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REPORT NO. 69

REPORT ON THE OPERATIONS OF THE ENVIRONMENTAL DATA COLLECTION AND PROCESSING FACILITY

FORMAL PROGRESS REPORT NO. 2

MARCH 1971

ELECTRONICS DIRECTORATE
OFFICE OF THE ASSISTANT CHIEF OF STAFF FOR
COMMUNICATIONS-ELECTRONICS
DEPARTMENT OF THE ARMY

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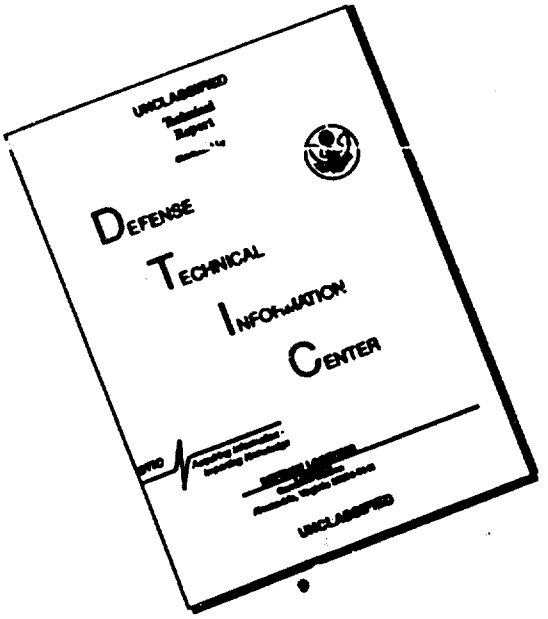

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REPORT NO. 69

REPORT ON THE OPERATIONS OF THE ENVIRONMENTAL DATA COLLECTION AND PROCESSING FACILITY (EDCPF)

FORMAL PROGRESS REPORT NO. 2

1 OCTOBER 1970 THROUGH 31 DECEMBER 1970

MARCH 1971

Environmental Data Collection and Processing Facility
Contract No. DAAB07-71-C-0010
PR&C No. 71X02
Electronics Directorate
Office of the Assistant Chief of Staff for
Communications-Electronics
Department of the Army

Bell Aerospace Company
Division of Textron
1050 East Valencia Road
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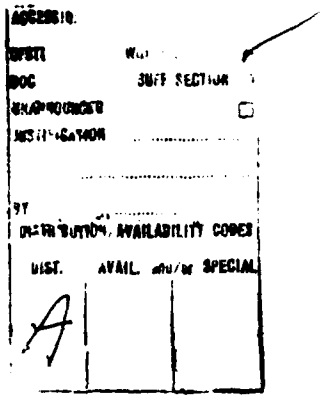

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FOREWORD

The Department of Defense (DOD) Electromagnetic Compatibility Program (EMCP) was established as a means of consolidating and coordinating the compatibility efforts within the military services. The EMCP is designed to achieve and maintain electromagnetic compatibility within and among the military services, and to insure that military communications-electronics (C-E) systems will not suffer operational failure or serious degradation because of radio frequency interference.

The Army EMCP has the same objectives as the overall DOD program, but is oriented toward intra-Army problems. The Assistant Chief of Staff for Communications-Electronics (ACSC-E) is responsible for providing Army support to the DOD EMCP and for coordinating the efforts of Army commands and agencies to insure adequate participation in, and compliance with, the overall DOD and Army programs.

The Environmental Data Collection and Processing Facility (EDCPF) was established to support the ACSC-E in fulfilling his responsibilities to the DOD and Army EMCP's, and to provide support through studies and recommendations for improved spectrum management. The EDCPF maintains current and future time frame technical and tactical data bases, including detailed C-E environments representative of potential military conflicts. The Bell Aerospace Company currently operates this facility in Tucson, Arizona under Contract No. DAAB07-71-C-0010. For more details on the support provided, see EDCPF Report No. 63, EDCPF Products and Services Catalog, dated June 1970.

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I. PROJECT MANAGEMENT AND GENERAL SUPPORT

A. GENERAL

The first quarterly progress report for the period 1 July 1970 through 30 September 1970 was forwarded to the ACSC-E on 12 October 1970. This report, EDCPF Report No. 68, was distributed in final form on 5 November 1970. Monthly letter reports for the months of October and November were forwarded to the ED on 12 November and 12 December, respectively. Technical and administrative reports are listed in table A-I, appendix A.

Contract delivery items prepared and delivered during this period are listed in table A-II, appendix A. Conferences, meetings, and briefings attended during the second quarter of the contract are listed in table A-III, appendix A.

During this report period, both the Tucson and Arlington facilities received security inspections from the cognizant security offices. No discrepancies were noted at either facility.

A total of 13,930 hours were expended on the contract during the report period. A list of personnel and hours worked has been provided the COR.

B. SYSTEM MAINTENANCE

The three major EDCPF systems, the Communications-Electronics Environmental Simulation System (CEESS), General Retrieval and Display System (GRADS), and the Data Base Maintenance and Update System (DBMUS), were all operated, maintained and enhanced as required in this report period. The primary emphasis on system enhancements was devoted to the modification of the CEESS to meet new deployment data requirements of the Electromagnetic Environmental Test Facility (EMETF). Several program modifications were made to satisfy the deployment data and tape format changes required by the EMETF. The most significant changes involved the reformatting of the deployment tape from a 168- to a 100-character length record. Also included in the reformatting effort were changes to several data fields such as changing the "equipment operator" designator from a 14-character abbreviated prose field to a 4-character numeric coded field, changing the units of geographic coordinates from tenths of seconds to ten-thousandths of degrees, and the standardizing of net numbers. Other enhancements were incorporated into the CEESS to improve data preparation, validation, and verification. Two primary programs were developed which provided considerable insight into the production of deployments; these programs are ESS013 (Net Structure Validate) and ESS014 (Net Frequency Requirements). Details of these programs and other CEESS enhancements are discussed in appendix B.

Minor changes were made to the programs in the GRADS and DBMUS systems. These included better methods of processing the data. Typical changes include the modification of programs for computer disk sorts instead of tape sorts to

decrease computer run times, adding more retrieval keys in the GRADS to expand the overall data display capability, and adding more error checks in the DBMUS as an extra measure in validating the data in the files.

II. PROGRAM REQUIREMENTS

A. OPERATIONAL SUPPORT

Thirty-three operational support tasks have been assigned in the first half of the contract year. Of the 33 tasks, 2 have been cancelled, 20 have been completed, and 11 are current. The two tasks cancelled were the MALLARD International EMC Data Base and Force Model 5. Details of the effort expended on each operational support task during the quarter can be found in appendix C.

B. WASHINGTON ENGINEERING

The Washington Engineering office of the EDCPF has continued to provide coordination with the ACSC-E and other agencies in the Washington, D. C. area in support of EDCPF contractual efforts. The major effort of this group continues to be devoted to the maintenance and operation of the EMCP Management Information and Control System. During this period the MICS data base was updated and modified as required to better satisfy user needs. The modifications were primarily format changes in MICS automated reports. Details of the MICS effort during this report period are contained in appendix D.

III. MAINTENANCE OF THE C-E DATA BANK

A. TACTICAL DATA BASE

During this report period the major effort on tactical data bases was the preparation of file information to support the Two-Corps (1971-1973) Field Army, the M60A1E2 and Sheridan/Shillelagh environment, and the Enemy-75 CAA and Front.

To insure that the Equipment Authorization File (EAF) for the two-corps deployment contained the latest TOE data, the EAF representing the current time frame forces was updated. All 44 T-series TOE's published for the ASTRO division were added. The U. S. Army Management Systems Support Agency provided complete Organizational Equipment Lists (OEL) on computer tapes. TOE data on C-E equipment and associated items were extracted from these tapes for all H-series and T-series TOE's. Similarly, all G-series TOE data was extracted to permit update of existing G-series data where required. As a result of this update action, a total of 44 G-series TOE's were added, 75 H-series replaced existing G-series TOE's and 81 G-series TOE EAF records were updated, based on the latest data. These represented the addition of 2,026 new individual records, the deletion of 753 obsolete records and changes to approximately 2,100 records. The updated EAF was processed through the computer error-check routines to prepare the file for use in a deployment early in the next quarter.

STANO equipments authorized in current TOE's were added to the EAF. Unattended ground sensors were also added to provide a representative mix of phase III type sensor equipments. This data will be updated as new basis of issue information is received.

Preparation of all EAF data required for the opposing forces and the Tactical Air Force was completed, including the frequency data for over 7,500 communications nets. Codebook, Equipment Characteristics, Antenna, Net, and Application File updates were also made.

Approximately 1,600 T-series TOE entries were made in the EAF. These TOE's represent the ASTRO mechanized division. Net number assignment and final processing of these TOE's will be completed in the next quarter.

The Net File (NF) was reduced from approximately 6,500 to 4,500 records. In addition to reducing the overall size of this file, the consolidation enhanced the tactical data base by making it possible to create an environment of a mixture of current and future time frame TOE's. In addition, the NF has been improved by the numbering of the multichannel systems. This facilitates a display of the total multichannel systems from central-to-central rather than just link-by-link.

A net number conversion table was developed to provide a means of converting all existing data files to the new numbers. To insure correct net number conversions, a comparison table was prepared which displays the old and new net data. This printout shows the net number, description, modulation and frequency limits of both the old and new nets.

The NF, card deck conversion table, printout of the card deck, and a printout of the comparison table were delivered to the EMETF on 30 October 1970.

The current EAF was updated to include all new and changed TOE information so as to provide the ECAC with an update to the Organization Platform Allowance File (OPAF), formerly known as the Vehicle Equipment Complement Index (VECI). This delivery included a list of all new current TOE's using C-E equipment, C-E equipment authorized in the TOE's, aircraft and marine craft authorized, and their associated C-E equipments. In addition, the ECAC was furnished worldwide asset information on Army aircraft and helicopters by theaters. A final update to the OPAF will be provided the ECAC during the fourth quarter of this contract year.

B. TECHNICAL DATA BASE

The Frequency Allocation to Equipment File (FAEF) was updated to include all J/F-12 actions up to 16 October 1970. During this quarter a total of 106 actions were processed, of which 59 were new frequency allocation requests, 38 were approval actions, and 9 were changes and cancellations.

All FAEF data added during this period were validated prior to the preparation of the new FAEF printout. The FAEF printout was distributed at the end of this quarter in accordance with guidance received from the COR. A

master index was included in order to make this product more useful. This index permits more rapid location of an allocation document when only the allocation number is known. This additional volume was added as the result of a user suggestion.

The AERF was updated with the data contained in the Army J/F-12 actions in the FAEF and all AERF function codes were verified. The function code permits retrieval of all C-E equipments listed in the AERF by major function.

The AERF was updated by the addition of antenna data to those equipments for which the current data were not previously available. Additions to the technical data from current TM's were also made. TM numbers and component nomenclatures were added to equipment files where required.

The AERF was reviewed against the ECAC current equipment characteristics file. Differences were noted and changes made where required.

C. MAINTENANCE AND UPDATE OF EXISTING C-E ENVIRONMENTS

1. Future Time Frame Field Army

During the period approximately 3,000 updates were made in the deployment of the AN/UVS-1 equipments. These updates included changes in netting, UTM coordinates, and elevations for airborne components.

Approximately 1,800 updates were made to the equipments comprising the Joint In-Flight Data Transmission System (JIFDATS). Different criteria were used to determine location and altitudes of the airborne equipments, depending on whether they were employed on a side-looking airborne radar mission or an infrared mission.

Several updates were made to the AN/URC-68 radio sets deployed with the Special Forces. Long link distances were discovered for this relatively low-powered radio. These radios were changed to net with friendly aircraft flying in their vicinity.

2. Future Time Frame Tactical Air Force

Several Tactical Air Force fighter planes were relocated during the report period. These updates were necessary to provide an airborne radio set in the vicinity of certain friendly patrols operating behind enemy lines.

During a visit to Headquarters, U. S. Air Force, it was recommended that the exclusive-user multichannel equipments and systems deployed in support of the seven intertheater airfields be deleted. At the same time a request was made to the Air Force for appropriate documents required as a basis for updates to the Tactical Air Force and Theater Air Force deployments. When these documents are received the recommended changes and other appropriate updates will be made.

3. Future Time Frame Enemy Forces

The fixed files for nondivisional units were updated to support the development of a new environment for the echelons above division. No updates have been made to this deployment file during the report period; however, the data for the organic divisions deployed in contact along the FEBA have been extracted and processed for inclusion in the enemy deployment.

4. Future Time Frame Theater Army

There was no change to the COMMZ elements during this report period.

D. DEVELOPMENT OF NEW C-E ENVIRONMENTS

1. Enemy-75 CAA and Front

During the report period, the required updates to supporting fixed files, the geographic positioning of all units, and the production of delivery copies of all tactical overlays and multichannel systems diagrams were completed. The production of environmental deployment data continued.

The acquisition of resource material, sanitized to the SECRET category of classification and in such detail as to display the employment of the total C-E inventory down to component level, continues to be a problem. A research visit was made to the U. S. Army Security Agency, Combat Developments Activity, during the latter part of the report period. Details on this visit are classified and will not be covered herein.

The collection of pinpoint deployment data required to complement the controlled distribution data will be completed early during the next period. A more detailed report of progress is contained in appendix E.

2. Two-Corps Environment (1971-1973)

Early in the quarter the development of a MALLARD deployment was suspended and the effort redirected toward development of a 1971-1973 two-corps environment.

The MALLARD troop list and task organization were modified to include ASTRO divisions. The modification entailed substitution of three infantry (mechanized) ASTRO divisions for the original 2nd, 3rd and 5th divisions. The tactical map deployment and the overlay design of the multichannel communications systems have been completed. Call cards and fixed files, based on G- and T-series TOE's were completed during this period. Further deployment processing has been suspended in order to accomplish update of the fixed files to conform to H-series TOE's which have recently become available. The fixed file update and the production of the Two-Corps Field Army deployment tape will be completed in the next period.

The Tactical Air Force considered appropriate to support this deployment consists of seven tactical air bases with twelve fighter, three reconnaissance, one refueling and six airlift squadrons. The TAF includes an Air Force

Component Command Post, Tactical Air Control Center and the necessary additional complementary units required to establish a Tactical Air Control System.

APPENDIX A

PROJECT MANAGEMENT AND GENERAL SUPPORT

Table A-I is a list of reports produced during the period 1 October 1970 through 31 December 1970.

Table A-II is a list of contract items delivered during this period.

Table A-III is a list of meetings and conferences attended by EDCPF personnel during this report period.

Table A-I. Reports

Type	EDCPF No.	Title	Date
Quarterly Draft	68	Contract Formal Progress Report No. 1, 1 July 1970 - 30 September 1970	12 Oct 70
Quarterly Final	68	Contract Formal Progress Report No. 1, 1 July 1970 - 30 September 1970	5 Nov 70
Monthly Letter Report	-	Monthly Letter Report for October 1970	12 Nov 70
Monthly Letter Report	-	Monthly Letter Report for November 1970	12 Dec 70

Table A-II. Contract Delivery Items

Agency	Item	Date
ECAC	Proposed Australian Table of Frequency Allocations (10 Gc/s to 40 Gc/s)	4 Nov 70
	Verification of ECAC Electronic Equipment Environment Records	6 Nov 70
	Verification of ECAC Electronic Equipment Environment Records	13 Nov 70
	Verification of ECAC Electronic Equipment Environment Records	24 Nov 70
	ECAC Organization Platform Allowance File (OPAF) Update	1 Dec 70
	Verification of ECAC Electronic Equipment Environment Records	8 Dec 70
	Verification of ECAC Electronic Equipment Environment Records	18 Dec 70
	Verification of ECAC Electronic Equipment Environment Records	22 Dec 70
	Frequency Allocation to Equipment File (FAEF) Listings, Army, Navy and Air Force	28 Dec 70
	Verification of ECAC Electronic Equipment Environment Records	31 Dec 70
ACSC-E	Review Draft of EDCPF Report No. 68, Contract Formal Progress Report No. 1	12 Oct 70
	Magnetic Tape Containing Computer Programs	22 Oct 70
	FAEF Tape	27 Oct 70
	Communications Systems Diagrams and Spectrum Occupancy Table	2 Nov 70
	MICS and CEESS Tapes and Information	3 Nov 70
	EDCPF Report No. 68, Contract Formal Progress Report No. 1	5 Nov 70
	CEESS Flowchart	9 Nov 70
	MICS Test Tapes	17 Dec 70
	MICS Listings	21 Dec 70
USAEPG	Technical Library Index	5 Oct 70
	EDCPF Products and Services Catalog	7 Oct 70
	EDCPF Antenna Code Listings	23 Oct 70
	Net Data File	30 Oct 70
	FAEF/AERF Listing (220-405 MHz)	4 Nov 70
	EDCPF Magnetic Tapes for Duplicate Storage	6 Nov 70
	Allied C-E Equipment Characteristics (220-405 MHz)	6 Nov 70
	Frequency Allocation to Equipment File (FAEF) Listings, Army, Navy and Air Force	28 Dec 70
USACDCCEA	Single Channel Net Data to Support TACSATCOM Cost Effectiveness Study	8 Oct 70
	Single Channel Net Data to Support TACSATCOM Cost Effectiveness Study	9 Oct 70

Table A-II. Contract Delivery Items (cont)

Agency	Item	Date
USACDCCEA (cont)	Theater Army, Field Army, Tactical Air Force, and Theater Air Force Communications Systems Diagrams	15 Oct 70
	Single Channel Net Data to Support TACSATCOM Cost Effectiveness Study	22 Nov 70
	Theater Army and Field Army Communications Systems Diagrams	23 Nov 70
	Single Channel Net Data to Support TACSATCOM Cost Effectiveness Study	27 Oct 70
	Single Channel Net Data to Support TACSATCOM Cost Effectiveness Study	28 Oct 70
ECOM	EW Jammers Used in CE/EW-75 Deployment	27 Nov 70
	MICS Listing	9 Dec 70
North American Rockwell Co.	EDCPF Products and Services Catalog	8 Oct 70
USASA	Frequency Allocation to Equipment File (FAEF) Listings, Army, Navy and Air Force	28 Dec 70
Third Army	Frequency Allocation to Equipment File (FAEF) Listings, Army, Navy and Air Force	28 Dec 70
Fourth Army	Frequency Allocation to Equipment File (FAEF) Listings, Army, Navy and Air Force	28 Dec 70
Hqs, AD&TC (AFSC)	Frequency Allocation to Equipment File (FAEF) Listings, Army, Navy and Air Force	28 Dec 70
DBMD (ASFS)	Frequency Allocation to Equipment File (FAEF) Listings, Army, Navy and Air Force	28 Dec 70
AFC White Sands	Frequency Allocation to Equipment File (FAEF) Listings, Army, Navy and Air Force	28 Dec 70
AFC Fort Huachuca	Frequency Allocation to Equipment File (FAEF) Listings, Army, Navy and Air Force	28 Dec 70
CG, Fort Bliss, Texas	Frequency Allocation to Equipment File (FAEF) Listings, Army, Navy and Air Force	28 Dec 70
EDL	Frequency Allocation to Equipment File (FAEF) Listings, Army, Navy and Air Force	28 Dec 70
USCONARC	Frequency Allocation to Equipment File (FAEF) Listings, Army, Navy and Air Force	28 Dec 70
CECAA	Program Documentation	23 Dec 70
	PERT/Time Report	23 Dec 70

Table A-II. Contract Delivery Items (cont)

Agency	Item	Date
USAMC	MICS Data Base Listing	10 Dec 70
OACSC-E	MICS Data Base Listing	16 Nov 70
USATECOM	MICS Data Base Listing	13 Nov 70

Table A-III. Meetings and Conferences

Date	Purpose	Agency	Location
1 Oct 70	Discuss EDCPF data submission to ECAC	ECAC, EDCPF	Annapolis, Maryland
2 Oct 70	Discuss and coordinate contract activities	ACSC-E, EDCPF	Washington, D. C.
12-16 Oct 70	Present EDCPF orientation and capabilities briefing	CECAA, EDCPF	Tucson, Arizona
13 Oct 70	Discuss progress and plans for EDCPF contract effort	ACSC-E, EDCPF	Tucson, Arizona
14 Oct 70	Coordinate EW document acquisition	EWSG, EDCPF	Arlington, Virginia
14-15 Oct 70	Present EDCPF orientation and capabilities briefing	ACSC-E, ACSFOR, OCRD, USACDC, USASTRATCOM, ECAC, USATECOM, USAEPG, AVCS(DMIS), CECAA, USACDCCSG, EDCPF	Tucson and Fort Huachuca, Arizona
15 Oct 70	Coordinate the MICS task	ACSC-E, EDCPF	Washington D. C.
20 Oct 70	Discuss ASTRO data for use in C-E environments	USACDC, EDCPF	Fort Belvior, Virginia
30 Oct 70	Present EDCPF capabilities briefing	USACDC, ACSC-E, EDCPF	Fort Belvoir, Virginia
30 Oct 70	Discuss contract progress, plans, and activities	ACSC-E, EDCPF	Washington, D. C.
10 Nov 70	Present EDCPF capabilities briefing	USAEPG, EDCPF	Fort Huachuca, Arizona
16 Nov 70	Coordination of EDCPF support to USAEPG	USAEPG, EDCPF	Fort Huachuca, Arizona
18-19 Nov 70	Discuss contract progress, plans, and activities	ACSC-E, EDCPF	Washington, D. C.
18 Nov 70	Discuss CE/EW-75 data requirements	CSD, ACSC-E, EDCPF	Washington, D. C.
19 Nov 70	Coordinate TACSATCOM cost effectiveness support	CSC, ACSC-E, EDCPF	Falls Church, Virginia
20 Nov 70	Present EDCPF capabilities briefing	USAECOM, EDCPF	Fort Monmouth, New Jersey
23 Nov 70	Discuss EDCPF Support to EMETF	USAEPG, EMETF, EDCPF	Vail, Arizona
1-2 Dec 70	Coordinate an EMETF Program Requirements Document	USAEPG, EMETF, EDC EDCPF	Tucson, Arizona
7-11 Dec 70	Discuss EMC Standards and TD-25	MALLARD-JEA, UK, ECAC, ACSC-E, RAC, EMETF, USAEPG, EDCPF	Tucson and Fort Huachuca, Arizona

Table A-III. Meetings and Conferences (cont)

Date	Purpose	Agency	Location
14 Dec 70	Discuss the STANSO spectrum requirements for the development of Phase IV/V unattended ground sensors and data transmission links	ACSC-E, STANSO, USATECOM, USACDCCEA, EMETF, EDCPF	Washington, D. C.
15 Dec 70	Discuss availability of documentation on Tactical and Theater Air Forces in support of an Army in the Field	USAF, EDCPF	Washington, D. C.
15 Dec 70	Discuss availability of documentation on Enemy Forces	USASACDA, EDCPF	Arlington, Virginia
28 Dec 70	Coordinate the Program Requirements Document and Program Support Plan for RADA	USAEPG, EMETF	Fort Huachuca, Arizona

APPENDIX B

SYSTEM MAINTENANCE

The three EDCPF computer systems were maintained, operated, and enhanced as required with the major effort being devoted to the C-E Environmental Simulation System (CEESS). The changes to the CEESS were effected as a result of new data format requirements of the EMETF. Minor changes were made to the General Retrieval and Display System (GRADS) and the Data Base Maintenance and Update System (DBMUS), primarily in the area of improving data processing efficiency.

Figure B-1 shows the overall system flowchart for the CEESS with the major functional categories of data processing indicated. Figures B-2 through B-7 illustrate the detailed system flowchart on a program-by-program basis. For identification purposes the individual programs of the detailed CEESS flowchart have been outlined and grouped into the functional categroies indicated in figure B-1. It should be noted that the "special purpose programs" shown in figure B-7 are optional programs which are used basically for data verification except for the translate and rotate programs which are used in the preparation of deployments.

The capabilities of the CEESS are many and varied with an emphasis on optional data processing modes. The dotted lines of figure B-1 indicate the optional routes available in the system. The first option exists in selecting the type of geographic coordinate positioning of vehicles which will be used in the deployment. Either the Deterministic Deployment technique or the Controlled Statistical Deployment technique, or a combination of both techniques, can be employed in the vehicle positioning scheme. The Deterministic Deployment technique is used when pinpoint geographic coordinate positioning of vehicles, equipments, and components is required. In this technique all geographic coordinates are manually prepared by the military tacticians and input via parameter cards into the computer program for data processing. In the Controlled Statistical Deployment technique the major coordinate positioning effort is accomplished by the computer with only key data supplied by the military tacticians. In this technique the tactician enters into the program via parameter cards, the geographic coordinate of the organizational unit command post and the geographic boundaries of the unit itself. The program then randomly deploys all vehicles, equipments, and components within that organizational unit around the specified command post within the limits indicated. The outputs of these two programs are then merged back together to form the basic deployment with all records assigned geographic coordinates.

The next major functional category with four basic options as shown in figure B-1 is the frequency assignment scheme. The four options of the frequency assignment scheme are the Controlled Statistical Frequency Assignment, the Computer Assisted Frequency Assignment (Simplex), the Computer Assisted Frequency Assignment (Duplex), and the Manual Frequency Assignment. Any one technique or any combination of the techniques can be used in assigning

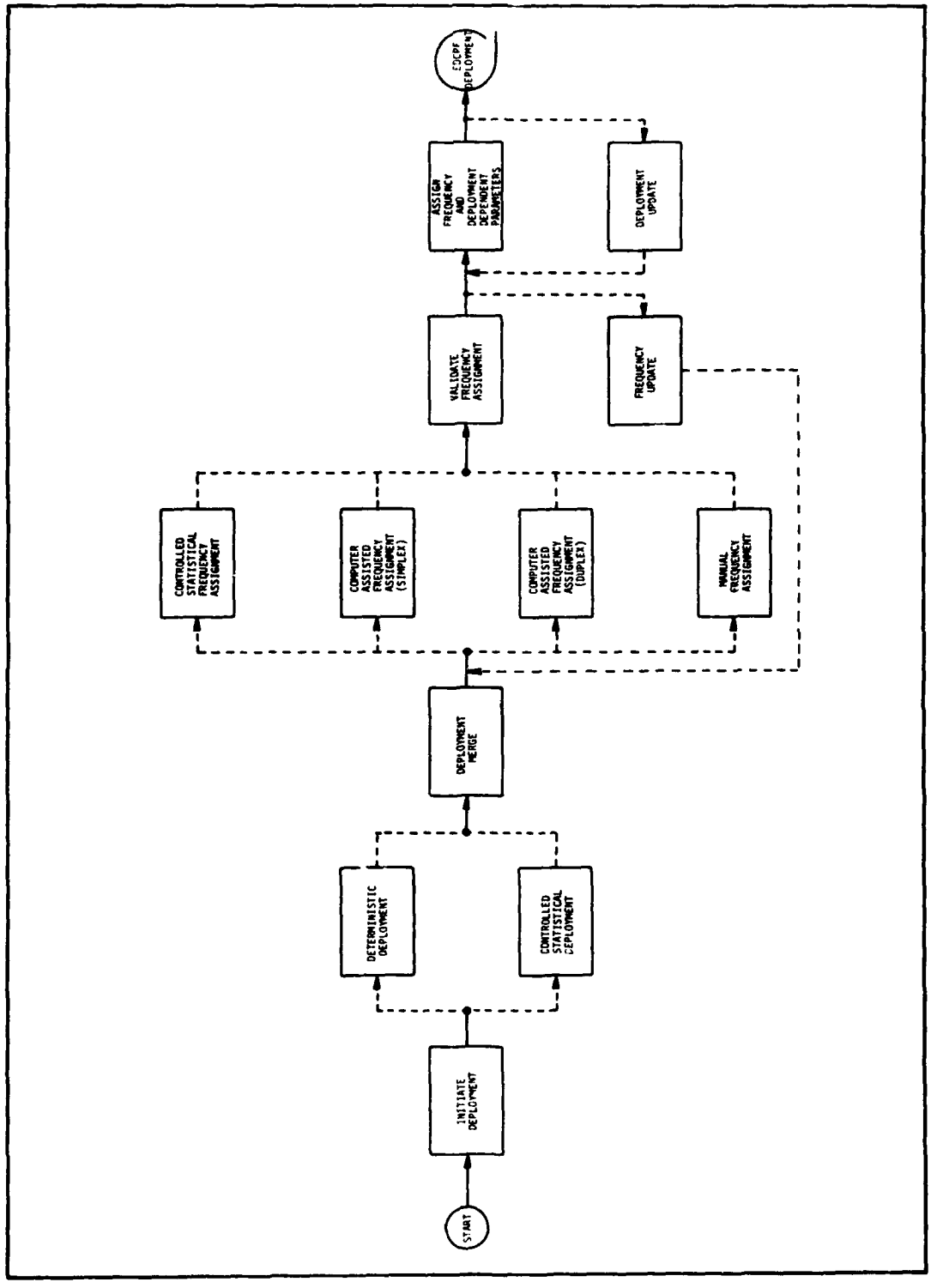


Figure B-1. Overall C-E Environmental Simulation System Flowchart

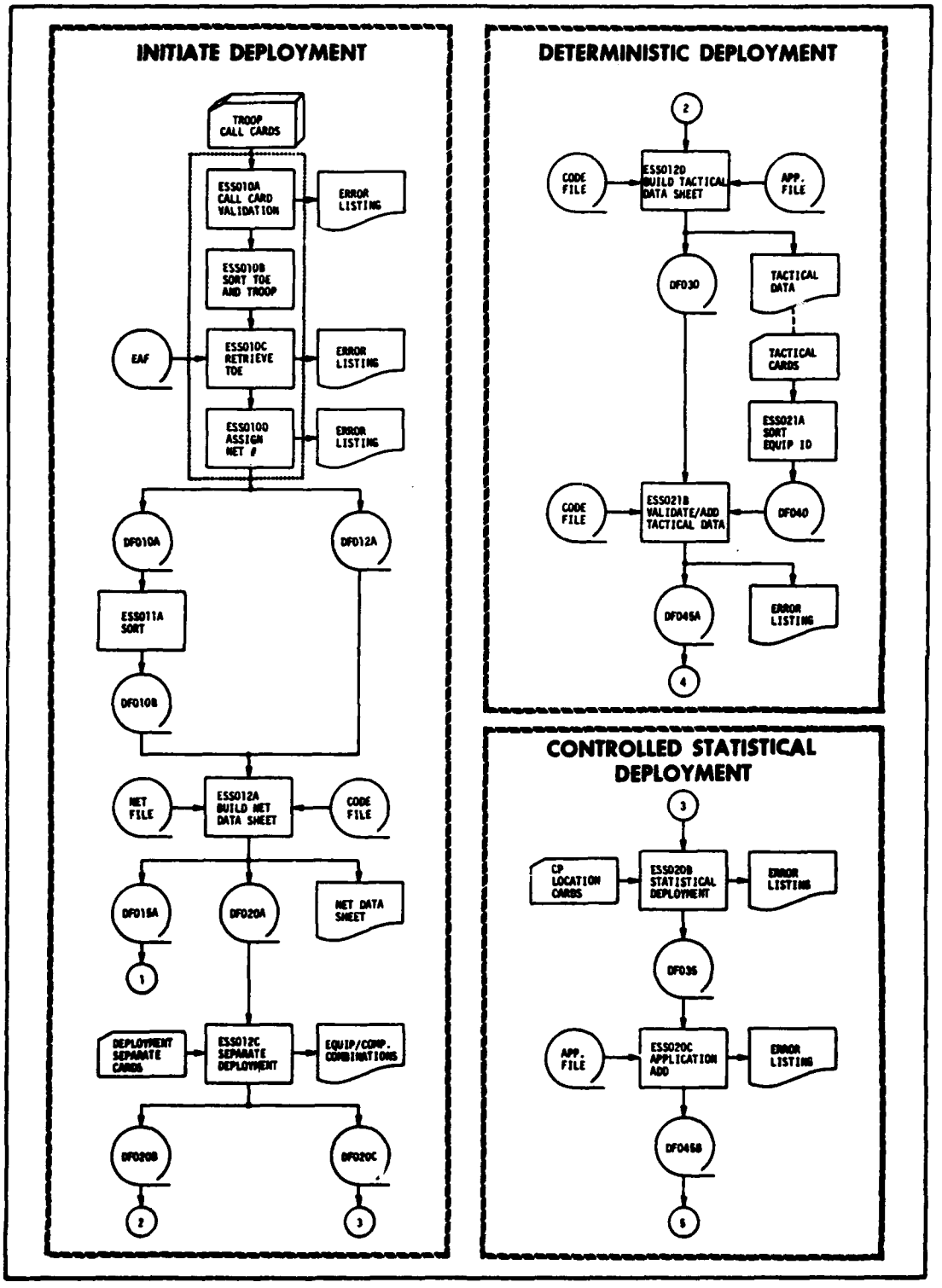


Figure B-2. Detailed C-E Environmental Simulation System Flowchart - Part I

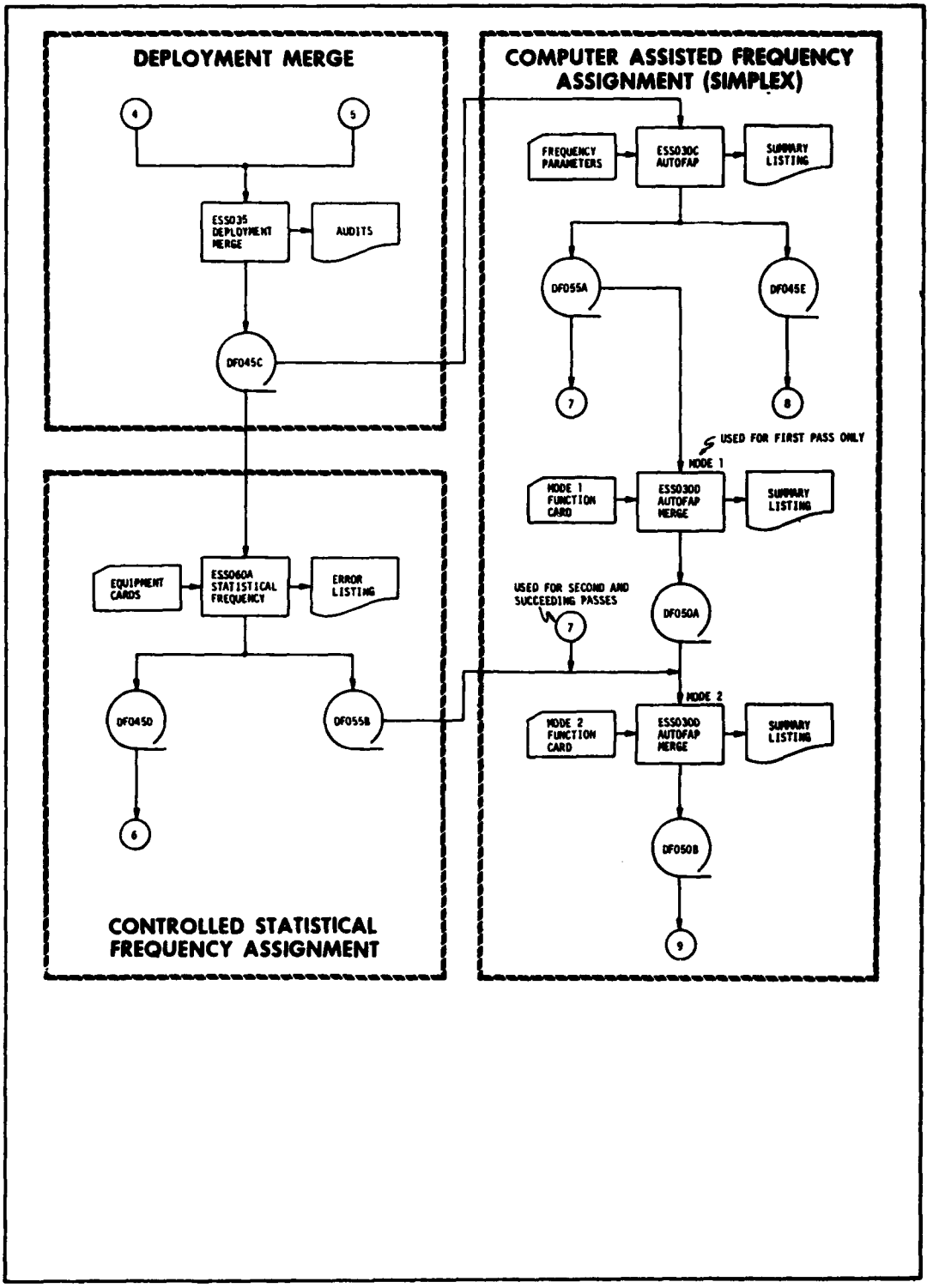


Figure B-3. Detailed C-E Environmental Simulation System Flowchart - Part II

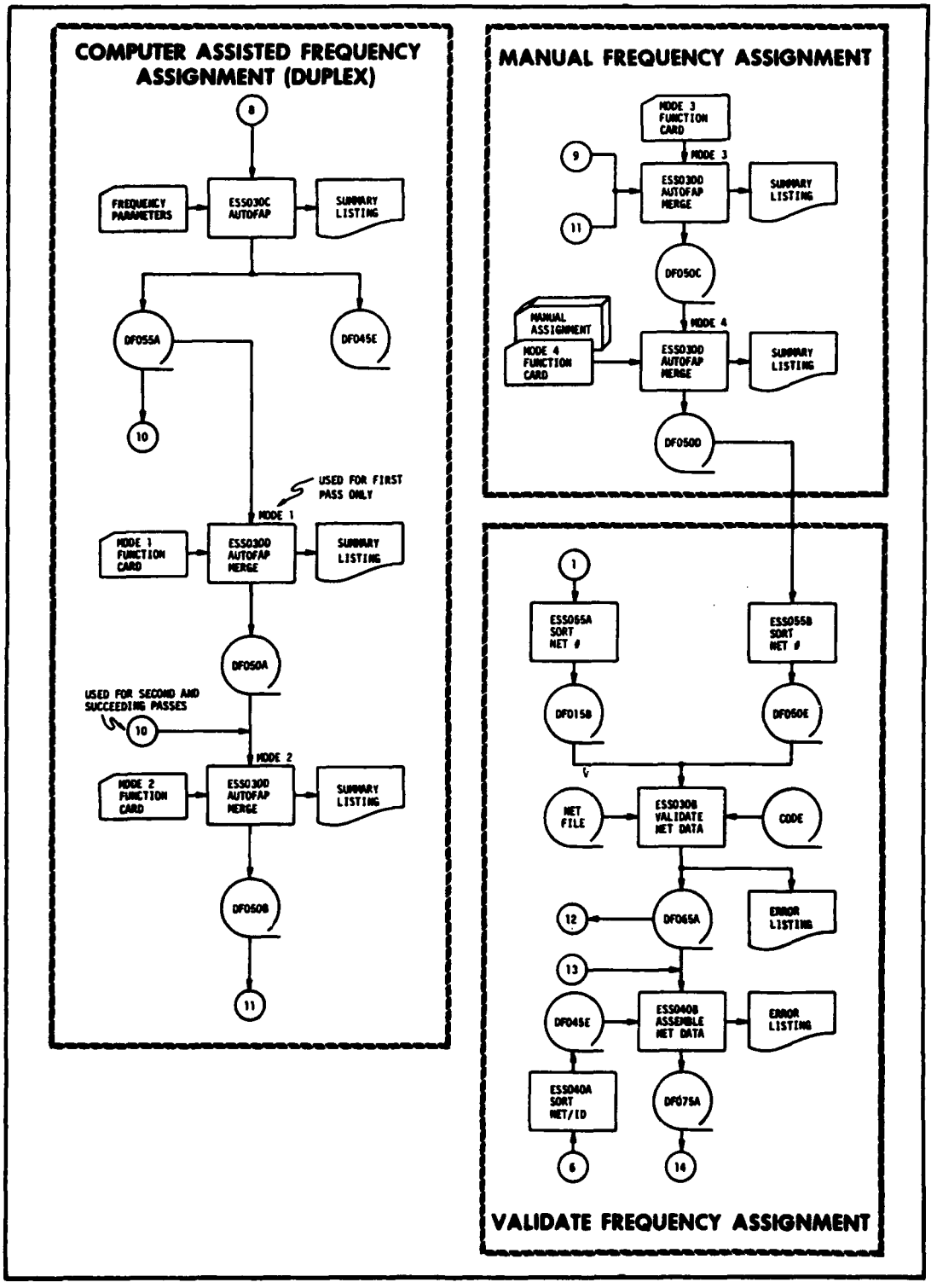


Figure B-4. Detailed C-E Environmental Simulation System Flowchart - Part III

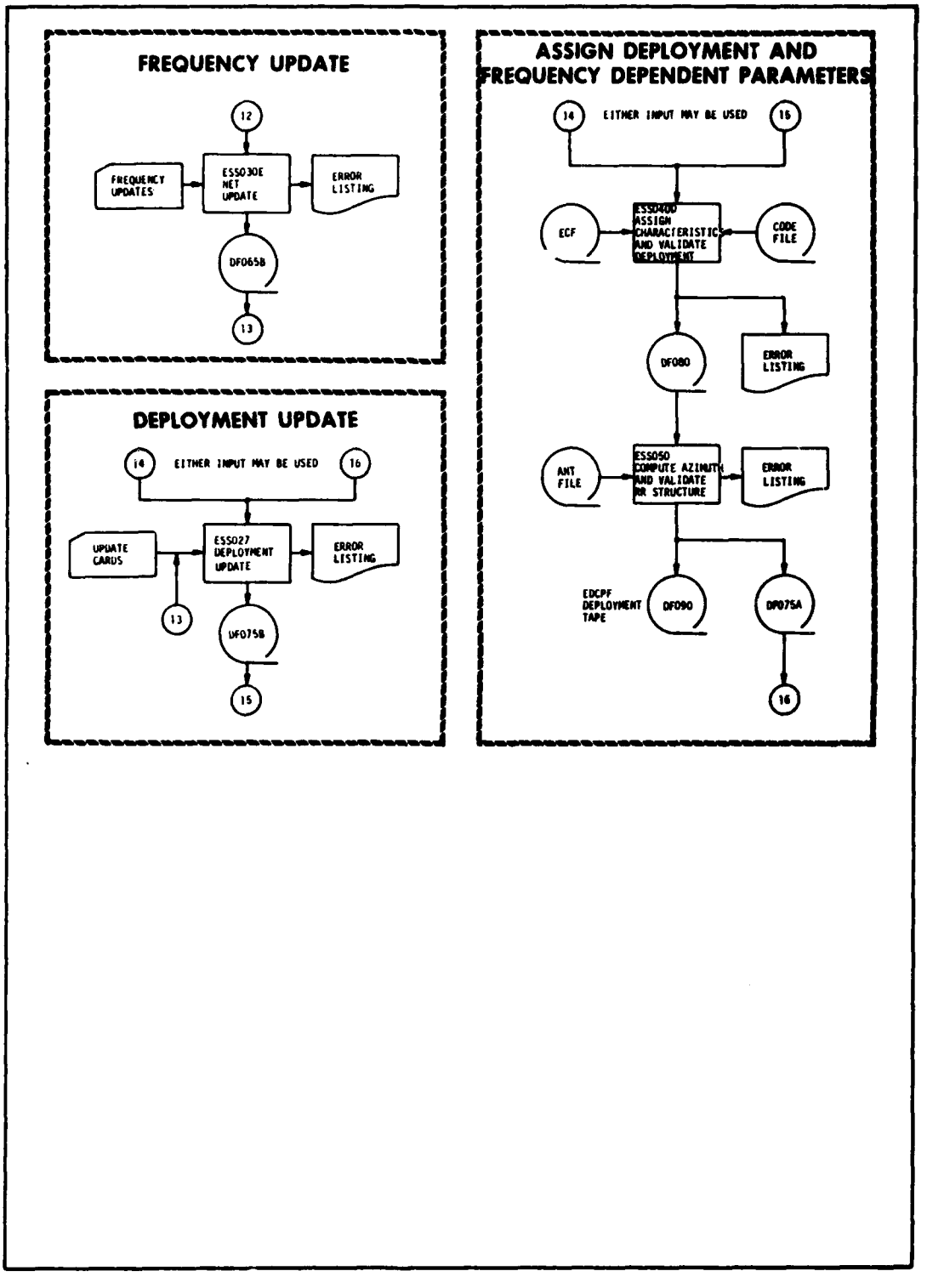


Figure B-5. Detailed C-E Environmental Simulation System Flowchart - Part IV

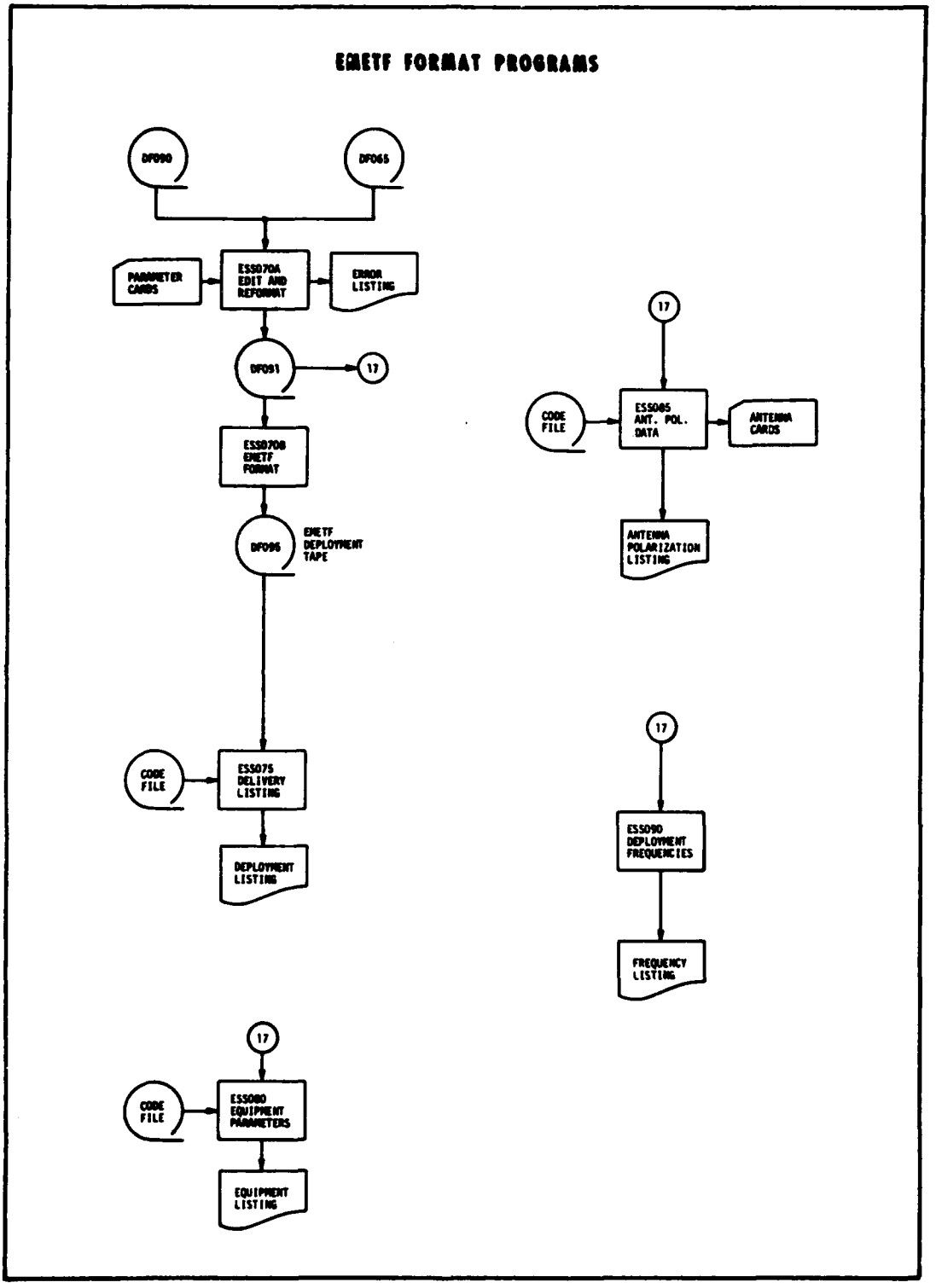


Figure B-6. Detailed C-E Environmental Simulation System Flowchart - Part V

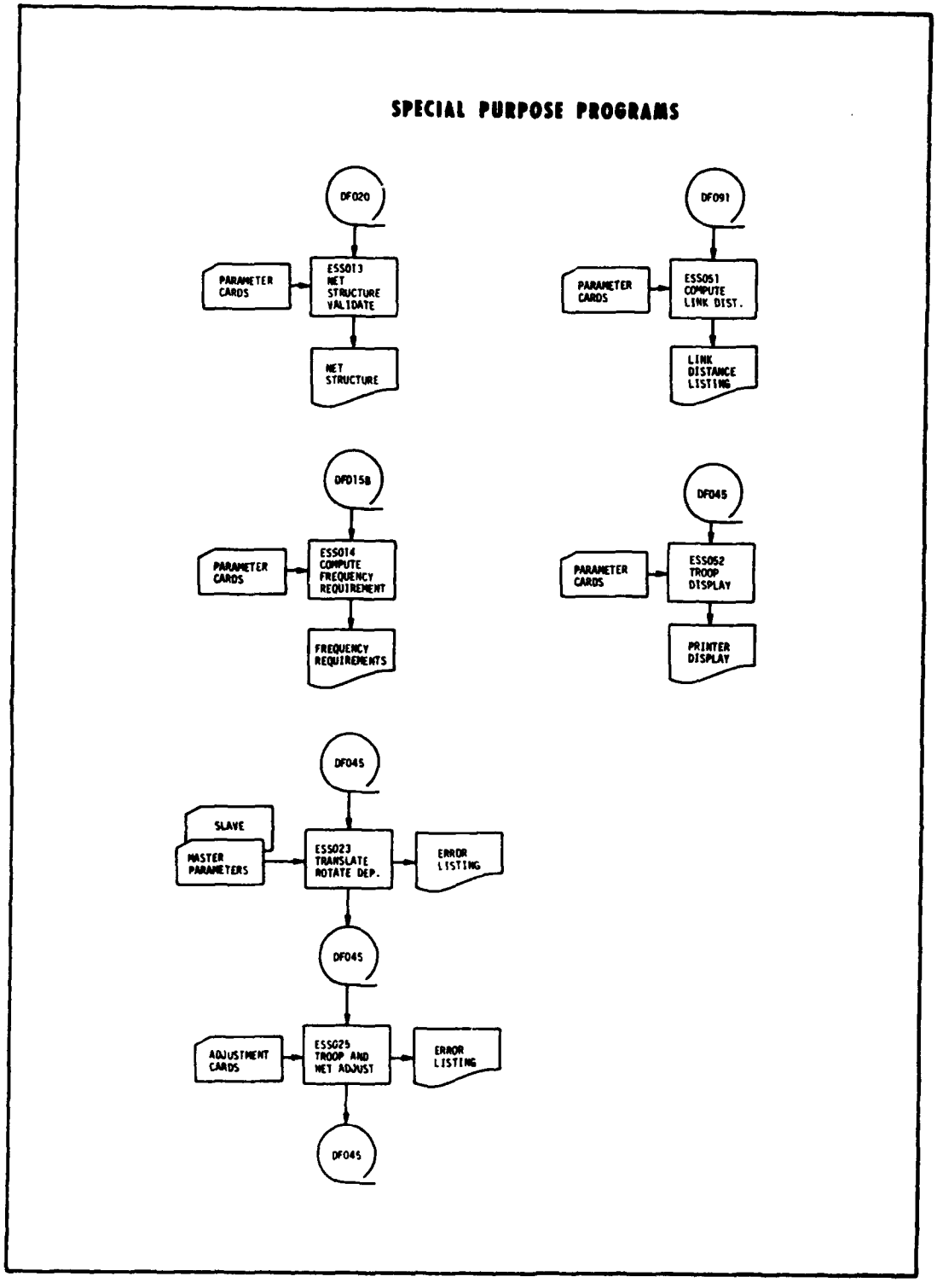


Figure B-7. Detailed C-E Environmental Simulation System Flowchart - Part VI

frequencies. The Controlled Statistical Frequency Assignment technique is primarily for use in assigning radar frequencies where the computer randomly assigns a discrete frequency from an input radar tuning range. The Computer Assisted Frequency Assignment technique is used to assign frequencies to simplex or duplex nets by the computer from input frequency lists. The principles of frequency assignment by the computer are in accordance with the procedures of standard Army doctrine as published in FM 24-2, Radio Frequency Management. The Manual Frequency Assignment technique is used whenever the military tactician manually assigns frequencies to any nets selected in the deployment. This manually prepared data is input via parameter cards to the computer program for data processing. The outputs of all the frequency assignment programs are then merged together for subsequent processing through the CEESS. The remaining functions of the system are to validate the data, add descriptive and additional data from the primary data base files (such as equipment characteristics and antenna data), update or affect any changes required, and finally format the data for the user. Figure B-8 gives the format of the new EMETF deployment tape.

The CEESS has many built-in features to validate and verify data. In all cases discrepancies are flagged by the computer and the type of error and the data record itself are printed on-line by the computer. In critical cases, data processing will halt when errors are detected and these errors must be corrected before further processing can be accomplished. Several programs are used in the actual data processing. Foremost among these programs is the ESS052, Printer Display, which displays vehicle positions within a troop to the representative scale actually deployed.

In this report period two new programs were developed and added to the CEESS which significantly add to the overall deployment production effort. ESS013, Net Structure Validate, and ESS014, Net Frequency Requirements, were designed, developed, tested, and implemented in this quarter. The Net Structure Validate is designed to produce the overall netting structure representing net assignments for the deployment being prepared. This program is used in the Initiate Deployment phase to verify the deployment netting structure so that any discrepancies in the basic net structure concept can be corrected in the master data base files prior to any subsequent data processing. The Net Frequency Requirements program is also used in the Initiate Deployment phase to assist the frequency engineer in preparing frequency lists and in making frequency assignments for the deployment. Figure B-9 shows a sample display of the output of the Net Frequency Requirements program.

As stated previously, only minor changes were made to the GRADS and the DBMUS. The Organizational Equipment List (OEL) programs which are designed to retrieve and display data from the U. S. Army Management Systems Support Agency (USAMSSA) tapes were refined in this report period. These programs retrieve only C-E type data from the USAMSSA tapes, reformat the data, and sort on SRC number for display. A sample output of these programs is shown in figure B-10. This data is then used in preparing inputs to the Equipment Authorization File to support the deployment production effort.

DATA FORMAT

TITLE DEPLOYMENT TAPE FORMAT

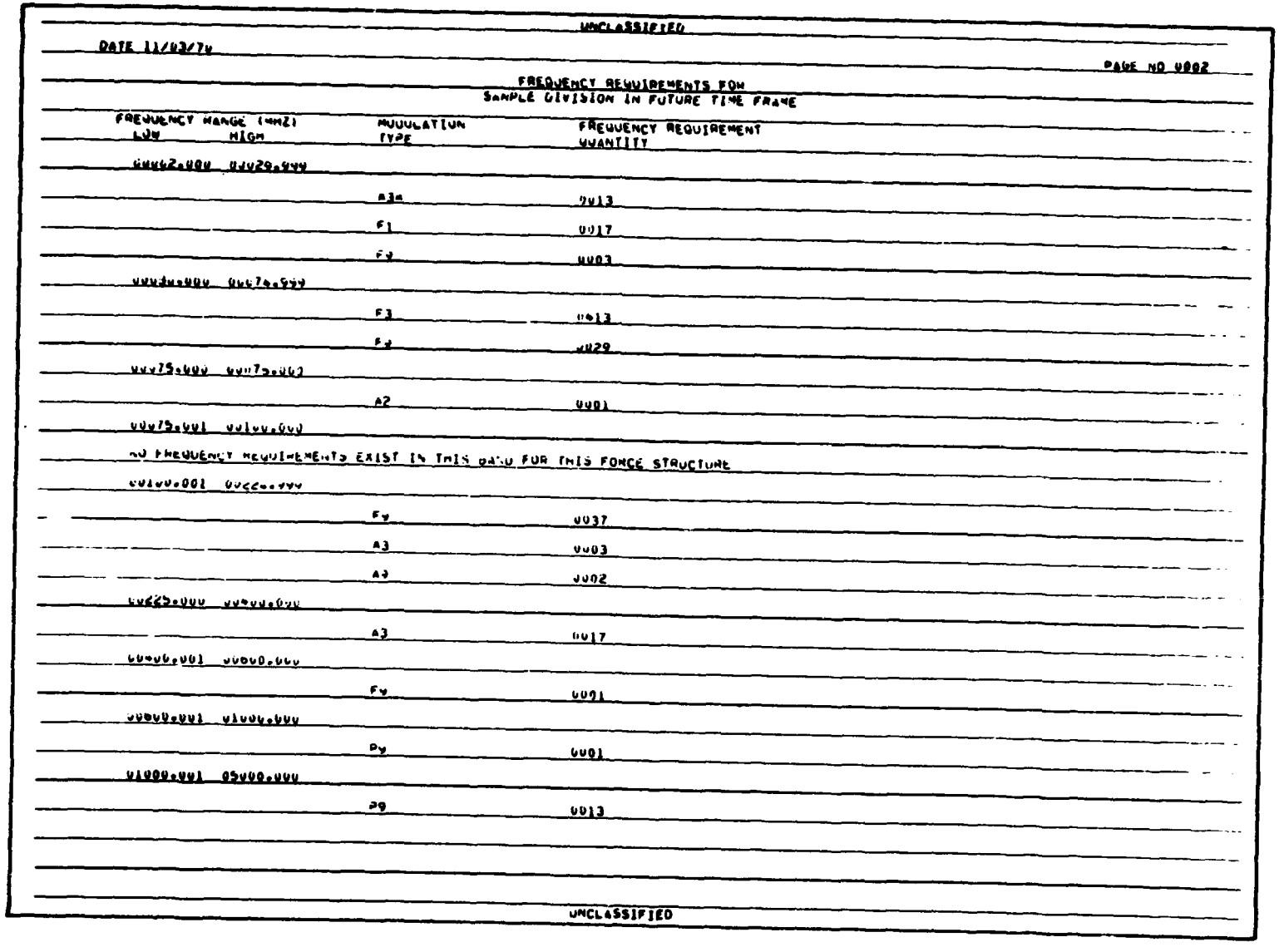
DATE 70 DEC 31 **SYSTEM** CEESS

CARD _____ **TAPE** X **TAPE DENSITY** 800 **RECORDS PER BLOCK** 12

TAPE LABEL _____ **NOTE: A=ALPHABETIC, N=NUMERIC**

FIELD NO.	FIELD LGTH.	CHAR. POSIT. START	CHAR. POSIT. END	CHAR. TYPE (A,N)	DATA DESCRIPTION
1	1	1	1	N	SECURITY CLASSIFICATION
2	10	2	11	N	NET NUMBER
3	3	12	14	N	SEQUENCE NUMBER WITHIN NET
4	8	15	22	N	ASSIGNED FREQUENCY (KHz)
5	1	23	23	N	GEOGRAPHIC QUADRANT CODE
6	7	24	30	N	LATITUDE (TEN THOUSANDTHS OF DEGREES)
7	7	31	37	N	LONGITUDE (TEN THOUSANDTHS OF DEGREES)
8	5	38	42	A/N	AIRCRAFT HEIGHT (METERS, MULTIPLIER CODE)
9	3	43	45	N	ANTENNA CODE
10	1	46	46	A	POLARIZATION
11	6	47	52	N	ANTENNA AZIMUTH (DEGREES)
12	6	53	58	N	ANTENNA ELEVATION (DEGREES)
13	3	59	61	N	ANTENNA STRUCTURE HEIGHT (TENTHS OF METERS)
14	5	62	66	N	POWER OUTPUT (DBM)
15	3	67	69	N	NUMBER OF CHANNELS
16	3	70	72	N	COMPONENT CODE
17	2	73	74	A/N	MAJOR EQUIPMENT CODE
18	2	75	76	N	MODULATION CODE
19	1	77	77	A	COMPONENT TYPE CODE
20	1	78	78	A	POSTURE CODE
21	4	79	82	N	OPERATOR NAME CODE
22	1	83	83	N	OPERATOR SEQUENCE NUMBER
23	4	84	87	N	TROOP NUMBER
24	1	88	88	N	NET CONTROL STATION (NCS) INDICATOR
25	3	89	91	A/N	VEHICLE CODE
26	3	92	94	A/N	MULTIPLE LOCATION CODE
27	1	95	95	N	DATA SET CODE
28	5	96	100	-	BLANK

Figure B-8. New EMETF Deployment Tape Format



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DATE 11/03/7v

PAGE NO 0002

FREQUENCY REQUIREMENTS FOR
SAMPLE DIVISION IN FUTURE TIME FRAME

FREQUENCY RANGE (MHZ) LOW	HIGH	MODULATION TYPE	FREQUENCY REQUIREMENT QUANTITY
0000.0000	0029.9999		
		A3E	0013
		F1	0017
		FX	0003
0029.9999	0067.9999		
		F3	0013
		FX	0029
0067.9999	0073.0000		
		A2	0001
0073.0001	0100.0000		

NO FREQUENCY REQUIREMENTS EXIST IN THIS BAND FOR THIS FORCE STRUCTURE

0100.0001	0225.0000		
		FX	0037
		A3	0003
		A9	0002
0225.0000	0400.0000		
		A3	0017
0400.0001	0600.0000		
		FX	0001
0600.0001	0700.0000		
		PX	0001
0700.0001	0900.0000		
		P9	0013

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Figure B-9. Sample Display of Net Frequency Requirements

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PAGE 0002

SMC/TDA/OPP	ORGANIZATION TITLE/EQUIPMENT NOMENCLATURE	SUPPLY	LIN NO.
01128T6000900	AERIAL RADIAC SYSTEM AN/ADR-6	5	A21249
01128T6000910	AVIONICS REP SEC		
	AERIAL RADIAC SYSTEM AN/ADR-6	0	A21249
01128T6001000	AV CO AERIAL SURVEILLANC		
	AIRPLANE OBSERVATION STOL OV-1A	6	A30221
	AIRPLANE OBSERVATION STOL OV-1C	12	A30271
	ANALYZER-CHARGER BATTERY AN/ASM-137	1	455243
	ANTENNA AT-984/G	5	A71712
	ANTENNA RC-292	2	A72263
	CIPHER MACHINE TSEC/KL-7	1	F64251
	ELECTRONIC TELETYPEWRITER SECURITY EQUIPMENT TSEC/KW-7	2	F72340
	RADIAC SET AN/PDR-27	3	319334
	RADIO SET AN/URR-5 MOUNTED IN TRUCK SHOP VAN	1	334795
	RADIO SET AN/URC-10	36	342142
	RADIO SET AN/VRC-24 MOUNTED IN TRUCK 3/4 TON CARGO	1	350754
	RADIO SET AN/VRC-46 MOUNTED IN TRUCK 1/4 TON	1	353926
	RADIO SET AN/VRC-49 MOUNTED IN TRUCK 3/4 TON CARGO	10	354037
	RADIO SET AN/VRC-47 MOUNTED IN TRUCK SHOP VAN	1	354544
	RADIO SET AN/VRC-47 MOUNTED IN TRUCK 1/4 TON	1	354618
	RADIO SET CONTROL GROUP AN/GRA-39	32	37H242
	RADIO TELETYPEWRITER SET AN/GRC-46	2	390843
	RECEIVING SET RADAR DATA AN/FRD-1 LESS POWER	14	436072
	SPEECH SECURITY EQUIPMENT TSEC/KY-8	1	J01275
	TACTICAL IMAGERY INTERPRETA TION FACILITY AN/TSQ-43 LESS POWER	2	V08H43
	TELEGRAPH TERMINAL GROUP AN/TCC-14	1	V2H233
	TELETYPEWRITER SET AN/FGC-21	1	V34639
	TERMINAL TELEGRAPH-TELEPHONE AN/TCC-29	1	V57N14
	TRUCK CARGO 2-1/2 TON 6X6 W/E	14	A40019
	TRUCK CARGO 2-1/2 TON 6X6 XLWB W/WINCH W/E	2	A40420
	TRUCK CARGO 3/4 TON 4X4 W/E	45	A34735
	TRUCK TRACTOR 5 TON 6X6 W/WINCH W/E	1	A54403
	TRUCK UTILITY 1/4 TON 4X4 W/E	4	A60H33
	TRUCK VAN SHOP 2-1/2 TON 6X6 W/E	2	A62340
	TRUCK WRECKER 5 TON 6X6 W/WINCH W/E	1	A63249
01128T6001001	COMPANY HEADQUARTERS		
	RADIO SET AN/VRC-47 MOUNTED IN TRUCK 1/4 TON	1	354618
	RADIO SET CONTROL GROUP AN/GRA-39	1	37H242
	TRUCK CARGO 2-1/2 TON 6X6 W/E	2	A40019
	TRUCK CARGO 2-1/2 TON 6X6 XLWB W/WINCH W/E	2	A40420
	TRUCK CARGO 3/4 TON 4X4 W/E	2	A34735
	TRUCK UTILITY 1/4 TON 4X4 W/E	2	A60H33
	TRUCK WRECKER 5 TON 6X6 W/WINCH W/E	1	A63249
01128T6001002	OPERATIONS PLATOON HQ		
	ANTENNA AT-984/G	2	A71712
	ANTENNA RC-292	1	A72263
	RADIO SET AN/URR-5 MOUNTED IN TRUCK SHOP VAN	1	334795
	RADIO SET AN/VRC-24 MOUNTED IN TRUCK 3/4 TON CARGO	1	350754
	RADIO SET AN/VRC-46 MOUNTED IN TRUCK 1/4 TON	1	353926
	RADIO SET AN/VRC-47 MOUNTED IN TRUCK SHOP VAN	1	354544

Figure B-10. Sample Organizational Equipment List Display

APPENDIX C

OPERATIONAL SUPPORT

The operational support tasks for which an effort was expended during this report period are discussed in the following paragraphs.

1. Processing of DD Form 1374 Data Reports and ECAC Form X-1

Twenty-six DD Form 1374 data reports and 95 ECAC X-1 data forms were reviewed for completeness and accuracy and forwarded to the ECAC. These data forms represent inputs from the First and Fourth Armies, U. S. Army European Command, and the Office of the Chief of Engineers, Civil Works Administration.

2. ECAC Future Environmental File (X-8)

Preliminary effort on this task included an extensive review of the current and future equipment reported by the ECAC as phasing-in or phasing-out in comparison to the last submission by the EDCPF to ECAC. Extensive effort will be initiated on this task in early January 1971, with delivery to ECAC planned for 1 March 1971.

3. ECAC Organization Platform Allowance File (OPAF) Update

The first of two updates to the OPAF this year was submitted to the ECAC on 30 November 1970. Figure C-1 is a sample of the listing. The update covered all data changes made since 28 May 1970, including new TOE's, changed, rescinded, and superseded TOE data. Also included was the worldwide asset information on Army aircraft as shown in figure C-2. A second and complete update of the OPAF is scheduled for 30 June 1971.

4. Frequency Allocation to Equipment File (FAEF) (Complete)

Thirteen copies of the complete printout of the FAEF were prepared and delivered on 28 December 1970. This update included all J/F-12 allocations received by the EDCPF as of 20 October 1970. Agencies receiving the FAEF were Headquarters, Armament Development and Test Center (AFSC); Directorate of Foreign Technology; CG, Third U. S. Army; CG, Fourth U. S. Army; USCONARC; USAEPG (2); ECAC; Frequency Coordinator, White Sands Missile Range; Area Frequency Coordinator, State of Arizona; CG, U. S. Army Air Defense Center; Electronic Defense Laboratories; and USASA. Figure C-3 is a sample of the FAEF listing for the Army.

A change was made to the FAEF index format as a result of a letter from the ACSC-E to the customers requesting suggested changes. The change permits easy identification of each J/F-12 with the cognizant service; the J/F-12 numbers are listed sequentially by service (Army, Navy, Air Force). One J/F-12 number may appear as many as three times, which means the allocation concerns all three services. The revised FAEF index is shown in figure C-4.

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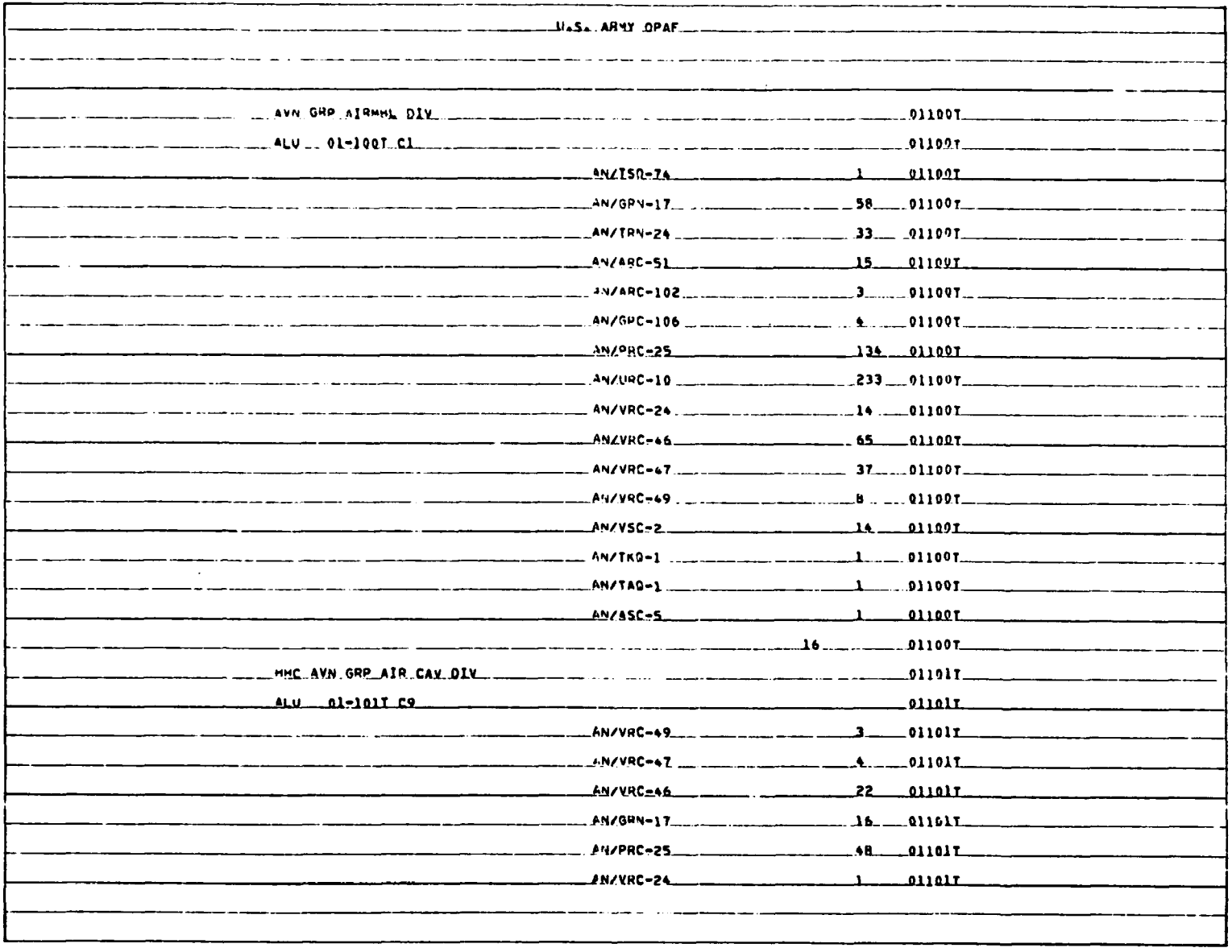

U.S. ARMY OPAF

AVN GRP AIRMBL DIV			01100T
ALO 01-100T C1			01100T
	AN/ISQ-74	1	01100T
	AN/GRN-17	58	01100T
	AN/TRN-24	33	01100T
	AN/ARC-51	15	01100T
	AN/ARC-102	3	01100T
	AN/GRC-106	6	01100T
	AN/PRC-25	134	01100T
	AN/URC-10	233	01100T
	AN/VRC-24	14	01100T
	AN/VRC-46	65	01100T
	AN/VRC-47	37	01100T
	AN/VRC-49	8	01100T
	AN/VSC-2	14	01100T
	AN/TKQ-1	1	01100T
	AN/TAQ-1	1	01100T
	AN/ASC-5	1	01100T
		16	01100T
HHC AVN GRP AIR CAV DIV			01101T
ALO 01-101T C9			01101T
	AN/VRC-49	3	01101T
	AN/VRC-47	4	01101T
	AN/VRC-46	22	01101T
	AN/GRN-17	16	01101T
	AN/PRC-25	48	01101T
	AN/VRC-24	1	01101T

Figure C-1. U. S. Army Organization Platform Allowance File Listing

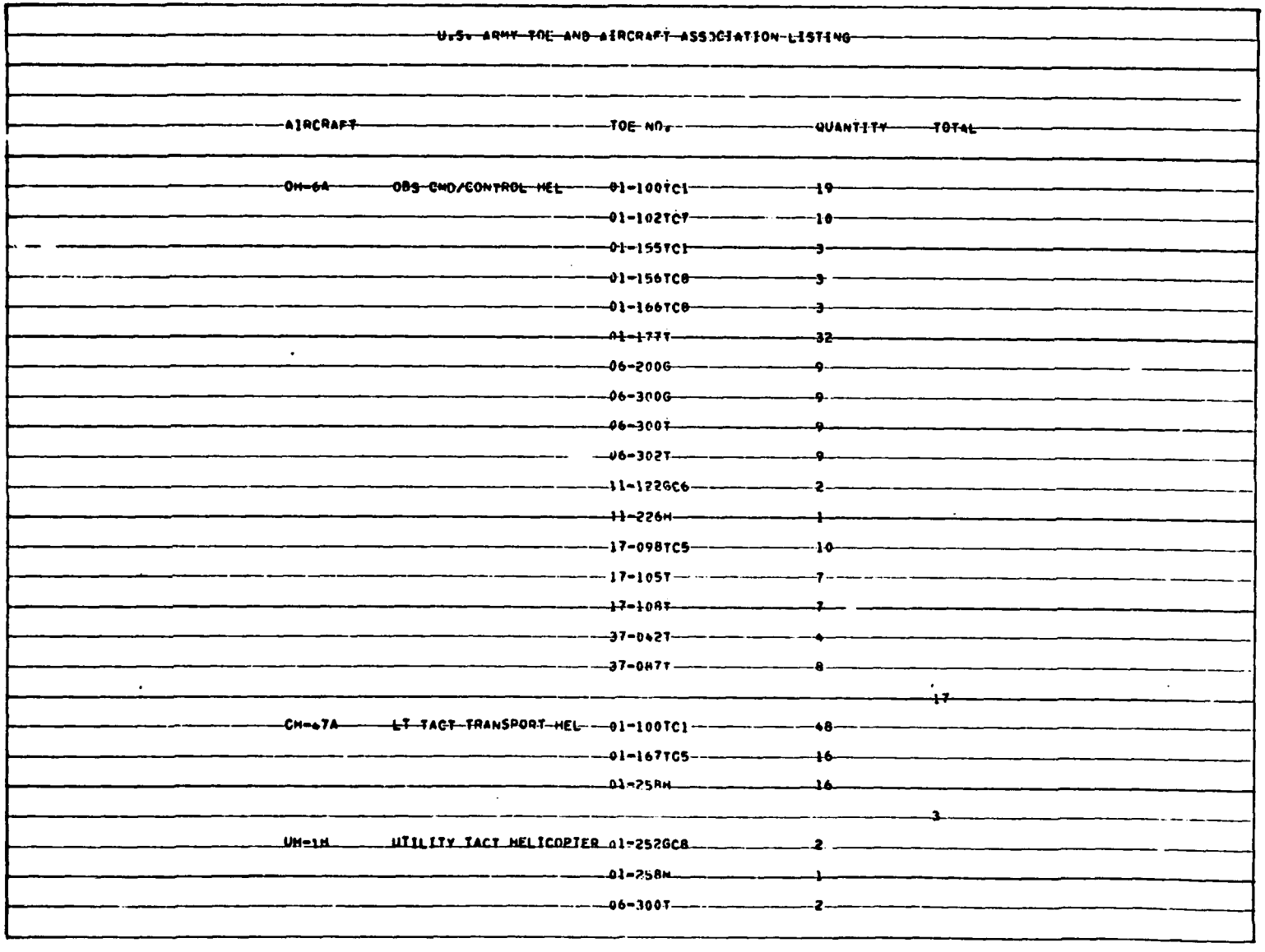

Figure C-2. U. S. Army TOE and Aircraft Association Listing

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FREQUENCY ALLOCATION TO EQUIPMENT FILE (ARMY)

ALLOC FREQ	1710-1850 MC/S	PREV ALLOC	J/F 12/1689
JFP NUMBER	J/F 12/1689/3	A/O COMMENT	AVAILABILITY OF FREQUENCY ASSIGNMENTS IN
EQUIP NOMEN	AN/DSQ-6007 SCORING SET MISS ROCKETS		A GIVEN 10 MC/S PORTION OF THE
CGGN AGENCY	AIR FORCE, ARMY (ECOM)		1710-1850 MC/S BAND SHOULD BE INVEST-
FUNCTION	CW DOPPLER RADAR TO DETERMINE MISS		IGATED PRIOR TO INTRODUCTION OF THIS
	DISTANCE BETWEEN AERIAL TARGET		EQUIPMENT IN ANY GEOGRAPHICAL AREA
	TRANSMIT INFORMATION TO GROUND		PROCUREMENTS SHOULD BE LIMITED TO THE
PURPOSE	USED FOR R AND D AND OPERATIONAL		NUMBER INTENDED FOR USE AT THOSE RANGES
	EVALUATION OF AIR-TO-AIR MISSILE		WHICH HAVE INDICATED AVAILABILITY OF
	SYSTEMS FIRED AT TOW TARGETS AND DRONES.		FREQUENCY ASSIGNMENTS. KNOWN REQUIRE-
	DOUBLE SIDEBAND SUPPRESSED CARRIER IS		MENTS FOR EACH APPROVED LOCATION ARE
	XMTD. DUAL RCVR RECEIVES, DETECTS		LISTED BELOW WITH THE FREQUENCY BANDS
	DOPPLER AND MEASURES PHASE DIFFERENCE,		WHERE IN ASSIGNMENTS ARE AVAILABLE AT
	TELEMETERS TO GROUND DATA AS DISTANCE		EACH LOCATION.
	VERSUS TIME		RANGE FREQUENCY BANDS TO USE
OPR ENVIRMT	TO BE USED IN R AND D AND OPERATIONAL DRONE		TYNDALL AFB 1710-1721 MC/S 200/YEAR
	TOW TARGET SYSTEMS		TYNDALL AFB 1710-1781 MC/S 200/YEAR
GEOG AREAS			TYNDALL AFB 173[illegible] MC/S (SPOTS) 200/YEAR
EVALUATE	NOTS CHINA LAKE, CALIF AFMDC HOLLOMAN		TYNDALL AFB 1752 MC/S (SPOTS) 200/YEAR
	AFB, N MEX APGC, EGLIN AFB, FLA		TYNDALL AFB 1798 MC/S (SPOTS) 200/YEAR
OPR USE	AIR DEFENSE COMMAND WEAPONS CENTER		TYNDALL AFB 1818 MC/S (SPOTS) 200/YEAR
	TYNDALL AFB, FLA AND ALL NATIONAL		TYNDALL AFB 1838 MC/S (SPOTS) 200/YEAR
	SERVICE TEST RANGES		EGLIN AFB 1710-1721 MC/S 20/YEAR
NUMBER EQPT			EGLIN AFB 1770-1780 MC/S 20/YEAR
INITIAL	10		EGLIN AFB 1732 MC/S (SPOTS) 20/YEAR
OPR USE	200 (PER YEAR FOR 5 YEARS)		EGLIN AFB 1752 MC/S (SPOTS) 20/YEAR
ONE AREA	1 (INITIALLY, BUT EVENTUALLY TACTICS		EGLIN AFB 1798 MC/S (SPOTS) 20/YEAR
	MAY REQUIRE OPERATION OF SEVERAL		EGLIN AFB 1818 MC/S (SPOTS) 20/YEAR
	SIMULTANEOUSLY)		EGLIN AFB 1838 MC/S (SPOTS) 20/YEAR
TARGET DATE			EDWARDS AFB 1775-1785 MC/S UNKNOWN
OPR AVAIL	7/63-(CONTINUING DEVELOPMENT)		WSMR 1719-1729 MC/S 5/YEAR
OPERATION	10/65		HOLLOMAN AFB 1719-1729 MC/S 25/YEAR
SPECT SGNR	NO		NOTING THAT THE SUBJECT DEVICE HAS
REMARKS	THE TRANSMITTED SIGNALS FROM THE AIR-		LIMITED TUNING FLEXIBILITY, THE PANEL
	BORNE SENSOR UNIT CONSISTS OF 2 SIDE-		RECOMMENDS THAT AN EFFORT BE MADE TO
	BANDS SPACED 1.2295 MC/S EITHER SIDE OF		INCORPORATE INCREASED TUNING FLEXIBILITY
	THE CENTER (CARRIER) FREQUENCY. THE		IN FUTURE SCORER DEVELOPMENTS
	RESULTANT PHASE DIFFERENTIAL (EXTRACTED	TRANSMITTER	
	FROM THE DIFFERENCE IN DOPPLER SHIFT AT	TUNE RANGE	1710-1850 MHZ
	THE 2 SIDEBAND FREQUENCIES) PROVIDES	INSTALL	TDU-9/B, TDU-19B, TDU-22A/B TOW TARGETS
	THE MISS-DISTANCE INFORMATION WHICH IS		BQM-34 DRONE CIM-10A TARGET DRONE
	TELEMETERED TO THE GROUND STATION. EACH	POWER AVG	70 MILLI W
	EQUIPMENT IS CAPABLE OF TUNING THROUGH	POWER PEAK	NOT AVAILABLE
	A 10 MC/S PORTION OF THE 1710-1850 MC/S	POWER PEP	NOT AVAILABLE
	BAND. EQUIPMENT MAY BE PROCURED TO	TYPE EMISS	AO
	OPERATE IN ANY PARTICULAR 10 MC/S	EMISS B/W	
	SEGMENT OF THE 1710-1850 MC/S BAND WITH	-3 DB	2.5 MC/S
	NO ADDITIONAL COST AT THE TIME OF	-20 DB	5 MC/S
	MANUFACTURE	OTHER	CARRIER AND UNUSED SIDEBANDS 18 DB BELOW
DATE APPRVD	27/05/66		70 MILLI W
OPR W/OTHER	YES	FILTER B/W	
TYPE ALLOC	OPERATIONAL	-3 DB	NOT AVAILABLE
COORD REQD	NONE	-20 DB	NOT AVAILABLE
EXTENT USE	USE IS INTERMITTENT ON R AND D	-60 DB	NOT AVAILABLE
	OPERATIONAL RANGES ON A SCHEDULED BASIS	STABILITY	.05 PCT (AFTER 1 MIN WARMUP, B PLUS

Figure C-3. Frequency Allocation to Equipment File (Army) Listing

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FAEF J/F-12 NUMBER INDEX

SOMT JFP NO	CLASS	ALLOCATED FREQ	EQUIPMENT NOMENCLATURE	PAGE 0045 PAGE	AGENCY
12/2764/1	U	1.435-1.535 GHZ	CONDOR MISSILE TELEMETRY	1063	NAVY
12/2765/1	U	1.435-1.535 GHZ	UHF TELEMETRY EQUIPMENT(UHF-100)	1064	NAVY
12/2767/1	U	2.7-2.9 GHZ	ASR-7 AIR SURVEILLANCE RADAR	1140	AIRFORCE
12/2767/1	U	2.7-2.9 GHZ	ASR-7 AIR SURVEILLANCE RADAR	1065	NAVY
12/2768/1	U	1-600 KHZ	357 MOD COMM ELECTRONICS INC (CEI) RCVR	1067	NAVY
12/2769/1	U	30-1000 MHZ	COMM ELECTRONIC INC RS-111-16-1R RCVR 357	1068	NAVY
12/2770/1	U	1.435-1.54 GHZ	1040 TELE-DYNAMICS TELEM TX DEI 1037G RX	1069	NAVY
12/2751/1	U	10.2-10.2 MHZ 11.33-11.33 MHZ 13.6-13.6 MHZ	AN/ARN-0099(XN-1) OMEGA NAVIGATION RECEIVER	1071	NAVY
12/2752/1	U	4-30 MHZ	AN/SMQ-0004(XN-1) OCEANOGRAPHIC BUOY RADIO	1072	NAVY
12/2753/1	U	2.2-2.3 GHZ	RESEARCH ROCKET TELEM CONIC CTM-UHF-305	1073	NAVY
12/2754/1	U	31-42 MHZ	AN/FRC-0143 COMMUNICATIONS EQUIPMENT	1075	NAVY
12/2755/1	U	132-150.8 MHZ	AN/FRC-0144 COMMUNICATION EQUIPMENT	1076	NAVY
12/2756/1	U	132-150.8 MHZ	AN/VRC-0068 COMMUNICATIONS EQUIPMENT	1078	NAVY
12/2757/1	U	31-42 MHZ	AN/VRC-0077 COMMUNICATION EQUIPMENT	1080	NAVY
12/2758/1	U	132-150.8 MHZ	AN/PRC-0091, 91A COMMUNICATIONS EQUIPMENT	1081	NAVY
12/2759/1	U	225-399.95 MHZ	AN/URC-0067 TRANSCEIVER	1083	NAVY
12/2760/1	U	225-399.95 MHZ	AN/URC-0069 TRANSCEIVER	1085	NAVY
12/2761/1	U	132-150.8 MHZ	U43MSN 1160 MOBILE TRANSCEIVER (MOTOROLA)	1087	NAVY
12/2762/1	U	132-150.8 MHZ	43UEN M/A PORTABLE RADIO SET (MOTOROLA)	1088	NAVY
12/2763/1	U	132-150.8 MHZ	L43MBH AM CONSOLETTE BASE STATION (MOTOROLA)	1090	NAVY
12/2764/1	U	40-90 MHZ	VHF EXPERIMENTAL PULSE RADARS	1162	AIRFORCE
12/2765/1	U	2.7-2.95 GHZ	VEGA MODEL 1075 BEACON TRANSMITTER	1164	AIRFORCE
12/2766/1	U	13-16 GHZ	JERROLD MODEL JMT 1316	1166	AIRFORCE
12/2767/1	U	296.6-296.8 MHZ	UHF TRANSMITTER-RCVR, MCDONNELL SCD 52-85710	1166	AIRFORCE
12/2768/1	U	15.016-15.016 MHZ	HF XMTR-RCVR MCDONNELL SCD 52-85710	1170	AIRFORCE

UNCLASSIFIED

Figure C-4. Frequency Allocation to Equipment File Index

NOT REPRODUCIBLE

5. Updated FAEF Tape

The first of three updates to the FAEF tape was submitted to the ACSC-E on 27 October 1970. This update included all data received by the EDCPF since 16 June 1970. The next update to the FAEF is scheduled for 1 March 1971, with the third and last update for the current contract due on 30 June 1971.

6. Documentation and Duplicate Files

Progress on the computer program documentation effort is continuing on schedule. All programs are now system-oriented and are contained in the CEESS, DBMUS, GRADS, and MICS.

Program card decks imaged in the COSY tape format are being updated as changes are made. Master data tapes are being copied as they are changed or developed. Nineteeen duplicate tapes were sent to the USAEPG for duplicate storage on 6 November 1970.

7. EMETF Cosite Interference Levels Task

Support to the EMETF continued on this task during the second quarter. During a conference between the USAEPG, EMETF and EDCPF on 18 December 1970 it was determined that the 17 hours of computer time thus far expended would be all that is required by the EMETF on the CDC 3300 computer except for 1½ hours to be provided by 8 January 1971.

8. Random Access Discrete Address (RADA) System

The Program Support Plan (PSP) has been rewritten and is being coordinated with the USAEPG for comparison with the Program Requirements Document now being rewritten by the USAEPG. The PSP will be forwarded to the ACSC-E after the coordination has been completed early in the next report period.

9. Threat Assessment and Control Receiver Study

Because the meeting scheduled in August 1970 between Dalmo Victor and the EDCPF did not take place, a letter was dispatched to Dalmo Victor on 2 December 1970 requesting information as to any existing requirement for the requested data. A letter was received from Dalmo Victor on 9 December 1970 stating that the requirement for data still exists and that confirmation of clearances of their employees who will visit the EDCPF in support of the information will be submitted in the near future. A Program Support Plan will be prepared during the coming meeting and forwarded to ED for approval.

10. EDCPF Data Base Support to a Cost Effectiveness Analysis of TACSATCOM

In September a task was initiated to support the USACDCCEA in an analysis of the cost effectiveness of TACSATCOM. The support required was to provide data on TACSATCOM candidate nets in a two-corps environment, battalion level and above, for the field army, COMMZ, and an independent corps. The data was presented in three categories. Category 1 provided all candidate nets

with a mean link distance of 40 kilometers or greater. Category 2 provided all candidate nets with a mean link distance of greater than 60 kilometers. Category 3 provided all candidate nets without regard to mean link distance. The data also included items such as net identification number, net title, distance between the most widely separated transmitter and receiver within a specific net (maximum link distance), mean distance between transmitters and receivers within a net, number of stations within a net, and nomenclatures of the types of equipment within a net. The data requirement for the field army, including a matrix to support the delivery, was completed on 23 October. The final delivery of the data for the independent corps was made on 29 October.

11. Surveillance, Target Acquisition and Night Observation (STANO)

In October an effort was initiated to enter the STANO equipment into the fixed files. A request was forwarded to the Defense Documentation Center (DDC) for a bibliography search on STANO and ISTANO to assure that the latest and most valid documentation could be requisitioned to support this update to the fixed files. Upon receipt of the bibliography a request was forwarded to DDC to obtain the appropriate documentation. In the meantime STANO equipments authorized in current TOE's have been added to the Equipment Authorization File as required. Unattended ground sensors were added to the ASTRO division deployment data to provide a representative mix of phase III type sensor equipments. Entries in the EAF will be modified as required as basis of issue and other information is received. A STANO conference in Washington, D. C. on 14 December 1970 was attended by members of the EDCPF.

12. Communications Systems Diagrams, Field Army, Theater Army, Tactical Air Force, and Theater Air Force

On 16 October 1970 full size sepia copies of the Theater Army and Field Army Communications Systems Diagrams were provided to the USACDCCEA. Reduced 8½"x11" diagrams of the Tactical Air Force and Theater Air Force were also delivered at this time. Reduced size drawings of all previously delivered diagrams were delivered on 23 October 1970.

13. Data Transfer Study Report

A report was developed in October for the ED which presented the planned spectrum occupancy of a U. S. future time frame force model. The report which was to be used in a spectrum study associated with the cancellation of the MALLARD program included a bibliography of reports on digital data transmission rates and emission bandwidths for the MALLARD C-E equipments, a technical note on differential phase envelope keying (DPEK), modulation data rate and bandwidth requirements, and a spectrum occupancy table. The spectrum occupancy table contained the types of U. S. C-E equipments planned for the future time frame field army and technical characteristics of each. The following data elements were given for each equipment type: equipment nomenclature, use or service, component nomenclature, modulation type, tuning range, bandwidth (-3db RF bandwidth), number of components in the force structure, and the number of communication nets planned. The table was displayed in various sorts for ease of use as follows: tuning range, equipment nomenclature, use or

service and modulation type. The delivery of this data was made on 3 November 1970.

14. EDCPF Antenna Codes

A listing of all antenna codes was retrieved from the EDCPF codebook and provided to the USAEPG on 23 October 1970.

15. Deployment Data for Electromagnetic Compatibility Test of the M60A1E2 Tank

In October, preliminary planning and coordination with USAEPG and EMETF was initiated in anticipation of providing the required EDCPF support in accordance with the final Program Requirements Document to be published by USAEPG. The background environment to be prepared in support of this task is being created to include three austere infantry (mechanized) divisions composed of recent T-series TOE's and includes the tactical air and nondivisional elements normally expected to be found in the division areas. Included in these units are the corps field artillery groups, self-propelled HAWK battalions, medical, hospital and evacuation units, corps surveillance and transport aircraft units, and ASA, chemical, civil affairs, military intelligence and engineer units. Units outside the division boundaries required to complete communications nets are simulated. The environment is being oriented along a FEBA in contact with the enemy environment which was delivered toward the end of FY 70.

The T-series TOE's used in this deployment have been modified to provide a mix of 36 105mm gun tanks and 18 152mm gun/missile tanks per tank battalion, based upon this same mix provided in the proposed H-series TOE's. Proposed H-series TOE's for the Sheridan-equipped armored cavalry squadrons were not available; therefore, the T-series TOE's were modified to include a Shillelagh subsystem with each armored reconnaissance airborne assault vehicle (Sheridan).

16. STRATCOM, COMMZ ADA, and Theater Air Communications Systems Diagrams

On 28 October full scale sepia copies of the STRATCOM, COMMZ ADA, and Theater Air Communications Systems Diagrams together with 8½" x 11" reduced copies, and vugraph projection transparencies were forwarded to the ACSC-E.

17. Net File Data

Information on the EDCPF net file was prepared and forwarded to the USAEPG on 30 October 1970. The data required by the USAEPG included a listing of the net file, a net comparison and net conversion card deck listing, and net conversion card deck. This data was required to update the EMETF Interference Prediction Model data base files. Figures C-5 and C-6 are samples of the listing.

18. Provision of Threat Data to Support Westinghouse TACSATCOM

The coordinates of the enemy EW jammers in the CE-EW-75 deployment

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NET DATA FILE

1=SEC	3=NET TYPE	4=NET DESCRIPTION	5=P	6=MOD	7=FREQ-LO	8=FREQ-HI	9=RESTRICTIONS
	15024	MP BN CMD NET FM	KY57	33	00030000	00075950	
	15025	PSYOP BN CMD NET FM	KY57	33	00030000	00075950	
	15026	QM PETROL OPN BN CMD NET FM	KY57	33	00030000	00075950	
	15027	QM PETROL SUPT BN CMD NET FM	KY57	33	00030000	00075950	
	15028	SIG CONST BN CMD NET FM	KY57	33	00030000	00075950	
	15029	SIG CMD OPNS BN CMD NET FM	KY57	33	00030000	00075950	
	15030	SIG MULTICHAN BN CMD NET FM	KY57	33	00030000	00075950	
	15031	SIG CABLE CONST BN CMD NET	KY57	33	00030000	00075950	
	15032	SIG SUPT BN CMD NET FM	KY57	33	00030000	00075950	
	15033	AHEA SIG BN CMD NET FM	KY57	33	00030000	00075950	
	15034	ARMY CMD SIG OPNS BN CMD NET	KY57	33	00030000	00075950	
	15035	ARMY MULTICHAN/RAD BN CMD FM	KY57	33	00030000	00075950	
	15036	SIG BN CMD NET FM	KY57	33	00030000	00075950	
	15037	SPEC FORCES BN CMD NET FM		33	00030000	00075950	
	15038	SUP/TRANS BN CMD NET FM		33	00030000	00075950	
	15039	SUP/SVC BN CMD NET FM		33	00030000	00075950	
	15040	SUPT BN CMD NET FM		33	00030000	00075950	
	15041	TANK BN CMD NET FM	KY57 P	33	00030000	00075950	
	15042	TRANS AIR TRANS BN CMD NET	KY57	33	00030000	00075950	
	15043	TRANS MTR TRANS BN CMD NET	KY57	33	00030000	00075950	
	15044	TRANS TERM BN CMD NET FM	KY57	33	00030000	00075950	
	15045	VULCAN/CHAP BN CMD NET FM	KY57 P	33	00030000	00075950	
	15046	MSL MAINT BN CMD NET FM		33	00030000	00075950	
	15047	ADA BN MAINT CMD NET FM		33	00030000	00075950	

Figure C-5. Net Data File Listing

NOT REPRODUCIBLE

NOT REPRODUCIBLE

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NET FILE COMPARISON TABLE

OLD NET	OLD NET DESCRIPTION	OLD MOD	OLD NET FREQ RANGE LOW	HIGH	NEW NET	NEW NET DESCRIPTION	NEW MOD	NEW NET FREQ RANGE LOW	HIGH
00001	THEATER ARMY CP	11	00000001	00000001	00001	THEATER ARMY CP	11	00000001	00000001
00002	AF COMPONENT CMD POST/AFCCP/	11	00000001	00000001	00002	AF COMPONENT CMD POST/AFCCP/	11	00000001	00000001
00003	AF TAC AIR CONTROL CTR/TACC	11	00000001	00000001	00003	AF TAC AIR CONT CENTER/TACC/	11	00000001	00000001
00004	TA GP HQ CP	11	00000001	00000001	00004	TA GP HQ CP	11	00000001	00000001
00008	ARMY MAIN CP	11	00000001	00000001	00008	ARMY MAIN CP	11	00000001	00000001
00009	ARMY ALTERNATE CP	11	00000001	00000001	00009	ARMY ALTERNATE CP	11	00000001	00000001
00010	ARMY REAR CP	11	00000001	00000001	00010	ARMY REAR CP	11	00000001	00000001
00011	ARMY FORWARD CP	11	00000001	00000001	00011	ARMY FORWARD CP	11	00000001	00000001
00012	AF CONTROL REPORTING CTR/CRC	11	00000001	00000001	00012	AF CONT REPORTING CNTR/CRC	11	00000001	00000001
00013	FASCOM MAIN CP	11	00000001	00000001	00013	FASCOM MAIN CP	11	00000001	00000001
00014	FASCOM ALTERNATE CP	11	00000001	00000001	00014	FASCOM ALTERNATE CP	11	00000001	00000001
00015	CONTROL REPORTING POST/CRP	11	00000001	00000001	00015	AF CONT REPORTING POST/CRP	11	00000001	00000001
00016	CORPS MAIN CP	11	00000001	00000001	00016	CORPS MAIN CP	11	00000001	00000001
00017	CORPS ALTERNATE CP	11	00000001	00000001	00017	CORPS ALTERNATE CP	11	00000001	00000001
00018	CORPS ARTY CP	11	00000001	00000001	00018	CORPS ARTY CP	11	00000001	00000001
00019	CORPS FORWARD CP	11	00000001	00000001	00019	CORPS FORWARD CP	11	00000001	00000001
00020	AF DIRECT AIR SUPT CENT/DASC	11	00000001	00000001	00020	AF DIRECT AIR SPT CENT/DASC/	11	00000001	00000001
00021	AF FWD AIR CONT POST/FACP	11	00000001	00000001	00021	AF FWD AIR CONT POST/FACP/	11	00000001	00000001
00022	DIVISION MAIN CP	11	00000001	00000001	00022	DIVISION MAIN CP	11	00000001	00000001
00023	DIVISION ALTERNATE CP	11	00000001	00000001	00023	DIVISION ALTERNATE CP	11	00000001	00000001
00024	DIVISION REAR CP	11	00000001	00000001	00024	DIVISION REAR CP	11	00000001	00000001
00025	DIVISION FORWARD CP	11	00000001	00000001	00025	DIVISION FORWARD CP	11	00000001	00000001
00026	SUPPORT COMMAND CP	11	00000001	00000001	00026	SUPPORT COMMAND CP	11	00000001	00000001
00027	DIVISION ARTILLERY CP	11	00000001	00000001	00027	DIVISION ARTILLERY CP	11	00000001	00000001
00028	BRIGADE MAIN CP	11	00000001	00000001	00028	BRIGADE MAIN CP	11	00000001	00000001
00029	BRIGADE ALTERNATE CP	11	00000001	00000001	00029	BRIGADE ALTERNATE CP	11	00000001	00000001
00030	BRIGADE TRAINS CP	11	00000001	00000001	00030	BRIGADE TRAINS CP	11	00000001	00000001
00031	BRIGADE FORWARD CP	11	00000001	00000001	00031	BRIGADE FORWARD CP	11	00000001	00000001
00032	REGT MN CP	11	00000001	00000001	00032	REGT MN CP	11	00000001	00000001
00033	REGT ALT CP	11	00000001	00000001	00033	REGT ALT CP	11	00000001	00000001
00035	GROUP MAIN CP	11	00000001	00000001	00035	GROUP MAIN CP	11	00000001	00000001
00036	GROUP ALTERNATE CP	11	00000001	00000001	00036	GROUP ALTERNATE CP	11	00000001	00000001
00037	BATTALION CP	11	00000001	00000001	00037	BATTALION CP	11	00000001	00000001
00038	SQUADRON CP	11	00000001	00000001	00038	SQUADRON CP	11	00000001	00000001
00039	COMPANY CP	11	00000001	00000001	00039	COMPANY CP	11	00000001	00000001
00040	TROOP CP	11	00000001	00000001	00040	TROOP CP	11	00000001	00000001
00041	BATTERY CP	11	00000001	00000001	00041	BATTERY CP	11	00000001	00000001
00042	DETACHMENT CP	11	00000001	00000001	00042	DETACHMENT CP	11	00000001	00000001
00051	CENTER CP	11	00000001	00000001	00051	CENTER CP	11	00000001	00000001
00052	LAB CP	11	00000001	00000001	00052	LAB CP	11	00000001	00000001
00053	DEPOT CP	11	00000001	00000001	00053	DEPOT CP	11	00000001	00000001
00054	HOSPITAL CP	11	00000001	00000001	00054	HOSPITAL CP	11	00000001	00000001
00055	TAC AF AIR BASE CP	11	00000001	00000001	00055	TAC AF AIR BASE CP	11	00000001	00000001
00056	TAC AF AIR SUPT RADAR TEAM	11	00000001	00000001	00056	TAC AF AIR SPT RADAR TEAM	11	00000001	00000001
00057	TAC AF CMBT CONTROL TEAM	11	00000001	00000001	00057	TAC AF CMBT CONTROL TEAM	11	00000001	00000001
00058	TAC AF TAC AIRCTL PARTY/TACP	11	00000001	00000001	00058	TACAF TACAIR CONT PARTY/TACP	11	00000001	00000001
00059	TAC AF AFCCP	11	00000001	00000001	00059	TAC AF AFCCP	11	00000001	00000001
00060	TAC AF THEATER HQ CP	11	00000001	00000001	00060	TAC AF THEATER HQ CP	11	00000001	00000001

Figure C-6. Net Data File Comparison Table Listing

were forwarded to the ECOM on 30 November 1970.

19. FAEF/AERF Listing (220-405 MHz)

On 6 November 1970 a retrieval was made from the FAEF and AERF on equipments falling in the 220-405 MHz band for use by the USAEPG. The listing contained all information found on the J/F-12 frequency allocations. The retrieval was also made from the AERF since some equipments are not covered by an allocation.

20. Onsite Coordination with CECAA Programmer/Analysts

Two programmer/analysts from the CECAA visited the EDCPF during the week of 16 November 1970. The purpose of the visit was to (1) define the scope of the program conversion effort, (2) identify potential problem areas and provide recommendations to facilitate the conversion effort, (3) establish a sequence of the conversion process, (4) determine what alternatives and/or factors were considered in the approach to problem solution, for instance, file structure, program logic, and so forth, (5) obtain an understanding of the interdependency of programs and their relative importance, and (6) provide continuity of service. The support provided included an initial briefing on the operations of the EDCPF with emphasis on the various computer programs.

21. MICS Test Tapes

The MICS files were prepared and forwarded to the CECAA. Father and son master MICS files, together with a glossary file, were forwarded on 17 December 1970.

APPENDIX D

EMCP MANAGEMENT INFORMATION AND CONTROL SYSTEM (MICS)

During the report period the MICS data base was updated and modified to better serve system users. The MICS data base currently contains approximately 1,200 records. The following were the primary sources of the update information:

1. DA Form 1774-R (Army RDTE Status Report)
2. Frequency Allocation Actions and Lists
3. Minutes of AMC Technical Committee Meetings
4. Army Force Development Plan (AFDP)
5. Test Programs, USATECOM, and MASSTER

These sources were reviewed to insure that the MICS data base would reflect the current life cycle status of the C-E materiel development programs. Minimum effort was expended in reviewing program data sheets as they are updated on an annual basis and have already been examined in detail.

The composition of individual MICS reports was improved to include a cover sheet and a "Glossary of Terms and Abbreviations." Individual data sheets with a MICS report were modified as follows:

1. Lines of heading, as well as the lines of data of each report are numbered when displayed. The specific line number of the displayed data relates to the line number in the heading. This correlation facilitates reading of data in the report.

2. Line 2 of each record may be displayed twice when required. This option would be used when any field within Line 2 contains multiple items of data. Examples of such fields are:

   CDOG References by Paragraph
   Related Projects/Tasks by Number

3. Suppress line of record in display when no data is present.

Additional fields or elements of data were added to the MICS data base to include the following:

1. Army Strategic Operational Plan (ASOP) Priorities
2. ACSFOR Priorities
3. EDCPF Workload
4. Time Frame when proposed concept/equipment would be implemented

Data regarding ASOP and ACSFOR priorities were added to the data base to assist in determining priority ratings for EMC tasks when scheduled. In addition, several changes were made in life cycle events displayed in MICS

reports in order to accomplish the following:

1. Take maximum advantage of life cycle data contained in program data sheets and other documentation reviewed for input to the MICS.

2. Better identify status of C-E materiel programs contained in the MICS in terms of their materiel life cycle.

During this period the MICS data base was expanded to reflect TACOMAP projects/tasks, the EDCPF workload, and EMETF test programs. TACOMAP projects/tasks include such equipments as nonradiating devices such as wire, terminal equipment, and so forth. These items are being added to the MICS so that it may be more responsive to overall tactical communications requirements. Detailed information regarding the EDCPF workload and EMETF test programs has been added to the MICS so that the MICS can better address specific tasks which are the responsibility of ACSC-E and USATECOM. The EDCPF workload and EMETF test program efforts have been included under Task Number 1E665701D615. These two efforts were included under this number to simplify retrieval of data for correlation purposes.

During the report period MICS reports were provided to the following DA offices:

1. Electronics Directorate, ACSC-E
2. TACOMAP Office, ACSC-E
3. CECAA, ACSC-E
4. Program Control Office, Headquarters, AMC
5. Electronics Testing Directorate, Headquarters, USATECOM
6. EW Office, Headquarters, USAECOM

MICS reports provided to the above offices varied in size of report and type of information provided. Contents ranged from retrievals of the entire data base to limited retrievals of data on such programs as:

1. Avionics
2. Electronic Warfare
3. Tactical Communications
4. USAMC Projects/Tasks
5. EMC analysis requirements for time frame FY 71 through FY 76

In addition, PERT/Time and PERT/Cost reports were prepared for ACSC-E as requested.

APPENDIX E

DEVELOPMENT OF NEW C-E ENVIRONMENTS

1. Enemy-75 CAA and Front

This deployment required updating of some of the previously prepared deployment data, and the additional deployment of a large number of newly structured units. The environment for newly structured units was prepared by a combination of the pinpoint and the controlled distribution techniques.

The previously prepared deployment data for all equipments and systems organic to the divisions in contact along the FEBA was updated by computer processing techniques in order to resequence the troop number identities of all units in conformity with an organized sequence applicable to an integrated deployment of all units in the Front. This update also included a parallel change of discrete net numbers assigned to all components operating in nets which are internal to these divisions. Approximately 2100 additional components in these divisions along the FEBA require update by manually prepared input for each individual record in order to establish net number identity with external nets generated by the newly structured units.

The newly structured units are identified as:

a. All ground combat divisions (eight) in a second echelon or reserve role;

b. All non-divisional elements of the Combined Arms Armies (CAA), the Tank Armies, and the Front, exclusive of those employed in a distinct electronic warfare role; and

c. All elements normally included in the tactical air complement considered organic to a deployment of this magnitude.

The call cards and controlled distribution cards for every newly structured unit, down to company level, were keypunched and computer processed during the report period. Each controlled distribution card contained a map coordinate for the command post of the unit represented and the control data governing distribution of the C-E components comprising the unit's inventory. From among the total inventory of components deployed by controlled distribution, approximately 16,000 were displayed on tactical data sheets for pinpoint consideration of vehicle positions resulting from the controlled distribution processing. The tactical data sheets included those components generally categorized as multichannel communications terminals and relays, airborne equipments, ground based radar, and equipments employed by such exemplified personnel as liaison officers and forward observers who are normally resident at some significant position away from their parent unit.

The CD-107 series of documents published by the USASA CDA provided basis for much of the fixed file content which was contained in this deployment. This series is currently in process of republication, and will contain

some updated data. The EDCPF has requested copies of this series, as soon as the republication has been completed.

The EDCPF requested in September a copy of sanitized extracts from the CD-76 series of documents, and from the CD-73 document. Recent information indicates that the category of classification of the CD-76 series precludes EDCPF acquisition, and that the CD-73 data can be expected sometime during the next report period. During this report period the EDCPF received a copy of the November 1968 publication, "A Type Soviet Army Front 1970-75. A Handbook in Support of the USACDC" (U). The handbook and attached change documents provided an excellent basis for verification of the troop list prior to initiation of deployment processing.

A visit was made to the USASACDA during early December to determine the validity of EDCPF assignment of frequencies. These frequencies, as assigned, were considered to be in consonance with currently governing criteria.

Tactical overlays have been prepared and reproduced for:

a. All units and CP fragments in the Front, down to and including regimental level, at a scale of 1:250,000.

b. Each of the five ground combat armies, down to company level, at a scale of 1:50,000.

c. All multichannel links in the Front, exclusive of the divisional organic systems, and all known users served by multichannel terminals, at a scale of 1:250,000.

2. Two-Corps Environment (1971-1973)

This deployment evolved from the effort which had been expended during the preceding quarter in the preparation of a two-corps MALLARD background environment. This approach was adopted to most economically convert the results of MALLARD efforts to a valid application in this deployment.

The MALLARD background deployment geometry, as required by the user, is illustrated in figure E-1. The UTM map coordinates for each of the approximately 2,400 company and separate detachment size units in the MALLARD area had been manually recorded, and were considered to be equally valid for like-type units in the two-corps deployment. Similarly, the controlled distribution data for the MALLARD background units had been recorded and keypunched, and were considered valid for like-type units in the two-corps deployment.

Early in this report period, T-series TOE's for all elements of the infantry (mechanized) division base and normally attached maneuver battalions were received at the EDCPF. These TOE's were indicated as applicable to the Army Strategic and Tactical Reorganization Objectives (ASTRO). These TOE's were added to the fixed files, and the two-corps troop list was updated by substituting ASTRO divisions for the 2nd infantry, the 3rd infantry (mechanized), and the 5th infantry (mechanized) divisions shown in figure E-1.

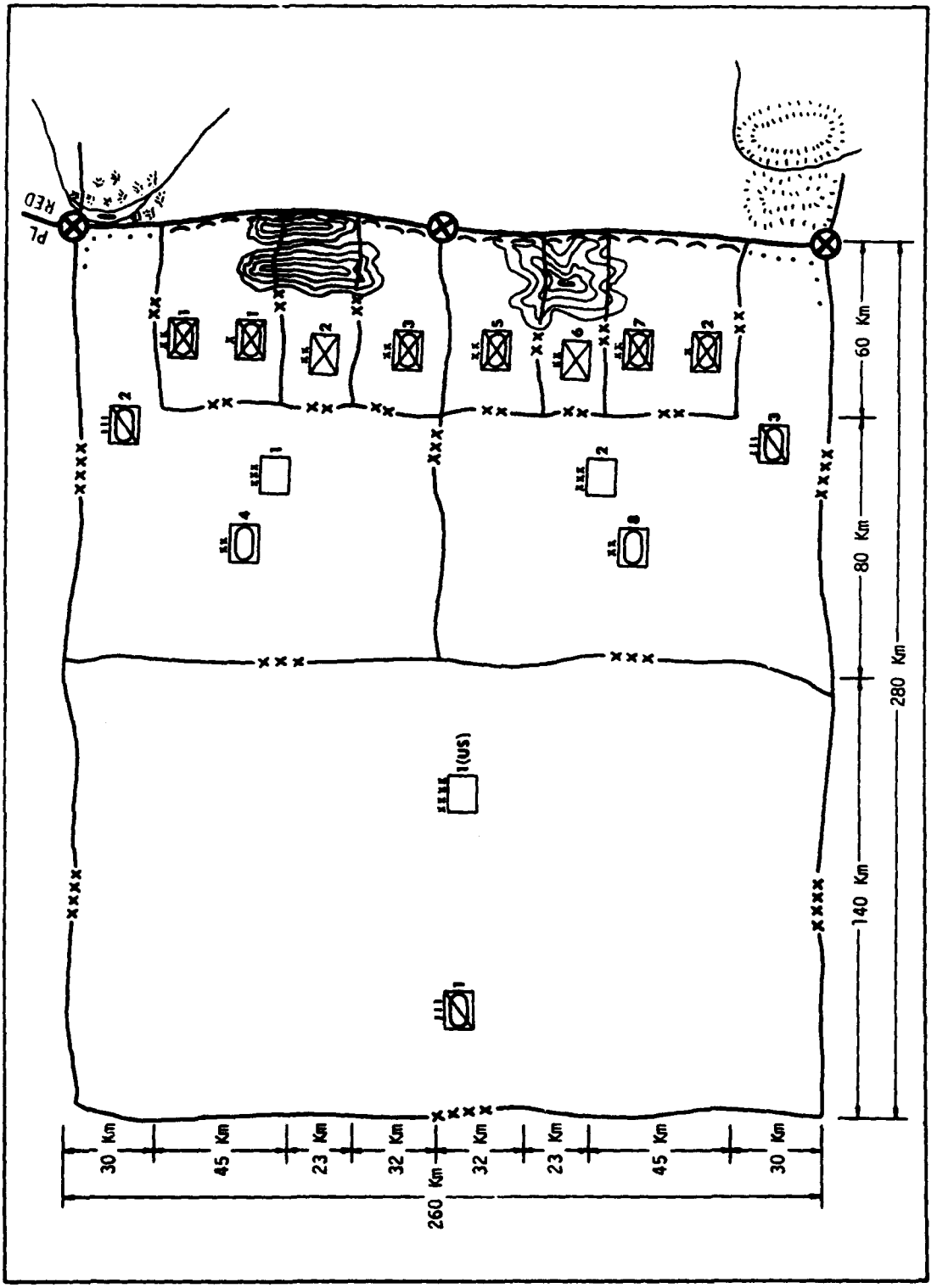

Figure E-1. Disposition of Major Field Army Elements

Minor updates were made to the controlled distribution data cards to fulfill certain positional requirements for units in the M60A1E2 tank deployment task (paragraph 15, appendix C).

Subsequent to commitment to this approach, Organization and Equipment List (OEL) tapes of TOE data were received at the EDCPF. The OEL data content indicated applicability of newer H-series TOE's for certain non-divisional units normally tenant in the division areas. The fixed files and controlled distribution data applicable to those few units deployed to support the M60A1E2 task were updated, and deployment processing to support the M60A1E2 task (ASTRO divisions) was initiated. Concurrently, H-series TOE data were extracted from OEL tapes in updating of all other fixed files required to support the two-corps deployment. Fixed file updates will be completed, and deployment effort will be resumed early in the next report period.

This deployment will be prepared by a combination of the pinpoint and controlled distribution techniques, followed by application of the deployment projection technique in order to create coincidence of the friendly force FEBA with the irregular trace of the enemy force FEBA.

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13. ABSTRACT

This report summarizes the work accomplished during the period 1 October 1970 through 31 December 1970 by the Environmental Data Collection and Processing Facility (EDCPF).

A summary of the tasks assigned to the EDCPF is given and the progress and status of these tasks are outlined. The tasks covered are: project management and general support; operation, maintenance, and enhancement of the C-E Environmental Simulation System, the General Retrieval and Display System, and the Data Base Maintenance and Update System; operational support as directed by the ED; frequency management support provided to the ED by the Washington Engineering Group; development of a Management Information and Control System; updating of data base files for the U. S. and opposing forces; development of new C-E environments; and conferences attended by EDCPF personnel.

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Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Electromagnetic Compatibility Frequency Allocation Frequency Assignment Information Retrieval Management Information System C-E Environments						

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