made that the Rand Corporation be given the job of evaluating the conversion of teletype systems to graphic systems. Airways and Air Communications Service (AACS) was requested to submit a quantitative operational requirement. (UNCLASSIFIED)

Globecom. Land acquisition and site survey: ^① The requirement for 829.82 acres of land at Puerto Rico has been approved by the Senate Armed Forces Committee and the Corps of Engineers has been requested to acquire the land. ^② The use of Wheeler Air Force Base and Bellows Air Force Base as the receiver and transmitter sites has been approved by the Air Staff and the Commander, Far East Air Forces. Base installation records have been changed to reflect

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these areas as communication sites. ⑤ The stations at Madrid, Spain, and Adana, Turkey, have been resurveyed to consider the vulnerability aspects of communications. The Madrid survey was approved and United States Air Forces in Europe was requested to acquire the necessary land. ⑥ Headquarters AACS reviewed their requirements for additional off-base land at Kindley Air Force Base and it was determined that the Globecom program could be realized with the existing sites we now have at Kindley Air Force Base. (CONFIDENTIAL)

Construction: Construction has started at the following stations:

Loring Air Force Base, Maine
(Transmitter and receiver sites)

Dhahran Air Force Base, Saudi Arabia
(Relay Center and receiver sites)

Construction has been completed at Sidi Slimane, French Morocco, Ladd-Eielson, Alaska, and Goose Bay, Labrador. Construction is now in progress at ten of the Globecom stations. Construction is required at 14 additional stations in the Globecom program. (UNCLASSIFIED)

Installation: Installation has begun on the Relay Center and inside plant at the transmitter at BW-1 (Narsarsauk, Greenland) and Goose Bay. Installation is now in progress at 10 of the Globecom stations. (UNCLASSIFIED)

Funds: An increase of \$426,500 at BW-8 (Sondrestroafjord, Greenland) was reprogrammed to cover additional construction. Most of this was for the Forward Scatter installation. An increase of \$262,400 was reprogrammed for BW-1. This increase was for power lines, roads, and increased cost of the building. \$454,000 was reprogrammed for the microwave facility and 31 miles of highway improvement

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and maintenance. \$230,000 was reprogrammed at Keflavik, Iceland, to cover security lighting and the construction of a microwave relay building at the transmitter site. (UNCLASSIFIED)

Iceland Tropospheric Scatter. In July 1954 it was decided that Tropospheric Scatter would be used as the primary means of communications for AC&W in Iceland. This system would replace the VHF/FM system originally programmed. The VHF/FM system consisted of four terminals and twenty-one relays and would cost approximately \$5,800,000 for construction alone. The Tropospheric Scatter will result in a savings of approximately \$5,500,000 plus the continual logistical support of the Radio Relay System. In addition a savings of approximately 168 personnel spaces would be realized. Air Research and Development Center (ARDC) was requested to determine the type of equipment considered adequate for the system. In addition it was recommended that the Tropospheric Scatter System be engineered and installed by contract with technical supervision and assistance provided by ARDC. (CONFIDENTIAL)

On 3 November 1954 a meeting to discuss Tropospheric Scatter for AC&W in Iceland was held at Headquarters USAF. Representatives from Headquarters Military Air Transport Service, ARDC, Headquarters Middletown Air Materiel Area, and Headquarters USAF were present. The over-all Tropospheric Scatter System was discussed, and it was decided that various types of action were necessary by all concerned in order to install this system as soon as possible. (UNCLASSIFIED)

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Northeast Air Command Cable. On 16 July 1954 a meeting was held at this headquarters between representatives of the Canadian National Telegraph Company (CNT) and representatives from the Directorate of Communications, The Directorate of Maintenance Engineering, and AMC. The purpose of this meeting was to enter into exploratory discussions regarding the cost of contracting for the operation and maintenance of the Newfoundland Long Lines Cable, to develop the cost figure or recurring charges for leasing circuits from CNT in the event the Air Force decided to sell, and to develop a method of determining the sale value. (UNCLASSIFIED)

It was agreed that a joint survey of the cable plant would be conducted by engineers of AMC and CNT. The purpose of this survey was to develop jointly the cost figures for operation and maintenance, and to conduct an inventory of the cable plant in order to assess the value of the cable system in the event the Air Force decided to sell. It was pointed out that this survey was to be conducted as soon as possible to provide the Air Force with the information on which to base the decision on whether to sell the cable and lease the required circuits, or to contract for the operation and maintenance. (UNCLASSIFIED)

On 28 July 1954, the joint survey team consisting of engineers from AMC and CNT assembled at Headquarters Northeast Air Command (NEAC) Pepperrell Air Force Base, Newfoundland. After a brief meeting with representatives from NEAC the joint team began to conduct the survey of the cable. This survey was completed on 3 August 1954. (UNCLASSIFIED)

The final report made by the joint survey team was received by the Directorate of Communications on 14 September 1954. This report contained the information required to base a decision on the disposition

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of the cable. The survey team determined that the value of the cable to include the "ON" carrier was \$5,847,662. CNT offered \$1,666,388 as purchase price of the cable. The cost of leasing present circuit requirements would be \$881,660 annually, with a termination charge of \$1,666,388 assessed. This termination charge would be reducible by 1/120 for each month of service. The cost of contracting for the operation and maintenance would be \$604,686 a year. (UNCLASSIFIED)

Based on the information contained in the report by the joint survey team, it was decided that the Air Force should retain ownership of the Newfoundland Long Lines Cable and contract for the operation and maintenance. AMC was directed to begin negotiations with the proper Canadian authorities for contract operation and maintenance of the cable. An existing contract with the Canadian Commercial Corporation was modified to include provisions for the contract operation and maintenance. (UNCLASSIFIED)

Point to Point Communications for Texas Towers. In October 1954 it was decided that submarine cable would be used as the primary means of communications for the Texas towers, and that tropospheric scatter would be used as backup. The channel requirements for each would be 48 voice quality channels initially capable of expanding to 60 channels after 1960. AMC was directed to undertake the engineering installation of these facilities. (CONFIDENTIAL)

In November 1954 Rome Air Force Depot (RAFD) advised this headquarters that no Air Force agency was qualified to survey,

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engineer, and install a tower to shore communications system. They recommended that the requirement be met by having one qualified agency engineer, furnish, and install the communications system. They further recommended that a meeting be held at this headquarters to resolve some of the problems relating to providing the communications systems. (CONFIDENTIAL)

On 14 December 1954 a meeting was held at this headquarters to discuss the communications facilities and the engineering installation problems associated with providing these facilities. Representatives from Air Defense Command (ADC), AMG, RAFD, MAAMA, and this headquarters were present. The mutual interference problem and the problems of submarine cable and Tropospheric Scatter were discussed and pointed out as not being solved. The representatives of RAFD stated that no agency in the Air Force was qualified to engineer and install these facilities. They further stated that ARDC would have to prepare specifications for both the cable and the tropospheric scatter. (UNCLASSIFIED)

On 22 December 1954 this directorate sent a memorandum to the Director of Research and Development through the Director of Requirements. This memorandum emphasized the problems of providing point-to-point communications for the Texas towers and requested that ARDC be advised of these problems and the action required by them, such as preparing specifications for the cable and tropospheric scatter, and solving the mutual interference problem. (CONFIDENTIAL)

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Project Pole Vault: This project was initiated in December 1953 to provide communications for the Labrador-Newfoundland radar chain by means of tropospheric scatter radio (FPTS). Work on this project progressed very satisfactorily throughout the summer of 1954. Although numerous shipping, manufacturing and construction problems arose, these were expeditiously resolved because of the intense interest of all agencies concerned. The optimistic construction and installation schedules earlier established were approximately 90% accomplished. Transit damage, shipping loss and construction delays at some of the more isolated locations precluded line-up and test of the whole system by end December 1954 as forecast at the start of the project. It now appears likely that this can be accomplished by end February 1955. (UNCLASSIFIED)

Favorable tropospheric scatter propagation tests through June of 1953 indicated that the circuits to be provided under Project Pole Vault would be operationally acceptable. Consequently, action was taken in early July 1954 to stop further production procurement of the microwave system originally projected to meet the Labrador-Newfoundland radar communications requirement. (UNCLASSIFIED)

Project Two Wheels. The first prototype model was the UHF/DF (AN/MRD-12). The unit was tested at Aberdeen Proving Grounds for road characteristics, stability, and ruggedness. After having passed the Aberdeen tests the unit was given the environmental test at Rome Air Development Center (RADC) with satisfactory results. Fabrication

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of the remaining prototypes had not begun due to the necessity of road and environmental testing of one typical trailer-shelter for satisfactory results. The Government Furnished Equipment (GFE) for production models was delivered to the contractor with the exception of fifteen lesser items. The unit was given an operational shakedown by the manufacturers and performed satisfactorily. (UNCLASSIFIED)

Project Fat Girl. This project was a transatlantic radio teletype circuit using the technique of frequency propagation by ionospheric scatter (FPIS). The project was described earlier. Progress has slipped primarily because of land acquisition difficulties at the United Kingdom terminal. The site selected was in the Kingston Wood area near Oxford. Local opposition was based on deformation of the countryside. At the close of this period the site had still not been obtained though we were much closer to settlement. Progress at the Iceland end of the Iceland - United Kingdom circuit has been given lesser priority, for lack of a matching terminal. Completion of the BW-8 to Iceland circuit was delayed by building construction and primary power distribution panels. An error in shipping building materials resulted in room partitions, windows, and doors being left in the ZI. The BW-1 to Goose Bay circuit was just made operational for initial adjustments and propagation tests by 31 December 1954. (CONFIDENTIAL)

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Project Stretch. This forward scatter test circuit became operational early in October 1954. The purpose of the test is to determine the probable success of a full scale operational circuit between Newfoundland and the Azores, a distance of 1414 miles. Preliminary results indicate that with exceptionally favorable sites at each terminal, it would be possible to operate such a circuit. (CONFIDENTIAL)

Project Four Wheels. With the exception of three major components and six minor components, all the necessary GFE was in the hands of the contractor so as to permit prototype construction. Of 180 major items of GFE, over 100 were in RAFD warehouses in production quantities and were processed for reshipment to the contractor. The mobile air route traffic control center was authorized for the 1st, 2nd, and 3rd Mobile Communications Squadrons. Based on a no-delay delivery, approval was granted in the design of the control tower AN/MRN-12 to provide a communications termination for a remote control position Ground Control Approach. A contract was awarded for the 10 KW diesel power unit. Initial delivery of the production model will be second quarter FY 56. Due to slippage in production of the facilities, the time table is forecasted to be:

July 1955 - 1st prototype

January 1956 - Last prototype

April 1956 - Completed testing

June 1956 - Delivery of production items (UNCLASSIFIED)

CONFIDENTIAL

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Project Wagon Wheels. This project required one each AN/MSC-4 (22 vans) and three each AN/MSC-7 (4 vans each) mobile communication units to be fabricated by Tactical Air Command. Pending receipt of the last few items, the project is scheduled for completion by 1 March 1955. Upon completion TAC plans to assign these units to 9th Air Force. (UNCLASSIFIED)

USAF Communications-Electronics Program (PC). The volume of revisions to the point-to-point and HF ground/air portion of the PC had a noticeable reduction. The majority of changes were administrative in nature. New requirements were mostly for support of units to be activated or deployment of current organizations. Department of Defense directive 4630.1 dated 29 October 1954, which required Office of the Secretary of Defense (Supply and Logistics) review of certain requirements was beginning to have its effect with the major commands submitting individual facility requests on the new Air Force Form 1295. Only a handful of Air Force Forms 1295 had been received. Most of the commands had limited their PC revisions to that of administrative nature, however, a few commands continued to include new requirements and requested a thirty day waiver of the use of Air Force Form 1295. (UNCLASSIFIED)

CONFIDENTIAL

APPENDIX IFUNCTIONS
SYSTEMS ENGINEERING BRANCH

(1 December 1954 to 1 January 1955)

The functions of the Systems Engineering Branch are:

- a. Program for budgetary action and assist in defense of all equipment required for long lines, base and the ground portion of ground to air HF facilities and systems.
- b. Assist in budgeting for, and defense of, construction and installation in support of these facilities and systems.
- c. Monitor all staff and command actions outside the Branch which may affect equipping, construction, or installation of these facilities and systems, and recommend appropriate action when necessary.
- d. Represent the Directorate of Communications (or Headquarters USAF) on all matters pertaining to the development and engineering of new techniques and to changes in design of existing equipment related to these facilities and systems.
- e. Provide Joint Communications-Electronics Committee (JCEC) representation on equipment working groups and panels as required. (UNCLASSIFIED)

The functions of the Long Lines Section are:

- a. Programming for budgetary action and assisting in the defense of all equipment in the Long Lines category required for these facilities and systems. (The Long Lines category includes all terminal and relay point to point communications equipment which furnishes connecting links between Air Force installations, and

between these installations and others outside the Air Force if furnished by the Air Force; and ground components of HF ground to air systems).

b. Review requirements and plans for new long lines category communications systems relative to realism of programmed operating dates, and to assure incorporation of latest state of the art engineering and equipment.

c. Keep abreast of the state of the art in Long Lines category communications.

d. Provide guidance as to type and composition of standard Communications-Electronics packages.

e. Monitor certain high priority communications projects to insure all elements are coordinated and accomplished on a timely basis.

f. Represent the Communications Systems Division on technical matters pertaining to development, design criteria for communications-electronics structures, land acquisition, standby and backup criteria and other subjects related to long lines category systems.

g. Represent the communications Systems Division on equipment programming and budgetary matters dealing with long lines systems.

h. Translate approved requirements into USAF C-E communications program.

i. Provide allocation guidance to Directorate of Supply and Services on critically short C-E equipment.

The functions of the Base Systems Section are:

- a. Programming for budgetary action and assisting in the defense of all equipment in the Base Systems category. (The Base systems category includes all on base systems used for security, maintenance, fire and crash, intercomm, telephone and terminal operating equipment).
- b. Review requirements and plans for new base systems relative to realism of programmed operating dates and to assure incorporation of latest state of the art engineering and equipment.
- c. Keep abreast of the state of the art in base systems communications.
- d. Provide guidance as to type and composition of standard C-E packages.
- e. Monitor certain high priority communications projects to insure all elements are coordinated and accomplished on a timely basis.
- f. Represent the Communications Systems Division on equipment programming and budgetary matters dealing with base systems.
- g. Represent the Communications Systems Division on technical matters pertaining to development, design criteria for C-E structures and other subjects related to base systems.
- h. Translate approved requirements into USAF C-E communications program.
- i. Provide allocation guidance to Directorate of Supply and Services on critically short C-Eth equipment.

j. Deal with matters pertaining to Government versus commercial ownership of base telephone and intercomm plants.

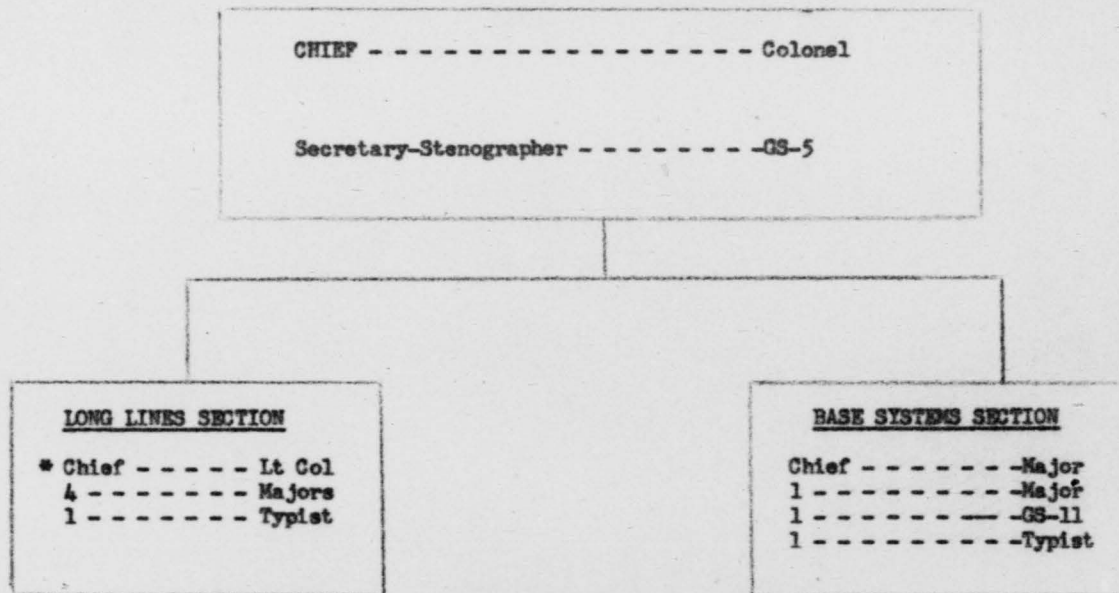
Functions of the Assistant for Programming:

a. This is an additional duty for the Chief of the Long Lines Section. He coordinates programming actions of the Long Lines and Base Systems Sections and represents the Branch on programming policies, program, budget and buying program support.

(UNCLASSIFIED)

ORGANIZATIONAL AND PERSONNEL CHART

(1 December 1954 through 1 January 1955)

PERSONNEL ASSIGNED BRANCH

Colonel James R. McNitt
 Lt Colonel Albert A. Kurz
 Major Donald J. Lake
 Major Conrad J. Welti
 Major Frank L. Perra
 Mrs. Mabel H. Fisher

Mrs. Mary K. Cutright
 Mr. Max A. Lofton
 Major Wallace J. Fry
 Major David H. Blakley
 Major George E. Townsend
 Mrs. Rosetta Valentine

* Additional duty - Assistant for Programming

(UNCLASSIFIED)

APPENDIX IIFUNCTIONS
SYSTEMS ENGINEERING BRANCH

(30 June 1954 through 30 November 1954)

The functions of the Systems Engineering Branch prior to reorganization were:

a. Programming for budgetary action and assisting in defense of all equipment required for these facilities and systems.

b. Assisting in budgeting for, and defense of, construction and installation in support of these facilities and systems.

c. Monitoring all staff and command actions outside the Branch which may affect equipping, construction, or installation of these facilities and systems, and recommending appropriate action when necessary.

d. Representing the Directorate of Communications (or Headquarters USAF) on all matters pertaining to the development and engineering of new equipments and techniques and to changes in design of existing equipment related to these facilities and systems.

(UNCLASSIFIED)

Engineering Section functions were:

a. Provide Joint Communications-Electronics Committee (JCEC) representation on equipment working groups and panels. Keep informed of latest communications developments and reflect this knowledge in the Communications-Electronics Programs by:

(1) Technical guidance to the programming section as to the type and composition of standard C-E packages.

(2) Selection of major items of equipment to be included in the various Standard Facility Equipment Lists (SFEL) associated with the Communications Systems Division portion of the program.

(3) Assisting other staff agencies in application of new techniques to USAF communications equipment and systems.

b. Represent Communications Systems Division on matters relating to SFEL. Review SFEL associated with packages programmed to insure major items selected will adequately meet Air Force communications requirements.

c. Monitor certain high priority communications projects to insure that all elements are coordinated and accomplished on a timely basis.

d. Represent the Communications Systems Division on technical matters pertinent to design of C-E structures, land acquisition, backup and standby criteria, and other subjects related to fixed communications facilities and systems.

e. Review engineering policies, practices, and standards to insure that these are consistent with Air Force operational requirements.
(UNCLASSIFIED)

Programming Section functions were to:

a. Represent the Communications Systems Division on equipment programming and budgeting matters.

b. Translate approved requirements into the USAF C-E Program.

c. Insure that C-E programs conform to Air Force Programming Guidance (PG), Base Utilization (PD), special instructions, etc.

d. Adjust or rephase the Division portion of the PC in accordance with funding capability.

e. Provide guidance to insure that approved plans and requirements are consistent with funding and technical capability.

f. Provide budgeting and procurement computation guidance and assistance to Deputy Chief of Staff, Material, and AMC. This will include budgeting and procurement information on items not included in the PC such as fabrication of special mobile C-E equipments, last minute program changes, etc.

g. Review budget and procurement computations made by AMC to insure proper support for the C-E program.

h. Assist in budget and procurement defense of those requirements generated by the Division portion of the C-E program.

i. Review SFEL to insure quantities of major items are consistent with programmed requirements.

j. Monitor new construction programming on major C-E projects such as Globecom, Alaskan AC&W Communications, etc., to insure that equipment and construction are in phase.

k. Assist Assistant Chief of Staff, Installations with C-E construction programming and provide budget defense as may be required to support the new construction program.

ORGANIZATIONAL AND PERSONNEL CHART

30 June 1954 through 1 December 1954

CHIEF - - - - - Col

Branch Secretary - - - - - GS-5

PROGRAMMING SECTION

Chief - - - - -	Lt Col
3 - - - - -	Majors
1 - - - - -	GS-11
1 - - - - -	Typist

ENGINEERING SECTION

Chief - - - - -	Lt Col
2 - - - - -	Majors
1 - - - - -	Typist

PERSONNEL ASSIGNED BRANCH

Col D. S. Woods
 Lt Col A. A. Kurz
 Maj G. E. Townsend
 Maj D. H. Blakley
 Maj C. J. Welti
 Maj F. L. Perra

Mrs. M. Gutright
 Mrs. M. Fisher
 Lt Col K. H. Smith
 Maj W. J. Fry
 Mr. N. A. Lofton
 Mrs. I. Bilby

(UNCLASSIFIED)

UNCLASSIFIED

HISTORICAL REPORT

1 July - 31 December 1954

OPERATIONS BRANCH

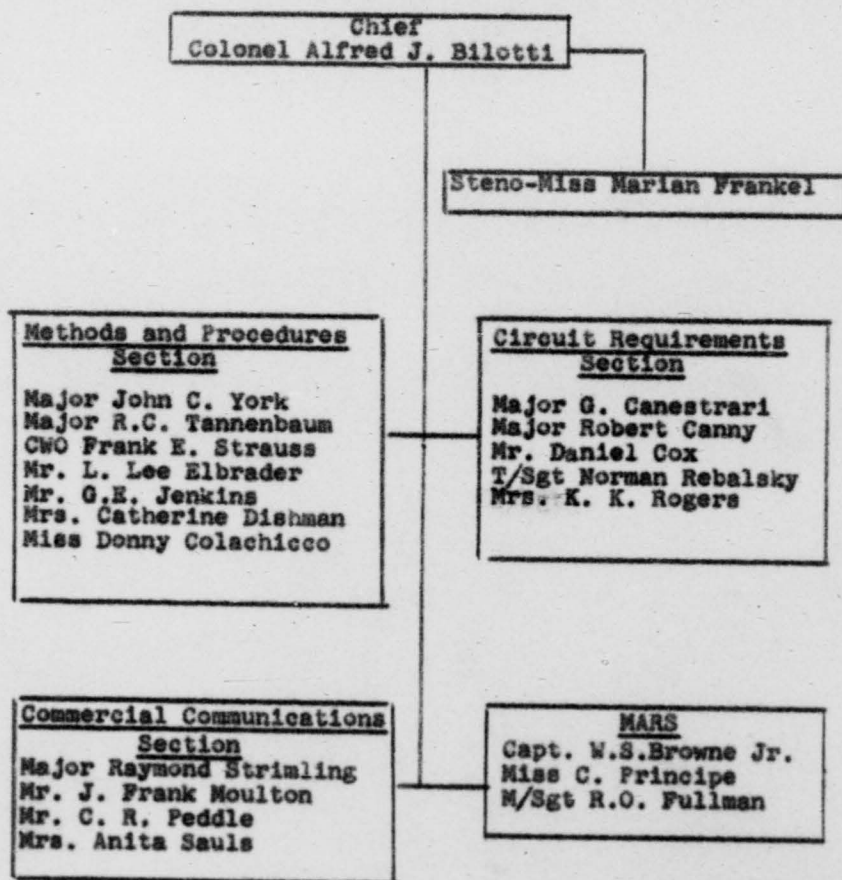
COMMUNICATIONS SYSTEMS DIVISION
DIRECTOR OF COMMUNICATIONS

OPERATIONS BRANCH
COMMUNICATIONS SYSTEMS DIVISION
DIRECTOR OF COMMUNICATIONS

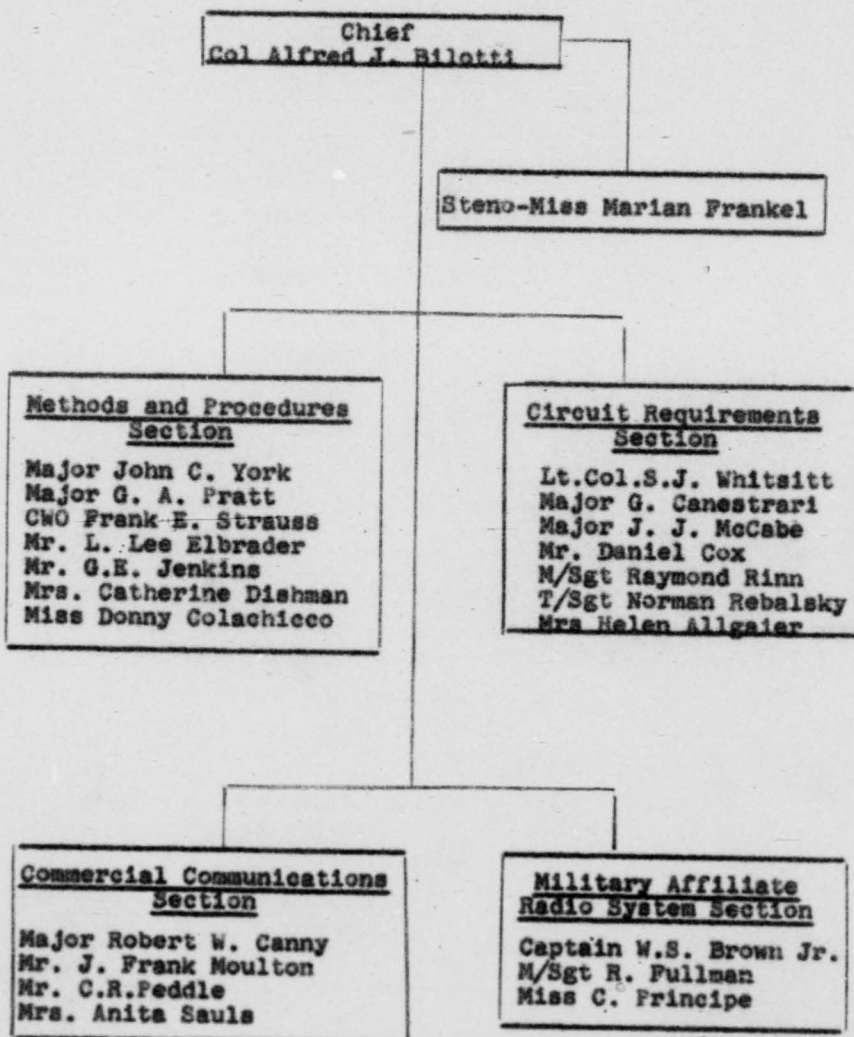
SECTION I - ORGANIZATION AND FUNCTIONS

At the beginning of the period, 1 July - 31 December 1954, the Operations Branch was organized as indicated in the chart below:

OPERATIONS BRANCH



At the end of the period, the Operations Branch was as indicated below:



Lt Col. S. J. Whitsitt - Transferred 1 August 1954 from Office of Communications Systems Division, to Chief, Circuit Requirements Section.

Major Raymond Strimling - Chief, Commercial Communications Section, reassigned on PCS to Alaskan Air Command on 30 July 1954.

Major Robert W. Canny - Was transferred from Circuit Requirements Section to Chief, Commercial Communications Section on July 1954.

Major Robert C. Tannebaum - Methods and Procedures Section, was reassigned PCS to the Air Command and Staff School, July 1954.

Major Gordon H. Pratt - Assigned 1 October 1954 from Hq. USAFE to duty in the Methods and Procedure Section.

M/Sgt William Eliason - Assigned 10 August 1954 from 2044th AACS Sq. to duty in the Methods and Procedure Section.

M/Sgt Raymond Rinn - Assigned 1 September 1954 from Korea to duty in Circuit Requirements Section.

OPERATIONS BRANCH

SCOPE - Methods, procedures and circuit requirements for USAP Strategic Communications and Related Systems (CEI Chapter 31).

FUNCTIONS - Reviews, evaluates and approves communications requirements to support Air Force activities and joint projects; programs, budgets and obtains leased communications services; allocates circuits for designated use from resources of Air Force, Army or Navy; negotiates for commercial leases; initiates action for effecting the programming and provision of required government-owned fixed station point-to-point and air/ground communications. Formulates, evaluates and prescribes communications doctrine, methods, and operating procedures for Air Force communications and for Air Force participation in joint panels; exercises supervision of Air Force MARS activities.

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SECTION II - ACTIVITIES

Use of Allocated Channels - During the reporting period action was initiated in conjunction with the Depts of the Army and the Navy to arrive at an understanding with regard to the communications channels which these two services are presently allocating to the Air Force. The specific points of understanding involve:

- a. The status of current allocations in the event of hostilities.
- b. The degree of support which can be expected in the event allocations are affected by outages during an emergency.
- c. The conditions wherein an allocated channel would be recalled from the allocatee.

Both the Army and the Navy stated that the current allocation of channels will remain effective in the event of hostilities, that maximum support possible in the form of common-user service of reallocations would be made in the event of outages and that current channel allocations would not be cancelled without the mutual consent of the two services involved. (UNCLASSIFIED)

New AIRCOMNET Buildings - During this period OSD withheld the release of funds for the three planned buildings at Carswell, Wright-Patterson and Robbins and requested that

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a complete review of the space requirement be conducted with a view towards reducing the size and the cost of the buildings. This was accomplished and by redesign and floor layout the over-all square footage was reduced to the satisfaction of the Air Force as well as OSD wherein funds for these buildings were released. The tentative target date for the completion of the three buildings is the third quarters of FY 1956. (UNCLASSIFIED)

Zone of Interior Air Operational Network (AIROPNET) - In view of the deficiencies with regard to passing aircraft movement type traffic between the Zone of Interior and the NEAC area, action was taken to extend this network to include both Goose and Harmon. This particular action does not alter the ground air traffic control procedures but provides an expeditious means of passing USAF aircraft movement data to agencies requiring such information at flight destinations. (CONFIDENTIAL)

New Strategic Air Command Communication Channel Requirements - As a result of the deployment of the 3d Air Division to Guam, a realignment of communications channels in support of the SAC emergency war plan was necessary. This was accomplished by ear marking certain channels in the USAF communications network for the specific use of SAC. In addition, additional channels were obtained from the Dept of the Navy and the Army on an allocated basis. The 3d Air

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Division requirements generated the need for the establishment of a single side-band circuit between Guam and Japan which has been included in the USAF Program. A requirement for a Guam ZI SSB also in primary support of the Strategic Air Command is currently being processed to be made part of the over-all program. (SECRET)

JCS Policy on the Use of On-Line Communications Channels -

During this reporting period the JCS established a policy wherein channels which are allocated to JCS activities will not be removed or shared unless to the satisfaction of the original allocatee. This policy resulted from a particular situation in the Far East where three JCS activities are involved. These activities are the Field Representative Far East, the Unified Command, CINCPAC and the SAC units. (SECRET)

Polyplex Operation - Mutual agreement between the Commonwealth of Australia and the Dept of Air Force has been reached concerning the conversion of the Okinawa - Melbourne circuit to polyplex operation. This operation will provide four channels of teletype communications with capability of on-line synchronous operation. The terminal equipment required by the Australians has been purchased and will be forwarded to the Australians. The Air Force has taken action to process orders for terminal equipment for installation at Okinawa. Initially, it is planned

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to operate this circuit on a twinplex or 2 channel basis.

(CONFIDENTIAL)

Interim Outline Plan for Handling NSA and Individual Security Service Traffic. - During this reporting period the subject plan was disseminated to all USAF major commands concerned. This plan resulted from a joint effort on the part of the three military services and the National Security Agency. The plan sets forth specific requirements or responsibilities on a world-wide basis. CINCAL has objected to the portion of the plan which involves his area. The differences set forth by CINCAL have been submitted to the JCEC for resolution. (SECRET)

Decision by the General Council - The Strategic Air Command presented a request to this headquarters in regard to the payment of telephones located in residences of key personnel in the United Kingdom. The General Counsel in conjunction with the General Accounting Office returned a favorable ruling in that the use of Government funds would be applicable in this for the payment of telephones in this particular category under the conditions existing in the UK. (CONFIDENTIAL)

Reengineering of the Strategic Operational Control System ZI. During this reporting period the reengineering of this system was approved to provide a capability of instantaneous alerting of all bases connected to this system. In addition,

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the reengineering encompasses the improvement of the transmission quality between any two installations in the system. The instantaneous alert feature provides maximum advantage gained from early warning of any potential enemy aircraft. (UNCLASSIFIED)

CAA Emergency Communications - During this period it was determined that the CAA and the ADC should formulate an over-all emergency communications plan for those communications facilities which directly affect the ADC with regard to positive identification of aircraft. CAA has been requested to make budgetary provisions for whatever plan is finally approved. In this respect, the CAA had previously requested budgetary assistance from the Dept of the Air Force. Although the Air Force may assist the CAA in the initial implementation of the emergency plan, the actual responsibility for funding rests with CAA. (CONFIDENTIAL)

Decision to Lease Communications for the ADC - It was decided to lease the internal communications required for the semi-automatic ground environment system (SAGE) in order to overcome the inherent logistic support problems associated with government owned system. Since this system will be restricted to the ZI there are no apparent advantages in purchasing the equipment. (UNCLASSIFIED)

Proposed DOD Instruction on Inventory of Point-to-Point Communications. - The Office of the Secretary of Defense is

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contemplating issuing a directive which would require the three services to report a sizable amount of communications data which would include numbers of channels, number of stations, personnel, personnel salaries, costs of leased equipment and circuits, total systems capacity and current load percentages on existing circuits. The Dept of the Air Force has taken a position that the information covered in the proposed directive would not fit the purposes stated by OSD and further, has recommended that any information to be obtained from the services should be gathered to assist management tools thereby precluding the necessity of establishing any records and new reporting system. At the present time, this matter has not been resolved but will be the subject of further discussions between OSD and the three military services. (UNCLASSIFIED)

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Interim Method of Operation for NSA between Japan and Melbourne, Australia. - NSA in a letter serial 00808, 21 Dec requested the Army and USAF to provide a patched through channel from Army Security Agency Far East (ASAFE) to Defense Signals Branch, (DSB) Melbourne, Australia, by 9 January 55 using 5 UCO. Arrangements were completed with the Army providing a radioteletype channel ASAFE to Okinawa and landline on Okinawa between the Army and USAF Primary Communications Relay Stations. The USAF continues to provide the radioteletype circuit over the remainder of the path, Okinawa to Australia. The requirement for hours of operations was 2300-1100 ZULU each day. This arrangement was to continue until additional channel capacity is provided between Okinawa and Australia, by going to a polyplex type circuit. (SECRET)

Survey Inspection of AACS Activities. - During the 2nd half of FY 1955 the Office of Inspection Services Hq, USAF were requested to survey AACS Activities for the following:

- a. Review all world-wide point-to-point and HF air/ground facilities approved by Hq, USAF for the following:
 - (1) Operational completion date.
 - (2) Reasons for delay of previously established operational date.
 - (3) Recommended actions for speeding up the availability of these facilities for operational use.
- b. Review all world-wide point-to-point and HF air/ground

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facilities from the standpoint of vulnerability to sabotage and modern weapons of war. (UNCLASSIFIED)

AMC LOGAIR Communications Support. - The AMC forwarded a letter dated 12 October 54 stating their requirements for a ZI private line teletype system linking 15 AMC locations in support of the logistics airlift requirement. A recommendation was furnished AMC on 22 November 54 stating that this requirement should be met by TWX facilities as an interim action in view of a pending study by AACS. The AACS study is being conducted to determine how to satisfy the AMC LOGAIR requirement as well as a MATS and Flight Service requirement. (UNCLASSIFIED)

Establishment of a Collection Center in the UK in support of NSA. - Letters were dispatched to AACS, USAFSS and NSA on 3 December 54, relating to actions in support of the establishment of a collection center in the UK in support of the NSA. USAFSS were designated as responsible for operation and maintenance of the proposed center and AACS were to be responsible for engineering and installation of the facility. The location of the facility was confirmed also. Planning actions were proposed to NSA for future action in this subject which involved NSA, Army and Navy as well as USAF participation. Hq, USAFSS were instructed to initiate actions relative to construction and building space requirements.

(SECRET)

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Full Period Landline Voice Circuit NEAC COC to Hq, USAF
Command Post. - NEAC requested a landline voice circuit
for use between their COC and the Hq, USAF Command Post (CP).
NEAC was told that this Headquarters could not support
this requirement since the primary operational requirement
for this type communication was between NEAC and ADC and SAC,
for which voice channels were already in being. The single
sideband voice channel Andrews (AACS) to Pepperrell AFB was
considered adequate for voice communications between Hq,
USAF and Hq, NEAC. Alternate routing by patching through
SAC or ADC to the Hq, USAF CP is available. (CONFIDENTIAL)

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Ground Air Communications for Secretary of State.- During August correspondence was received from the Dept of State requesting that the Air Force make necessary arrangements to insure the provision of rapid communications for the delivery of messages to and from the Secretary while in flight. This matter was discussed with representatives from AACS and the State Department was advised that the following could be implemented to provide the required service:

a. Prior to departure of the Secretary or Under Secretary of State, the proposed itinerary would be furnished Hq AACS as far in advance as possible. This would facilitate alerting ground-air stations along the proposed route of flight.

b. The MATS transport control center at Andrews would maintain the latest information report received from the aircraft.

c. By coordination with MATS TCC messages would be routed to the Air Ground station having the last contact with the aircraft with appropriate instructions to relay the information as expeditiously as possible.

d. The AACS Ground Air Station would employ either CW or voice for delivery of the message to the aircraft. The CW frequencies would be those now employed on the CW circuits connecting each ground-air station.

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Subsequent to the initiation of this procedure, Secretary Dulles made several trips and the test messages transmitted were delivered in a satisfactory manner. (UNCLASSIFIED)

Canada-U.S. Circuits for Operational Messages - As a result of operation Full House in the NEAC area during the summer of 54 it became apparent that there was a lack of strategic operational communications between the US, Canada, and NEAC. In an effort to provide a rapid and reliable means for the exchange of in-flight information a meeting was held on 26 August in Ottawa, Canada with representatives from both the RCAF and DOT. It was agreed that interphone circuits would be established between Olmsted, Montreal and Moncton for the automatic distribution of in-flight position reports etc. Subsequent exchange of correspondence between the Air Attache in Canada and this Headquarters confirmed the need for these circuits and stated that the USAF would bear the full cost of the leased lines since it was considered to be primarily a US requirement. A further exchange of correspondence revealed that the DOT desired that they order and control the Canadian portion of the circuit up to the US border and that the US effect the necessary transfer of funds to the DOT for the payment of bills. Since there is not a present US-Canada agreement covering services of this nature, it has not been possible to effect the installation of the required circuits. At the

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present time discussions are underway between the American Telephone and Telegraph Company and the Canadian Bell of Canada for a possible working arrangement wherein the DOT would order and control the circuit, however, the US would pay the complete length with a transfer of funds accomplished thru inter-company agreements. (UNCLASSIFIED)

Budgetary Data - The Fiscal Year 1956 Budget Estimate in the amount of \$45,827,000 was presented to the Budget Advisory Committee on 23 September. Action by that Committee included approval of two new program elements and a reduction of \$2,218,000 to be applied to program slippage. Military communications requirements in Spain at an estimated cost of \$7,398,000 and a new GOC program objective of 73 filter centers and 24,000 posts made up the new elements which were approved during the BAC Hearings. Our estimate as presented for the combined Office of the Secretary of Defense and the Bureau of the Budget review was \$51,827,000. This review, held during October 1954, resulted in an initial mark-up recommending a reduction of \$16,727,000. The Air Force presented additional justification and requested full restoration. Final OSD-BOB action restored all but \$3,335,000 of the recommended reduction. Preparation of the Fiscal Year 1956 Budget Estimate, Project 482 for presentation to Congress is now underway. (UNCLASSIFIED)

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Flight Service Communications Requirements. - During the reporting period several meetings were held in discussion of the modernization of the Flight Service Communications. The AT&T agreed to survey the Flight Service Communications with the following objectives:

- a. Immediate improvements in the existing system.
- b. An ultimate system capable of meeting future AF requirements. With respect to the immediate improvements, the AT&T corrected transmission difficulties due to weak reception, heavy noise and distortion of the Flight Service interphone circuits. Selective code signalling was installed at 6 ARTC Centers which enabled the Flight Service Centers to have a direct signalling capability into the ARTCC. Dial switching arrangements were converted to manual control. New 102A key box designation strips were installed at all the Flight Service Centers. New type telephone head sets were offered to each Flight Service Center as replacements for the existing head sets. Health pamphlets discussing the health aspects of the telephone head sets were furnished each Flight Service Center. AT&T undertook to make a comprehensive study of Flight Service message traffic during December 1954. AT&T anticipated that approximately three months would be required for study completion and subsequent to the completion final recommendations would be made. (UNCLASSIFIED)

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Telautograph Telescriber Service. - As a local aid in the expeditious dissemination of base weather data for the safe conduct of flying operations, the use of Telautograph Telescriber Service was found to be extremely useful. Telautograph Telescriber Service is an electrical apparatus which transmits hand written intelligence on an instantaneous transmission basis. AMC negotiated a contract for the leased use of this equipment on a world-wide basis. (UNCLASSIFIED)

Canadian Commercial Communications Contract. - The contract for landline communications services in support of Project "Pinetree" which is the establishment of an Air Defense Early Warning Network in the northern part of the North American continent was negotiated by AMC. (UNCLASSIFIED)

Automatic Teletype Switching Equipment. - During this reporting period Rome Air Force Depot was advised to begin negotiations with Western Union for a contract for leasing automatic teletype switching equipment. Rome Air Force Depot advised that they were conducting an exhaustive review of the Western Union proposed terms and conditions to establish which of these terms could legally, and in the light of good business judgement, be acceptable. Action was taken to conduct a thorough review of the automatic switching requirements. (UNCLASSIFIED)

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Long Range Proving Ground Submarine Cable. - The AT&T visited Patrick AFB, Florida during this reporting period to discuss provisions of landline extensions to ZI locations from the submarine cable. Manner of provision of this service was under consideration by AT&T. (UNCLASSIFIED)

Decentralization of Issuance of Communication Service Authorizations (CSA's). - By letter dated 15 Nov 1954, the ZI major commands were requested to comment on a proposed procedure which would decentralize to the major commands the responsibilities for issuing Communication Service Authorizations. Subsequent to receipt of the command comments, revision was to be made of the applicable AFR's and the procedures established at the earliest possible date. (UNCLASSIFIED)

Emergency Restoration of AF Leased Circuits within the ZI. - By letter dated 17 Aug 1954, the major ZI commands were advised that priorities for the restoration of AF leased circuits within the ZI had been established. Existing statutory restrictions do not permit the establishment of military facilities to satisfy all essential military point-to-point requirements in the U.S. Consequently, the military services are dependent in varying degrees on existing commercial facilities. It was anticipated that during a war emergency or domestic disturbances such as strikes, fires, floods, etc. that the commercial communications facilities would suffer temporary

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or permanent disruption. The AF had no specific arrangements with the commercial carriers, wherein AF circuits would be restored on a priority basis. The establishment of priorities within the AF was considered a necessary measure to insure that outages were not prolonged and that the most essential circuits were restored in their relative importance. The priorities established were: Priority I - Air Defense, Priority II - Retaliatory, Priority III - Logistics, Priority IV - Reconnaissance, Priority V - Command, Priority VI - Weather, Priority VII - Flight Service, Priority VIII - AIR-COMNET, and Priority IX - All other not covered above. Based on the foregoing, the commands were advised to submit a list of those circuits which required immediate restoration. Subsequent to receipt of this information, consolidation was to be made and the communications companies advised. (UNCLASSIFIED)

IBM Transceivers. - Meetings were held with Stat Control and AMC concerning AMC use of the IBM transceivers. It was developed that AMC would have first priority concerning the use of IBM transceivers. Based on estimated traffic loads supplied by AMC, figures were developed by the AT&T for the necessary circuits involved. AMC submitted a schedule for installation of the IBM transceivers. This schedule was furnished AT&T for advance planning purposes. (UNCLASSIFIED)

Command Post Switchboard. - Plans were developed with the telephone company for a new Command Post switchboard.

Orders were issued to the telephone company for this facility. It was anticipated that approximately 10 months would be required to complete this project. The new switchboard will be flexible and will meet anticipated Command Post requirements and provide many special features not available in the existing switchboard. (CONFIDENTIAL)

Project "DEEP FREEZE". - During this reporting period, negotiations and finalizing of a contract between the USAF and the Commercial Cable Company were completed. Contract with the Commercial Cable Company provides the AF with a choice of option for either 13 teletype channels for 6 years or 8 channels for 10 years. The total rental guarantee in either case would amount to \$16,000,000. The commercial cable will be laid between the U.S. and U.K. via Newfoundland, Greenland, Iceland and Scotland. (UNCLASSIFIED)

Guide to Base Communications Administration. - Chapter 12 of the USAF Communications-Electronics Instruction was distributed to the AF commands. This is the guide to Base Communications Administration that deals with the issuance of CSA's, personal commercial telephone or telegraph service, and other items necessary for the standardization of Base Telephone Systems. It also provided for new AF forms to be used in connection with the Base Telephone Systems. The commands were requested to forward any comments or suggestions for possible revision of Chapter 12. (UNCLASSIFIED)

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The Third North Atlantic Regional Air Navigation Meeting (III NAT RAN) at Montreal, Canada, in October 1954. - In general, the U.S. position was adequate and served to meet all points of the Agenda. However, on Agenda Item 5 of Sub-committee 1 (altimeter setting procedures) the U.S. position and arguments were not sufficiently convincing technically to overcome the arguments of the proponents of the standard pressure system, particularly since Iceland strongly supported standard pressure.

In addition, the U.S. position on "Regional Boundaries" was unrealistic and inadequate. It resulted in an initial denial of an opportunity for States (and IATA) holding certificates (or assurances) for the so-called "polar routes" to present their requirements for air navigation. This involved the projected SAS operations to Sondrestrom (BW-8) and Winnipeg; also from Norway to Alaska. Though never openly expressed, there was a strong undercurrent of feeling against Canada and the United States for their reluctance to discuss legitimate operational requirements which were so closely associated with the NAT Region in the general view that they should be considered.

It became entirely clear to the U.S. Delegation that in the future, the United States must display a more cooperative attitude toward the presentation through ICAO of the requirements of international operators in Continental U.S. and Canada. While the matter may now not be pressed for a considerable time, it seems only reasonable that eventually the U.S. and Canada must acquiesce in a broadening of the present boundaries of

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existing ICAO Regions, or the creation of a North American Region.

The success of the delegation was due in large measure to the unusual high degree of competence and application of the individual members. With the comparatively heavy civil and military interest of the U.S. in the NAT Region, it is significant to note that Canada was represented by 20 delegates, the U.K. by 15, France by 9, and the Scandinavian countries (Denmark, Norway and Sweden) by a total of 17.

(UNCLASSIFIED)

The Special European-Mediterranean (EUM) Communications (COM) Meeting, at Paris, France, November 1954. - The specific purpose for calling this special EUM COM Meeting resulted from notification by the ICAO that numerous United States Air Force aircraft were severely congesting the HF air/ground Family B channels in Europe, particularly with respect to disregard of communications discipline.

After considerable discussion, more significant facts were brought out which were indicative of contributing to this congestion:

- (1) Lack of responsibilities required at and by aeronautical stations within a radiotelephony network.
- (2) Failure of network stations and Air Traffic

Services to observe compliance with existing PANS and supplementary procedures for the EUM area to reduce unnecessary communications via the aeronautical mobile frequencies.

- (3) Extensive area of coverage of the Family B radiotelephony network (this area extends from Beirut on the East to Casablanca on the West and to Amsterdam on the North together with the use of these aeronautical network frequencies for both mobile and fixed services traffic.

- (4) Lack of a Regional Radiotelephone Manual.

The Meeting did accomplish its work with respect to paragraphs 2a(2) (Refer Recs. 25 and 26, Final Report) and 2a(3) (Refer Recs. 3 and 5, Final Report). As concerns paragraphs 2a(1) and 2a(4), the Meeting was of the opinion that an exhaustive study of the merits of these proposals had not been given by States. Therefore, the matter of acceptance was referred back to States with a request that a reply be made to the ICAC not later than 1 April 1955.

Considering that the U.S. Position was maintained throughout the Meeting, and although specific responsibilities for network stations were not established at the Meeting, it is considered from an Air Force point of view that much was gained by minimizing the "stigma" that Air Force aircraft

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was the major contributing factor in the congestion of the HF/RT networks in the EUM Region. (UNCLASSIFIED)

Change in Commercial Refile for Colorado. - Surveys conducted by the Air Defense Command indicate that the majority of message traffic received at Station JEDEN, Ent Air Force Base, Colorado for refile with a commercial carrier are destined for addressees located in the Denver area. Based on this fact, they proposed that Lowry Air Force Base, which is physically adjacent to Denver, be designated as refile point for the State of Colorado.

Considering the amount of traffic involved and the monetary savings that would be realized, this headquarters concurred in the change.

The proposal has been forwarded to the Air Training Command for review and installation of necessary teletypewriter equipment at the Lowry Air Force Base Communications Center. (UNCLASSIFIED)

Change in Routing Indicator Assignment Policy. - Heretofore, routing indicators have been assigned to Air Defense Command Squadrons not having direct AIRCOMNET outlets. Under this plan, Air Division Communications Centers having AIRCOMNET terminations were given a Minor Relay Station status and their subordinate units on the ADC Network were assigned corresponding tributary station routing indicators.

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Traffic studies indicated that the volume of traffic generated by these tributaries for introduction into the AIRCOMNET was extremely low and in some instances the overall tributary load was less than that of the parent Air Division Headquarters. On the other hand, the number of procedural errors and message mishandling incidents was comparatively higher. This stemmed from lack of traffic volume to permit handling familiarity and the requirement that the operators be proficient in two different procedures.

After coordination with ADC representatives, it was concluded that hereafter routing indicators would be assigned only to stations having AIRCOMNET drops. Under this plan, subordinate units of the Air Division will operate as off-net stations using the routing indicator of their respective Air Division communications center in accordance with Article 209h, Revised Provisional Tape Relay Procedure Manual. This will eliminate the conditions described in Paragraph 2, since it places the responsibility for insuring that traffic introduced into the AIRCOMNET is prepared correctly by the Air Division Communications Center. Also, it eliminates the false impression that the ADC Tactical Network is an integral part of the AIRCOMNET.

Changes concerning units of the Eastern Air Defense Force have been completed and those involving units of the Central and Western Air Defense Forces are being formulated and are expected in the near future. (UNCLASSIFIED)

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Call Signs for TV Stations. - The Air Force is now assigning call signs to TV stations located on Air Force installations. In identifying TV stations, the letters TV are added to the international fixed station call sign assigned to the base. A proposal has been entered into the Joint Call Signs Panel recommending that this assignment policy be adopted by the Joint Services. (UNCLASSIFIED)

SAC Use of JANAP 119 Call Words. - Strategic Air Command has been authorized to use JANAP 119 call words suffixed by two digits as the aircraft call sign on all tactical missions. One call word will be assigned to Group and the individual aircraft will be identified by the suffix. This call sign procedure being used by SAC represents a change in policy on security of aircraft in flight in that heretofore security was a primary consideration whereas this call sign plan offers a minimum of security. (CONFIDENTIAL)

"MATS" Prefix. - Since SAC considers that security is no longer a major factor when transmitting aircraft call signs, this headquarters approved a MATS request for reinstatement of the "MATS" prefix as part of the aircraft call sign on MATS scheduled flights. (CONFIDENTIAL)

Status of Aircraft Call Sign Encryption Plan. - The Aircraft Call Sign Encryption Plan which was designed to offer a maximum degree of security to aircraft in flight has been approved at the CAN-UK-US working group level. This plan has

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been forwarded to SAC and PFAF for comment prior to this office submitting call signs panel concurrence on the proposed encryption system. (CONFIDENTIAL)

Revision of USAF Section of ACP 113(F). - Since Technical Order No. 19-85-16 dated 29 September 1953 assigned new designators to most Air Force Marine Equipment, it has become necessary to completely revise the USAF Section of ACP 113(F). The new call sign assignments will be reflected in the forthcoming revision to ACP 113(F) (UNCLASSIFIED)

A Revision to Joint Directive, AFR 102-8, Flight Service Interphone Communications Procedures, Has Been Published. -

Major changes which were incorporated in this revision were the deletion of frequencies, pilot and instrument ratings, and highest rank below Colonel from the flight plans. Conversely, load data for transport flights has been added to the remarks section of the flight plan. (UNCLASSIFIED)

A Revision to the USAF Supplement to ACP 125(A) Has Been Published. - This revision further streamlines air/ground communications procedures and incorporates those changes which were approved by ICAO in a recent conference which took place in Montreal. This supplement has been offered to the U.S. services with a view towards adopting these procedures for joint use. Upon adoption of this supplement by the joint services, it will be introduced into the Combined Methods and Procedures Panel for consideration that it be adopted for combined use. (UNCLASSIFIED)

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Proposed Revision of JANAP 199(E).- All Commands, including ANG, were advised that this headquarters intends to revise Chapter 2, JANAP 199(E) to accomplish the deletion of activities below group (or equivalent) echelon from the programed distribution; to align eligible activities in numerical order within echelons; to reflect the current requirements of eligible activities; to list and provide for separate distribution of US and USAF Supplements to JANAPs/ACPs; and to indicate that JANAP 169 is assigned AF distribution "B" and should be requisitioned in accordance with Section 11, Volume 1, AFM 67-1. (UNCLASSIFIED)

New AN Nomenclature Chart. - AF holders of JANAP 196 were notified that the Summary of Joint Nomenclature System (AN System) for Communication-Electronic Equipment, dated 30 Jan 53, was approved by the US JCEC on 9 Jan 53 as a replacement for the JANAP 196 appendix, dated 30 Sep 49. (UNCLASSIFIED)

New ACP. - ACP 136 "Communications Instructions-Panel Signalling", an unclassified, nonregistered publication is currently being printed and is given the same distribution as ACP 129. (UNCLASSIFIED)

Use of Cardinal Numbers. - Chapter 13, AFM 10-1. - Responsibility for review and changes to procedures pertaining to message preparation has been delegated to the Directorate of

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Communications. These instructions have been revised and forwarded to the Air Adjutant General for inclusion in the revision of AFM 10-1. Emphasis has been placed on the use of book message in lieu of multiple address messages, greater utilization of mailing handling to "INPO" addressees, and the use of digits instead of words for numbers. Changes should tend to improve message preparation and decrease traffic volume. (UNCLASSIFIED)

MARS Operation in Greenland Defense Areas. - The Commander, Northeast Air Command, requested assistance in securing amateur operating privileges in the defense areas of Greenland. Preliminary discussions with the Danish authorities had revealed that they interposed no objection to American operation and licensing in the defense areas. The request for authorization to operate and the allocation of call signs to be utilized for the operation was forwarded from the Directorate of Communications to OSD (S&L) in order to allow proper coordination between the FCC, Department of State and Department of Defense.

The Assistant Secretary of Defense, Supply and Logistics, notified the Directorate of Communications that information had been received from the Department of State that the FCC had established a block of call signs for use in the Greenland Defense area. At that time a query was interjected con-

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cerning the proper control of amateur operation which would cover the areas of responsibility of the FCC, Department of State and Department of Defense. The proposed directive was received by this office and forwarded to the Assistant Secretary of Defense, Supply and Logistics, for approval, which was subsequently granted. It is anticipated that notification of the call sign block to be utilized will be received in the Directorate of Communications in the very near future. Subsequent to receipt, the Commander, NEAC, will be authorized to implement operation within the theatre. (UNCLASSIFIED)

Photos for Documentation Purposes. - In order to provide pictorial documentation of AF base MARS stations throughout the world, the Office of Chief MARS requested two copies of each station operating facilities be forwarded for inclusion in the base MARS station file.

Numerous requests in the past for pictures of MARS stations participating in emergency communications activities, disasters, Armed Forces Day, etc., have been received from APFIO, commercial publications pertinent to the radio field and other periodicals has resulted in this office having to forward individual requests for stations affected.

It is felt that the documentation outlined above will be of appreciable assistance in programming, historical reports, in addition to fulfilling those requests for publicity articles when requested. (UNCLASSIFIED)

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The Arizona State Fair. Facilities of AF MARS were used to officially open the Arizona State Fair on 5 November 1954 at Phoenix, Arizona. On opening day, initial contact was made with the MARS station at Hickam AFB, Hawaii, 30 minutes before the scheduled time to open the fair. At a given signal, Mrs. George W. Blake, wife of the Executive Secretary of the fair, placed a lei on the plaque commemorating the sinking of the USS Arizona at Pearl Harbor on 7 December 1941. The Hawaiian ceremony was described via MARS broadcast by S/Sgt James L. Cooper of Hickam AFB MARS station. Simultaneous with the placement of the wreath, Governor Howard Pyle of Arizona, struck the ship's bronze bell from the USS Arizona, on the Arizona State Fair, eight times in commemoration of the eight dead crew men from Arizona who still lie entombed in the sunken battleship. As the last note was struck, the fair ground gates were opened, the 1954 State Fair was under way. A MARS exhibit station was operated from the fair grounds throughout the fair to transmit greetings for the public and to display MARS readiness to perform in event of an emergency. During the 10 day operation, the MARS station averaged 300 messages per day. In some cases, direct voice communications was made between servicemen and families. (UNCLASSIFIED)

Pageant of Peace. - The Chiefs MARS (Army and Air Force) were requested to provide a MARS message handling facility

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for the Washington Pageant of Peace, 17 December-6 January. This pageant was opened with the traditional lighting by the President of the Christmas tree in President's Park just south of the White House.

Daily programs were presented by local churches and school groups, embassies of foreign nations and civic organizations. One program featured United Nations children in native costume. Santa Claus and 8 reindeer were present. Arrangements were made to house a MARS exhibit in a Marine Corps field shelter which was placed on loan during the period 17 December-6 January. A duplex radio-teletype circuit was placed in operation from the exhibit site to the MARS Headquarters station in the Pentagon. A telecon screen was in operation so that the official greetings of the President, Secretary of Defense, Chairman, JCS, and the Chiefs of Staff could be transmitted from the Pentagon and viewed by the visiting public. Messages were accepted for transmission to servicemen within the ZI and overseas where MARS facilities exist. Messages were sent to the Pentagon station by the wire link and then put on the air from MARS Headquarters. The joint facility was manned by Air Force and Army operators. An average of 100 messages per day were handled from the exhibit station. (UNCLASSIFIED)

MARS-PCDA Liaison Frequency. - On 3 November 1954, the frequency 143.46 mcs was assigned for use in the Continental United States by USAF MARS. The primary utilization of this frequency is the

establishment and maintaining liaison circuits for supplementing communications requirements of the Federal Civil Defense Administration and to provide liaison to the military units which are committed to the support of FCDA requirements.

(UNCLASSIFIED)

MARS Operation in French Morocco. - On 17 July, the French Government requested the Commander of the 17th AF to cease utilization of ZAF (phone patch) MARS facilities in North Africa for other than AF business. Message traffic of a solicitation or felicitation nature only has been curtailed. Essential traffic affecting the welfare of troops such as serious illness, dependents overseas travel, port calls, etc., is still authorized to be handled by MARS station in French Morocco. Headquarters USAF, in consonance with the request of the 17th AF, has instructed MARS stations world-wide to curtail all traffic, other than that defined as essential, which is destined for delivery in French Morocco. Placing into effect these restrictions has possibly obviated the loss of all operational privileges in French Morocco.

Continued operation on a limited scale, as outlined above, resulted from French Moroccan representatives of commercial companies protesting their loss of tariff. Their specific complaint was prompted by the loss of revenue anticipated from personal messages that would be generated by personnel of the Armed Forces stationed in French Morocco which were handled

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by the MARS network. Initial discussion with the French authorities concerning authorization for MARS operation did not make clear the nature of MARS operations as a military network of stations; MARS operating on military frequencies, utilizing military call signs, and does not operate under amateur cognizance of the FCC in the U.S. and similar authorities in other parts of the world. The impression retained by the French was that MARS was an extension of the U.S. Amateur Service that would fall under the provisions of the General Regulations on Radio Communications (Atlantic City 1947), Article 42 of these regulations prohibits messages traffic on the behalf of third parties, except where specific agreements between countries is made. Under this philosophy, the French Moroccan authorities are entirely correct. The Commander-in-Chief, USAFE, has been requested to seek a solution to the problem by advising the French of the military nature of the MARS network. Based upon the reappraisal of the true nature of operation, reach an agreement for such operations acceptable to all concerned. Troop morale of semi-isolated and isolated installations is greatly aided by the use of MARS facilities where it is possible to contact family and relatives on personal matters and mail would normally not be rapid enough. The Office of Chief MARS has in two instances, prepared memorandums to OSAP L&L providing in-

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formation upon which to base a reply to inquiries received in connection with the MARS North African operations. (UNCLASSIFIED)

MARS RATT Facilities. - On 11 August 1954, all major air commands, the numbered Air Forces, Air Defense Forces, Crew Training Air Force, Flying Training Air Force, Technical Training Air Force, San Antonio Air Materiel Area, Sacramento Air Materiel Area, Pacific Division (MATS), Ramey AFB, Nouasseur Air Base, Limestone AFB, Westover AFB, Thule AB and Anderson AB (Guam) were advised they were being equipped with radio-teletype (RATT) package stations.

The Continental Air Command, who is responsible for ZI traffic handling and related matter, was advised to convert the ZI traffic handling system on the frequency 6997.5 kcs to RATT beginning approximately 30 September. Overseas trunk facilities were advised to convert their operation on the frequency 14405 from manual to automatic at least for one 2-hour period per day and preferably two. Initially, MARS RATT operation would employ message format as outlined in ACP 124. At a later date, JANAP 127 and the USAF tape relay procedures would be incorporated to allow stations the capability of supplementing regular communications channels, as required, as outlined in Air Force CEI 11-1, March, 1954. (UNCLASSIFIED)

Solar Eclipse, 25 December 1954. - The Department of Physics,

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Rhodes University, Grahamstown, C.P., Union of South Africa, made an appeal in the September issue of QST for assistance in observing radio propagation phenomena during a solar eclipse on 25 December 1954. The use of joint Army and AF MARS activities were extended to the University to assist them in this observation. Frequencies, times, modes of emission and call sign of station, together with log format to be used when making reports, were disseminated by Office of Chief MARS to all major air commands. Initial reports received at Office of Chief MARS from MARS stations throughout the world indicates that considerable valuable information has been collected. These reports are being consolidated by geographical area coverage and will be forwarded to the Rhodes University. (UNCLASSIFIED)

Emergency Mobile Communications Facilities of The USAF MARS Program. - On 21 July 1954, Chief MARS, selected 21 bases within the ZI as sites upon which would be satellited mobile-fixed communications facilities capable of sustained operations at scene of disasters, and/or disaster operations, in support of the MARS mission and requirements as relate to natural or military operations. As an operational concept, these mobile communications equipments are considered to be available on an area support basis to meet requirements which may be generated at adjacent or geographically related AF installations not having similar capabilities. Action was taken on that date to have shipped, the mobile trailers which would provide the basic

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communications shelter. These trailers are to be equipped for radio-telephone, radio-telegraph and radio-teletype facilities. At least 80% of the bases selected have received initial shipments of radio equipment, test equipment, tools, primary and secondary power supply and antenna components. The equipment being made available has been secured entirely from excess and surplus materials from the Departments of the Army, Navy and Air Force. At several locations these mobile facilities have been completely outfitted and are presently operational. It is anticipated that all facilities will become fully operational by July 1955. (UNCLASSIFIED)

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