**DOI 55-1**

**HEADQUARTERS**

**33d AIR DIVISION**

CHAPTER I

ORGANIZATION

1-1. General. This chapter outlines the organization of 330PM and specifies responsibilities within the 33d Air Division. (See Annex A)

1-2. Responsibilities. The Chief, 33d Operational Program Maintenance will be responsible for the proper functioning of 330PM. He will assign programmers to each of the duties specified in paragraph 1-3.

1-3. Programmer Coordinator Duties. The following duties will be assigned as additional duties to programmers assigned to 330PM.

a. Program Coordinator. This programmer will be responsible for coordinating all programming activities. He will assign additional duties based on programmer areas of responsibility and current workload. He is the direct representative of the Chief, 330PM and the focal point of all programming activities. All incoming programming information is distributed by him or through him to the programmer concerned. He is responsible for assigning programmers to special projects and other duties such as Analysis Reports, SAGE Program Change Requests, trouble shooting and testing functions. He will provide assistance to programmers as required based on programming priorities. The Program Coordinator will be directly responsible for providing the Chief, 330PM, with all information pertinent to the operation of 330PM. He will be responsible for editing all version descriptions.

b. Tape Load Coordinator. This programmer will be responsible for coordinating all tape load activities. He will provide written directives describing in detail the procedures to be followed in loading SUOP tapes. He will update these procedures as required. The Tape Load Coordinator will schedule all tape load activities through the Program Coordinator. The Tape Load Coordinator will be familiar with all Program Coordinator duties and will perform the duties of the Program Coordinator in his absence.

c. Initial Conditions Coordinator. This programmer will be responsible for coordinating all Initial Conditions changes. He will provide written directives describing in detail the procedures to be followed in updating Initial Conditions (Chapter 6). He will maintain a master file of Initial Conditions and will provide this file for tape load as required.
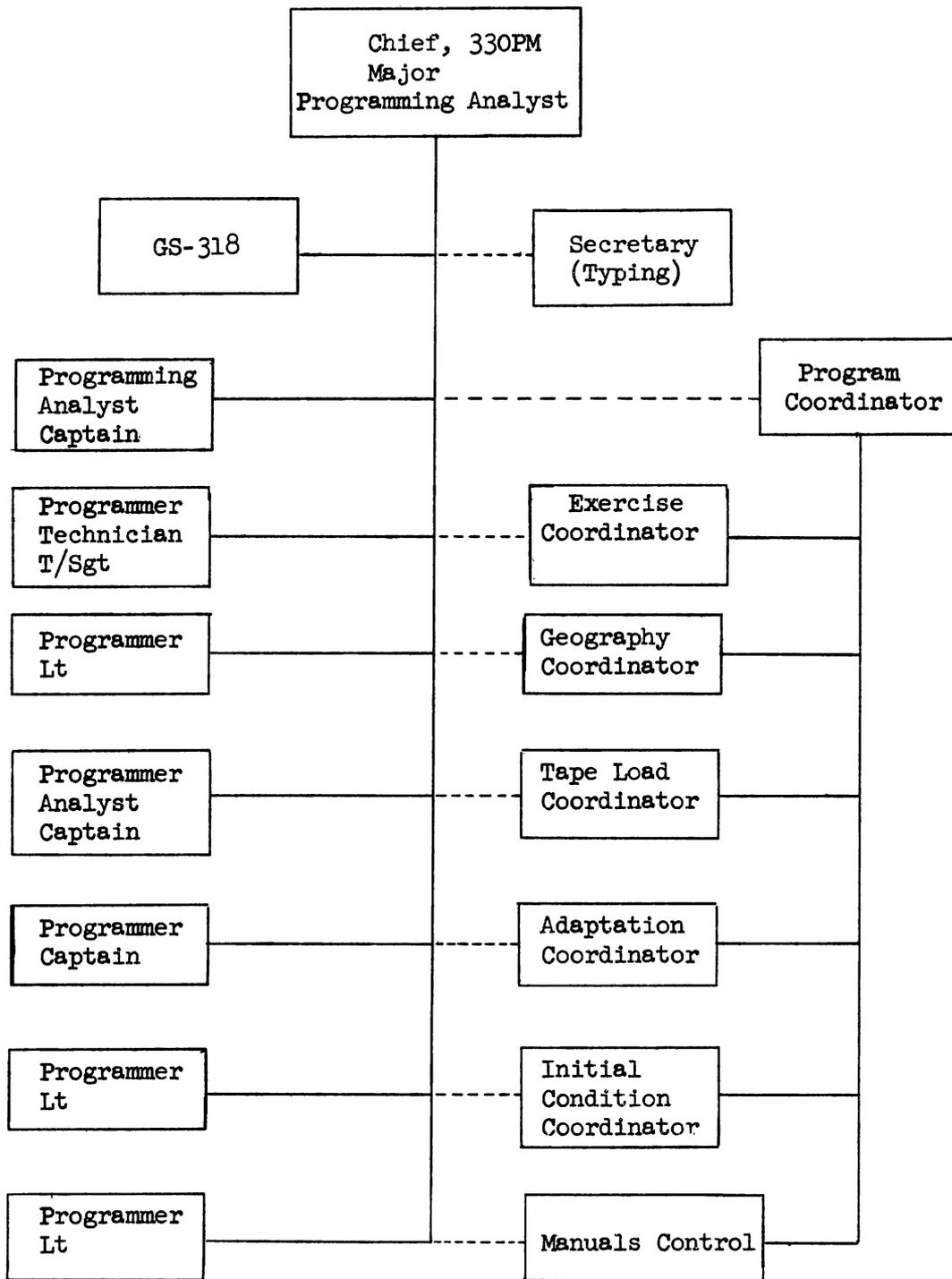
d. Adaptation Coordinator. This programmer will be responsible for coordinating all Adaptation updates. He will provide written directives describing in detail the procedures to be followed in updating Adaptation. (Chapter 6) He will maintain a master file of Adaptation and provide this file for tape load as required.

e. Geography Coordinator. This programmer will be responsible for coordinating all Geography changes. He will provide written directives describing in detail the procedures to be followed in updating Geography. (Chapter 6) He will maintain division Geography and provide updated Geography as required.

f. Exercise Coordinator. This programmer will be responsible for supervising all division exercises. He will maintain a file of all exercise information by month and will coordinate Exercise Monitor duties with the Program Coordinator. The Exercise Coordinator will insure that a programmer is assigned to each division exercise. He will maintain a file of all data obtained in connection with exercises. The Exercise Coordinator will generally be the programmer that is assigned to the SPARS program. He will be well qualified in the operation of the simulation program and be thoroughly familiar with TBS operation.

g. Manuals Control Officer. One officer will be assigned duties as Manuals Control Officer. He will be responsible for maintaining all division manuals. He will also inspect division manuals quarterly to insure completeness and currency. He will submit a quarterly report on the status of division manuals to the Chief, 330PM. The Non-Commissioned Officer will be the Assistant Manuals Control Officer and will be thoroughly familiar with security regulations and control procedures.

1-4. Administrative Duties. The 330PM Administrative Section will consist of the Secretary and the NCOIC. The NCOIC will supervise and control 330PM supply ordering and maintenance. The Secretary is delegated authority to act for the Chief, 330PM in all matters pertaining to 330PM administrative functions. The Secretary will be responsible for the accuracy and appearance of all 330PM correspondence. The Secretary will also maintain 330PM BUIC manuals and all administrative files.

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                          ┌─────────────────────┐
                          │    Chief, 330PM      │
                          │       Major          │
                          │ Programming Analyst  │
                          └──────────┬──────────┘
                                     │
     ┌──────────────┐                │           ┌──────────────┐
     │   GS-318     │────────────────┼ ─ ─ ─ ─ ─ │  Secretary   │
     │              │                │           │  (Typing)    │
     └──────────────┘                │           └──────────────┘
                                     │
     ┌──────────────┐                │                              ┌──────────────┐
     │ Programming  │                │                              │   Program    │
     │ Analyst      │────────────────┼ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ │ Coordinator  │
     │ Captain      │                │                              └──────┬───────┘
     └──────────────┘                │                                     │
     ┌──────────────┐                │           ┌──────────────┐          │
     │ Programmer   │                │           │  Exercise    │          │
     │ Technician   │────────────────┼ ─ ─ ─ ─ ─ │ Coordinator  │──────────┤
     │ T/Sgt        │                │           └──────────────┘          │
     └──────────────┘                │                                     │
     ┌──────────────┐                │           ┌──────────────┐          │
     │ Programmer   │                │           │  Geography   │          │
     │ Lt           │────────────────┼ ─ ─ ─ ─ ─ │ Coordinator  │──────────┤
     └──────────────┘                │           └──────────────┘          │
     ┌──────────────┐                │           ┌──────────────┐          │
     │ Programmer   │                │           │  Tape Load   │          │
     │ Analyst      │────────────────┼ ─ ─ ─ ─ ─ │ Coordinator  │──────────┤
     │ Captain      │                │           └──────────────┘          │
     └──────────────┘                │                                     │
     ┌──────────────┐                │           ┌──────────────┐          │
     │ Programmer   │                │           │  Adaptation  │          │
     │ Captain      │────────────────┼ ─ ─ ─ ─ ─ │ Coordinator  │──────────┤
     └──────────────┘                │           └──────────────┘          │
     ┌──────────────┐                │           ┌──────────────┐          │
     │ Programmer   │                │           │  Initial     │          │
     │ Lt           │────────────────┼ ─ ─ ─ ─ ─ │  Condition   │──────────┤
     └──────────────┘                │           │ Coordinator  │          │
                                     │           └──────────────┘          │
     ┌──────────────┐                │           ┌──────────────┐          │
     │ Programmer   │                │           │              │          │
     │ Lt           │────────────────┴ ─ ─ ─ ─ ─ │Manuals Control│─────────┘
     └──────────────┘                            └──────────────┘
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CHAPTER 2

## COMPUTER SCHEDULING

2-1. General. Monthly master SAGE computer time schedules are made up and distributed by 33MGE-WC. Schedules are normally finalized in a computer scheduling meeting that is conducted approximately three weeks prior to the effective date of the schedule. Requests for computer time should be made to the 330PM Computer Scheduling Officer no later than the 1st week of the month preceeding the month in which time is desired. These requests are required if programming requirements require more time than normally scheduled. Computer time that is normally allotted to 330PM may be coordinated within 330PM as the need arises.

2-2. Responsibilities. The Chief, 330PM will assign one programmer as Computer Scheduling Officer. This programmer will perform ALL coordination between 330PM and 33MGE-WC, pertaining to computer scheduling. Upon receipt of the monthly master computer schedule, the Computer Scheduling Officer will publish a Programming Team Computer Schedule, based on the time allocated to 330PM.

2-3. Scheduled Computer Time. All team members will comply with the published computer schedule. If it is not possible to adhere to the published schedule, r if it becomes apparent that there is no need for a scheduled block time, ᴜhe Computer Scheduling Officer will be notified immediately. Team members are authorized to exchange scheduled block times among themselves, or arrange for substitute users, however, the Computer Scheduling Officer will be notified ɔf all deviations to the published schedule.

2-4. Unscheduled Computer Time: If it becomes necessary for a team member to acquire computer time in excess of the published schedule allocation, a request for extra time will be given to the Computer Scheduling Officer. Where possible, the Computer Scheduling Officer will meet requests for more computer time from the 330PM master schedule allocation. If this is not possible or practical, the Computer Scheduling Officer will request additional time from 33MGE-WC.

2-5. Priorities. Requests for computer time for testing and correcting problem reports will take precedence over the published schedule. Team members requiring computer time for problem checkout will notify the Computer ᒼcheduling Officer/Program Coordinator. The Program Coordinator will determine ᴜae priority level of the request, and take action to meet the request, if necessary.

2-6. Records. At the end of each month, a copy of the master computer time schedule, attached to a copy of the Program Team Computer Schedule will be filed in the Office of Program Maintenance. Both schedules will be annotated with all changes that occured during the month. Schedules will be kept on file �²or a minimum of twelve months.

CHAPTER 3

MATERIAL CONTROL

3-1. General. This chapter outlines procedures to maintain control of the tapes, plugboards, control cards and card decks available to the 330PM programmers.

3-2. Responsibilities.

a. The Program Coordinator will assign one programmer to initially set up and monitor the tape files located in the computer maintenance room.

b. The assigned programmer will establish the stated tape files as prescribed in Annex A to this chapter. He will further monitor to ensure that the procedures outlined below are being followed.

3-3. Procedures.

a. Tapes:

(1) The assigned programmer will initially set up the tape file cabinet in the computer room as per Annexes A and B, respectively.

(2) He will spot check the cabinets at frequent intervals to ensure that tape order is being maintained.

(3) Any additions or deletions to the master tape file will be coordinated with the programmer responsible for tape control.

b. Plugboards: Operational plugboards, test memory and printer, will be labeled 330PM and stored in the plugboard storage area in the computer room.

c. Cards:

(1) Each programmer will be assigned a drawer in the card cabinet located in the 330PM office area. Programmers who have been assigned coordinator duties such as Adaptation, Initial Conditions, Geography, etc. which require large storage areas will be assigned additional drawers as required. The Tape Load Coordinator will control assignment of card storage areas.

(2) The card cabinet located in the computer room will be used for control cards and card decks necessary for computer operation. Drawers used for other purposes will be labeled with the programmer's name. Programmers will coordinate the use of card cabinet drawers with the Tape Load Coordinator.

CHAPTER 3 - ANNEX A

## TAPE CABINET SET UP

1. Eleven cabinets located in the computer room are available for 330PM use. Seven of these cabinets will be co-assigned to programmers for tapes used in special projects, emergency and test change processing etc. These cabinets will be labeled A-F and the programmer name will be tagged on the cabinet door in addition to the label.

2. Two cabinets will be used for tape preparation and be marked Tape Load (SUOP) and Tape Load (Support Systems). The SUOP cabinet is for use by the Tape Load Coordinator. The Support Systems cabinet is for use by support systems programmers. Specifically, these are assigned to Adaptation, Geography, SPARS, GIANT, RUN and UNISIM. This cabinet will contain basic support system tapes and geography DLO tape in addition to SPARS for support system development.

3. Two cabinets will be retained for use by all programmers. These will be marked Masters-Current Version and Masters-History respectively. Specific content and handling of tapes in these lockers is contained in Annex B of this chapter.

4. One cabinet will be marked Spare Blanks/Parity Tapes and contain any spare or parity tapes on hand. Programmers will use this cabinet for replacements needed in their own or OPM cabinets.

CHAPTER 3 - ANNEX B

MASTER'S FILES - CONTENT AND HANDLING PROCEDURES

I  Content

    A.  The Master - Current Version file will contain 17 slots as follows:

        1.  Maintenance Master

        2.  4 File Master (Orig)

        3.  4 File Master (copy 1)

        4.  Combined Adaptation

        5.  Binary Adaptation

        6.  Binary Geography

        7.  UNISIM (Adapted)

        8.  SPARS (Adapted)

        9.  RUN (Adapted)

      10.  GIANT

      11.  COSEAL

      12.  Load/Version (Orig)

      13.  Load/Version (Copy 1)

      14.  Load/Version (Orig)

      15.  Load/Version (Copy 1)

      16.  Load/Version (Orig)

      17.  Load/Version (Copy 1)

    B.  The Masters-History file will contain 17 slots as follows:

        1.  Maintenance Master

        2.  4 File Master

        3.  Combined Adaptation

        4.  Binary Geography

        5.  Last SUOP Version/Subversion to cycle

ANNEX - B

6.  UNISIM (Adapted)

7.  SPARS (Adapted)

8.  RUN (Adapted)

9  _16 Repeat of 1-8

17.  GIANT

II.  Handling

    A.  Handling of tapes between the Current and History files will be
performed by the assigned programmer only.  When tapes are moved into the
current files those being replaced will be moved into the history file as
their contents dictate.  For example:  If V45 is current then V44 and V43
(or their latest subversion tapes) would occupy the history file.  When
V46 became current V45 tapes would replace the history containing V43 tapes,
thus the latest tapes are always retained.  Sub-version loads normally re-
quire only shifting of SUOP DCA sub-version tapes into the current file by
the Tape Load Coordinator.  Should more than two sub-versions be produced,
the programmer assigned tape control should be notified of a requirement
    shift tapes between current and history files.

    B.  Two-man control:  To assure constant two-man control, all DCA
tapes will contain a tape control label number in addition to a tape
verification label.  This number will be logged by the Program Coordinator.
Removal or exchange of labels will require approval of the OPM Chief and his
assistant, or in their absence, two qualified programmers.  Tampering with
these labels will be considered a violation of 330PM Nuclear Safety Verifi-
cation procedures and will be reported to the Chief, 330PM by anyone sus-
pecting or detecting tape control label number or certified label alterations.

CHAPTER 4

DOCUMENT CONTROL

4-1. General.  Programmers assigned to 330PM will utilize common documentation wherever possible.  This chapter does not pertain to documentation, official or unofficial which is a part of individual professional libraries.

4-2. Responsibilities.

a.  Document control for the Programming Team will be accomplished by the Manuals Control Officer.  The Manuals Control Officer will coordinate with the Chief, 330PM to ensure that the documentation needs of the Programming Team are fulfilled.

b.  The Chief, 330PM, will apprise the Manuals Control Officer of the documentation needs of the Programming Team.

c.  Team members will inform the Chief, 330PM, of documentation needs over and above normal distribution.

d.  Each programmer will maintain documentation for the Programming Team IAW the procedures outlined below.

4-3. Storage.  Programming team documentation will be retained in ringed binders, and stored in cabinets within the Programming Team Office.  Binders removed from storage cabinets will be returned to the storage area use.

4-4. Labelling, Numbering of Master Volumes.  330PM Master Volumes will be clearly labeled as Master Volumes, Volume ___ of ___Volumes.  The Manuals Control Officer will designate 330PM Volumes that are to be designated and maintained as Master Volumes based on distribution allotments for 330PM. The Manuals Control Officer will designate individual Programmers that are to receive and maintain copies of Master Volumes.  In all cases, Master Volumes will be labeled as Master Volumes and will be maintained in an up-to-date status at all times.  Volumes other than Master Volumes such as Individual Reference Manuals will be clearly marked "Reference Only".  Designating volumes as Reference Only will alert programmers that the material may not be up-to-date.

4-5. Document Control.

a.  All documentation will be initially received by the administrative section of 330PM.  Items of interest to the programming team will be forwarded through the Program Coordinator.  If the Program Coordinator determines that an item is to be placed in a specific binder, it will be noted at the top of the routing slip prior to being sent to the programming team members.  If no filing notation is made, and a member of the programming team desires that an item be placed in a specific binder, that member will make the proper annotation at the top of the routing slip.  When the Manuals Controls Officer receives the document through distribution, he will file it or have it filed in the appropriate binder.

b. Anytime a document is removed from a binder, a red card, stored in the steel cabinet, will be inserted at the place of removal. The document removed, along with the individual's initials will be noted on the card. When the document is replaced, the red card will be removed from the binder the annotation marked out, and the card replaced in the storage box.

4-6. New Version Documentation. Documentation pertaining to a new version will be handled separately from all other distribution.

a. The Chief, 330PM, and the Program Coordinator will be notified immediately upon receipt of all new version documentation.

b. New version documentation will be logged in on a special inventory form, unique to that numbered version. The documentation will be stored as designated by the Program Coordinator. In the case of data pertaining to area notebooks, documents will be inserted in existing binders, behind current information.

c. Information pertaining to past versions will not be deleted from binders until after the effective date of a new version, and then only upon permission of the Program Coordinator. Documentation removed from binders will not be destroyed without the expressed permission of the Program Coordinator.

4-7. Requests for Documentation. Requests for new, or additional documentation will be directed to the Secretary.

4-8. Team Publication. The Secretary will handle publication of all documents produced by the programming team.

CHAPTER 5

COMMUNICATIONS

5-1. **General**. This chapter outlines communications procedures of an official nature.

5-2. **Procedures**.

    a. **Policy Making**: Authority to conduct external communications of a policy making nature rests with the Chief, Office of Program Maintenance.

    b. **Within 33d Air Division SAGE Complex**: Team members are authorized to conduct communications with all agencies within the 33AD SAGE Complex while performing duties related to program maintenance.

    c. **Lateral Units (CC Teams and DC Teams)**: Team members are authorized to conduct communications with all lateral units while performing duties related to program maintenance.

    d. **270PT**: Team members are authorized to conduct communications with 270PT while performing duties related to program maintenance.

    (1) Team members will notify the Chief, 330PM, prior to initiating all telephone calls to 270PT.

    (2) All telephone communications with 270PT, regardless of place of initiation, will be recorded in the Telephone Communications Log, located in the Secretary's office. The information to be recorded is as follows:

        (a) Date/Time.

        (b) Team member's name.

        (c) Individual contacted/Place.

        (d) Nature of call.

    e. **Air Defense Command**: Team members will conduct communications with ADC only after obtaining approval from the Chief, 330PM. Recording procedures specified in paragraph 4-2d(2) above apply.

    f. **Santa Monica**: Team members will conduct communications with all agencies at Santa Monica only after obtaining approval from the Chief, 330PM, to communicate with an agency at Santa Monica, the Chief, 330PM, will be notified prior to initiating the call. Recording procedures specified in paragraph 4-2d(2) above apply.

CHAPTER 6

PROCESSING INITIAL DATA, ADAPTATION AND GEOGRAPHY

6-1. General: Prior to the receipt of the Maintenance Master Tape from the Test and Acceptance Agency, TAA, it is the responsibility of the assigned programmer(s) to ensure that the adaptation binary tape and initial data and geography decks for the 33d Air Division are completed for the initial tape load.

6-2. References:

      a. TM-3255/001/00Z - Standard Direction Center Adaptation Guide

      b. TM-3255/003/00 - Standard Direction Center Initial Conditions Guide.

      c. TM-3010 - FAST User's Manual

      d. TM-3233/001/00 - COSEAL Utility System User's Manual

      e. TM-820/010/00 - Enviromental Data Guide

6-3. Responsibilities:

      a. The Chief, 330PM, will assign programmers to the areas of adaptation, initial data and geography. This assignment may be in addition to other area assignments for those programmers.

      b. The programmers assigned the areas of adaptation, initial data and geography are responsible for the calculation, testing and documentation for these areas. They are also responsible for the structure and currency of those card decks necessary for initial data and geography.

      c. Team members will ensure that no changes are made to either the initial data deck, geography deck or adaptation tape without notifying the assigned Program Coordinator.

6-4. Procedures:

      a. Calculating and Testing:

         (1) Initial Data:

            (a) The assigned programmer should use the following documents for adaptation and initial conditions.

               1 Calculations:

                  a TM-3255/001/00Z - Standard Direction Center Adaptation Guide

<u>b</u>  TM-3255/003/00 - Standard Direction Center
Initial Conditions Guide.

<u>2</u>  Sources of Environmental Data:

<u>a</u>  TM-820/103 - Region/Division Centers.

<u>b</u>  TM-820/106 - Airbase and Squadron Data.

<u>c</u>  TM-820/107 - AADCP Data

<u>d</u>  TM-820/613 - Unique to Site - Ft Lee AFS

(Note:  For some calculations COSEAL's YVG can be used.)

(b)  Upon the completion of the initial data calculations,
the existing initial data deck will be updated.  (Note:  The deck is updated
using procedures outlined in Annex A to this chapter.)  The Tape Load
Coordinator (TLC) will be advised that the initial data is ready for the
initial tape load.

(c)  After the initial tape load, the printout will be checked
to ensure that all the initial data was loaded correctly.

(2)  Adaptation:

(a)  Specific coordination responsibilities:

<u>1</u>  Coordinate with the Tape Load Coordinator to establish
a cutoff date for all adaptation inputs for the tape load.

<u>2</u>  Maintain the adaptation combined tape using the COSEAL
function.

<u>3</u>  Assigning the work load as required on each programmer.

<u>4</u>  Conduct a briefing period for version contents and
adaptation.

(b)  Requirements for adaptation changes.

<u>1</u>  Changes in environmental or physical factors are ac-
quired through canvassing of directorates, Operations Plans, Aerospace Defense
Command, Air Force Headquarters teletyped information, and a keen awareness
of what environmental factors influence adaptation.

<u>2</u>  Adaptation changes resulting from redesign normally
come by way of SPC, AR, PC, TC, and EPC documents.  The Phoenix Release
Documents, TM-LS-123/XXX/XX, summarizes these documents but is complete up
to a certain date.

(c) Authorization for adaptation changes.

$\underline{1}$ Values to be used for adaptation are contained in the TM (ADC)820/XXX/XX series. When adaptation values contained in this series are altered, either due to a change or addition, authorization must be obtained from the controlling agency (ADC or Air Force) as listed in TM ADC)820/000/XX. This authorization is normally in the form of a letter from the Director of Operations who has the delegated authority from First Air Force to approve Air Force controlled adaptation. ADC adaptation is authorized upon receipt of the military teletype for ADC Headquarters. Often, adaptation changes which result from programs redesigned do not require an alteration, except for perhaps format, in the TM(ADC) series. These changes do not require further authorization for implementation.

(b) In the past, adaptation workshops had the authority to make necessary changes in adaptation. This is not the normal means of gathering adaptation information.

NOTE: See Annex B to this chapter for detailed adaptation procedures.

(3) Geography:

(a) TM-3233/001/00, User's Manual COSEAL Utility System and the same sources as listed for initial data should be used in the preparation of geography.

(b) Upon completion of the geography deck for the version, the COSEAL subsystem GEO will be used to generate the binary geography tape which will be used as an input to the version initial tape load. This binary tape will be filed in the Tape File Cabinet in the Computer Room. A printout of the geography load will be obtained, and after being checked it will be given to the TLC for filing in the Tape Load Log Binder. (NOTE: Geography procedures are outlined in Annex B to this chapter.)

b. Changes to Initial Data and Geography:

(1) Required by New Versions:

(a) Changes to existing data which are reflected in the release document will be coded and inserted in the respective deck. Loading, verifying and test changes will be as in 4a(1) and (2) above.

(b) Procedures for requesting data changes and reporting data documentation errors are contained in ADCM 55-32 and ADCM 55-33, respectively.

CHAPTER 6 - ANNEX A

INITIAL DATA PROCEDURES

1. Introduction - Initial data are those items and tables in permanent core or used during precycle which are preset on the Master tape by use of ETS. These items and tables consist of the following types:

    a. Data which must be set to an assigned value for correct operation of the Air Defense Program. The value of these items may depend on the configuration of the Division but are independent of the environment.

    b. Data which must be set to a value which depends on the Division environment.

    c. Data which is set as a convenience to the operational crew.

Initial data, although more static than adaptation, is less tractable. It is often times difficult to recognize the ramifications a program change may have on initial data settings. Also, problems arise because initial data tables and items can not be easily related to any single program and there is often a question of individual responsibility.

2. Compendium of Initial Data - A guide to initial data, TM-3255/003/XX, has recently been made available. This document contains directions on how to code the values. It also lists those items which must be set. There is no guarantee that items set for convenience only will be included, inasmuch as they vary greatly between divisions; however, some attempt has been made to include them. There is no document, as the TM-820 is for adaptation, providing information on specific value settings for the 33d Division.

3. Recognition of Required Change - Cognizance of necessary changes in initial data of the type that must be set will ordinarily be obtained through the version release document. However, due to the difficulty mentioned above in relating program changes to a required initial data change, this line of communication has frequently failed. To avoid overlooking these changes and to recognize how environmental or program changes can affect initial data of the "convenience" type, requires that the programming shop be keenly aware of which items are set and why they are set. Also, to advise Operations on how initial data can be used to support their activities; i.e., initial status settings available for masking, height finders, forwardtell etc, requires a thorough knowledge of the purpose and mechanics of initial data.

ANNEX A

4. <u>Procedures</u> - The methods listed chronologically are those presently used for the loading and handling of initial data.

a. After a required change is recognized, its operational impact is explained to the affected personnel and a date for installation is set.

b. The necessary change cards are coded and tested using the ETS function of FAST during a test mode of startover. All initial data cards are coded using item values and not by table. This will make them compool independent and easier to maintain; i.e., you do not have to be concerned that the item may be moved within the table or put into another table. Also, the cards should be well commented to provide a more readable printout during tape load.

c. For a version load, the tested cards are inserted directly into the initial data deck. This deck, kept properly marked in the card filing cabinet, is arranged alphabetically by item. The entire deck is loaded during the first version load. The control card specifies "Clear All" thereby removing all items preset by Phoenix except those mentioned in the version release document. These items which can not be cleared can have their values overridden by overloading.

d. For a subversion load, only the cards changing initial data need be loaded and the "Clear All" option for ETS is not used. It is important that the loaded cards be inserted into the initial data deck after loading. Failure to do this may result in the change being overlooked on the next version load.

e. Upon completion of the load, the deck is returned to its proper location. The listing remains part of the version load listing which is filed in the version notebook. To obtain a value for an initial data item requires not only looking at the version load list but also through the subversion loads.

2

CHAPTER 6 - ANNEX B

ADAPTATION PROCEDURES

1. Methods for loading adaptation.

    a. Adaptation Sources

        (1) The basic source for the division's adaptation is a COSEAL format combined adaptation tape. This tape is ordered so that the mode adaptation programs (TRA, TRB, TRN, YXA, YXB, and YXN) are the first records and the remaining programs are in alphabetical order. This is done for ease in bookkeeping and tape manipulation. The 33d does not have a completed card deck of adaptation, at least three combined tapes from past versions and associated SYC update decks of adaptation are filed as a backup. This is the only means of recovering from tape parties on the present version of adaptation.

    b. Initial adaptation load (Mtape)

        (1) When adaptation is loaded onto the intial Phoenix release tape, the past version combined tape is reassembled using symbolic corrector cards to install any needed changes. The product of this COSEAL assembly is a binary tape, an updated combined tape, and an assembly listing of adaptation (DLO). The corrector cards are used to update the backup combined tape; the binary tape will be used as the input source for adaptation during the DCA tape load (M tape); the updated combined tape becomes the new source for the division's adaptation, and the assembly listing is filed in the version release notebook. When adaptation programs are e ᵈled, deleted, or have a change in their number of registers, the combined tape requires updating using the COSEAL ADAPT function.

    c. Final area adaptation.

        (1) Final area adaptation is kept separate from other adaptation and loaded directly onto DCA using program SYC (usually by the Tape Load Coordinator). A deck of final area adaptation is maintained and updated as soon as possible after the 'M' tape load. The Phoenix Tape Release document, TM-LS-123/XXX/XX, lists the final area adaptation requirements for the version. Final area adaptation usually exists because adaptation registers have not been reassembled with associated programs and/or compools by SDC personnel at Santa Monica.

    d. Other adaptation loads.

        (1) After the initial load has been made, it may be necessary to change additional adaptation, i.e., subversion loads. A few adaptation corrections normally do not warrant the effort needed to obtain a reassembled binary tape. The correctors are then loaded directly onto DCA using symbolic format (SYC). It is important to note that these symbolic cards must be eventually loaded onto the combined tape either during or prior to the next adaptation assembly. Failure to do this results in those correctors possibly

ANNEX B

being overlooked in the next DCA load which uses a binary tape for input adaptation. The combined tape is the basic source of division adaptation and requires close control. A good procedure is essential. Closely check the COMDOC and the Analytical Compendium for psuedo programs and DCA programs for starting core location which is expressed as relative starting core location in the Analytical Compendium and the length of the block of adaptation values in each program. (See f.(1) )

(2) The Adaptation Coordinator will direct the team's efforts in preparing adaptation for the DCA tape load in coordination with the Program Coordinator. A time will be established for the Adaptation Coordinator to turnover a Binary Output Tape for the Tape Load Coordinator's DCA load. Each programmer with a DCA area responsibility has to insure the changes in adaptation in his area are coded and punched. These cards are the Adaptation Coordinators assurance the adaptation programs are okay. He should always recheck the coding, starting core location, and the length of the program.

e. Use the following procedure for an adaptation load onto a Phoenix release tape.

(1) Determine the adaptation requirements for a tape load and assure the Phoenix tape release document or message(s) reflect this.

(2) Assign and reassign the task of producing the adaptation to the responsible programmer(s) and assure an even work load, ie., some areas will have little or no changes.

(3) Update the combined tape prior to the reassembly, if necessary. The types of changes requiring updating are:

(a) An adaptation program is added or deleted. (eg. POS 2R)

(b) The number of registers of the adaptation program already on the combined tape is changed, (COSEAL delete)

(c) The end card of one of the tape adaptation programs is altered:

<u>1</u>  C  END  XX  05D T06 for tape correctors OR

<u>2</u>  END  XX  for card inputs.

(4) Assure the final area adaptation is complete and accurate. This deck is kept separately in a well marked slot in the division's card filing cabinet(s) and is used on the 'N' tape DCA load or following load.

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(5)  Perform a COSEAL assembly of the combined tape.  The prepared corrector cards will be used for this assembly.  The output will be:

(a)  TD#3 - binary tape for adaptation source input during the DCA load.

(b)  TD#4 - A DLO assembly listing.

(c)  TD#5 - Updated combined tape.

(6)  Make a copy of the updated combined tape for backup and store in a safe place.

(7)  File all tapes and advise the Tape Load Coordinator of the new binary adaptation tape update and insert in the division notebook.

(8)  Assure that all adaptation changes which may affect an adjacent division or the BUIC are communicated to that facility.

f.  Recurring adaptation problems.  (Some areas which frequently cause problems in loading adaptation)

(1)  COSEAL assembles a program adaptation for the third register in the program unless another register is specified in the "end" card. This is obtained from the Analytical Compendium in the relative location section.  Therefore, a program whose adaptation does not start in the third register must have the starting location punched in the "end" card.  A blank equals relative starting location two (2) or the third (3) register in the program.

(2)  Tags on the combined tape are not loaded on to the DCA master and are used for referencing only during the updating and correcting the combined tape.

(3)  When assembling an adaptation program(s), particular attention should be paid to the alphabetical ordered setting and possible change of program names which will necessiate frequent TFM routines to position the combined tape to establish an alphabetical order.

g.  Assemble adaptation computer set up:

(1)  TD#1 - COSEAL

(2)  TD#2 - OPS CMB ADAPT

(3)  TD#3 - BLANK FOR BINARY OUTPUT

(4)  TD#4 - BLANK FOR DLO

(5)  TD#5 - BLANK FOR COMBINED OUTPUT

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Assembly deck in card reader.

SS 3 ON to suppress EOF after each program on DLO tape.
(recommended)

h.  Adaptation for non-N tapes.

(1)  The responsible programmer will punch the necessary cards in the
SYC format (according to the FAST Complex User's Manual, Chapter 2, Para. 1)
and place them behind the program card in the ADAPT DECK file box.  All SYC
adaptation changes for non-M tapes must be entered on the adaptation Log book.
All change cards must have descriptive but unclassified comments.  If miscoded
or mispunched adaptation loaded is subsequently repaired and reloaded, the
bad adaptation cards should be discarded before the load deck is placed in
the ADAPT DECK file box.

CHAPTER 6 - ANNEX C

DCA - GEOGRAPHY PROCEDURES FOR 33d AIR DIVISION

1. Introduction - Geography is the term applied to the situation display
data which is COSEAL assembled and loaded onto DCA. This display data
is a visual aid presented to the operational crew to help them conduct air
defense in the 33d Air Division environment. Local geography procedures
are established accordingly. Operating within certain design constraints
of the hardware/software system, an effort is made to produce the most
effective display.

2. Geography Specifications - The overall SAGE system design is predicated
upon particular displays being available at certain consoles. To assure
this, geography displays are divided into categories and the routing of these
categories are firmly established. The Variable Display Equipment Spec-
ifications, TM-1005/001/xx, specifies both the class of displays belonging
to each category and the category routings. It is the responsibility of
330PM to maintain the integrity of the VDE Specifications. The specific con-
tent of each of these displays is contained in the positional handbooks,
specifically the Common Appendix, ADCSPH 55-1-1.

3. Geography Procedures - Formal procedures have been established for the
operational crews to communicate desired or necessary geography changes re-
sulting from an environmental change. OPM depends on operations to be
aware that such changes require the attention of the programming shop and
to communicate them verbally and by letter of request. Changes brought about
because of program redesign are described in the release document for the
version containing that change.

Once a desired change is recognized and defined, the programming staff
examines its feasibility exploring:

    a. The necessary routing (category) of the display.

    b. How many additional slots will be required.

    c. The clutter effects.

    d. The relative need for the change.

    e. The best time for implementation.

Knowledge of the above points is gained by review of the present 33d
geography and through discussions with the involved operations personnel.
If the change is decided necessary, the operations personnel are asked to
submit a letter of request. This letter may be written by the programming
shop for operation's signature and specifies the exact change and time for
implementation. A file of these letters is maintained in the GEOGRAPHY
NOTEBOOK.

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Upon receipt of the letter of request and prior to tape load, the card deck of geography is updated and then assembled from card or tape. The output of the COSEAL assembly is a binary tape and an assembly listing. The tape is the input source during DCA load and the listing is used to update the Version -xx pressboard binder. By using meaningful comments in the input deck, a much more meaningful and readable assembly listing is available.

4.  Control cards - (located with the geography deck)

| columns | 18 | 22 | 27 | 32 | 37 | 42 | 52 |
|---|---|---|---|---|---|---|---|
| 1. | LOAD | | | | | | |
| 2. | QUIT | | | | | | |
| 3. | PRI | 2R | | EOF | | | |
| 4. | POS | 2R | | | | | |
| 5. * | OPTION | | TAPE | | TAPE | TAPE | DRUM |
| 6. * | OPTION | | CARD | | TAPE | TAPE | DRUM |
| 7. ** | GEO | | | | | | |
| 8. | LOG | 3R | | | | | |

* OPTION card-GEO does not accept corrector inputs and does not output a combined tape. Binary output is for drum storage regardless of what is specified in col. 52.

** GEO card cannot contain options. GEO will stay in control until a ZE card is read. This card follows the OPTION card in the deck.

5.  Deck Structure - Structure of the deck GEOGRAPHY (para 2.0) is at the user's discretion so long as the following rules are followed;

a.  Drum slot assignments are allocated as specified in current FAST-users Manual and/or Analystical Compendium. Normally FAST manual will suffice, however, a check should be made with each Tape Release Content to insure changes in deck structure have not been made. If more than one source of information is available, check them all to insure you are in fact loading according to the most current directives.

b.  Card order requirements are specified in the COSEAL Users Manual and must be followed.

c.  33d Unique Coding - Coding specifications may be deviated from in situations warrenting the same:

(1) Symbology position/positions as specified in the DC COMMON APPENDIX can be moved to avoid clutter. For example, Hampton Roads AADCP symbology appears South of the E feature where it will not conflict with RIC (Richmond) symbology. The APPENDIX states the AADCP symbology will appear North of the associated site.

2

ANNEX - C

(2) Fixed geography serving more than one purpose requires special coding. For example; RIC is used for display as an airbase and as a city. Coding must insure the C features are not duplicated (appear twice) and that the E features do not overlay and cause non-readability.

(3) Warning areas are limited to one category, therefore are coded for Xl display only. They are positioned approximately 15 nm apart to insure a clear picture of the warning areas on all expansions.

(4) Comments on the deck cards are limited primarily in the areas of the deck which contain classified information. The programmer responsible for geography should be consulted when questions arise as to the content of the cards.

(5) Geography normally is fairly static. The 33d Air Division geography changes are usually in the Warning/Restricted Areas section of the deck. Since nearly all slots have been allocated it would be impossible to add much to the existing system without making deletions. Reference a current listing for the exact number of available slots.

(6) V cards instead of TA cards are used by 33d Air Division for display of AADCP rings to preclude overlapping rings. Rings for adjacent/ overlap AADCP's are coded outside our boundaries for Xl expansion only. Coding for all expansions is made where rings appear within the 33d Division boundaries.

6. Geography - STOPS and ADA Areas are classified and therefore do not appear in the listing below. The list does contain the existing Geography in the order it is presently loaded.

    Boundaries
    X2 landmarks
    X1 landmarks
    Inner/Outer ADIZ
    Warning areas
    Restricted areas

    GEOREF
    Radar Sites
    FAA Check Points (required by Letters of Agreement)
    Radio Fixes (also referred to as common reference points)
    Cities
    FGN

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7. Prestore Procedures (optional, but very helpful if the readers are not functioning properly. Also saves wear on the card deck.)

   a.  TAPE SET-UP

      1 - COSEAL MASTER
      2 - Blank (prestor)
      3 - Blank
      4 - Blank
      5 - not used
      6 - not used

   b.  DECK STRUCTURE

      LOAD (#1) card
      geography deck (C5  S5  14  card through the ZE card)
      QUIT (#2) card

   c.  SWITCHES

      Master Reset
      SFTM

   d.  OPERATION

      1.  Assure tape set up is proper.
      2.  Load the deck in Reader.
      3.  Activate switches.
      4.  When complete, insert PRI card (#3) in Reader and LFAM, check print-out for obvious errors.
      5.  Rewind TDU#2-manually or with POS card (#4) plus PROGRAM CONTINUE button.
      6.  Tag all tapes produced and continue with assembly or store in the proper tape cabinets.

8. ASSEMBLY PROCEDURES

   a.  Tape Set-up

      1.  COSEAL MASTER
      2.  Prestore(optional)
      3.  Binary output
      4.  DLO
      5.  not used
      6.  not used

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b.  Deck Structure

    1.  OPTION card (#5) tape input <u>OR</u>
       OPTION card (#6)
    2.  GEO card (#7)
    3.  geography deck (C S5 14 card through ZE card) <u>OR</u> Prestore tape

c.  Switches

    1.  SFIM <u>OR</u>
    2.  LFAM (if COSEAL on Drums)

d.  Operations

    1.  Assure tape set-up.
    2.  If using OPTION #4, assure TDU #2 is rewound.
    3.  Load the deck in the reader.
    4.  Activate switches.
    5.  When complete, insert LOG 3R (#8) in the reader and press
       PROGRAM CONTINUE.
    6.  Check the log for errors.
    7.  Tag all tapes produced and store in proper cabinets.

9.  SUMMARY - Geography procedures can be summarized as follows:

    a.  Recognition of a needed or desired change is gained through the version release document or through formal requests from operation's personnel.

    b.  A decision is made whether the change is to be installed, how it should be installed, and when to install it.

    c.  The card deck of geography is updated immediately so that it is always current for assembly listings and binary tape production.

    d.  The binary tape is produced with either prestore or card input. This tape will be used by the Tape Loader and must be kept current and available for all version and sub-version loads.

    e.  Geography must be periodically reviewed to assure that all displays which are no longer required or desired are removed.

CHAPTER 7

TAPE LOAD

7-1. <u>General</u>. This chapter outlined procedures to be followed in the production of the Operational Master Direction Center Active Tape.

7-2. <u>References</u>:

    a. ADCM 55-33 - Testing Acceptance and Maintenance of SAGE Computer ograms.

    b. TM-3010/220/00 - FAST User's Manual.

7-3. <u>Responsibilities</u>:

    a. The Chief, 330PM will designate one programmer as Tape Load Coordinator.

    b. The Tape Load Coordinator will:

        (1) Ensure that all team members comply with the procedures outlined in this chapter. Nuclear Safety Verification procedures outlined in TM 55-33 will be checked for compliance. See Annex A, this chapter, page 6

        (2) Load the Operational Master Tape, and subsequent revisions.

        (3) Duplicate and maintain all tapes in accordance with applicable directives.

        (4) Provide written directives describing in detail the procedures to be followed in loading SUOP tapes. These instructions will be updated as required to keep all information current. These instructions will be maintained as Annex A to this chapter.

        (5) Keep the Chief 330PM informed on the progress of all tape loads.

        (6) Schedule all activity through the Program Coordinator. The Program Coordinator will provide any assistance desired after considering rrent workload.

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(g) Extract onto individual tapes the Coseal, Run, Giant and Unisim files. Notify programmers with primary interest when this operation has been completed. This procedure is carried out under Coseal Control.

(3) Completing the "M" Load:

(a) The first or "M" Load should include Geography, Adaptation and Initial Conditions. Inputs are in the form of Binary Tape for Geography and Adaptation and Symbolic (ETS) cards for Initial Conditions.

(b) The above inputs are to be provided in final format by the individual programmers concerned no later than the date specified by the program coordinator in the production schedule.

(c) The Adaptation Coordinator will assist in accomplishing the "M" and "N" loads.

(d) Upon completion of the "M" load, schedule a Tape Check-out. The check time, procedures and objectives should be coordinated with the program coordinator.

(e) The following printouts must be obtained direct or DLO and inserted under tab in the pressboard binder.

<u>1</u>  Deck Process

<u>2</u>  ETS Printout

<u>3</u>  Tape LOG

<u>4</u>  Tape Compare (Ops-Master to "M" Load)**

(4) Completing the "N" Load:

(a) The "N" Load should contain all applicable Emergency Changes, Test Changes, Final Address Adaptation and changes required by special projects which have not been included on the Phoenix Version Release.

(b) The following printouts must be obtained direct or DLO and inserted under tab in the pressboard binder.

<u>1</u>  Deck Process

<u>2</u>  SYC Printout

<u>3</u>  Tape LOG

<u>4</u>  Tape Compare ("M" to "N" Load)

2    **The Adaptation DLO may be substituted for the Tape Compare, however a Compare DLO Tape should be retained until the tape goes operational.

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(c) Upon completion of the "N" Load, individual programmers with primary responsibility for loaded data will review the SYC and Tape Compare printouts. (See "Individual Programmer Responsibilities")

(d) After load verification schedule a minimum checkout. The check time, procedures and objectives should be coordinated with the program coordinator.

(5) Completing the "P" Load:

(a) A minimum of two (2) duty days prior to the "P" Load, the Tape Load Coordinator should obtain a listing of all correctors to be included on the tape. This listing should be tabbed and inserted in the Pressboard Binder and verified by individual programmers having a responsibility for Program Correctors.

(b) The "P" Load will contain all program correctors pertinent to the version being constructed and received prior to a date specified by the Program Coordinator in the production schedule.

(c) Local procedures require that all programs be placed in alphabetical order within the file being corrected.

(d) Upon completion of the "P" Load, schedule a detailed checkout. The check time, procedures and objectives should be coordinated with the Program Coordinator.

(e) The following printouts must be obtained direct or DLO and inserted under tab in the pressboard binder:

    <u>1</u>  Deck Process

    <u>2</u>  SYC Printout

    <u>3</u>  Tape LOG

    <u>4</u>  Tape Compare ("N" to "P" Load)

(f) Upon completion of the "P" Load, individual programmers will review the SYC and Tape Compare printouts. (See "Individual Programmer Responsibilities")

(6) Overloads:

(a) Overloads consist of installing additional correctors to the system or correcting earlier correctors erroneously conceived, coded, punched or loaded.

(b) The procedures outlined for the "P" Load apply.

3

(7) General:

(a) It is the responsibility of the Tape Load Coordinator to assure that the listings placed in the Pressboard Binder have been thoroughly verified and that all applicable entries have been checked and initialed.

(b) The use of a Yellow Hi-lite to accentuate particularly relevant printout entries may prove beneficial.

(c) The Inventory Log preceeding the deck process should be verified by the Tape Load Coordinator for accuracy and completeness.

2. Individual Programmer Responsibilities

a. Version Description:

(1) Provide inputs to the Version Description document for all assigned:

(a) Analysis Reports

(b) Emergency Changes

(c) Test Changes

(d) Sage Program Changes

(e) Program Error Corrections of significant operational impact.

(f) Equipment Changes, and

(g) Environmental Data Changes

(2) Each individual input will be placed on a separate sheet of bond paper.

(3) The format prescribed in ADCM 55-33 will be adhered to.

(4) Periodically review input data to assure its accuracy.

b. Program Correctors:

(1) Upon receipt of a TWX or version release document specifying correctors to be loaded to the DCA programs, the individual programmers with primary responsibility in the areas concerned will code, key punch, and verify the symbolic cards.

(2) Local procedures require a duplicate IDT card be provided for each corrector packet to be inserted in a Tape Load Inventory file. IDT cards will contain the following notations in the comment field:

Column 47 thru 50 - The File in which the correctors must be inserted.

Column 52 thru 58 - The first seven letters of the responsible programmers last name.

Column 60 thru 71 - The correction identifier as it appears on the TWX or other document.

eg

4     5     6       7
7     2     0       2

IPGD SHEPPAR 000 09D028-A

(3) All corrector cards will include the card number and correction identifier in columns 60 and following.

(4) Verified corrector decks will be inserted in their proper slots in the tape load card file drawer. The duplicate IDT card will be inserted behind the divider marked "LOAD LOG" to serve as a ready reference for the Tape Load Coordinator.

c. Corrector Deck Verification:

(1) Approximately two duty days prior to the "P" Load the Tape Load Coordinator will obtain a printout of the "P" Load deck. This printout will be used as a final coding check prior to the actual load. Programmers should verify coding and initial thru their names for each corrector packet checked.

d. Test Changes/Emergency Changes:

(1) Programmers with the responsibility for maintaining Test and/or Emergency Changes will utilize a deck printout of the change and the current and new version reflect disassemblies to verify nuclear safety and program compatibility. The TC/EC deck printout, appropriately annotated will be included in the version Pressboard Binder.

(2) All TC-s and EC-s must be verified prior to loading.

e.  Load Verification:

(1)  Upon completion of each load, programmers concerned will verify the tape load by comparison of the Tape Compare and SYC printouts. THIS IS A PRIORITY ITEM AND MUST BE ACCOMPLISHED AS SOON AS POSSIBLE (IMMEDIATELY) FOLLOWING A TAPE LOAD.

(2)  Each register that has been modified will be checked and a check or "X" placed to the right of the non-comparing line on the compare printout.

(3)  Blocks of non-comparing registers will be bracketed and initialed by the verifying programmer upon completion of his checks.

(4)  Explanatory notes, if considered worthwhile, should be included in the right margin of the Compare printout.

f.  Two-man control:

(1)  It is the responsibility of each individual to insure constant two-man control of all DCA productions and the cycling of DCA for other than active air defense. This responsibility includes insuring at least two qualified programmers are present for any modification made to a DCA tape in production or test for any reason other than active air defense.

(2)  Any modified DCA tape must be compared with an existing certified tape. After comparison and verification, the new DCA tape must be labeled with a tape control label number and a certification label. The label number will be logged by the Program Coordinator. Upon destruction of any existing DCA tapes, the labels (certification and control number) will be removed and returned to the Program Coordinator (Reference 330DC letter, Nuclear Safety Verification, Sept 68.)

CHAPTER 8

PROCESSING LOCAL CHANGES

8-1  General:  Certain operational requirements may necessitate the processing of local changes to SUOP programs and other support programs.  These changes generally require special handling and are usually in the form of Emergency Program Changes (EPC's) or Test Changes (TC's).

8-2.  References:

        a.  ADCM 55-32 - Configuration Control of the SAGE and BUIC Computer Program Systems.

        b.  ADCM 55-33 - Testing, Acceptance and Maintenance of SAGE Computer Programs.

8-3.  Responsibilities:

        a.  The Program Coordinator will be responsible for effecting all required coordination:

                (1)  Between agencies requesting changes and 330PM, and;

                (2)  Between Headquarters, First Air Force and ADC, and;

                (3)  All other interested agencies, i.e., other DC's and BUIC's, LRR's, etc.

        b.  The Program Coordinator will assign a programmer to each Local Change Request to determine:

                (1)  Feasibility testing requirements.

                (2)  Coding requirements and testing of approved changes.

        c.  The assigned programmer will load and supervise the testing of all approved changes.

8-4.  Procedures:

        a.  The administrative processing of EPCs and Test Changes will be IAW with the references stated in para 8-2 above.

        b.  Requests for EPC's and/or Test Changes will be made by letter to 330PM, from the requesting agency.  Request will be made IAW the procedures outlined in the reference listed in 8-2a above.

        c.  The Chief, 330PM, will direct the Programming Coordinator to conduct a feasibility study concerning the requested change.  The Programming Coordinator will appoint a programmer, or team of programmers to conduct the study.  When more than one programmer is assigned to a project, one programmer will be designated as the responsible programmer for the task to be performed.

d. Coding and testing will normally take place during the feasibility study, but in some cases may be delayed.

e. Upon completion of the feasibility study:

(1) If the results show the change to be impractical, the requesting agency will be notified immediately.

(2) If the results show the change to be practical, a request for approval will be forwarded to ADC, and the requesting agency will be notified.

f. Upon notification from ADC:

(1) If request for approval is denied, the requesting agency will be notified immediately.

(2) If request for approval is granted, the Programming Team will implement the change as soon as possible, after ensuring proper coding and testing is completed.

g. Documentation Required:

(1) TPR.

(2) Sub-version description, if applicable.

(3) Annotations to existing documentation to reflect changes.

CHAPTER 9

ERROR RESOLUTION

9-1. <u>General</u>: This chapter will deal with the procedures for problem solving. The procedures outlined point out the general direction that error resolution should take, spell out the requirements for recording data pertaining to problems and solutions, and methods of monitoring the resultant documentation.

9-2. <u>References</u>:

a. HOI 55 Series, Use of Program Incident Report (ADC Form 119).

b. ADCM 55-32, Configuration Control of the SAGE and BUIC Computer Program Systems.

c. ADCM 55-33. Testing, Acceptance, and Maintenance of SAGE Computer Programs.

9-3. <u>Responsibilities</u>:

a. The Chief 330PM will:

(1) Ensure that all team members are familiar with the accepted methods of problem solving within the SAGE Computer programming complex.

(2) Ensure that all team members comply with current directives pertaining to problem solving and documentation.

(3) Monitor the progress of all problems handles by the Programming Team to ensure prompt and effective solutions, and proper documentation.

b. Team Members will:

(1) Be familiar with the accepted methods of problem solving within the SAGE Computer Programming complex.

(2) Have complete knowledge of all current directives pertaining to problem solving and documentation.

(3) Keep the Chief 330PM advised of the progress of all problems for which they have been delegated responsibility.

(4) Ensure that adequate documentation is produced for all problems for which they have assigned responsibility.

c. The Secretary will:

(1) Assist the Chief 330PM and team members in the production of all required documentation.

(2)  Provide the Program Coordinator with an adequate distribution system for all documentation pertaining to problem solving.

9-4.  Problem Solving: The most difficult task of the Programming Team is problem solving.  This section serves only to guide the problem solver in determining alternative solutions, and is not an attempt to standardize processes of logic and analysis.  All of the elements of problem solving listed below are in the context of the SAGE System.  It is accepted that not all problems require the application of all of the elements listed, some data are axiomatic or empirical, and need not be processed, but merely used.

a.  Definition.  This is the first phase of problem solving.  It occurs first, continues throughout analysis, and should be used at the end to ensure that the resulting solutions are for the correct problem.

(1)  Define the problem and record data:

(a)  Review problem report.

(b)  Interrogate individuals concerned.

(c)  Observe the problem, using, simulation when necessary.

(d)  Team, or sub-team discussion.

(2)  Clarify the problem:

(a)  Determine effects and priority (Category).

(b)  Isolate reported factors.

(3)  Determine Action:

(a)  Establish criteria.

(b)  Limit the problem.

(c)  Determine objectives of solutions.

(d)  Determine responsibilities and limiting factors.

b.  Investigation:  This second phase of problem solving should only begin after the first, definition, is fairly complete.  It too should continue throughout the analysis, and is limited only by time and availability of data.

(1)  Data Analysis:

(a)  Review recorded data to determine how the system is working.

(b) Review published data to determine how the system should work. This will include investigation of:

 1 Operational Specification.

 2 Operations Handbooks (Positional Handbooks).

 3 Program Listings.

 4 Program Modifications (SPCs, ARs, EPCs, etc.).

 5 Supplementary Program Data

(c) Compare how the System is working to how the System should be working.

 1 If the system is working as it should, this fact must be presented to the originator of the problem report. In some cases this may first require a clarification request pertaining to certain published data.

 2 If the system is not working as it should, the problem becomes a matter of determining why there is a discrepancy.

(2) Finding Alternatives: If a system discrepancy is found to exist:

(a) A problem report should be forwarded to 27TAA as soon as possible (See Chapter 11). If it appears that a solution is imminent, the report may be reasonably delayed until it can include suggested corrective action. In all cases, 27TAA should be notified by telephone immediately upon determination that a discrepancy exists.

(b) Lateral units should be consulted concerning the problem. An exchange of information may prove useful in arriving at a solution.

(c) Determine what modifications to the system are required to correct the problem. It must be remembered that, in most cases, there will be more than one solution. Within limits, as many solutions as possible should be considered.

c. Evaluation: The third phase of problem solving involves taking action upon data derived from the previous two.

(1) Choosing an Alternative: Once a set of solutions is defined, a choice must be made as to which is to be implemented. This decision-making process must take into account:

    (a) Does it meet with the established criteria?

    (b) Does it alter established system specifications?

    (c) How does it effect the rest of the system?

    (d) How complex is the alternative?

    (2) Testing: When an alternative is chosen it must be tested. The test must be as comprehensive and accurate as possible.

    (a) First the solution is placed into a format which is compatible with the system. In most cases this will involve coding correctors, to modify the program or programs in question.

    (b) The solution must be paper-checked. This involves testing the logic through flow analysis, or program listing analysis.

    (c) Machine testing follows paper-checking. The system, modified by the solution is cycled in the computer. Where practical, this may be accomplished using live air defense. In most cases it will involve the use of simulation techniques.

    (d) Changes to a solution may be required as testing takes place, dictated by test results.

    d. Reiteration: The processes of problem solving are performed reiteratively. Once a solution is found and tested, the entire process should be gone through again, making use of the new information derived from the first cycle. This is true during any phase. Information derived from the investigation phase may dictate a return to the problem definition phase. The problem solving stops when the limits of time and/or resources have been reached, or when it becomes apparent that further iteration will not significantly add to the solution already obtained.

    e. Documentation: The last phase of problem solving is the production of documentation. The following documentation is required, as specified.

    (1) Technical Programming Reports (TPR). See Chapter 11 for requirements and formats.

    (2) Sub-Version Description. Required when the solution to a problem involves major changes, or if it is to be incorporated as a part of a major change to an operational tape. It explains the differences between the old tape and the tape which has been loaded with correctors. The format is the same as for Version Description (Chapter 10)

(3) Coding Sheets: Required for all solutions which involve modifications to existing programs. These sheets contain the program coding required to produce the IBM punch cards, and are placed in the appropriate Area Notebook to update the listings.

9-5. **Processing Operational Crew Problem Reports (PIR, ADC Form 119):**

    a. Operational Problem Reporting:

        (1) Problems will be reported to 330PM IAW the appropriate HOI.

        (2) When practicable, the Chief, 330PM, will be notified by telephone, of the existence of a possible problem.

    b. Team Processing:

        (1) Two copies of each Problem Incident Report (PIR) are sent to 330PM. Upon receipt the following actions will take place:

        (a) The Secretary will log the report in by its reference number and immediately notify the Chief, 330PM, and the Program Coordinator. One copy will be given to the Program Coordinator and one copy will be retained in the PIR file.

        (b) The Program Coordinator will immediately review the PIR, and assign a programmer, or team of programmers to take action on the report. One programmer will be designated as the team member primarily responsible for the project.

        (c) The responsible programmer, acting in conjunction with the other assigned programmers will take action to clear the problem report and produce the required documentation IAW 9-4 above.

        (d) Upon completion of action to clear the problem report, the responsible programmer will complete section II of the PIR. The text will be written on lined paper, attached to the Programming Team Copy, and given to the Secretary for typing of Section II. The ADC Form 119 will be completed as follows:

           <u>1</u> A statement will be made as to whether the reported problem was or was not a valid DCA problem.

           <u>2</u> If the problem was not valid, a generalized explanation will be made, citing references where applicable.

           <u>3</u> If the problem was valid, a statement will be made noting the generalized area at fault, what action has been taken to correct the discrepancy, and approximate time of implementation. If higher echelon action is required, it will be so noted. Explanation will be concise and in conventional language.

(e)  Upon receipt of the test and team copy of ADC Form 119, the Secretary will type the information for Section II on both team and file copies.

(2)  The following records pertaining to PIRs will be maintained to facilitate training and provide a data base for study:

(a)  Invalid problem reports:

<u>1</u>  PIR number and date.

<u>2</u>  Reporting individual.

<u>3</u>  Responsible programmer

<u>4</u>  System area.

<u>5</u>  Time expended.

(b)  Valid problem reports:

<u>1</u>  PIR number and date.

<u>2</u>  Reporting individual.

<u>3</u>  Responsible programmer.

<u>4</u>  System area.

<u>5</u>  Action required.

<u>6</u>  Time expended.

c.  <u>Disposition</u>:

(1)  The Program Coordinator and Chief, 330PM, will review all completed PIRs prior to disposition.

(2)  The Team copy will be sent to 330CC through normal distribution channels.

(3)  The File copy will be stamped "Action Completed" and returned to the file.

CHAPTER 10

## SITE VERSION PRODUCTION AND TURNOVER

10-1. General: This chapter assigns responsibilities and sets forth procedures to be followed in the production, documentation and turnover of DCA program versions.

10-2. References:

a. ADCM 55-33, Testing, Acceptance and Maintenance of SAGE Computer Programs.

b. ADCM 55-32. Configuration Control of the 416L. (SAGE) and 416M (BUIC) Computer Program Systems.

10-3. Terms Commonly Used (Defined by ADCM 55-33):

a. Delivery: The transfer of an accepted version from the Test and Acceptance Agency (TAA) to the field military programming team.

b. Version Package: A term including

(1) The Version Tape.

(2) Program Listings.

(3) Version Description.

(4) Release Documentation.

(5) List of Untested Areas.

(6) Program Status Report.

c. Turnover: The availability of a computer program for operational use in active air defense.

d. Release: The transfer, by the programming contractor, to the military TAA of a computer program version that has been tested and declared acceptable by the TAA.

10-4. Responsibilities:

a. Chief, 330PM:

(1) Determines the operational date of a major version if not already directed by ADC.

(2) Provides administrative support for the programming team.

(3) Exercises final authority on the content of the site produced portion of versions or sub-versions.

b. Program Coordinator:

(1) Responsible for the quality of the version turned over to the Direction Center.

(2) Supervises the programming team in version production and related areas.

(3) Establishes a production schedule for a pending version or sub-version.

(4) Determines site unique content.

(5) Assigns specific responsibility for initial conditions and geography. (as required)

(6) Edits and supervises publication of Version releases.

(7) Assigns Emergency Program Changes (EPCs), Test Changes (TCs), SAGE Program Changes (SPCs), Analysis Reports (ARs), and Program Error Corrections (PECs) to team members as a prime responsibility during version production.

c. Team Members

(1) Responsible for his assigned program areas, and specific assignments in version production.

(2) Performs other tasks as directed by the Chief 330PM and the Program Coordinator.

10-5. Procedures: Major Version Production

a. Pre-Delivery Phase:

(1) Team members review all documentation pertaining to SPCs and ARs scheduled for the version, with particular emphasis on those SPCs and ARs assigned.

(2) Update,to the degree possible,individual geography and initial conditions.

(3) Review assigned EPCs or TCs for possible coding changes.

b. Receipt of Version Package Phase:

(1) Process documentation IAW Chapter 3.

(2) Tape Load Coordinator assumes responsibility for the version maintenance master and starts tape load procedures.

(3) Delivery documentation reviewed in detail for new program Mods, Compool and initial data changes and program changes resulting from ARs and SPCs.

(4) Finalize geography and initial conditions.

(5) Recode if necessary EPCs and TCs - test. Provide Tape Load Coordinator with required load deck.

c. Testing and Verification Phase:

(1) Computer time requirements for team members are defined in Chapter 2.

(2) Testing and Verification will be accomplished using the prescribed tape.

(3) Testing will be accomplished IAW Chapter 7.

(4) Verification procedures are contained in Chapter 8.

(5) As each assigned area is verified and tested the Program Coordinator will be so advised.

(6) Any errors uncovered will be processed IAW Chapter 9 and Chapter 11.

(7) Testing and verification will be completed on the date indicated in the version production schedule.

(8) The last operation during this phase will be the loading of training tape (NTV # #).

d. Documentation:

(1) EPCs and SPCs, etc., initially assigned for testing will also be documented by the same programmer for the version release.

(2) Drafts of the documentation will be given to the Program Coordinator on or prior to the date established on the production schedule.

(3) The format will be IAW current ADCM 55-33 procedures.

(4) The version description will be published and distributed as soon as possible after the training tape is made available to the Direction Center.

(5) Team members are to proof read their portion of the version description.

e.  Version Turnover:

(1)  The operational load will be made IAW Chapter 8 on the date established in the production schedule.

(2)  The Chief 330PM will review the history of the version prior to its turnover.

(3)  A turnover letter to the Director (330CC) will be prepared by the Secretary when so advised by the Program Coordinator/Chief 330PM.

10-6.  Production:  Sub-Version Production:

a.  The requirement for and the content of a sub-version will be determined by the Chief 330PM and Program Coordinator.

b.  The production schedule will be established based on the urgency of the situation.

c.  Tapeload procedures to be followed are contained in Chapter 8.

d.  Testing and verification will be accomplished as specified in paragraph 10-5 c above.

e.  Procedures for documentation and turnover are essentially the same as described in para 10-4d, except that the version description will be turned over with or prior to the tape turnover.

CHAPTER 11

PROBLEM REPORTING

11-1. General: This chapter outlines procedures and format for Technical Programming Reports (TPRs).

11-2. References: ADCM 55-33, Testing, Acceptance, and Maintenance of SAGE Computer Programs.

11-3. Responsibilities:

      a. Chief, 330PM, is responsible for insuring that problem analysis and reporting is conducted according to accepted standards and procedures. Overall responsibility will be assigned to one programmer whenever problems overlap into several areas. All programmers' duty assignments will be made by the Program Coordinator.

      b. The programmer responsible for the area involved will initiate TPRs. He must insure the technical accuracy of all statements and solutions contained in the TPR.

1-4. Procedures:

      a. The responsible programmer will call 27TAA immediately upon isolation of the problem (See Chapter 4).

      b. A TPR will be sent to 27TAA as soon as possible.

      c. The responsible programmer will fill out the body of the report including suggested correctors if any.

      d. The Program Coordinator will edit the draft TPR to insure completeness and accuracy.

      e. The approved text will be given to the Secretary who will put it in the proper format.

      f. The final report will be proofread by the responsible programmer.

      g. The report will be sent out via military teletype with priority assigned in accordance with the problem category.

        (1) Category I - PRIORITY.

        (2) Category II - ROUTINE.

CHAPTER 12

UTILITY AND SUPPORT SYSTEMS

12-1. General: There are five utility and support systems used at the 33d AD. COSEAL, GIANT, UNISIM, RUN and SPARS.

12-2. Responsibilities:

    a. The Chief, 330PM, will designate a programmer to be responsible for one or more of these systems.

    b. The designated programmer will be responsible for loading correctors and for problem reporting.

12-3. Procedures:

    a. New Version: TAA sends a four-file master tape to 330PM containing COSEAL, GIANT, UNISIM and RUN. SPARS will be received on a separate tape (Each system will be copied onto a separate tape.) and will be made available for use in the computer room. An extra copy of the RUN tape will be made to accompany the release of the new DCA version.

    b. Problem Processing: After defining the problem, the responsible programmer will fill out a Technical Programming Report following the procedures in ADCM 55-33.

<u>TESTING</u>

13-1.   General.   System Verification Assurance Testing is done at Phoenix by the Test and Acceptance Agency.   All other testing is the responsibility of 330PM.

13-2   <u>Procedures</u>:

    a.   Version Testing.

        (1)   The programming Team will be under the direction of the Program Coordinator for all version testing.   The Program Coordinator will coordinate any special testing requirements with the Tape Load Coordinator and the programmer concerned.   The Program Coordinator will assign version-specific SAGE Program Changes (SPC's) and Analysis Reports (AR's) to individual programmer(s) for testing.   The assigned programmer(s) will:

            (a)   Read all documentation and become thoroughly familiar with the expected results.

            (b)   Thoroughly check all coding to see that it was loaded properly and determine that the coding checks on paper.

            (c)   Using test tools, determine that actual results check with expected results.

            (d)   Verify compatability during RENTS and also during normal cycling.

            (e)   Report discrepancies to TAA following the procedures in ADCM 55-33.

        (2)   Local program changes and initial data changes will be updated by the responsible programmer(s) and testing following (b), (c) and (d) above. Program Error Corrections will be tested by the responsible programmer IAW - 13a(1) thru (e) above.

    b.   Sub-Version Testing:   Sub-version testing procedures will follow version testing procedures except for the requirement for the RENT.

    c.   Standard Tests:   Each programmer will write testing instructions in the form of checklists for checking each of their program areas.   These checklists will be designed in such a manner that any programmer can check any assigned areas.   These checklists should include test objectives, expected results, and any other information required to perform the test.   Control cards and data cards should be designed as required.   The Program Coordinator will maintain a copy of all checklists.   Programmers are responsible for providing the Program Coordinator with current checklists.