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Research Product 80-9

**PLANIT Support Programs, Version 4.0,
Operator/User Manual**

**Manpower & Educational Systems
Technical Area**

May 1977

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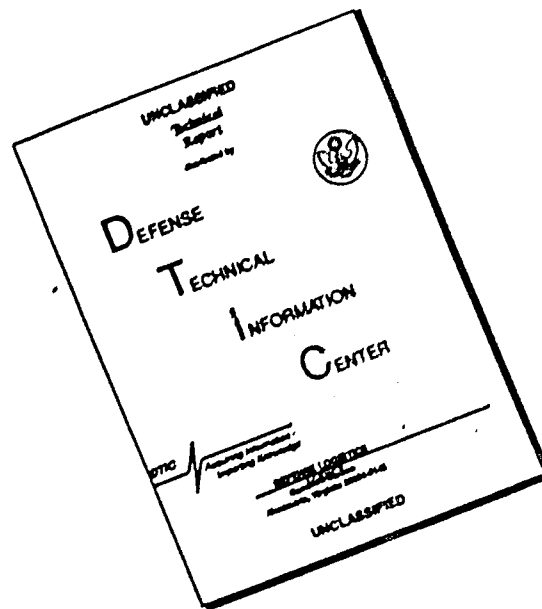


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Research accomplished under contract
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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER Research Product 80-9	2. GOVT ACCESSION NO. ADA85116	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) PLANIT SUPPORT PROGRAMS, VERSION 4.0, OPERATOR/USER MANUAL		5. TYPE OF REPORT & PERIOD COVERED
7. AUTHOR(s) Data Systems Division, Litton Systems, Inc.		6. PERFORMING ORG. REPORT NUMBER Document No. 125200-900A
9. PERFORMING ORGANIZATION NAME AND ADDRESS Data Systems Division, Litton Systems, Inc. 800 Woodley Avenue Van Nuys, CA 21409		8. CONTRACT OR GRANT NUMBER(s) 15 DAHC19-76-C-0014
11. CONTROLLING OFFICE NAME AND ADDRESS Army Research Institute for the Behavioral and Social Sciences (PERI-OK) 5001 Eisenhower Avenue, Alexandria, VA 22333		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 2Q763743A771
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) ARI 19 TR-82-11 12-12		12. REPORT DATE May 87
		13. NUMBER OF PAGES 93
		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) PLANIT (Programming Language for Interactive Teaching) Software support PLANIT support programs		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This document presents the general operational information and specific procedural data for the operation and use of the PLANIT Support Programs. These programs were developed as a part of the system installation of PLANIT (Programming Language for Interactive Teaching) on the AN/GYK-12 (TACFIRE) computer.		

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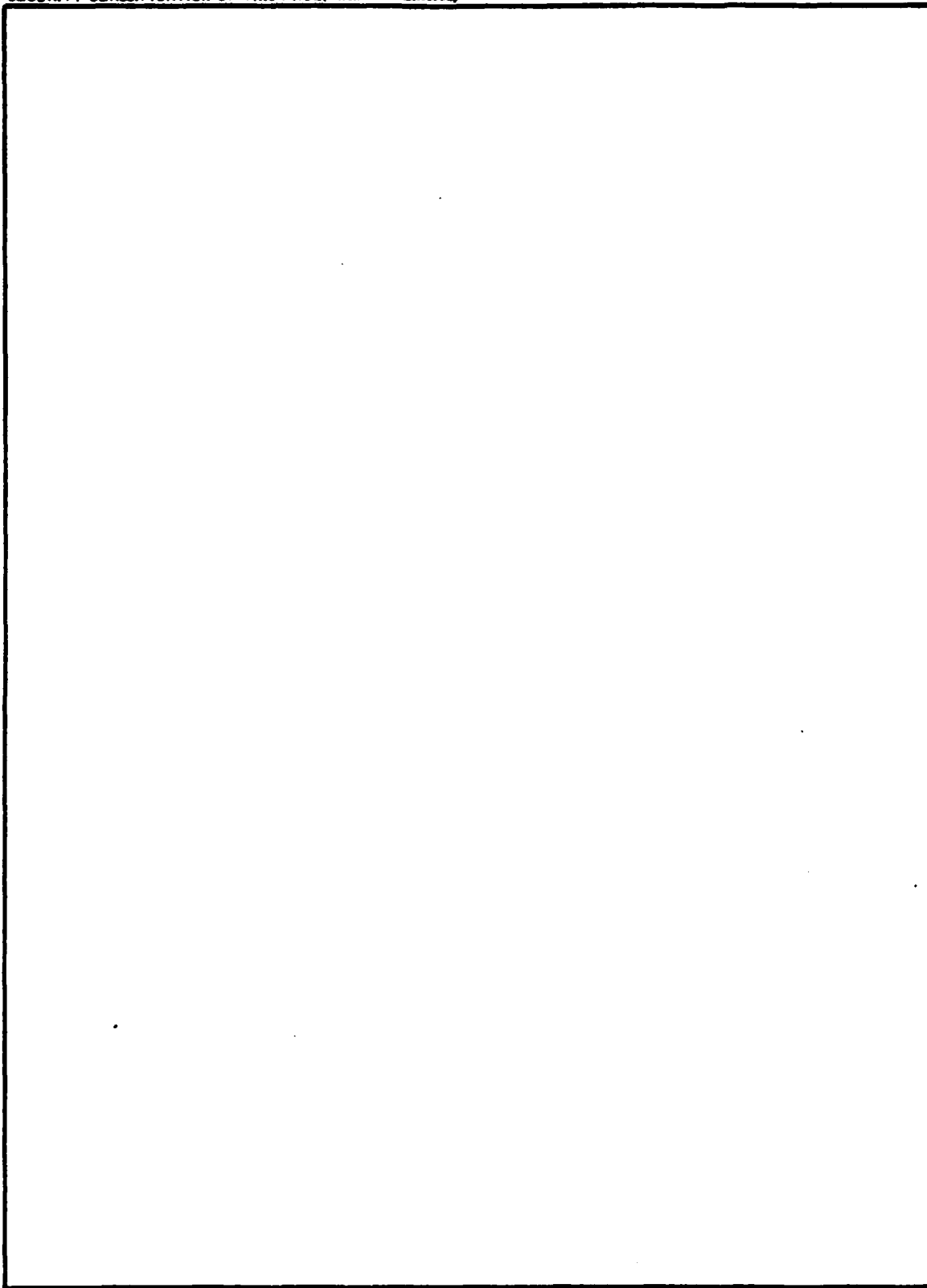
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FOREWORD

The PLANIT Support Programs were developed as a part of a Litton Systems, Inc., Data Systems Division (DSD), contract with the U. S. Army Research Institute for the Behavioral and Social Sciences (ARI). This contract (# DAHC19-76-C-0014) was awarded on 15 December 1975 as a part of an overall ARI research project which addresses the application of tactical computers to training. This contract specifically addressed the installation and enhancement of the capability of the PLANIT author/student language on the U. S. Army Artillery Tactical Fire Direction System (TACFIRE) general purpose computer. This computer (AN/GYK-12) is also used in several other Army tactical computer systems.

ABSTRACT

This document presents the general operational information and specific procedural data for the operation and use of the PLANIT Support Programs. These programs were developed as a part of the system installation of PLANIT (Programming Language for Interactive Teaching) on the AN/GYK-12 (TACFIRE) computer.

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SECTION 1
INTRODUCTION

1.1 Scope

This manual covers the general and specific aspects of using and operating the PLANIT Support Programs. These programs are a part of the overall AN/GYK-12 computer PLANIT installation and provide the required equipment and operator interface routines to interface PLANIT with the AN/GYK-12 computer and related peripheral devices and user terminals.

1.2 Manual Organization

This manual has been organized in procedural/sequence of operations scenario format as an aid to understanding the use and operation of the PLANIT Support Programs. The sections of the manual have been ordered in the same sequence that a user would normally encounter the individual program modules, procedures and operational sequences. The information covered in each section is briefly summarized below:

- a. Section 1: This section provides general and background information related to the overall AN/GYK-12 PLANIT system installation.
- b. Section 2: POS/RAMCHECK program modules procedures and operational sequences encountered during PLANIT system initialization. This section specifically identifies the messages, error indicators and procedures to be utilized during system initialization.
- c. Section 3: START program module procedures and operational sequences encountered during PLANIT system initialization. This section specifically identifies the messages, error indications and procedures to be utilized during system initialization after the POS/RAMCHECK initialization sequences have been completed.
- d. Section 4: MIOP/TMIOP program modules procedural and operational sequences encountered during PLANIT system initialization and PLANIT operation. This section specifically identifies the messages, error indications and procedures to be utilized during system initialization and system operations involving MIOP and TMIOP.

- e. Section 5: FINAL program module procedures and operational sequences encountered during PLANIT system termination operations. This section specifically identifies the messages, error indications and procedures to be ^{used} utilized during PLANIT system termination.
- f. Appendix A: Diagnose Status Codes summary. This section lists in numerical order and describes the meaning of Diagnose Status Codes (DIG Codes) output to the CPU DIG lights by the PLANIT Support Programs.
- g. Appendix B: ACC/OCC operating procedures. This section identifies the specific operator/author/student operating procedures associated with the ACC and OCC terminals.
- h. Appendix C: MIOD operating procedures. This section identifies the specific operator/author/student operating procedures associated with the MIOD terminal.
- i. Appendix D: VFMED operating procedures. This section identifies the specific operator/author/student operating procedures associated with the VFMED terminal.
- j. Appendix E: PLANIT character sets. This section summarizes the character differences between: 1.) the TACFIRE (and TOS²) ASCII and EBCDIC character sets, 2.) the ARI CDC 3300 character set, and 3.) the ARI Univac 1108 character set.
- k. Appendix F: PLANIT cards file. This section provides a sample listing of the cards file used in the AN/GYK-12 PLANIT installation.
- l. Appendix G: PLANIT map. This section provides a sample listing of the PLANIT map used in the AN/GYK-12 PLANIT installation.
- m. Appendix H: TACFIRE/TOS² equipment pictures. This section provides a set of pictures of the TACFIRE and TOS² equipment items most frequently used during operation of the AN/GYK-12 PLANIT system.
- n. Appendix I: Glossary of terms. This section provides a glossary of terms and mnemonics used throughout the PLANIT support and utility programs manuals and related documentation.
- o. Appendix J: ACC Patch and Display operating instructions. This section describes how to use the core patch and display routine.
- p. Appendix K: Full terminal control lessons. This section describes the features available to full terminal control lessons.

1.3 General Information

The AN/GYK-12 PLANIT System installation consists of a set of PLANIT programs and a set of PLANIT Support Programs (described in this manual). The basic PLANIT programs are generated in FORTRAN using parameters which tailor the programs to the AN/GYK-12 computer and system. The FORTRAN PLANIT programs are converted to TACPOL by a translator program. The TACPOL source PLANIT and PLANIT Support Programs are compiled and integrated into object and load tapes using various utility programs. In addition to this manual and the individual program listings, detailed information on the operation and use of the AN/GYK-12 PLANIT System can be found in the following documents:

Litton Systems, Inc. Data Systems Division

125201-901	PLANIT Utility Program
23 August 1976	PUPTWO User Manual
586000-914	User Manual for the Short
1 May 1977	System Tape Generator (SSTGEN)
125202-950A	PLANIT Support and Utility
1 May 1977	Program Flow Charts
125200-901	Design Description Document for
21 April 1977	PLANIT System Enhancements

System Development Corporation

TM-(L)-4422/001/01	PLANIT Author's Guide
1 October 1970	
TM-(L)-4422/002/01	PLANIT Language Reference Manual
1 October 1970	

Northwest Regional Educational Laboratory

12 February 1974	Document Update Information
revised 26 March 1974	for PLANIT, Version 2.0
9 March 1976	PLANIT Language Extensions
	Through Version 2.8

The SSTGEN User Manual describes the procedures and control cards necessary to generate PLANIT load tapes and cartridges.

The PUPTWO User Manual describes the procedures and control cards necessary to process PLANIT translation tapes and support tasks involved with lesson preparation.

The flow chart document provides an overview of the AN/GYK-12 PLANIT System functional interfaces and the detailed flow charts of the support programs and utility routines.

The System Development Corporation and Northwest Regional Educational Laboratory documents provide the information required for the application and use of PLANIT itself. The Design Description Document for the Enhanced system provides additional information in preparing special lessons which can ^{we} utilize the full capabilities of the ACC/OCC MIOD and VFMED terminals.

1.4 Special Considerations

The basic (commercial computer) PLANIT system is written in a meta FORTRAN and uses the floating point, trig functions and other special features of the FORTRAN language. The AN/GYK-12 computer and its TACPOL language uses fixed point arithmetic and display buffers of 520 terminal output characters. The translation of PLANIT from FORTRAN to TACPOL results in certain special considerations in the operation and use of the AN/GYK-12 PLANIT system. These special considerations are described below:

- a. The display format is 72 characters per line (plus carriage return/line feed) by 7 lines. The top line is used for special MIOP messages or is blank for entering answers. Thus a single PLANIT display output segment is 6 lines (up to 72 characters per line). This is a fixed (non-scrolling) display output, i. e., a frame of 21 output lines of data in PLANIT will result in 3 display outputs of 6 lines followed by a display output of 3 lines (plus a top blank line for response if applicable).
- c. 62,15 [DCL X (62,15)] notation was used in the majority of the cases of conversion from the FORTRAN floating point arithmetic to the TACPOL fixed point arithmetic (scientific notation was used in some instances). The selection of 62,15 results in up to four (4) decimal place numbers.
- d. The 62,15 notation and the single word precision used in the TACPOL library functions (such as SQRT, LOG, LN, etc.) results in a limitation to a maximum value of 2^{15} for input to these functions.
- e. ^{Because} Since TACPOL does not include fractional exponentation, only integer powers may be used. The base number may be fractional (e. g., $(3.1416)^5$).

- f. The limitation of 4 place (decimal) numbers, e. g., XX.XXXX, in the current implementation restricts the use and decimal accuracy of CALC statements and answers. Certain combinations of math statements may result in a degree of error in the decimal portion of the resulting answer. For example, XX.XXX times YY.YY implies five place accuracy in the calculation and will result in a degree of error in the resulting decimal portion of the answer. On the other hand XX.XXX times YY.Y implies four place accuracy and will yield a correct answer. Similarly certain functions such as SQRT (square root) may yield a degree of error in the decimal portion of the answer. Integer arithmetic is not affected by this limitation.

This does imply the need to use the WITHIN expression for answer matching within lessons in cases where the decimal portion of the answer may be affected by this limitation in the current implementation.

SECTION 2

POS/RAMCHECK PROCEDURES/SEQUENCE OF OPERATIONS

This section describes the procedures, sequence of operations, messages and error indications during loading of the POS and RAMCHECK modules and the POS initialization process. The description and procedures enable execution of PLANIT on any of the current AN/GYK-12 system configurations as follows:

TACFIRE Field Configurations
(Division or Battalion)

TOS² Field Configurations
(Division or Brigade)

TOS² SSS Configurations
(Division or Brigade)

Subsection 2.2 describes the meanings of the TEST SWITCH settings after system loading which in conjunction with the COMPUTER RESTART pushbutton allow the TAPE, CARD and PRINTER devices to be changed from the field devices to the SSS devices and vice versa. This allows a SSS center to more easily prepare tapes for field use. The ACC PATCH and DISPLAY routine may also be selected.

2.1 PLANIT System Set-Up and Loading Procedure

The following procedures allow system loading on the standard AN/GYK-12 configurations and include options for various memory, drum and terminal configurations which may be encountered.

PLANIT may be loaded in any of the following core/drum configurations.

- a. 7 8-K Memory Banks with 1 or 2 drums.
- b. 1 MCMU Memory Bank with 1 or 2 drums.
- c. 3 or 4 MCMU Memory Banks (no drums).

- A. Core Memory Setup. Assign all memory banks consecutively (00,01, 02 ...). Do not have mix 8-K and MCMU memory tapes.
 - B. Drum Setup. If loading in an 8-K or single MCMU system turn on one or two drums.
 - C. Set the DATA EXCHANGE CHANNEL SELECT switches (IOU Maintenance and Status Panel) A, B and C = 1, 2 and 3 respectively.
 - D. Set the ACC ADDRESS switches on the IOU to the ACC/OCC switch assembly device address (normally 25 for TACFIRE, 35 for TOS²).
 - E. Mount the PLANIT LOAD TAPE or TTC on one of the following devices:
 - a. ARMM1 TACFIRE TTC
 - b. POTTER DRIVE #1 TOS² (800 BPI tape)
 - c. IBM Drive 0, 1, 2 or 3 TOS² SSS tape
 - F. Set the right digit of the test switch to indicate the load device as follows:
 - a. 0 - ARMM1
 - b. 1 - POTTER, DRIVE #1
 - c. 2 - IBM DRIVE 0
 - d. 3 - IBM DRIVE 1
 - e. 4 - IBM DRIVE 2
 - f. 5 - IBM DRIVE 3
 - G. Set the left digit of the test switch to indicate drum track size and ACC PATCH AND DISPLAY SELECTION as follows:
 - a. 0 256 track drums
 - b. 2 192 track drums
 - c. 4 256 track drums - PATCH AND DISPLAY SELECTED
 - d. 6 192 track drums - PATCH AND DISPLAY SELECTED
- Use 0 or 4 for non-drum MCMU system.
- H. If TACFIRE or TOS² Field configuration skip to Step P.
 - I. If the cards file is to be entered via the Card Reader, place cards in input hopper and start Card Reader.

- J. Set INSTRUCTION STOP and press MASTER CLEAR on Computer Test Set.
- K. Set PEBU CHANNEL SELECT ^{switch} which to 1 and BSL SELECT switch to the TUO-TU3 setting which corresponds to the tape drive selected for system load.
- L. Depress the PEBU Load switch to Bootstrap Load the PLANIT Operating System from the System Tape. If the load is successful, the computer will halt and the DIAGNOSE STATUS Lights will display 777201. If the load is unsuccessful, rewind the System Tape and return to Step J.
- M. Set the PEBU CHANNEL SELECT switch to 7.
- N. Release the INSTRUCTION STOP Switch and press the COMPUTER START Switch. This action will start system initialization.
- O. Continue with Step Q.
- P. Depress CHANNEL 11 Program Load Switch on the IOU Maintenance and System Panel. This action will bootstrap load the PLANIT Operating System. If the loading operation is successful, the DIAGNOSE STATUS Lights will momentarily display 777201 and System Initialization will begin.
- Q. During System Initialization, certain errors may occur which will cause a DIAGNOSE STATUS display code. Generally an expected action will not occur and corrective action must be taken. A list of all DIG Codes, their meanings and recommended action is included in Appendix A.
- R. At this point the CE display of the ACC/OCC will be displaying the PATCH AND DISPLAY text or the "PLANIT SYSTEM; PDS (Physical Device Status) Skeleton" (Figure 2-1).

If the PATCH AND DISPLAY option was selected the POS program may be modified. Proceed according to Appendix J.

If no display appears, check the DIAGNOSE STATUS Display and proceed according to Appendix A.

If no display and no DIAGNOSE STATUS Display, verify and repeat the procedure from Step A.

```
PLANIT SYSTEM; PDS (PHYSICAL DEVICE STATUS);  
CTUO/ARMM1 :11; CTU1/ARMM2 :36; CTU2 :00; CTU3 :00;  
ACC :25; LINES : 7;  
ELP1 (ACC COPY) :27;  
ELP2 (SYSTEM PRINTER) :00;  
CARD READER :00; CARD PUNCH :00; HIGH SPEED PRINTER :00;
```

Figure 2-1 - PDS (Physical Device Status) Skeleton

- S. The PDS Skeleton (Figure 2-1) allows modification of device addresses and the selection of 7 or 14 lines for the ACC/OCC. Activation of the tab key will position the cursor to each channel or line selection in turn and a new entry may be made.

Example 1. To change the ACC/OCC to 14 lines, position the cursor to the colon following lines and enter 14.

Example 2. To change the two ELP channel selections to indicate a single ELP to be used as the system printer (1st priority) and for ACC copy (2nd priority).

Position the cursor to the colon following ELP1 and enter the correct channel assignment. Position the cursor to the colon following ELP2 and enter 00. 00 indicates device is off-line.

- T. When the skeleton is acceptable, press the C/E D CMPTR ACTION button. The skeleton will be printed on ELP1.
- U. The second skeleton will then be displayed and is entitled "PLANIT SYSTEM; TAS (Terminal Allocation Status)" (Figure 2-2).

PLANIT SYSTEM; TAS (TERMINAL ALLOCATION STATUS);									
TERM	TYPE	CHAN	LINES	NO-ACK	TERM	TYPE	CHAN	LINES	NO-ACK
2	:VFMED/RDT;	:12;	: 7;	:OFF;	7	:VFMED/RDT;	:30;	: 7;	:OFF;
3	:VFMED/RDT;	:14;	: 7;	:OFF;	8	:VFMED/RDT;	:34;	: 7;	:OFF;
4	:VFMED/RDT;	:16;	: 7;	:OFF;	9	:VFMED/RDT;	:00;	: 7;	:OFF;
5	:VFMED/RDT;	:20;	: 7;	:OFF;					
6	:VFMED/RDT;	:22;	: 7;	:OFF;					

Figure 2-2 - TAS (Terminal Allocation Status Skeleton)

V. The TAS skeleton allows modification of Terminal type, channel, 7 or 14 lines and turning ON the NO-ACK mode for VFMED terminals. The terminal number from 2 to 9 corresponds to the PLANIT terminal number assignment (1 is always an ACC/OCC). The entries and legal values are given below:

- a. TYPE - The terminal type variable was initially filled in according to the test switch setting. The legal selections are as follows:

:VFMED/RDT;	New TACFIRE VFMEDs
:VFMED/OLD;	Old TACFIRE VFMEDs
:MIOD ;	TOS ² MIOD
- b. CHAN - The channel selection variable represents the receive side (even number) of the DDT to be used for that terminal. Enter 00 to indicate an off-line device.
- c. LINES - The line selection may be changed to 14 if desired.
- d. NO-ACK - The NO-ACK option for the VFMED may be activated by changing :OFF; to :ON ;. When selected, PLANIT output text is directed to the remote printer without operator intervention. See Appendix D for more information.

W. When the skeleton is acceptable, press the C/E D CMPTR ACTION button. The skeleton will be printed.

X. If the system is configured with drums, the second program on the system tape (RAMCHECK) will be loaded and executed.

Execution of RAMCHECK will terminate with the display of one of the following DIAGNOSE STATUS Codes:

0540XX (XX = # Drums on-line) - Drums are operational and program has advanced to Step Y.

056001-056020 Non-recoverable error. Rewind system tape and return to Step G.

Y. The remaining programs on the system tape are now being loaded. Successful conclusion results in either of the following:

- a. The ACC PATCH AND DISPLAY option display (if selected) and any core resident program may be patched. Proceed according to Appendix J.
- b. Activation of the "START" program as indicated by the lighting of the PRIORITY MESSAGE lite on the ACC/OCC. POS initialization and program loading is complete.

2.2 Test Switch Settings During Hot Start

Anytime after the system has been loaded and PLANIT requests "PLEASE LOG IN" the TEST SWITCH setting used in conjunction with the COMPUTER RESTART pushbutton may be used to change the TAPE, CARD and PRINTER devices from the field device assignments to the PSS/SSS device assignments or vica versa. Activating the COMPUTER RESTART will in addition cause a PLANIT HOT START and resumption of PLANIT with the "PLEASE LOG IN" message.

The right digit of the TEST SWITCH setting will have the following affect on system operation only if it has been changed since system loading:

- X0 Clears indications of CARD READER, CARD PUNCH AND H-S PRINTER. Replaces four possible tape unit assignments with ARMM assignments 1/1 and 3/6.
- X1 Clears indications of CARD READER, CARD PUNCH and H-S PRINTER. Replaces four possible tape unit assignments with POTTER assignments (all 1/1).
- X2 Enters assignments for CARD READER (7/4), CARD
thru
X7 PUNCH (7/5) and H/S PRINTER (7/6). Replaces four possible tape unit assignments with IBM Commercial assignments (7/0 thru 7/3).

In addition to changing the configuration, activation of the COMPUTER RESTART will cause the ACC patch and display routine to be entered if the left digit of the TEST SWITCH setting is 4, 5, 6 or 7. See Appendix J for operating instructions for the patch and display routine.

3.3 RAM Message

The next message from START will be output only if the system configuration includes RAMs. The message prints the number of online drums ~~found~~ and the number of bad tracks (in octal). The message is informational and requires no operator action. The message appears as follows:

```
+  
+2 DRUMS ON LINE  
+01 BADTRACKS (OCTAL)
```

If there were bad tracks, an informational report will be displayed which appears as follows:

```
+BADTRACK ALTERNATE (DRUM TRACK IN OCTAL)  
+1 216    0 003  
+1 220    0 004
```

The above report indicates that tracks 216 and 220 (octal) of drum 1 were bad and that tracks 3 and 4 of drum 0 were assigned as alternates.

3.4 History Tape Mount Message

A tape mount request will be displayed if the HISTORY start was selected. The message will suggest a tape unit on which to mount the HISTORY tape (IBM UNIT 0, POTTER UNIT 1 or ARMM UNIT 1) depending on the system configuration. The message appears as follows:

```
+  
+PLANIT SUSPENDED, MOUNT INPUT TAPE  
+ON IBM UNIT 0  
+REEL IDENTITY IS HISTORY  
+REPLY CANCEL OR UNIT WHEN COMPLETED (C,0,1,2,3)
```

The operator should verify that the tape is mounted and ready on some unit and then reply with the correct digit (0 thru 3 for IBM units, 1 thru 4 for POTTER units, 1 or 2 for ARMM units).

The next message is the header data from the HISTORY tape showing when the HISTORY tape was created; it appears as follows:

HISTORY TAPE DATE 122174 TIME 0420

The HISTORY tape will be loading after this message is displayed.

3.5 START Initialization Complete Message

The last message from START is as follows:

+
+START INITIALIZATION COMPLETE

No operator action is required.

If the HISTORY or TAPE mode was selected the following message will be displayed:

+YOU MAY REMOVE TAPE FROM IBM UNIT 0

The operator may remove the tape at this time.

3.6 PLANIT Log In Message

The next message to appear will be the PLANIT log in message which is as follows:

PLEASE LOG IN***

3.7 START Error Messages

Error messages from START are shown in Table 3-I. A typical error message is shown below:

+HISTORY LOAD PROBLEM
+HISTORY TAPE HEADER RECORD INVALID
+DO YOU WISH TO RETRY HISTORY LOAD (Y,N)
+

Enter a Y for yes or an N for no.

The Y response will rewind the tape and cause the following message:

+YOU MAY REMOVE TAPE FROM IBM UNIT 0

It is not necessary to remove the tape and the next message will be the tape mount message as described in 3.4.

If the N response is given the following message will be displayed:

+LOAD NEXT SYSTEM ON COMPUTER

No further operation is possible until the next system is booted into the computer.

TABLE 3-1. ERROR MESSAGES FROM START (Sheet 1 of 2)

MESSAGE	POSSIBLE CAUSE	RECOMMENDED ACTION
+SYSTEM LOAD ABORTED - NO RECOVERY +MORE THAN 64 BAD TRACKS, PLANIT CANNOT RUN +TRY RELOADING SYSTEM	Badtracks on drum(s) exceed 64	Try reloading system. Replace drum or turn off failing drum. PLANIT requires one or two drums depending on PLANIT file allocation
+SYSTEM LOAD ABORTED - NO RECOVERY +FILE DID NOT OPEN +TRY RELOADING SYSTEM	Not enough RAMs or MCMUs on line and HISTORY tape from larger system.	Verify number of on-line RAMs or MCMUs and origin of history tape. Try reloading system.
+HISTORY LOAD PROBLEM +MOUNT OR HISTORY TAPE NOT ACCOMPLISHED +DO YOU WISH TO RETRY HISTORY LOAD? (Y,N) +	Incorrect or no response to tape mount message.	Enter Y (yes) and respond correctly to tape mount message
+HISTORY LOAD PROBLEM +MOUNT OF HISTORY TAPE NOT APPROVED +DO YOU WISH TO RETRY HISTORY LOAD? (Y,N) +	Incorrect response to tape mount message.	Enter Y (yes) and respond correctly to tape mount message.
+HISTORY LOAD PROBLEM +HISTORY TAPE DID NOT OPEN +DO YOU WISH TO RETRY HISTORY LOAD? (Y,N) +	No tape was mounted or tape was not mounted on correct unit.	Enter Y (yes) and respond correctly to tape mount message. Verify location of HISTORY tape.
+HISTORY LOAD PROBLEM +HISTORY TAPE HEADER RECORD INVALID +DO YOU WISH TO RETRY HISTORY LOAD? (Y,N) +	Incorrect tape was mounted or incorrect response given to tape mount message.	Enter Y (yes) and verify tape to be read in is HISTORY tape.

TABLE 3-1. ERROR MESSAGES FROM START (Sheet 2 of 2)

<u>MESSAGE</u>	<u>POSSIBLE CAUSE</u>	<u>RECOMMENDED ACTION</u>
+HISTORY LOAD PROBLEM +HISTORY TAPE UNRECOVERABLE ERROR +DO YOU WISH TO RETRY HISTORY LOAD? (Y,N) +	Tape error	Enter Y (yes) and try again. If still no good, use older history tape.
+HISTORY LOAD PROBLEM +UNRECOVERABLE FILE WRITE ERROR +DO YOU WISH TO RETRY HISTORY LOAD? (Y,N)	RAM controller error	Enter Y (yes) and try again. If still no good use RAMFI program to verify RAM status.

SECTION 4

MIOP/TMIOP PROCEDURES/SEQUENCE OF OPERATIONS

This section describes the procedures, sequence of operations, messages, and error indications during MIOP/TMIOP operations.

MIOP/TMIOP messages consist of tape mount messages. PLANIT termination messages and error messages. Tape mount messages are ^{used}utilized by both the START and FINAL modules as well as PLANIT.

- 4.1 Mount Input Tape Message. PLANIT operation is suspended when a tape mount request is made. A typical request will appear as follows:

```
+
+PLANIT SUSPENDED, MOUNT INPUT TAPE
+ON IBM UNIT 0
+REEL IDENTITY IS TEST 001
+REPLY CANCEL OR UNIT WHEN COMPLETED (C,0,1,2,3)
+
```

The message "MOUNT INPUT TAPE" indicates that the tape will be read only. It is suggested that the write ring be removed before mounting. The message also suggests a unit on which to mount the tape, that unit or any free unit may be used. The next line gives the reel identity, in this case "TEST 001."

The operator should either cancel the request or mount the tape and reply with the proper digit (0 thru 3 for IBM units, 1 or 2 for ARMM units, 1 thru 4 for POTTER units).

If an error is made, one of the following will replace the top line of the mount message:

- a) +INVALID REPLY, TRY AGAIN

A reply other than CANCEL or a legal digit (0 thru 3 for IBM units, 1 thru 4 for POTTER units; 1 or 2 for ARMM units) was given. Reenter reply.

- b) +REPLY UNIT IS BUSY, TRY A DIFFERENT UNIT

The unit selected by the operator was not released by PLANIT. Reply with an unused unit.

4.1.1 Multi-Lesson Input Tape Message. The next message is used to determine if the tape is a multi-lesson tape or not. The message appears as follows:

```
+
+PLANIT SUSPENDED, A TAPE READ REQUEST HAS BEEN MADE FOR
+REEL nnnnnnnn LESSON pppppppp.
+
+IS THE NAMED LESSON PART OF A MULTI-LESSON REEL?
+REPLY YES, NO OR CANCEL. (Y,N,C)
```

The message indicates the reel and lesson name requested for the read request. The message gives the operator the opportunity to verify the lesson name and reel against various tape inventories.

The operator should either cancel the request or reply Y or N as appropriate.

If an operator error is made the top line of the message will be replaced by the following:

```
+INVALID REPLY, TRY AGAIN.
```

A reply other than Y, N or C was given.

Re-enter reply.

If the reply is N, the tape is rewound and PLANIT will read the tape.

If the reply is Y, the tape will be automatically positioned by MIOP before PLANIT will read the tape.

- 4.2 Mount Card Input Tape Message. PLANIT operation is suspended when this tape mount request is made. A typical request will appear as follows:

```
+
+PLANIT SUSPENDED, MOUNT CARD INPUT TAPE
+ON ARMM UNIT 1
+IDENTITY IS CARD INPUT TAPE
+REPLY CANCEL OR UNIT WHEN COMPLETED (C,1,2)
+
```

This message is a special case of the mount input tape message. The tape mounted must be in a special format created by the stand alone PLANIT Utility Program (PUP) or a card output tape created by this system (see 4.4).

The operator should either cancel the request or mount the requested tape on an available unit. The operator should then reply with the proper digit (0 thru 3 for IBM units, 1 thru 4 for POTTER units, 1 or 2 for ARMM units).

If an error is made one of the following will replace the top line of the mount message:

- a) +INVALID REPLY, TRY AGAIN
- b) +REPLY UNIT BUSY, TRY A DIFFERENT UNIT

See 4.1 a) and b) for a description of the errors.

- 4.3 Mount Write Enabled Scratch Tape Message. PLANIT operation is suspended when a tape mount request is made. A typical request will appear as follows:

```
+
+PLANIT SUSPENDED, MOUNT WRITE ENABLED SCRATCH TAPE
+ON IBM UNIT 0
+REEL IDENTITY IS TEST 002
+REPLY CANCEL OR UNIT WHEN COMPLETED (C,0,1,2,3)
+
```

The message "MOUNT WRITE ENABLED SCRATCH TAPE" indicates that the tape will be written on. The message also suggests a unit on which

to mount the tape, that unit or any free unit may be used. The next line gives the reel identify, in this case "TEST 002."

The operator should either cancel the request or mount the tape and reply with the proper digit (0 thru 3 for IBM units, 1 thru 4 for POTTER units, 1 or 2 for ARMM units).

If an error is made one of the following will replace the top line of the mount message:

- a) +INVALID REPLY, TRY AGAIN
- b) +REPLY UNIT BUSY, TRY A DIFFERENT UNIT

See 4.1 a) and b) for a description of the errors.

4.3.1 Multi-Lesson Output Tape Message. The next message is used to determine if the tape is to be a multi-lesson tape or not. The message appears as follows:

```
+
+PLANIT SUSPENDED, A TAPE WRITE REQUEST HAS BEEN MADE FOR
+REEL nnnnnnnn LESSON pppppppp.
+
+IS THE NAMED LESSON PART OF A MULTI-LESSON REEL?
+REPLY YES, NO OR CANCEL. (Y,N,C)
```

The message indicates the reel and lesson name which will be written on the tape. The message gives the operator the opportunity to verify the lesson name and reel before continuing.

The operator should either cancel the request or reply Y or N as appropriate.

If an operator error is made the top line of the message will be replaced by the following:

+INVALID REPLY, TRY AGAIN

A reply other than Y, N or C was given.
Re-enter reply.

If the reply is N, the tape is rewound and PLANIT will write the lesson on the tape.

If the reply is Y, the next message will be displayed.

4.3.2 First Record Output Tape Message. The third message is used to determine if the lesson is to be written as the first file on the tape. The message appears as follows:

```
+
+PLANIT SUSPENDED, A TAPE WRITE REQUEST HAS BEEN MADE FOR
+REEL. nnnnnnnn LESSON pppppppp.
+IS THE NAMED LESSON TO BE WRITTEN
+AS THE FIRST RECORD ON THE REEL?
+REPLY YES, NO OR CANCEL. (Y,N,C)
```

This message gives the opportunity to add a new lesson to an existing tape (N response) or start a new tape (Y response).

The operator should either cancel the request or reply Y or N as appropriate.

If an operator error is made the top line of the display will be replaced by the following:

```
+INVALID REPLY, TRY AGAIN
```

A reply other than Y, N or C was given.

Re-enter reply.

If the reply is N, the tape is rewound and PLANIT will write the lesson on the tape.

If the reply is Y, the tape will be automatically positioned by MIOP before PLANIT writes the lesson on tape.

4.4 Mount Card Output Tape Message. PLANIT operation is suspended when this tape mount request is made. A typical request will appear as follows:

```
+
+PLANIT SUSPENDED, MOUNT WRITE ENABLED SCRATCH TAPE
+ON IBM UNIT 2
+MARK IDENTITY AS CARD OUTPUT TAPE
+REPLY CANCEL OR UNIT WHEN COMPLETED (C,0,1,2,3)
+
```

This message is a special case of the mount output tape message. The card output tape will be written in a special packed format which can only be read by the stand alone PLANIT Utility Program (PUP) or as a card input tape in this system. (see 4.2).

The operator should either cancel the request or mount a scratch tape on an available unit. The operator should then reply with the proper digit (0 thru 3 for IBM units, 1 thru 4 for POTTER units, 1 or 2 for ARMM units).

If an error is made, one of the following will replace the top line of the mount message:

- a) +INVALID REPLY, TRY AGAIN
- b) +REPLY UNIT BUSY, TRY A DIFFERENT UNIT

See 4.1 a) and b) for a description of the errors.

- 4.5 Remove Tape Message. When PLANIT is finished with a tape it will cause the following typical message to be displayed:

+YOU MAY REMOVE TAPE FROM IBM UNIT 0

The unit is now free for use and the reel or MLU may be removed and labeled as required.

- 4.6 PLANIT Termination Messages. When PLANIT terminates it will produce one of the following messages:

+PLANIT NORMAL END (In response to PLANIT
+DUMP HISTORY TAPE? (Y,N) QUIT ALL Command.)

or:

+PLANIT FATAL ERROR 000 (In response to PLANIT
+DUMP HISTORY TAPE? (Y,N) FATAL ERROR indication.)

In the case of a "FATAL ERROR" the number given is a PLANIT error number and is described in the PLANIT manual.

At this point the operator must determine whether a HISTORY TAPE should be made. As a general rule, a HISTORY TAPE should be made for the PLANIT NORMAL END condition and none should be made for the PLANIT FATAL ERROR condition.

A HISTORY TAPE preserves lesson and student record files so that system operation can be resumed with no loss of data.

The N (no) response to the "DUMP HISTORY TAPE" question will produce the following message:

+PRESS MASTER RESET TO HOT START PLANIT IF DESIRED
+OTHERWISE MOUNT NEXT SYSTEM
+FINI

As indicated the computer can be MASTER RESET which will restart PLANIT or the next system can be loaded.

The Y(yes) response to the "DUMP HISTORY TAPE" question will cause the FINAL module to be executed (see Section 5).

- 4.7 RD Screen Error Messages. Table 4-1 shows the error messages which may appear on the RD screen or the ACC(OCC). The most recent error will be at the bottom of the screen and errors will move from the bottom to the top of the screen as more errors occur. The error messages appearing on the RD screen require no action and PLANIT, START or FINAL will put out specific messages requesting action should any be required.

Table 4-1. RD Screen Error Messages

ERROR ON POTTER UNIT X
ERROR ON IBM UNIT X
ERROR ON ARMM UNIT X
ERROR ON CARD READER
ERROR ON CARD PUNCH
ERROR ON SYSTEM LINE PRINTER
ERROR ON ELP1
ERROR ON TERMINAL X
ERROR ON DRUM
PAPER LOW ELP1
PAPER LOW ELP2

- 4.8 MIOP Error Messages and Error Correction. Table 4-II shows the error messages which may occur during MIOP tape positioning of multi-lesson tape reels. Most of the errors will cause an automatic cancellation of the request and return to PLANIT for further activity.
- 4.8.1 Multi-Lesson Tape Inventory. To inventory a tape, use the PLANIT request "GET TAPEINV nnnn". MIOP will detect the lesson name "TAPEINV", rewind the tape and display headers, six at a time, until a double EOF is detected. A cancel will be returned to PLANIT at the completion of the task and the tape will be rewound. Reel and lesson name checking is bypassed and no multi-lesson questions are asked.
- 4.8.2 Multi-Lesson Tape Error Correction. Tape correction is provided in the write mode by responding to error messages. The tape correction is limited to ending the tape or rewriting over the invalid lesson and rewriting all following lessons. Either of the following messages will be displayed when an error situation is encountered:

Message A. +
 +WRITE REQUEST FOR EEEL nnnnnnnn LESSON pppppppp
 +REEL DOES NOT MATCH TAPE HEADER WHICH IS:
 0999 FMI ZFMI GERMAS
 +REPLY OK TO WRITE NEW LESSON, END TO END TAPE OR
 +CANCEL. (OK,END,C)

Message B. +
 +WRITE REQUEST FOR REEL nnnnnnnn LESSON pppppppp
 +LESSON MATCHES EXISTING TAPE HEADER WHICH IS:
 09999 FMI ZFMI GERMAS
 +REPLY OK TO WRITE NEW LESSON, END TO END TAPE OR
 +CANCEL. (OK,END,C)

The END response to message A or B will cause two End of File (EOF) marks to be written over the header record, ending the tape.

The OK response to message A or B will allow PLANIT to write the desired lesson over the header record.

The following examples illustrate correction of typical problems:

Example 1

To correct a reel number error where the TAPEINV display is as follows:

212	MATH1	ZMATH1	DOE
212	MATH2	ZMATH2	DOE
222	MATH3	ZMATH3	DOE
212	MATH4	ZMATH4	DOE
END OF TAPE			

- a. Position the tape manually at BOT.
- b. SAVE the correct lesson and Reel, i.e.,
"SAVE MATH3 212".
- c. Message A will be displayed, Reply "OK".
- d. When completed SAVE the next lesson on tape, i.e.,
"SAVE MATH4 212".

Example 2

To correct a lesson name error where the TAPEINV display is as follows:

100	TANKS1	ZTANKS1	DOE
100	RIVER	ZRIVER	JOE
100	TANKS3	ZTANKS3	DOE
END OF TAPE			

- a. Position the tape manually at BOT.
- b. SAVE the incorrect lesson and reel, i.e.,
"SAVE RIVER 100".
- c. Message B will be displayed, Reply "END".
Tape will be ended and rewound.
- d. SAVE the correct lessons and reel, i.e., SAVE TANKS2
100" and "SAVE TANKS3 100".

Example 3

To correct a tape on which the last lesson is not complete (end of tape encountered), and where the last part of the TAPEINV display is as follows:

...			
900	MATH50	ZMATH30	DOE
900	MATH51	ZMATH51	DOE
TAPE ERROR			

NOTE: The "TAPE ERROR" entry indicates the lesson preceeding (MATH51) was bad.

- a. Position the tape manually at BOT.
- b. SAVE the last lesson and reel, i.e., "SAVE MATH51 900".
- c. Message B will be displayed, Reply "END".

TABLE 4-II. ERROR MESSAGES FROM MIOP (Sheet 1 of 2)

<u>Message</u>	<u>Cause</u>	<u>Recommended Action</u>
+ +READ REQUEST FOR REEL nnnnnnnn LESSON pppppppp +CAN NOT BE PROCESSED AT THIS TIME. +WAIT FOR COMPLETION OF PRESTORE OR PUNCH JOB(S) +AND TRY AGAIN. +REQUEST AUTOMATICALLY CANCELLED.	The Buffer used for tape positioning is allocated to a Prestore or Punch job.	Cancel or wait for completion of Prestore or punch job and try again.
+ +WRITE REQUEST FOR REEL nnnnnnnn LESSON pppppppp +CAN NOT BE PROCESSED AT THIS TIME. +WAIT FOR COMPLETION OF PRESTORE OR PUNCH JOB(S) +AND TRY AGAIN. +REQUEST AUTOMATICALLY CANCELLED.	The Buffer used for tape positioning is allocated to a Prestore or Punch job.	Cancel or wait for completion of Prestore or punch job and try again.
+ +READ REQUEST FOR REEL nnnnnnnn LESSON pppppppp +COULD NOT BE LOCATED. END OF TAPE + +REQUEST AUTOMATICALLY CANCELLED.	The lesson tape was searched from beginning to end and the lesson name could not be located.	Verify spelling of lesson name compared to inventory of lesson tape.

TABLE 4-II. ERROR MESSAGES FROM NIOP (Sheet 2 of 2)

<u>Message</u>	<u>Cause</u>	<u>Recommended Action</u>
+ READ REQUEST FOR REEL nnnnnnnn LESSON pppppppp + REEL DOES NOT MATCH TAPE HEADER WHICH IS: 0999 FMI AFMI GERMAS + REQUEST AUTOMATICALLY CANCELLED.	Incorrect reel was mounted or incorrect unit reply given for tape mount.	Verify lesson name and reel compared to inventory of lesson tape.
+ WRITE REQUEST FOR REEL nnnnnnnn LESSON pppppppp + REEL DOES NOT MATCH TAPE HEADER WHICH IS: 0999 FMI ZFMI GERMAS + REPLY OK TO WRITE NEW LESSON, END TO END TAPE OR + CANCEL. (OK,END,C)	Reel number in tape header does not match write request.	See Section 4.8 Tape Error Correction.
+ WRITE REQUEST FOR REEL nnnnnnnn LESSON pppppppp + LESSON MATCHES EXISTING TAPE HEADER WHICH IS: 0999 FMI ZFMI GERMAS + REPLY OK TO WRITE NEW LESSON, END TO END TAPE OR + CANCEL. (OK,END,C)	Lesson name in tape header matches write request.	See Section 4.8 Tape Error Correction.

SECTION 5

FINAL MODULE PROCEDURES/SEQUENCE OF OPERATIONS

This section describes the procedures, sequence of operations, messages and error indications during execution of the FINAL module for PLANIT system termination operations.

The FINAL module is activated by replying Y (yes) to the MIOP message "DUMP HISTORY TAPE?". The FINAL module will make a HISTORY tape by copying the contents of all PLANIT files.

5.1 Tape Mount Message

The first message to be displayed is the tape mount message. The message will suggest a tape unit on which to mount a write enabled scratch tape which will become the HISTORY tape. The unit suggested depends on the system configuration (IBM UNIT 0, POTTER UNIT 1 or ARMM UNIT 1). A typical message appears as follows:

```
+
+PLANIT SUSPENDED, MOUNT WRITE ENABLED SCRATCH TAPE
+ON IBM UNIT 0
+REEL IDENTITY IS HISTORY
+REPLY CANCEL OR UNIT WHEN COMPLETED (C,0,1,2,3)
+
```

The operator should mount a write enabled scratch on any available unit, double checking that the tape is at load point (beginning of tape) and write enabled. The operator then responds with the correct digit (0 thru 3 for IBM units, 1 thru 4 for POTTER units, 1 or 2 for ARMM units).

5.2 History Header Record Message

The next message is the HISTORY tape header record. It includes the current date and time and appears as follows:

```
+HISTORY TAPE DATE 012975 TIME 2356
```

- Although the message is informational, it is suggested that the data be copied onto a stick-on-label to be affixed to the physical tape or MLU.

5.3 File Allocation Message

The next two messages are an informational table on the PLANIT files and appear as follows for a RAM system:

FILE	R SIZE	COUNT	DRUM	TRACK	SECTOR
01	000640	000005	0	001	000
02	000640	000010	0	003	004
03	000384	000010	0	009	012
04	000320	000400	0	013	004
05	001824	000050	0	138	004

FILE	R SIZE	COUNT	DRUM	TRACK	SECTOR
06	004160	000009	0	227	006
08	000064	000001	1	007	024
09	004160	000002	1	007	026
10	000160	000100	1	015	030
11	000160	000025	1	031	018

For an all MCMU system the report will appear as follows:

FILE	R SIZE	COUNT	ADDRESS
01	000640	000005	022000
02	000640	000010	0237FE
03	000384	000010	0258A0
04	000320	000400	02F990
05	001824	000050	03D000

FILE	R SIZE	COUNT	ADDRESS
06	004160	000009	06E3F0
08	000064	000001	0A33FC
09	004160	000002	0A34CC
10	000160	000100	100300
11	000160	000035	12AF30

The tables are interpreted in the following manner:

- FILE. PLANIT file number 1 thru 11 except 7 which is non-existent.
- ADDRESS. For the all MCMU system this is the core address (in hex) of the beginning of the file.
- DRUM, TRACK, SECTOR. For the RAM system this is the address in decimal of the beginning of the file.
- R SIZE. This is the size of each record in the file in 32 bit words.
- COUNT. This is the number of records in the file.

The Report is informational and no operator action is required.

5.4 Remove Tape Message

When the HISTORY tape is complete the tape will rewind and the following typical message will be output:

+YOU MAY REMOVE TAPE FROM IBM UNIT J

The tape should be removed, labeled and the write ring removed (if not an MLU).

5.5 History Tape Complete Message

The last message from FINAL is as follows:

+HISTORY TAPE COMPLETE WITH NO ERRORS
+TRACKS USED 000305 OR MCMU WORDS 312320
+REMOVE HISTORY TAPE
+PRESS MASTER RESET TO HOTSTART PLANIT IF DESIRED
+OTHERWISE MOUNT NEXT SYSTEM
+FINI

The first variable is the number of tracks used for a TACFIRE or TOS² drum system plus the number of bad tracks. The MCMU words value for a drum system is the additional core required to replace the drums and does not include resident core storage.

The MCMU words value for an MCMU system (no drums) is the total core used for resident programs and PLANIT FILES. The tracks value is the track equivalent of the MCMU words and is not directly relateable to a drum system.

As indicated the computer can be MASTER RESET which will restart PLANIT or the next system can be loaded.

5.6 FINAL Error Messages

Error messages from FINAL are shown in Table 5-I.

TABLE 5-I. FINAL ERROR MESSAGES (Sheet 1 of 2)

<u>MESSAGE</u>	<u>POSSIBLE CAUSE</u>	<u>RECOMMENDED ACTION</u>
+CANNOT REOPEN ACC TERMINAL FOR MESSAGES (Note: Appears on RD screen only)	ACC turned off or failing. ACC incorrectly cabled or 100 switches incorrect.	Turn on ACC (if off) verify configuration of system. If recovery is effected, the error message will remain but normal operation will be possible.
+HISTORY DUMP PROBLEM +MOUNT OF HISTORY TAPE NOT ACCOMPLISHED +DO YOU WISH TO RETRY HISTORY DUMP? (Y,N) +	Incorrect or no response to tape mount message.	Enter Y (yes) and respond correctly to tape mount message.
+HISTORY DUMP PROBLEM +MOUNT OF HISTORY TAPE NOT APPROVED +DO YOU WISH TO RETRY HISTORY DUMP? (Y,N) +	Incorrect response to tape mount message	Enter Y (yes) and respond correctly to tape mount message.
+HISTORY DUMP PROBLEM +HISTORY TAPE DID NOT OPEN +DO YOU WISH TO RETRY HISTORY DUMP? (Y,N) +	No tape was mounted or tape was not mounted on correct unit.	Enter Y (yes) and respond correctly to tape mount message. Verify location of scratch tape.

TABLE 5-1. FINAL ERROR MESSAGES (Sheet 2 of 2)

<u>MESSAGE</u>	<u>POSSIBLE CAUSE</u>	<u>RECOMMENDED ACTION</u>
+HISTORY DUMP PROBLEM +HISTORY TAPE UNRECOVERABLE ERROR +DO YOU WISH TO RETRY HISTORY DUMP? (Y,N) +	Tape error	Enter Y (yes) and try again. If still no good, use a different scratch tape.
+HISTORY DUMP PROBLEM +UNRECOVERABLE DRUM READ ERROR +DO YOU WISH TO RETRY HISTORY DUMP? (Y,N) +	RAM controller error	Enter Y (yes) and try again. If still no good use RAMFI program to verify RAM status.

APPENDIX A
DIAGNOSTIC STATUS (DIG) CODES

<u>CODE</u>	<u>MEANING</u>	<u>CORRECTIVE ACTION</u>
0549XX	RAM FUNCTIONAL, XX DRUMS ONLINE	NONE REQUIRED
056001	DTU ON ITR TO DRUM	1. RE-BOOT SYSTEM 2. REPAIR SYSTEM
056002	ITR INPUT PARITY ERROR	SAME AS 056001
056003	DTU ON OFR TO DRUM	SAME AS 056001
056004	DTU ON DEV TO DRUM	SAME AS 056001
056005	BUSY FAULT IN ITR WORD	SAME AS 056001
056006	ERROR BIT SET IN ITR WORD	SAME AS 056001
056007	F & J BITS IN TERMWORD NOT SET	SAME AS 056001
056010	TRANSMISSION OR OPERATIONAL ERROR	SAME AS 056001
056011	COMPUTER ERROR OR DRUM WRITE PARITY ERROR	SAME AS 056001
056012	DRUM READ PARITY ERROR	SAME AS 056001
056013	EDS NOT 0 IN TERMWORD	SAME AS 056001
056014	ITR WORD FAILURE	SAME AS 056001
056015	DRUM 0 NOT ONLINE	1. VERIFY DRUM ADDRESSES THEN SAME AS 056001
056016	WRITE DATA ERROR (CONTROLLER)	SAME AS 056001
056017	READ DATA ERROR (CONTROLLER)	SAME AS 056001
056020	DRUMS NOT ASSIGNED CONSECUTIVELY	1. VERIFY DRUM ADDRESSES THEN SAME AS 056001

A. CORRECTIVE ACTION FOR PDS DETECTED ERRORS DURING SYSTEM LOAD
 1. RE-BOOT SYSTEM
 2. REPAIR SYSTEM IF PROBLEM PERSISTS

B. CORRECTIVE ACTION FOR PDS DETECTED ERRORS AFTER SYSTEM LOAD
 1. PRESS MASTER RESET
 2. RE-BOOT SYSTEM IF PROBLEM PERSISTS
 3. REPAIR SYSTEM IF PROBLEM PERSISTS

CODE	MEANING	CORRECTIVE ACTION
770000	UNUSED PROGRAM LEVEL CALLED FOR	A OR B ABOVE
770100	OTD ON DEV TO RESTART CLOCKS	A OR B ABOVE
770200	OTD OR PARITY ERROR ON ITR TO MONITOR REGISTER	A OR B ABOVE
771200	TOR INSTRUCTION FAILED	A ABOVE
771201	ILLEGAL ADDRESS IN PDS SKELETON	A ABOVE
771202	INCORRECT TERMINAL TYPE IN TAS SKELETON	A ABOVE
771203	ILLEGAL ADDRESS IN TAS SKELETON	A ABOVE
771204	INCORRECT LINE NUMBER VARIABLE IN SKELETON	A ABOVE
771205	INCORRECT ADDRESS ASSIGNMENT IN TAS SKELETON	A ABOVE
771206	DISPLAY ERROR ON THE ACC/ODC	A ABOVE
771207	PRINTOUT STATUS ERROR ON ELP1	A ABOVE
7713XX	XMIT CHANNEL ERROR ON DDT XX	SEE NOTE BELOW
7715XX	RECEIVE CHANNEL ERROR ON DDT XX	SEE NOTE BELOW
NOTE	DDT ERRORS USUALLY SELF CORRECTING. IF REMOTE TERMINAL UNRESPONSIVE THEN B ABOVE.	

<u>CODE</u>	<u>MEANING</u>	<u>CORRECTIVE ACTION</u>
771700	DTD OR PARITY ERROR ON ITR TO ACC/OCC	A ABOVE
771701	ACC/OCC TERMINAL READ ERROR	A ABOVE
771702	ACC/OCC INTERRUPT ERROR	A ABOVE
772402	RAM OVERLAY READ ERROR	B ABOVE
774200	DTD ON DFR TO SET EOB COUNTER FOR ITR TAPE HEAD	A ABOVE
774201	PROGRAM ID ON TAPE INCORRECT	A ABOVE
774402	DOT ON RAM WRITE COMMAND	A ABOVE
774403	RAM WRITE ERROR	A ABOVE
774404	RAM WRITE STATUS ERROR	A ABOVE
774405	TAPE HEAD ERROR	A ABOVE
774406	DTD ON DFR OR ITR TO RAM	A ABOVE
776300	DOT ON DFR TO MONITOR REGISTER	A OR B ABOVE
776301	DTD OR PARITY ERROR ON ITR TO MAINTENANCE PANEL	A OR B ABOVE
776302	DTD ON DEV TO START CLOCKS	A OR F ABOVE
776303	ACC ADDRESS LESS THAN 12	1. CORRECT ACC SWITCHES 2. RE-BOOT SYSTEM
776304	ILLEGAL LOAD TAPE DRIVE SELECTED	1. VERIFY TEST SW VALUE 2. RE-BOOT SYSTEM
776305	ILLEGAL LOAD TAPE DRIVE SELECTED	1. VERIFY TEST SW VALUE 2. RE-BOOT SYSTEM
776306	DTD ON ITR TO RAM	A ABOVE
776307	AUCTION FELL THROUGH TO LEVEL 63	A OR B ABOVE
77XY17	OVERFLOW TRAP IN LEVEL XX	A OR B ABOVE

APPENDIX B
LOCAL TERMINAL (ACC/OCC) OPERATING PROCEDURES

1. The following sequence of steps is designed to assist the student/operator in preparing the ACC/OCC as the PLANIT Local Terminal.

A. MANDATORY REQUIREMENTS:

1. ACC/OCC POWER Switch ON.
2. Keyboard POWER Switch ON.
3. COMPOSE MODE Switch ON.
4. AUX I/O Switch OFF.

B. OPTIONAL REQUIREMENTS:

1. RD POWER Switch ON.

The RD Screen is used by PLANIT to display information which is useful but not necessary for successful terminal operation.

2. ELP1 POWER Switch ON.

All information displayed on the Compose/Edit Display will be printed via ELP1 except if ELP1 is the only printer available and is being used as a system printer for a PLANIT specified function. The unavailability of an ELP prevents execution of PLANIT listing functions and hard copies of C/E displays during execution of PLANIT system printer functions.

2. Terminal Operating Procedures.

A. TERMINAL INPUT:

Messages generated by PLANIT to be displayed on the C/E screen are transmitted to the terminal only when requested by the student/operator.

Whenever a PLANIT message is ready for transmission to the terminal, the PRIORITY MESSAGE Switch on the Switch/Assembly is illuminated to alert the student/operator. The student/operator will receive the message on the C/E Display when

he depresses the PRIORITY MESSAGE Switch. If the entire message can be displayed on one screen, the light associated with the PRIORITY MESSAGE Switch is extinguished. If the message length exceeds the display screen size the PRIORITY MESSAGE Switch light will remain lighted. Subsequent depression(s) of the PRIORITY MESSAGE Switch will display the remaining portion(s) of the message.

B. TERMINAL OUTPUT

If a message received from PLANIT requires a response from the student/operator, the top line of the C/E display will be blank to accommodate this student/operator response which is entered as follows:

1. Reset the cursor.
2. Enter the response via the keyboard (72 characters max.).
3. (Optional) Enter EOT (␣) character.
4. Reset the cursor.
5. Depress the XMIT Switch.

Failure of the terminal to transmit is indicated by the illumination of the XMTG light and by the failure of the cursor to re-position itself beyond the end of the message. Remedial action consists of turning the COMPOSE MODE Switch OFF, then ON, then repeating steps 4 and 5 above. Repeated failures may necessitate a hot start.

C. MESSAGE REPEAT:

If the student/operator requires a re-display of the last message received depression of the CYCLE MESSAGES Switch on the Switch Assembly will initiate a retransmission of the last message display segment.

D. SUMMARY:

Excepting the keyboard entry keys, only three ACC/OCC switches are normally utilized during PLANIT Terminal Operations:

1. PRIORITY MESSAGE - press when lighted to receive PLANIT message.
2. CYCLE MESSAGES - press when repeat of last PLANIT message is desired.

3. XMIT - press when response to PLANIT message has been entered into top line of C/E display. Message length may be up to 72 characters ; messages should be (optional on ACC/OCC) followed by an EOT (␣) character.

APPENDIX C
REMOTE TERMINAL (MIOD) OPERATING PROCEDURES

1. The following sequence of steps is designed to assist the student/operator in preparing the MIOD as a PLANIT remote terminal.

A. OPERATIONAL REQUIREMENTS:

1. DDT associated with MIOD properly set up [max of one MIOD per computer DDT (A-H) channel].
2. DDT POWER Switch ON.
3. Keyboard POWER Switch ON.
4. COMPOSE MODE Switch ON.
5. AUX I/O Switch OFF.
6. ELP POWER Switch ON.
7. ELP CHANNEL SELECT Switch set to "0".

2. Terminal Operating Procedures.

A. TERMINAL INPUT:

Messages generated by PLANIT to be displayed on the C/E screen are transmitted to the terminal only when requested by the student/operator. Whenever a PLANIT message is ready for transmission to the terminal, the MESSAGE READY Switch is illuminated to alert the student/operator. The student/operator should reset the cursor and will receive the message on the C/E display when he depresses the MESSAGE READY Switch. If the message length exceeds the display screen size, the first line of the display screen will advise "PRESS ACK FOR REST OF MESSAGE". Resetting the cursor and depression of the ACK Switch will display the next portion of the message.

B. TERMINAL OUTPUT:

If a message received from PLANIT requires a response from the student/operator, the top line of the C/E display will be blank (except for 0000FJ) to accommodate the student/operator response which is entered as follows:

1. Reset the cursor.
2. Enter the communications address preamble J00000 (numeric zeros) via the keyboard.

3. Enter the response via the keyboard (66 characters max.,
4. Enter the EOT (␣) character. one line of display only).
5. Reset the cursor.
6. Depress the XMIT Switch.

Failure of the terminal to transmit is indicated by the failure of the cursor to reposition itself just beyond the EOT marker. Remedial action consists of turning the COMPOSE MODE Switch OFF, then ON, then repeating steps 5 and 6 above.

C. MESSAGE REPEAT:

If the student/operator requires a re-display of the last message received, the student/operator resets the cursor and depresses the RE-XMIT Switch which will initiate a retransmission of the last message display segment.

D. SUMMARY:

Excepting the keyboard entry keys, only four MIOD Switches are normally utilized during PLANIT terminal operations:

1. MESSAGE READY - press when lighted to receive PLANIT message.
2. RE-XMIT - press when repeat of last PLANIT message is desired.
3. ACK - press when directed to do so on C/E display.
4. XMIT - press when response to PLANIT message has been entered into top line of C/E display. Message must start with the communications address preamble J00000 (letter J, numeric zeros) followed by a message of no more than 66 characters (one line of display) followed by an EOT (␣) character.

APPENDIX D

REMOTE TERMINAL (VFMD) OPERATING PROCEDURES

1. The following sequence of steps is designed to assist the student/operator in preparing the VFMD as a PLANIT remote terminal.

A. OPERATIONAL REQUIREMENTS:

1. DDT associated with VFMD properly set up [max of one VFMD per computer DDT (A-H) channel].
2. DDT POWER Switch ON.
3. Keyboard POWER Switch ON.
4. COMPOSE MODE Switch OFF. (after Cursor Reset to top of display).
5. AUX I/O Switch OFF.
6. ELP POWER Switch ON.
7. ELP CHANNEL SELECT Switch set to "0".

2. Terminal Operating Procedures.

A. TERMINAL INPUT:

Messages generated by PLANIT to be displayed on the C/E screen are transmitted to the terminal only when requested by the student/operator. Whenever a PLANIT message is ready for transmission to the terminal, the message "0000TJ MESSAGE WAITING, PRESS ACK SWITCH" is printed and the MESSAGE light is illuminated to alert the student/operator. The student/operator will receive the message on the C/E display when he resets the cursor and depresses the ACK Switch. If the message length exceeds the display screen size, the first line of the display screen will advise, "PRESS ACK FOR REST OF MESSAGE". Resetting the cursor and depression of the ACK Switch will display the next portion of the message.

B. TERMINAL OUTPUT:

If a message received from PLANIT requires a response from the student/operator, the top line of the C/E display will be blank (except for 00003J) to accommodate the student/operator response which is entered as follows:

* To reset the cursor, turn COMPOSE MODE Switch on, depress CURSOR RESET, then turn COMPOSE MODE Switch off.

1. Switch COMPOSE MODE Switch to ON.
2. Reset the cursor.
3. Enter the communications address preamble J00000 (numeric zeros) via the keyboard.
4. Enter the response via the keyboard (66 characters max., one line of display only).
5. Enter the EOT (␣) character.
6. Reset the cursor.
7. Depress the XMIT Switch.
8. Reset the cursor.
9. Switch COMPOSE MODE Switch to OFF.

Failure of the terminal to transmit is indicated by the failure of the cursor to reposition itself just beyond the EOT marker after XMIT (step 7 above). Remedial action consists of turning the COMPOSE MODE Switch OFF, then ON, then repeating steps 6-9 above.

C. MESSAGE REPEAT:

If the student/operator requires a re-display of the last message received the student/operator resets the cursor^{*} and depresses the RE-XMIT Switch which will initiate a retransmission of the last message display segment.

D. SUMMARY:

Excepting the keyboard entry keys, only three VFMED Switches are normally utilized during PLANIT terminal operation:

1. RE-XMIT - press when repeat of last PLANIT message is desired.
2. ACK - press when directed to do so on C/E display.
3. XMIT - press when response to PLANIT message has been entered into top line of C/E display. Message must start with the communications address preamble (J00000 letter J, numeric zeros) followed by a message of no more than 66 characters (one line of display) followed by an EOT (␣) character.

* To reset the cursor, turn COMPOSE MODE Switch on, depress CURSOR RESET, then turn COMPOSE MODE Switch off.

3. NO-ACK Optional Terminal Procedures.

If the VFMED terminal has been initialized in the NO-ACK mode the operating procedures will be greatly simplified.

A. TERMINAL INPUT

Messages generated by PLANIT will be printed on the ELP automatically. The messages will not be displayed on the C/E display and no button actions are required. The last printout will be automatically upspaced so that it can be read without advancing the paper.

B. TERMINAL OUTPUT

Responses are sent back to PLANIT the same as before (2.B) except that the compose mode switch may be left in the ON position.

C. MESSAGE REPEAT

The RE-XMIT switch will cause a retransmission of only the last message segment and normally should not be used.

D. RDY-VFMED TERMINAL SETUP

To set up the RDY-VFMED for use, set switches as follows:

<u>SWITCH</u>	<u>POSITION OR VALUE</u>
DESTN	12 (for J)
SEC	60 (for O)
ENCRYPT	SEL (off)
KEYTIME	1

Then press PURGE.

APPENDIX E

AN/GYK-12 PLANIT SYSTEM CHARACTER SETS

Table E-1 summarizes the character differences between: 1) the TACFIRE (and TOS²) AN/GYK-12 PLANIT system ASCII and EBCDIC character sets, 2) the ARI CDC 3300 character set, and 3) the ARI Univac 1108 character set.

The AN GYK-12 PLANIT character set includes the letters A through Z zero (0) through 9 and the special characters shown in Table E-1. The AN/GYK-12 PLANIT system operates internally with the ASCII Character Set and code converts to from the EBCDIC Character Set for output to or input from the commercial card punch, card reader and the high speed printer.

In addition to the special characters shown in Table E-1, the system includes the following ASCII/EBCDIC characters:

Quote (") - EBCDIC punch 7, 8
At (@) - EBCDIC punch 4, 8
Greater than (>) - EBCDIC punch 0, 6, 8
Underscore (_) - EBCDIC punch 0, 5, 8

Unrecognized EBCDIC input characters (including ¢, see below) are code converted in the AN/GYK-12 planit system to the ASCII ACK character (␣). Unrecognized ASCII output characters including the ASCII ACK (␣), NAK (ⓧ), EOT (␣), left bracket ([) and right bracket (]) are code converted to the EBCDIC cents character (¢); EBCDIC punch 12, 2, 8.

Table E-1

PLANIT Character Set Differences - AN/GYK-12 and ARI Commercial Systems

TACFIRE PLANIT (ASCII) CHARACTER	IBM (EBCDIC) PUNCH	029 KEY PUNCH CHARACTER	CDC PUNCH	029 KEY PUNCH CHARACTER	UNIVAC PUNCH	029 KEY PUNCH CHARACTER
Plus +	12,6,8	+	12	+	12	+
Minus -	11	-	11	-	11	-
Asterisk *	11,4,8	*	11,4,8	*	11,4,8	*
Slash /	0,1	/	0,1	/	0,1	/
Open Paren (	12,5,8	(	0,4,8	(	0,4,8	(
Close Paren)	11,5,8	)	12,4,8	<	12,4,8	<
Period .	12,3,8	.	12,3,8	.	12,3,8	.
Percent %	0,4,8	%	12,6,8	+	0,5,8	-
Equals =	6,8	=	3,8	=	3,8	=
Comma ,	0,3,8	,	0,3,8	,	0,3,8	,
Colon :	2,8	:	2,8	:	5,8	/
Semi-colon ;	11,6,8	;	5,8	/	11,6,8	;
Prime '	5,8	'	4,8	@	4,8	@
Backslash \	11,7,8	—	11,2,8	!	0,6,8	>
Blank		(Blank)		(Blank)		(Blank)
Pound Sign #	3,8	#	12,5,8	(	2,8 ⁽¹⁾	:
Ver Arrow ^	12,7,8		11,5,8	)	11,7,8	—
Hor Arrow <	12,4,8	<	12,2,8	+	11,6,8	;
Question Mk ?	0,7,8	?	11,7,8	—	12,0 ⁽²⁾	0
Dollar Sign \$	11,3,8	\$	11,3,8	\$	(multi-punch) 11,3,8	\$
Exclamation !	11,2,8	!	None	(Blank)	11,0 ⁽²⁾	0
Ampersand &	12	&	None	(Blank)	(multi-punch) 2,8	:

(1) An ampersand is used for the Pound Sign in this system.

(2) Letters A-Z and numbers 0-9 are same in all three code sets.

APPENDIX F PLANIT CARDS FILE

C=0123456789ABCDEF0GHIJKLMNOPQRSTUVWXYZ+-*/().:;'-> <?@	04000200
ABCDEF0GHIJKLMNOPQRSTUVWXYZ	04000300
1.5 "	04000400
2.5 "	04000500
C:THE TWO CARDS ABOVE PERMIT THE ADDING OF NEW CHARACTERS	04000600
C:THAT MAY BE FOUND IN THE TERMINAL AND EQUATING THE NEW ONE	04000700
C:(2ND CARD) WITH THE OLD ONE (1ST CARD) DIRECTLY ABOVE IT. THE	04000800
C:OLD CHARACTER MUST BE FROM THE LIST ON THE FIRST CARD. THIS	04000900
C:THE " " IS EQUATED TO THE " " AND LOWER CASE LETTERS MAY BE ADDED	04001000
C:ON THE 2ND CARD IN A SIMILAR MANNER. EQUATING THEM WITH UPPER	04001100
C:CASE WHICH WOULD BE ADDED TO THE 1ST CARD. IF ADDITIONAL SPACE	04001200
C:IS NEEDED, REPEAT THE PAIR OF CARDS IMMEDIATELY BELOW.	04001300
C:	04001400
C:-NOTE- THE BACKSLASH CHARACTER IN THE FIRST CARD HAS BEEN	04001500
C:EXCHANGED TO A " " TO FACILITATE TRANSPORT. IT SHOULD BE CHANGED	04001600
C:BACK AGAIN IF THAT CHARACTER IS DESIRED.	04001700
C:	04001800
IRECRD IFRN NAMES NSRCH KHP LINKS NUCHN PRNF PI OPERATOR ISYS	04001900
NEGPOS NUCH 40FF 40LOG TQUANT NOTUSED IFRST ICHN PRICES	04002000
C:	04002100
C:THE FOLLOWING (1ST) CARD CONTAINS THE TOTAL COUNTS	04002200
C:OF THE NUMBER OF DISK RECORDS WHICH HAVE BEEN ALLOCATED	04002300
C:TO EACH OF THE 11 DISK FILES. PLANIT WILL USE ANY OF	04002400
C:THESE BUT NO MORE. DO A COLD START AFTER ANY CHANGE.	04002500
IFSTN 0 15 15 400 50 9 0 1 2 100 25	04002600
C:	04002700
C:THE CARDS BETWEEN MUST LIST EACH PLANIT PROCEDURE NUMBER AFTER	04002800
C:THE OVERLAY PARTITION NUMBER ON WHICH IT RESIDES. NUMBER ZERO	04002900
C:IS THE MAIN PROGRAM. UNASSIGNED PROCEDURE NUMBERS ARE IGNORED	04003000
C:IF THEY HAPPEN TO BE IN THE LIST BELOW.	04003100
1# 26.27.28.29.30.31.32.33.34.35.36.37	04003200
2# 38.40.41.42.43.44.45.46.47.48.49	04003300
3# 50.51.52.53.54.55.56.57.58	04003400
4# 60.61.62.63.64.65.66.67	04003500
5# 69.70.71.72.73.74.75.76	04003600
6# 78.79.80.81	04003700
7# 83.84.85.86.87.88.89	04003800
8# 91.92.93.94.95.96.97.98	04003900
C:	04004000
C:THE ORDER OF THE FIRST FOUR CARDS MUST NOT BE CHANGED. THE	04004100
C:REAR CARDS TO HERE HAVE SOME ORDER RELATIONSHIPS WITH THOSE	04004200
C:THAT FOLLOW AND SHOULD COME EARLY IN THE DECK. THE ORDER	04004300
C:OF THE REMAINING CARDS UP TO THE ADDING CARDS ARE OPTIONAL	04004400
C:(THE ADDING CARDS MUST IMMEDIATELY PRECEDE THE FINAL STAS CARD).	04004500
C:	04004600
OPERATOR = 1	04004700
C:A SECOND NUMBER MAY APPEAR AFTER THE OPERATOR'S NUMBER	04004800
C:WHICH WILL INITIALIZE AN AUX TERMINAL IF SO DESIRED.	04004900
NUMCH=	04005000
C:THE ABOVE 'NUMCH' MAY BE LESS THAN THE GENERATED 'NUMCH'	04005100
C:IF DESIRED.	04005200
C:	04005300
TQUANT=10	04005400

C:QUANT (QUANTUM) UNITS ARE CONSISTENT WITH THE <SECDIV>	04005400
C:PARAMETER (NUMBER OF UNITS PER SECOND).	04005500
IOCHK(1) ST	04005600
C:THE NAME IN IOCHK(1) WILL DESIGNATE THE PREFIX OF STUDENT LOGINS.	04005700
PRICES 1.0 .033 .055 .009	04005800
C:PRICES ARE IN PENNIES FOR CPU/SEC. CONNECT SECONDS. UNIT	04005900
C:REQUIRED UNITS. AND DISK SPACE PER <MFCSZ> WORDS PER DAY.	04006000
C:	04006100
C:THE TSYS. NAMES AND NEGPOS ARRAYS CONTAIN ALL THE PRIMITIVE	04006200
C:NAMES OF PLANT. THESE MAY BE CHANGED IF DESIRED SO LONG AS	04006300
C:THEY REMAIN DISTINCT (WITHIN EACH ARRAY).	04006400
C:	04006500
TSYS A F I J DATE ENTRY VALUE LOOK PRESTORE PURCH ADILLO DELLOG OK	04006600
TSYS(14) CANCEL WAIT AUX SAVE HCT TOC DEBUG DELETF BUILD LIST	04006700
TSYS(24) CAN UNLOAD AND EXCEPT ALL EOTEXT ACCOUNT JOBS	04006800
NEGPOS(11) PISNEG	04006900
PRIME 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71	04007000
73 79 83 89 91 97	04007100
PI=3.1415	04007200
NDCMAN 08 64 78 87 84 89 90 91 92 93 92 99 105 106 110	04007300
129 71 76 111 125 95 96	04007400
C:	04007500
C:THE FOLLOWING MOFF ENTRIES ARE SET TO (-1) TO DESIGNATE	04007600
C:THAT THE CORRESPONDING CALL AUTHOR NAMES ARE TO BE	04007700
C:INITIALIZED TO THE ALLOWED STATUS. ANY AUTHOR ENTRY BEYOND	04007800
C:THE 57TH ONE MAY BE THUS INITIALIZED.	04007900
MOFF(100) -1	04008000
MOFF(101) -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	04008100
MOFF(120) -1	04008200
MOFF(121) -1	04008300
KFEP 1 4 54 53 50 37 40 27 157 107 112 160	04008400
LINKS 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 104	04008500
LINKS(27) 25 29 0 41 42 35 34 35 36 104	04008600
LINKS(37) 34 39 40 41 42 43 44 45 0	04008700
LINKS(44) 47 48 49 50 51 52 0	04008800
LINKS(52) 54 55 56 57 58 0	04008900
LINKS(58) 60 61 62 63 0	04009000
LINKS(64) 65 66 67 0	04009100
LINKS(68) 0 70 73 76 84 84 80 81 82	04009200
LINKS(77) 123 124 76 87 85 75 77 74	04009300
LINKS(85) 75 76 85	04009400
LINKS(88) 87 90 91 92 93 94 95 96 98 0 127 100 101 102 105 110	04009500
LINKS(104) 109 106 105 88 104 0	04009600
LINKS(110) 0 129 117 114 103 116 125 118 119 120 121 122	04009700
LINKS(122) 115 125 85 111 86 128 99 113	04009800
LINKS(154) 0 156 154 71	04009900
LINKS(155) 0	04010000
NAMES S P O I E A COPY EX PHEAK GET SAVE OUT RESTART	04010100
NAMES(15) UNLOCK LOCK CLEAN ATTACH DISPLAY SYSTEM DIAL	04010200
NAMES(27) T NOT CANOT	04010300
NAMES(30) FROM ALL NONE RIGHT WRONG SPAN USED	04010400
NAMES(37) YES CORRECT TRUE RIGHT OR POSITIVE PLUS ACCURATE SH	04010500
NAMES(46) NO WRONG FALSE INCORRECT NEGATIVE MINUS INACCURATE	04010600

NAMES(51) LS LU EQ GU GR NO	04010700
NAMES(54) IF AND OR ELSE END	04010800
NAMES(64) F 2 C H	04010900
NAMES(68) CHANGE SPT TO PRINT DROP ROUND TEMP FINISHED ALIGN	04011000
NAMES(77) FOR MATRIX NORMAL AFWAY READY RETURN SUM PROD	04011100
NAMES(85) FUNCTION RANDOM ASSIGN	04011200
NAMES(88) KEYWORD PHONETIC FORMULAS EQUATE TRACE	04011300
NAMES(93) RELATED WAIT RECYCLE TEXT	04011400
NAMES(97) WITHIN STATUS TIME FRAME RESPONSE REVIEW MINUTES ALLOW	04011500
NAMES(106) PROHIBIT GOOD REEL CALC	04011600
NAMES(110) HELP WANK SORT COMB FACT LOG LN SIN COS TAN	04011700
NAMES(120) CRT SEC USC ABSOLUTE TRUNCATE INVERT	04011800
NAMES(126) PT USE APPLY SORT	04011900
NAMES(157) ON OFF ALL LINK	04012000
NSRCH(15) 45 51 52 53 55 56 59 65 66 67 70	04012100
NSRCH(15) 0 0 0 0 0 10 9 12 11 13 14 15 22 23 25 16 17 18 19 20 0 0	04012200
NSRCH(35) 0 9 17 18 19 22 23 -11 20 25 -10 -12 -13 -14 -15 16	04012300
NSRCH(51) 0	04012400
NSRCH(52) 2	04012500
NSRCH(53) 2 25	04012600
NSRCH(55) 1 16 25	04012700
NSRCH(58) 25	04012800
NSRCH(59) 24 2 3 4 5 25	04012900
NSRCH(65) 2	04013000
NSRCH(69) 4	04013100
NSRCH(71) 6 7 8	04013200
171.1 ENTER CALC LINE	04013300
242.2 (P10.114)(Q1P.110.1)(R.110.1)	04013400
283.3 NH OFSC. BACKGROUND MAILED.	04013500
4120.265 T 2	04013600
2149.14 T 14.4	04013700
510.1 DONE	04013800
211.1 DONE	04013900
312.1 IN	04014000
913.1 WILL DO	04014100
460.274 ENTER COMMAND	04014200
967.244 1/4/77P	04014300
666.66(1.1) DONE	04014400
664.64 FRAME	
70.262 LABEL**	04014600
7575.245 62. STATEMENTS	04014700
7378.246 62. CIPHERS	04014800
961.244 62. TEXT	04014900
7262.250 63. ANSWERS	04015000
7283.252 64. ACTIONS	04015100
84.249(51)	04015200
85.250(52)	04015300
86.251(53)	04015400
101.259 74.1.1.1	04015500
102.260 HK? (Y/N)	04015600
77103.201 7/20/77	04015700
9104.104 AT FRAME	04015800
7105.105 GROUP	04015900

7106.106 . LINE	04016000
7112.112 READY.	04016100
7120.267 ENTER SYSTEM COMMAND.	04016200
6122.122 TO: S	04016300
6125.5 *10**	04016400
2128.128 DEREG MODE.	04016500
7132.132 BREAK AT	04016600
7135.135 **STUDENT**	04016700
7136.136 FUNCTIONS**	04016800
7137.137 MATRICES**	04016900
7138.138 ITHAS**	04017000
7139.139 **LESSON**	04017100
7150.150 ENTER YOUR ANSWER	04017200
8152.152 CORRECT	04017300
3153.153 FINE	04017400
3154.154 GOOD	04017500
3155.155 OK	04017600
3156.156 RIGHT	04017700
3157.157 TRUE	04017800
3158.158 VERY GOOD	04017900
4159.159 YES	04018000
6162.162 FALSE	04018100
7163.163 INCORRECT	04018200
8164.164 NO	04018300
7165.165 NOT SO	04018400
7166.166 NOT TRUE	04018500
3167.167 WRONG	04018600
10169.169 WRONG TRY AGAIN	04018700
10170.170 NUMERIC ANSWER PLEASE	04018800
200	04018900
14.224 SYNONYMS HAVE BEEN DROPPED	04019000
15.225 CAN'T USE THIS NAME WITH ALICE OR PROMPT	04019100
16.226 UNRECOGNIZED	04019200
17.231 NAME IS BUTHY PROTECTED	04019300
18.232 ILLEGAL PARENTHESIZATION	04019400
19.233 LINE CONTINUATION NOT PERMITTED	
20.234 ILLEGAL DIVISION BY ZERO	04019600
21.235 ILLEGAL COMBINATORIAL	04019700
22.236 ILLEGAL USE OF LOGS	04019800
23.237 ILLEGAL NEGATIVE SQUARE ROOT	04019900
24.238 ILLEGAL USE OF TRIG FUNCTION	04020000
25.239 FACTORIAL LIMITS EXCEEDED	04020100
26.240 ILLEGAL CHARACTER ON LINE	04020200
27.241 ILLEGAL DECIMAL POINT IN NUMBER	04020300
28.242 COMMA MISUSED	04020400
29.243 MISUSED	04020500
30.244 NUMBER OR SYMBOL MISPLACED	04020600
31.245 LEFT PARENTHESIS MISSING	04020700
32.246 RIGHT PARENTHESIS MISSING	04020800
33.247 *! MISUSED	04020900
34.248 NAME MISUSED	04021000
35.249 NAME NOT FOUND	04021100
36.250 NAME ALREADY IN USE	04021200

37.233	ILLEGAL--NOT A MATRIX	04021300
38.233	BUILT-IN NAME CAN'T BE REDEFINED	04021400
39.234	VARIABLE HAS NOT PREVIOUSLY BEEN DEFINED	04021500
40.235	ILLEGAL FORMAT. ONLY TYPE THE COMMAND NAME AND DESIRED ENTRY LABEL (OR JUST THE COMMAND NAME ALONE).	04021600
41.233	FUNCTION CAN'T CALL ON ITSELF	04021700
42.233	ILLEGAL USE OF FORK	04021800
43.233	ILLEGAL SUBSCRIPTING	04021900
44.233	SUBSCRIPTING EXCEEDS DEFINED RANGE	04022000
45.233	WRONG NUMBER OF ARGUMENTS OR SUBSCRIPTS	J4022100
46.233	MATRICES ARE NOT CONFORMABLE	04022200
47.233	MATRIX MUST BE N BY N TO INVERT	04022300
48.233	A SINGULAR MATRIX CAN'T BE INVERTED	04022400
49.236	HANGING EXPRESSION	04022500
50.237	MATRIX SPACE IS FULL	04022600
51.237	ITEM SPACE IS FULL	04022700
52.237	FUNCTION SPACE IS FULL	04022800
53.233	WORK SPACE EXCEEDED	04022900
54.235	FORK VARIABLE NOT CLOSING IN ON TERMINAL VALUE	04023000
55.233	ALIGN STATEMENT MUST SPECIFY A COLUMN	04023100
56.233	LABEL NAME NOT VALID. TYPE JUST THE COMMAND NAME TO SEE THE FULL LIST.	04023200
57.233	PATTERN NAME MISSING	J4023300
58.1	ENTER LABEL	04023400
59.1	EXIT TO	04023500
61.61	PLEASE LOG IN***	04023600
114.60	TERMINAL LESSON RESTORED.	04023700
312.312	PLANNET TERMINAL NO.	04023800
62.241	ILLEGAL USE OF SLASH	04023900
63.63	ENTER NEXT LINE OF LESSON	04024000
64.60	NAME OR FORMAT ERROR.	J4024100
65.60	NO SUCH FRAME/LABEL	J4024200
66.60	FRAME TABLE FULL. DELETE BEFORE ADDING	J4024300
71.71	SAVE LESSON? (Y/N)	J4024400
72.242	FRAME DIRECTORY FULL.	04024500
73.243	ILLEGAL GROUP	J4024600
74.70	ILLEGAL LABEL/FNAME. ENTER COMMAND	J4024700
76.76	RECORDS FOR	J4024800
77.77	REINTERPRETS (Y/N)	J4024900
79.60	READ-ONLY. CANNOT ALTER LESSON.	J4025000
80.248	ILLEGAL FRAME TYPE CHANGE	04025100
87.87	INVALID	04025200
89.253	ILLEGAL ANSWER FORMAT	J4025300
89.254	ILLEGAL MIX OF ANSWER TYPES	04025400
90.255	REINTERPRETS NOT PROPERLY PAIRED.	04025500
91.60	FRAME DOESN'T EXIST	J4025600
92.60	GROUP DOESN'T EXIST	04025700
93.60	LINE DOESN'T EXIST	04025800
94.60	FRAME LENGTH EXCEEDED	04025900
95.65	ELSE/FNO MUST FOLLOW IF	04026000
96.66	ILLEGAL CORRECTIVE...AND/OR MUST FOLLOW IF	04026100
97.67	RECORD TABLE FULL AND NO MORE WILL BE KEPT. LESSON WILL CONTINUE BUT YOU SHOULD PROBABLY SIGN OFF AND GET HELP.	J4026200
		J4026300
		J4026400
		J4026500

98.257 FRAME LABEL EXISTS. LABEL=8	J4026600
99.258 FRAME EXISTS	04026700
100.259 GROUP EXISTS	J4026800
107.300 LINE EXCEEDED	J4026900
108.100 IDENTIFY YOURSELF	J4027000
109.310 NOT ON DISK	J4027100
110.60 WRONG REEL NO.	J4027200
111.60 AUTHORIZED COMMANDS RESTRICTED. GET YOUR LESSON.	J4027300
113.60 RESTART TO SAVE LESSON FIRST.	J4027400
115.60 NO DISK SPACE	04027500
116.60 NO 31 ANSWERS. ERROR	J4027600
117.60 DECISION STATEMENT MUST START WITH A CONNECTIVE OR P.C. NAME.	04027700
118.265 DUPLICATE LESSON NAME	04027800
119.1 ILLEGAL USE OF READY	J4027900
121.120 SAVE LESSON ON TAPE FIRST.	J4028000
123.120 UNLOAD AND SAVE LESSON ON TAPE FIRST.	J4028100
124.60 INTEGERS ONLY FOR GROUPS/LINES/COLUMNS	J4028200
127.127 LESSON REEL	04028300
129.129 CHOICE LINE	04028400
130.601001 NOT ON DISK	J4028500
131.60 LESSON REEL	J4028600
133.269 IMPROPER KEYWORD SPECIFICATION	J4028700
134.60 TO NONEXISTENT FRAME/LABEL	04028800
140.140 NONE-DEFINED	J4028900
141.270 IMPROPER FROM SPECIFICATION	J4029000
142.270 ERROR IN DECISION STATEMENT	J4029100
143.270 TAGS MISSING IN DECISION STATEMENT	J4029200
144.144 NUMBER OF FRAMES LEFT	J4029300
145.145 YOU'VE BEEN LOGGED OFF DUE TO A BAD LESSON.	J4029400
146.140(64)	
147.140(60)	J4029500
151.120 DEVICE IS BUSY. TRY LATER.	04029700
151.151 CAN'T USE CALC JUST NOW.	J4029800
161.160(12) THIS ENTRY IS RESERVED FOR NEW FEEDBACK MSOS.	J4029900
161.161(12) THIS ENTRY IS RESERVED FOR NEW FEEDBACK MSOS.	J4030000
163.163 1-7 ANSWER IS:	J4030100
171.171 CHOOSE ONE OF THE ABOVE LETTERS.	J4030200
172.17 ANSWER EITHER YES OR NO.	J4030300
173.17 IMPROPER USE OF FEEDBACK CORRECT ANSWER SPECIFIED	J4030400
174.17 ILLEGAL USE OF FEEDBACK	J4030500
175.60 IMPROPER USE OF CORRECT ANSWER SPECIFICATION.	J4030600
176.176 IMPROPER COMMAND	J4030700
177.177 CITE	J4030800
178.178 STUDENT HISTORY	04030900
179.179 STUDENT SUMMARY	J4031000
180.180 LESSON NAME	J4031100
181.181 STUDENT NAME	04031200
182.182 FRAME TYPE TIME NEUTRAL ANSWER LABEL	J4031300
183.183 MIN/ RIGHT+ TAIL	04031400
184.184 SEC. WRONG-	J4031500
185.185 NUMBER RIGHT	J4031600
186.186 NUMBER WRONG	J4031700
187.187 NUMBER ENTRIES	04031800

188.188 NUMBER TIME-OUTS	04031900
189.189 TOTAL TIME	04032000
190.233 FOR MUST BE COMBINED WITH SUM OR PROD	04032100
191.60 DISK I/O ERROR. GET HELP. IF NOT AVAIL. TYPE OUT TO LOGOUT.	04032200
192.192 END	04032300
193.193 START	04032400
194.194 LESSON NOT IN REEL SPECIFIED.	04032500
195.195 ENTER RECORD NAMES. FOLLOW ALL BUT LAST NAME BY A COMMA.	04032600
196.196 NEW TAPE? (Y/N)	04032700
197.197 NO ENTRY LABELS ARE AVAILABLE AT THIS TIME.	04032800
198.198 SUMMARY ONLY? (Y/N)	04032900
199.199 TO THE TERMINAL? (Y/N)	04033000
200.200 CARD READER ERROR	04033100
201.60 TAPE REQUEST CANCELLED.	04033200
202.202 WAITING PERIOD:	04033300
203.120 DEVICE OUT OF SERVICE.	04033400
204.204 IDENTITY CARD UNIT-REC CONNECT FROM	04033500
JNY CURR-MEM TOTAL	04033600
205.205 ILLEGAL CARD NUMBER.	04033700
206.206 DUPLICATE FRAME NUMBERS--INCREMENTED BY 0.01.	04033800
207.207 CONTINUATION CARD DOES NOT FOLLOW A PROPER CONT.	04033900
208.208 LABEL TABLE FULL.	04034000
209.209 DUPLICATE LABEL.	04034100
210.1 ENTER HELP (ANY BUILT-IN OR USER DEFINED NAME)	04034200
211.1 PARI(MATRIX NAME)--PARI THE VALUES OF THE MATRIX.	04034300
212.1 SQR(EXPRESSION)--POSITIVE SQUARE ROOT FUNCTION.	04034400
213.1 COMB(4,7)--COMBINATION OF 4 THINGS TAKEN AT A TIME.	
214.1 LOG(EXPRESSION)--LOG TO ANY BASE.	04034500
215.1 LOG10(EXPRESSION)--LOG TO ANY BASE.	04034600
216.1 LOG10(4,7)--LOG TO THE BASE 4.	04034700
217.1 SIN(EXPRESSION)--SINE FUNCTION.	04034800
218.1 COS(EXPRESSION)--COSINE FUNCTION.	04034900
219.1 TAN(EXPRESSION)--TANGENT FUNCTION.	04035000
220.1 COT(EXPRESSION)--COTANGENT FUNCTION.	04035100
221.1 SEC(EXPRESSION)--SECANT FUNCTION.	04035200
222.1 CSC(EXPRESSION)--COSECANT FUNCTION.	04035300
223.1 ABSOLUTE(EXPRESSION)--ABSOLUTE VALUE FUNCTION.	04035400
224.1 TRUNCATE(EXPRESSION)--ROUNDS TO AN INTEGER.	04035500
225.1 INVERSE(MATRIX NAME)--PERFORMS A MATRIX INVERSE OPERATION.	04035600
226.1 A BUILT-IN 1 X 10 MATRIX. CONSULT TA-442/002 PART V FOR ITS USE.	04035700
227.1 BUILT-IN NAME. CONSULT TA-442/002 PART V FOR ITS USE.	04035800
228.1 BUILT-IN NAMES CAN'T BE DROPPED.	04035900
229.1 NAME ENTERED CAN'T BE USED USING THE COMMAND--PROHIBIT(NAME).	04036000
230.1 NAME ENTERED CAN'T BE FOUND.	04036100
231.1 CAN'T ALTER AN AUTHOR-DEFINED NAME.	04036200
232.1 A CALC STATEMENT CAN'T EXCEED A SINGLE LINE IN A LESSON.	04036300
233.1 CONSULT TA-442/002 APPENDIX C FOR REPRESENTATIVE ERROR SITUATIONS.	04036400
234.1 SORRY, BUT YOU LOST FRAME NO.	04036500
235.40 A COMMA OR TOO MANY LABELS HAVE BEEN ENTERED.	04036600
236.1 STATEMENT IS AMBIGUOUS AND CAN'T BE EVALUATED.	04036700
237.1 DELETE AN ITEM: FUNCTION, OR MATRIX END TRY AGAIN.	04036800
238.238 BACKGROUND OPERATIONS. LEVEL	04036900
239.239 GROUP 1 CARD FORMAT ERROR.	04037000
	04037100

240.120 NOT FOUND.	04037200
241.60 A NUMBER MUST FOLLOW THE + OR -.	04037300
242.60 DELETE ONE OR MORE FRAMES TO CONTINUE.	04037400
243.70 GROUP NUMBER ENTERED IS NOT LEGAL FOR THE TYPE OF FRAME.	04037500
244.201 (QUESTION/MULTIPLE CHOICE/DECISION/PROGRAMMING)	04037600
245.75 02. ENTER PROGRAMMING STATEMENTS	04037700
246.75 02. ENTER DECISION STATEMENTS	04037800
247.1 1. REPLY MUST FOLLOW 'SET' OR 'USE'.	04037900
248.60 CAN'T MAKE L OR M FRAME INTO A D OR P FRAME OR VICE VERSA.	04038000
249.61 02. SPECIFY QUESTION.	04038100
250.60 03. SPECIFY ANSWERS.	04038200
251.62 ENTER FRAME TYPE.	04038300
252.63 04. SPECIFY ACTIONS.	04038400
253.60 ANSWER TAG FORMAT IS ILLEGAL. E.G., A OR B..	04038500
254.60 NUMBER AND LETTER ANSWER TAGS CAN'T BE MIXED WITH DELIMITERS.	04038600
255.60 ANSWER IN A CONDITIONAL D FRAME MUST BE ENCLOSED BY DELIMITERS	04038700
256.200 BACKGROUND HALTED.	04038800
257.70 01. LESS. CAN'T CONTAIN A DUPLICATE FRAME LABEL. ENTER NUMBER.	04038900
258.60 CAN'T INSERT OVER AN EXISTING FRAME OR GROUP.	04039000
259.101 SPECIFY CHARACTERS TO BE USED IN SEARCH.	04039100
260.102 REQUEST CHARACTERIZATION THAT RANGE OF FRAMES IS TO BE DELETED.	04039200
261.103 SPECIFY CHARACTERS FOR MODIFICATION.	04039300
262.200 LABEL FRAME IF DESIRED.	04039400
263.70 01. LABEL MUST START WITH A LETTER.	
264.204 PRESS AGAIN TO TRY AGAIN OR TYPE 'RESET' TO ESCAPE.	04039500
265.204 (BACKGROUND) LINES MUST FINISH FIRST.	04039600
266.60 SEPARATE THE COMMAND WITH A DIFFERENT NAME.	04039700
267.120 THE SYSTEM COMMANDS FOR AN AUTHORING AID ARE: LIST, DELET, REPEAT, LIST, UNLOAD.	04039800
268.11 ENTER A VALUE FOR THE INDICATED DATE.	04040100
269.60 KEYWORD WAS NOT FOLLOWED BY ALL, OFF, ON, OR A NUMBER.	04040200
270.7701234 CONSULT TM-4422/002 APPENDIX C FOR FRAME SITUATIONS.	04040300
271.671 ON AT THE END OF LINE IS	04040400
272.200 ENTER Y TO UNLOAD OR N TO ADD MORE NAMES.	04040500
273.1 01.500 ACTIONS DEFINED BY AUTHOR.	04040600
274.100 PLEASE COMMANDS ARE: A (APPEND), ATTACH, COPY, CALC, CLEAR, COPY, D (DELETE), DEL, DISPLAY, E (EDIT), EX (EXTRACT), GET, I (INSERT), INFO, K (KEY), L (LIST), P (PRINT), RESTART, SAVE, S (SEARCH), SYSTEM, UNLOCK. SEE TM-4422/002 FOR DETAILS.	04040700
275.100 REPEAT WITH FRAME NAMES.	04040800
276.100 ENTER A NAME THAT CAN BE USED WITH THE BUILD COMMAND.	04040900
277.2 01. TRY TO REDESK? TAPE ASSIGNMENT	04041000
278.2 01. TAPES REQUIRED IS AFTER USE.	04041100
279.1 01 THIS TAPE ALREADY CONTAINS RECORDED RECORDS.	04041200
280.100 ILLEGAL ADDRESSING FORMAT.	04041300
281.100 NAME LIST IS NOT FOUND.	04041400
282.202 TAPE 1/41 ERROR.	04041500
283.60 BUSY. ENTER COMMAND.	04041600
284.2 01. TOO MANY CHARACTERS ON INPUT LINE	04041700
285.200 END	04041800
286.272(107) OK? (Y/N)	04042200
287.207 0/0	04042300
288.200 0/0	04042400

289.289 LOCKED	04042500
290.290 STUDENT	04042600
291.291 UNLOCKED	04042700
292.304 NOT FOUND/NOT ACTIVE	04042800
293.293 NUMBER OF JOBS ENQUEUED:	04042900
294.120 NOT READY YET.	04043000
295.295 DUPLICATE USE OF RECORD IN:	04043100
296.296 CHAINED RECORD ERROR IN:	04043200
297.297 DELETE ALL RECORDS. Y/N?	04043300
298.00 UNEXPECTED END OF TAPE.	04043400
299.120 SOME RECORDS WERE ALREADY UNLOADED ON ANOTHER TAPE.	04043500
300.120 REQUEST ABANDONED.	04043600
301.301 END OF REQUESTED SEQUENCE.	04043700
302.00 INCORRECT LESSON NAME GIVEN.	04043800
303.233 NAME ASSIGNMENT COULD NOT BE MADE	04043900
304.304 AUTHOR HAS LOCKED THE LESSON. YOU WILL BE LOGGED OUT	04044000
305.305 LESSON OR SAM IN USE. CANNOT DELETE OR UNLOAD.	04044100
306.305 SAME IDENTITY ALREADY BEING USED FOR THIS LESSON.	04044200
307.407 UNAUTHORIZED.	04044300
308.00(198) BUSY	04044400
309.100 EMPLOYED BY TO OUT OF RANGE	
310.276 ENTER FILE NAME.	04044600
311.311 ENTER REEL NO.	04044700
313.313 NOT LOGGED IN.	04044800
314.314 PLANT ERROR	04044900
315.315 SYSTEM SHUTDOWN? (Y/N)	04045000
316.104 TO GET FROM TAPE: TYPE GET LESSONNAME 12345	04045100
(FILL IN YOUR OWN LESSONNAME AND REEL NUMBER).	04045200
317.00 EMPTY LESSON DELETED. ENTER COMMAND.	04045300
318.1 REVIEW LABEL -- TYPE REVIEW TO GET THE LIST.	04045400
319.1 SORT LABEL -- SORTS VALUES IN MATRIX.	04045500
320.320 DEVICE STATUS:	04045600
ADDLOG /PCVE/CHP/CHICK/BAKER/ANSON/BERNAS/BERG/CILV/DEFF/ELTON/	04045700
ADDLOG /ST01/ST02/ST03/ST04/ST05/ST06/ST07/ST08/ST09/	04045800
CHOOSE AS MANY ADDLOG CARDS AS NECESSARY AND AS MANY NAMES ON EACH	04045900
CARD AS DESIRED. ONLY THE 0555 CARD MAY FOLLOW ADDLOG CARDS.	04046000
5555555	04046100
ADD CARDS.	

APPENDIX G

PLANIT MAP

++WRITE PRINT,PLAN10		
1 IFIRST(1)		00001
2 MSGTBL(125)		00002
127 KARDUM		00003
128 KARSET(57)		00004
185 MAPDUM		00005
186 MAP(255)		00006
441 PRIME(25)		00007
491 PRICES(4)		00008
499 MSGOPR(20)		00009
519 MSGOPN		00010
520 MCHPHN(26)		00011
546 INNPRT		00012
547 IPART(100)		00013
647 IDISK(50)		00014
697 LUGNR(9)		00015
706 ICWH		00016
707 IETIME		00017
708 JOUTBF(1170)		00018
1878 JCNT		00019
1879 JDIAL(23)		00020
1902 ISPOOL(10)		00021
1912 JSPOOL(10)		00022
1922 LPAR		00023
1923 ILIST		00024
1924 IPUNCH		00025
1925 IROR		00026
1926 ISYS(62)		00027
1988 NEGPOS(2)		00028
1990 INCHK(2)		00029
1992 MSGDR1(330)		00030
2322 MSGDR2(330)		00031
2652 IBLANK		00032
2653 MAGTBL(10)		00033
2663 NDCMBN(25)		00034
2688 IASMD(1)		00035
2691 IDSMA(3)		00036
2694 IDVCE(9)		00037
2703 IRSTAT(9)		00038
2712 IWSTAT(9)		00039
2721 IDIAL(9)		00040
2730 IFPTR(9)		00041
2739 ISTAT(9)		00042
2748 IDASP1(9)		00043
2757 IDALOG		00044
2758 IFBTK(11)		00045
2769 IFBTH(11)		00046
2780 IFBTN(11)		00047
2791 IDATE		00048
2792 IOPRTR		00049
2793 IOPER		00050
2794 IAUX		00051
2795 PI		00052
2797 IRAND		00053

2798	ISTART	00054
2799	NCHBFG	00055
2800	NUMCH	00056
2801	KYPBRK	00057
2802	ICHNUM	00058
2803	ICHNO	00059
2804	MRKGND	00060
2805	NBKGND	00061
2806	ISTOP1	00062
2807	ISTOP2	00063
2808	JOB	00064
2809	IQUANT	00065
2810	ISWAP	00066
2811	IMASK	00067
2812	NAMES(480)	00068
3292	NAME SX(180)	00069
3472	NBRNAM(2)	00070
3474	LOCTAG	00071
3475	LSTNAM(2)	00072
3477	MDEF(133)	00073
3610	KFEP(34)	00074
3644	LEP(14)	00075
3658	NREC1	00076
3659	NREC2	00077
3660	NREC3	00078
3661	NOTFUL	00079
3662	AQUIT	00080
3663	MKNT1	00081
3664	MKNT2	00082
3665	INREVW	00083
3666	MFUNSV(50)	00084
3716	LPTATX	00085
3717	LPTMFU	00086
3718	WITHIN	00087
3720	ROUND	00088
3721	LSTRYL	00089
3722	NBRRL	00090
3723	KEEPID(2)	00091
3725	LNCORR(2)	00092
3727	LHSCOM	00093
3728	MDE	00094
3729	LFND	00095
3730	LNHR	00096
3731	LFREXD	00097
3732	LSTPTR(6)	00098
3738	LSDF(2)	00099
3740	LHEPLY(2)	00100
3742	NREPLY(40)	00101
3782	RSPNSE	00102
3784	ARG(61)	00103
3906	ATXVAL(400)	00104
4706	IONUFF(10)	00105
4716	I RECRD(528)	00106
5244	LSNENT	00107

5245	LRNENT	00108
5246	LESSON(2)	00109
5248	KURRYL	00110
5249	NEWORD	00111
5250	LSDK1(118)	00112
5368	LSDR2(118)	00113
5486	LAB1(94)	00114
5580	LAB2(48)	00115
5628	MSVMSG(6)	00116
5634	KPTR(8)	00117
5642	LTBS(10)	00118
5652	ICYCLE	00119
5653	IPRCLE(20)	00120
5673	MSGBUF(160)	00121
5833	LESLIN(80)	00122
5913	MRUMSG	00123
5914	IDLFLG	00124
5915	IDASR	00125
5916	LTOC	00126
5917	ICHCLN	00127
5918	LPSW	00128
5919	KNEG	00129
5920	NPNT1	00130
5921	NPNT2	00131
5922	IDAFD	00132
5923	IDASRM	00133
5924	NDEX(5)	00134
5929	NPTR	00135
5930	IBLFLG	00136
5931	ICHAP	00137
5932	ICMPRE	00138
5933	ICNDWN	00139
5934	ICR	00140
5935	IFMT	00141
5936	IFRSWD	00142
5937	IFTFLG	00143
5938	MODFLG	00144
5939	IMAG1	00145
5940	IMAG2	00146
5941	IMOVER	00147
5942	INDFLG	00148
5943	INFORM	00149
5944	INWDNR	00150
5945	INDWRT	00151
5946	NMRPLY	00152
5947	IBTPTR	00153
5948	ITPCNT	00154
5949	NEXT	00155
5950	ISRBYT(10)	00156
5960	IND8YT(10)	00157
5970	IT08YT(10)	00158
5980	ISVDEC	00159
5981	ISCFLG	00160
5982	IEXP	00161

5983	ISVBYT	00162
5984	ISVDWN	00163
5985	ITRFLG	00164
5986	IWKPTR	00165
5987	JWKPTR	00166
5988	KWKPTR	00167
5989	LWKPTR	00168
5990	LFMT	00169
5991	LMARG	00170
5992	IRMARG	00171
5993	LSBLNK	00172
5994	LSBLWD	00173
5995	ILNPR	00174
5996	JLNPR	00175
5997	KLNPR	00176
5998	MLNPR	00177
5999	NLNPR	00178
6000	INTR	00179
6001	MINT	00180
6002	NINT	00181
6003	MOVER	00182
6004	MVEND	00183
6005	INT	00184
6006	ISKIP	00185
6007	LINEUP	00186
6008	IDEC	00187
6009	INTPTR	00188
6010	INDVCE	00189
6011	INTTBL(12)	00190
6023	MINFLG	00191
6024	MCUE	00192
6025	NWRD1	00193
6026	NWRD2	00194
6027	NPACK	00195
6028	NFUNL	00196
6029	MCUESV	00197
6030	LSTCHR	00198
6031	NWRK	00199
6032	NPCNT	00200
6033	NAMBEG	00201
6034	NPREV	00202
6035	NUMFLG	00203
6036	NUMPRS	00204
6037	NCHAR	00205
6038	NFOH	00206
6039	NOKTR	00207
6040	NSRCH(75)	00208
6115	NCPU	00209
6116	NUNITR	00210
6117	NCONN	00211
6118	MEMORY	00212
6119	LIBSV	00213
6120	LIBUSE	00214
6121	ITMNM(2)	00215

6123	NPRSV	00216
6124	LBYTE(80)	00217
6204	X(1)	00218
6206	IWORK(164)	00219
6370	NOP1(60)	00220
6430	NOP2(60)	00221
6490	EXP1(60)	00222
6610	EXP2(60)	00223
6730	MFRAME(320)	00224
7050	NFRAME(320)	00225
7370	MNSTAT(2)	00226
7372	MNNENT(2)	00227
7374	NTRYF	00228
7375	NTRYG	00229
7376	NTRYL	00230
7377	MNFSW	00231
7378	NFULL	00232
7379	NLINE	00233
7380	JDLFLG	00234
7381	LHSEQ	00235
7382	NFNLSV	00236
7383	ISTFLG	00237
7384	ITIME	00238
7385	ITYM	00239
7386	IFRFLG	00240
7387	NRMFLG	00241
7388	IARPTR	00242
7389	IPRPTR	00243
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7395	NSVPRS	00249
7396	IVLEND	00250
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7401	LRET	00254
7402	KFN9RX	00255
7403	LPTR	00256
7404	LCNT	00257
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7406	LDIR2	00259
7407	KBLNO1	00260
7408	KRLNO2	00261
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7410	NCODE	00263
7411	KFN9R	00264
7412	KGN9R	00265
7413	KLN9R	00266
7414	KOMNR	00267
7415	IFCOND	00268
7416	MKIND	00269

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7426	JHOLD(9)	00271
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7437	YHOLD	00273
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7443	LAN53	00278
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7447	LSW	00282
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7449	LOOP	00284
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7453	KGONLY	00288
7454	KLONLY	00289
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7458	KHR	00293
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7463	KWROS	00298
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7468	LBRK2	00303
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7482	NMREEL	00314
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7517	ISYS13	00329
7518	ISYS14	00330
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7593	IBYT2	00407
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2402	ICHNUM	00412
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7390	ICOMMA	00415
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706	ICWH	00417
5052	ICYCLE	00418
7461	IDA	00419
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2757	IDALUG	00421
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5923	IDASRM	00423
2748	IDASH1(9)	00424
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1990	IDCHK(2)	00426
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7464	IDERR	00429
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647	IDISK(50)	00431

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2691	IDSMA(3)	00433
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7471	IDUSER(2)	00435
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7574	IERROR	00438
707	IETIME	00439
5982	IEXP	00440
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2769	IFBTM(11)	00442
2780	IFBTN(11)	00443
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7610	IFILL(2)	00445
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5935	IFMT	00447
7386	IFRFLG	00448
7392	IFRLUP	00449
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5937	IFTFLG	00452
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7417	IHOLD(9)	00454
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7473	ILOG(2)	00457
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5940	IMAG2	00459
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5941	IMOVER	00461
5960	IND9YT(10)	00462
7594	INDEX	00463
5942	INDFLG	00464
6010	INDVCE	00465
5943	INFORM	00466
546	INNPR	00467
3665	INREVM	00468
6005	INT	00469
6009	INTPTR	00470
6000	INTR	00471
6011	INTTBL(12)	00472
7481	INUSE	00473
5944	INWDNR	00474
4706	IONOFF(10)	00475
2793	IOPER	00476
2792	IOPATR	00477
7595	IORST(15)	00478
7391	IPAREN	00479
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7393	IPMPTR	00481
5653	IPRCLE(20)	00482
7389	IPRPTH	00483
1924	IPUNCH	00484
7580	IPUSH(9)	00485

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2797	IRAND	00487
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5945	IRDWRT	00489
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6006	ISKIP	00497
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7402	KFNBRX	00564
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7456	KF TYPE	00566
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7466	KLNBK1	00570
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7414	KOMNR	00574
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185	MAPDUM	00643
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7370	MNSTAT(2)	00663
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5938	MODFLG	00665
6003	MOVER	00666
3662	MOUIT	00667
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2322	MSGDR2(330)	00670
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519	MSGOPN	00672
499	MSGOPR(20)	00673
2	MSGTBL(125)	00674
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7469	NCAIC	00684
2799	NCH3EG	00685
7410	NCOOE	00686
7445	NCONJ	00687
6117	NCONN	00688
6115	NCPU	00689
6037	NOCHAR	00690
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6039	NDKTR	00692
1988	NEGPOS(2)	00693
5249	NEWORD	00694
5949	NEXT	00695
7382	NFNLSV	00696
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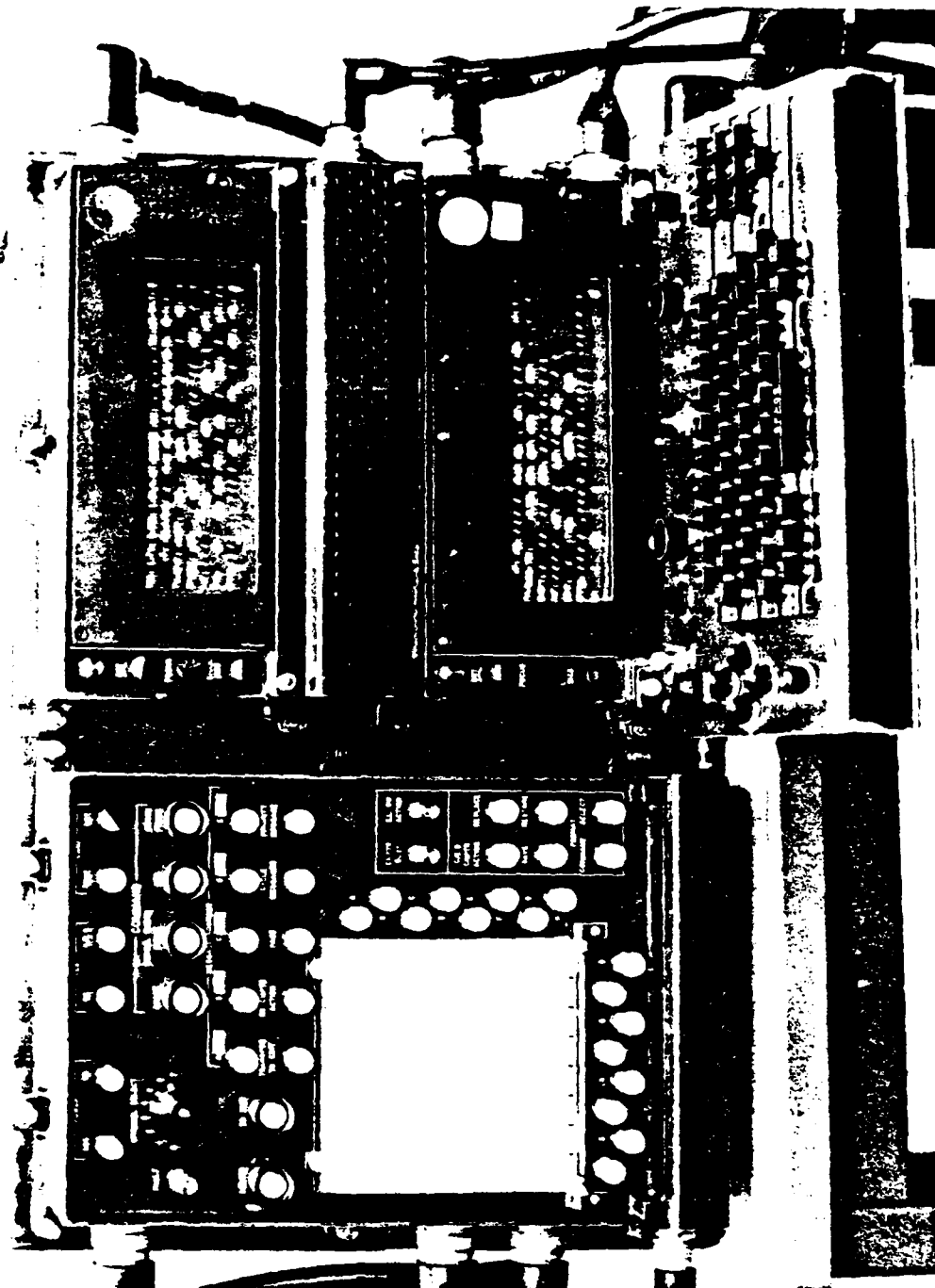
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7450	NPASS	00711
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5929	NPTH	00717
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7375	NTRYG	00751
7376	NTRYL	00752
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6035	NUMFLG	00754
6036	NUMPRS	00755

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6026	NWRD2	00758
6031	NWRK	00759
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7556	N1	00761
7557	N2	00762
2795	P1	00763
491	PRICES(4)	00764
441	PRIME(25)	00765
3782	RSPNSE	00766
7564	TEMP1	00767
7566	TEMP2	00768
7568	TEMP3	00769
7570	TEMP4	00770
7397	VALUE	00771
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6204	X(1)	00773
7435	XHOLD	00774
7558	X1	00775
7560	X2	00776
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APPENDIX H
TACFIRE/TOS² EQUIPMENT PICTURES

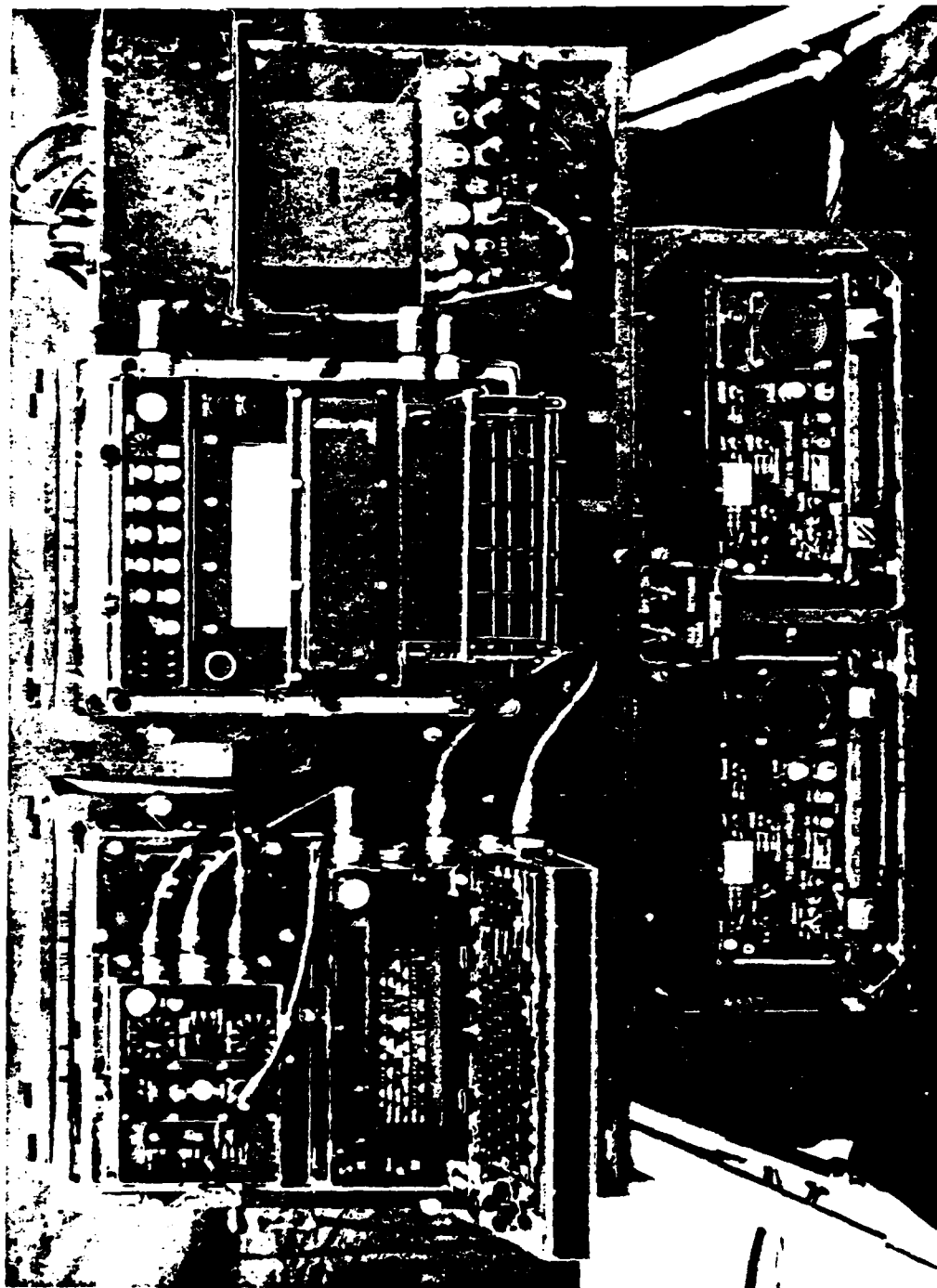
This appendix includes a set of pictures of the TACFIRE and TOS² equipment items most frequently used during operation of the AN GYK-12 PLANIT system. The equipment items shown are those which include significant PLANIT operator/author/student interface. The figures are as follows:

- Figure H-1. Artillery Control Console (ACC)/
Operator Control Console (OCC)
- Figure H-2. Variable Format Message Entry Device (VFMED)
- Figure H-3. Message Input/Output Device (MIOD)
- Figure H-4. Electronic Line Printer (ELP)
- Figure H-5. AN GYK-12 Computer
[CPU, IOU, (2) 8K Memories, MCMU]
- Figure H-6. Auxiliary Removable Media Memory (ARMM)
and Random Access Memory (RAM)
- Figure H-7. (TOS²) Potter Tape Unit
- Figure H-8. Digital Data Terminal (DDT)
- Figure H-9. Computer Test Set (CTS)



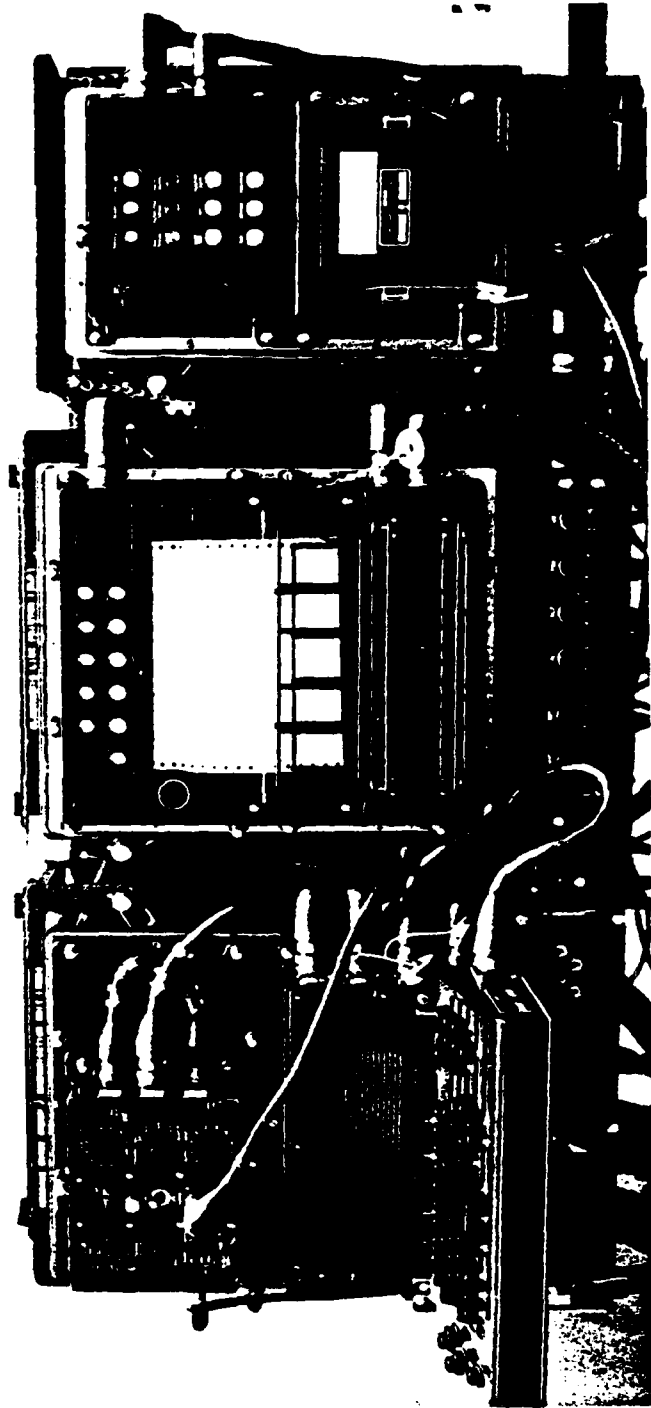
633-H

Figure 11-1. Artillery Control Console (ACC)/
Operator Control Console (OCC)



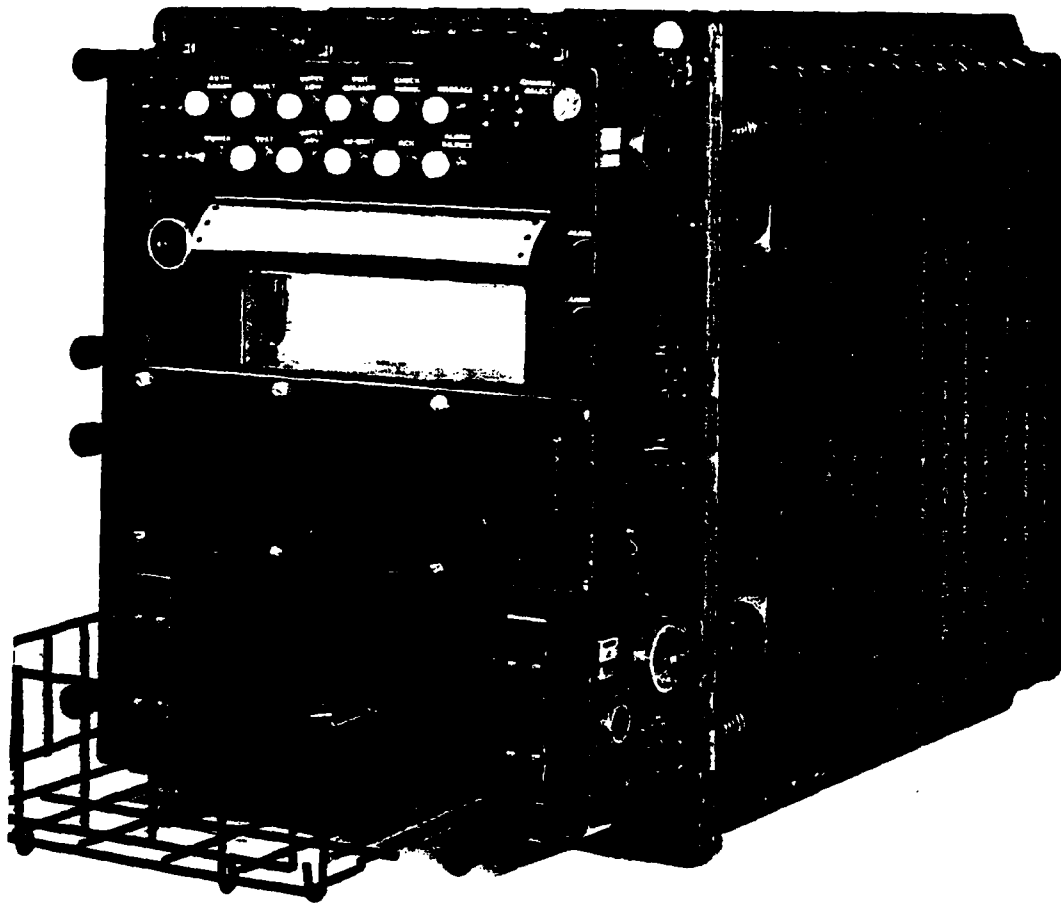
633-9

Figure H-2. Variable Format Message Entry Device (VFMED)



PD 566-23A

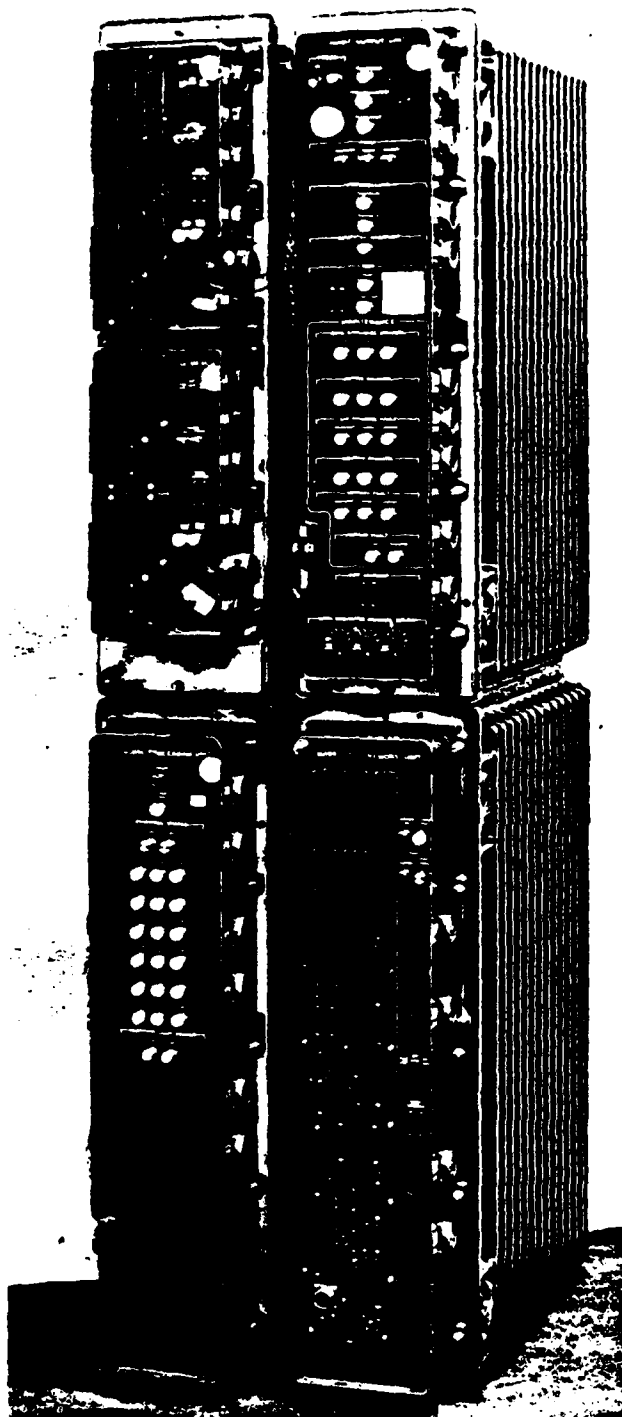
Figure H-3. Message Input/Output Device (MIOD)



PD 321-121A

Figure H-4. Electronic Line Printer (ELP)

H-5

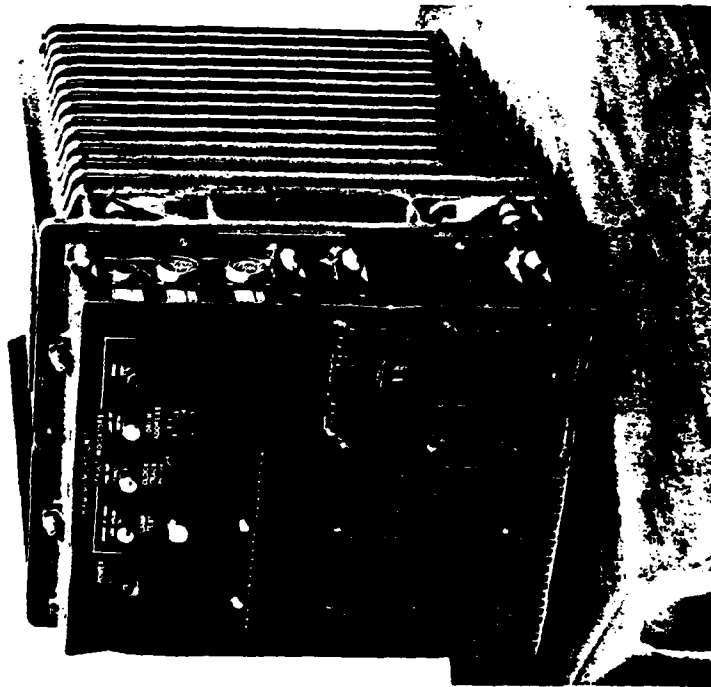


633-17

Figure H-5. AN/GYK-12 Computer

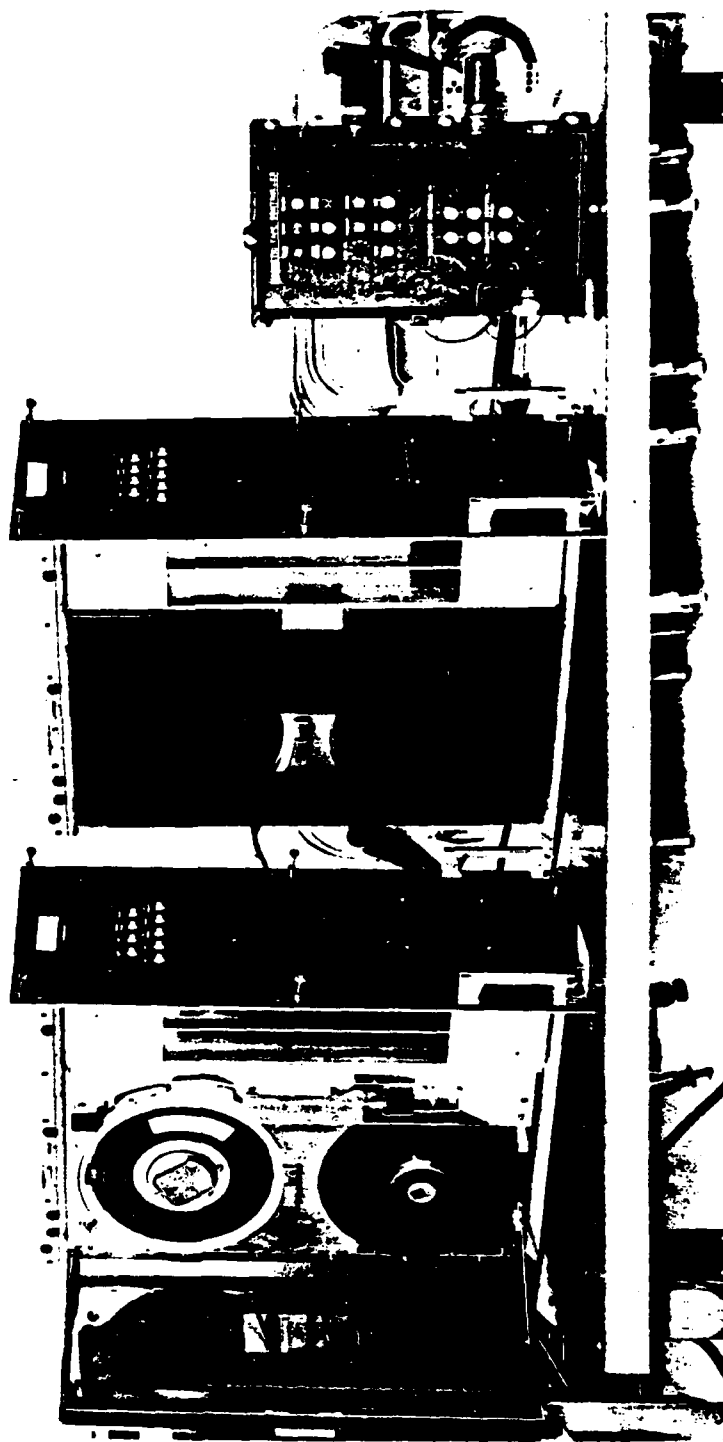


633-19



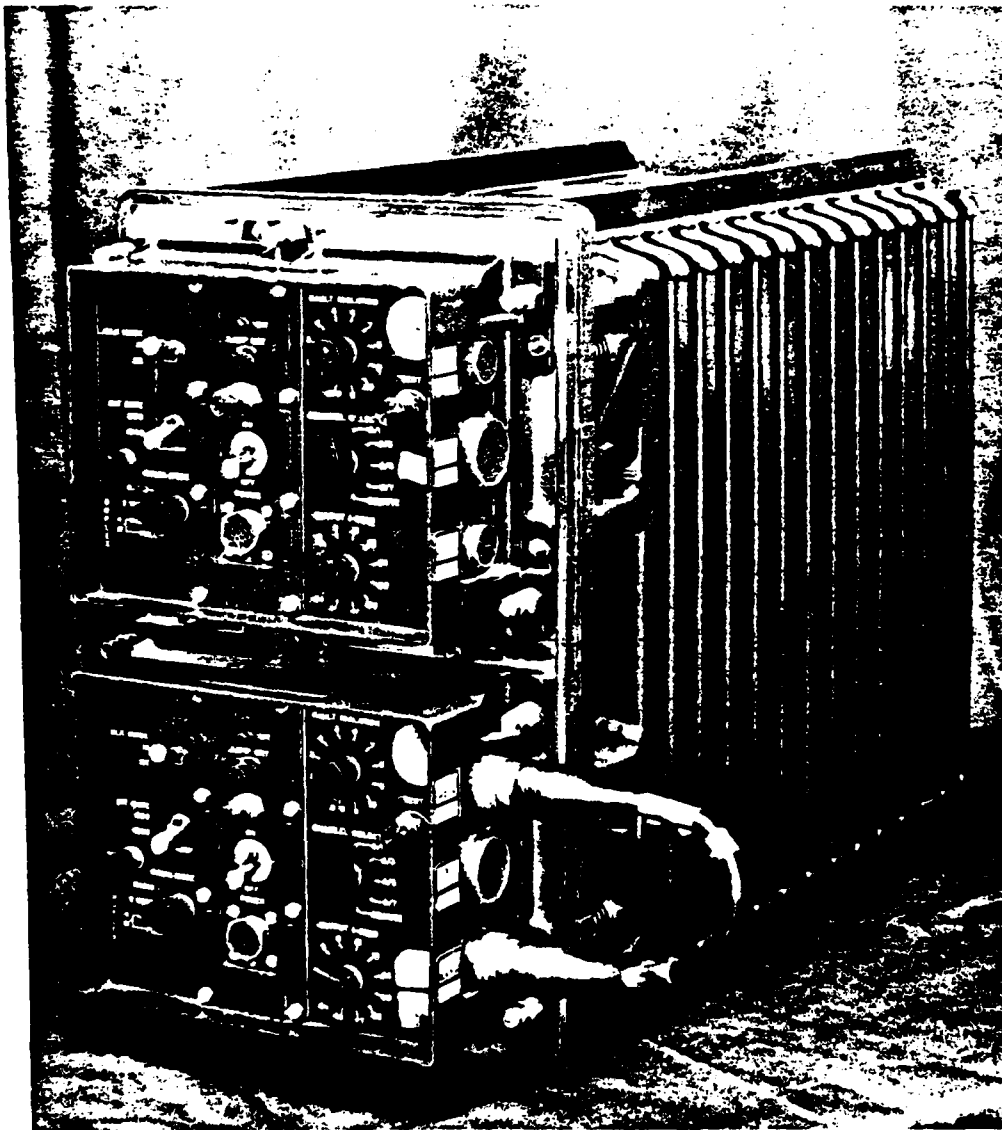
633-14

Figure H-6. Auxiliary Removable Media Memory (ARMM) and Random Access Memory (RAM)



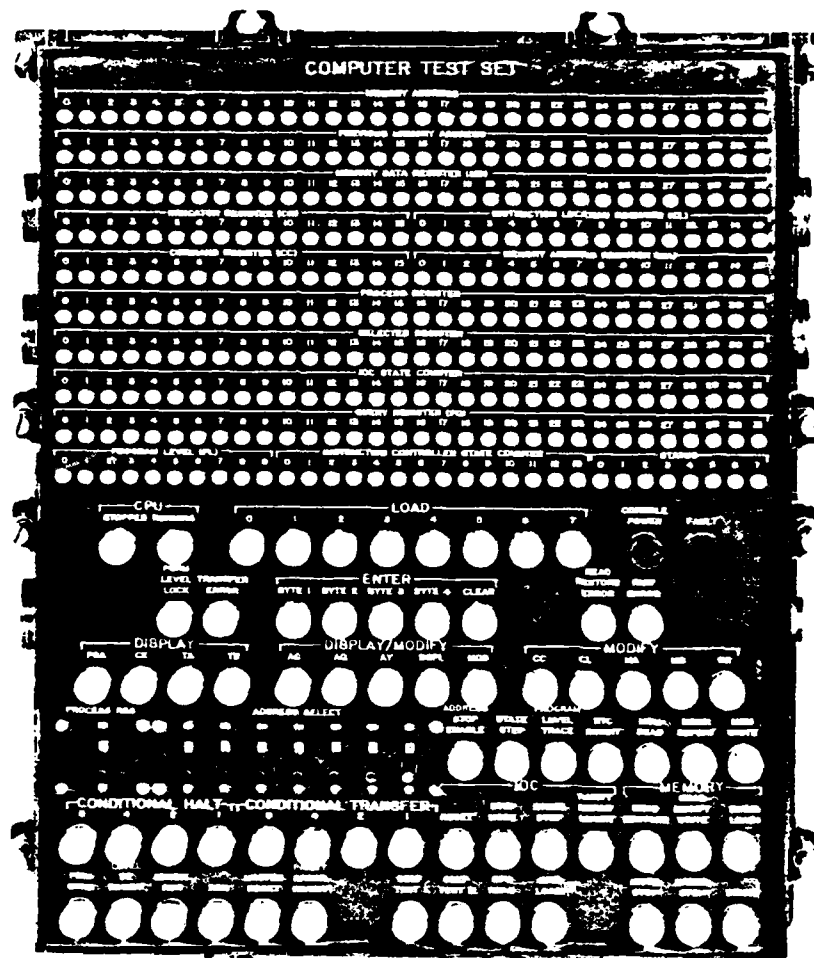
PD 495-4

Figure H-7. (TOS²) Potter Tape Unit



633-21

Figure H-8. Digital Data Terminal (DDT)



PD 321-106B

Figure H-9. Computer Test Set (CTS)

APPENDIX I
GLOSSARY OF TERMS

A

ACC - (TACFIRE) Artillery Control Console
ACCCE/ACCCEd - (ACC) Compose Edit (lower) Display
ACCRD - (ACC) Receive (upper) Display
ACCSA - (ACC) Switch Assembly
ARMM - Auxiliary Removable Media Memory Unit (includes MLU)

B

BOT - Beginning of Tape
BSL - Bootstrap Load

C

CE/CED - Compose Edit Display on the ACC or OCC (Same as ACCCEd
(C/E) or (CCCEd)
CPU - AN/GYK-12 Computer Central Processing Unit
CTS - Computer Test Set

D

DDT - Digital Data Terminal
DE - Display Editor
DIG - (CPU) Diagnose Status Lights
DPM - Digital Plotter Map (not used with PLANIT)

E

ELP - Electronic Line Printer

EOT - End of Tape

ETD - Electronic Tactical Display (not used with PLANIT)

F

FI - Fault Isolation program(s), part of AN/GYK-12 system software
(not a part of PLANIT system)

FINAL - AN/GYK-12 PLANIT System Final (termination of PLANIT
System operations) program module

FSU - (NIOD) Format Storage Unit (not used with PLANIT)

H

HSP - High Speed Printer (commercial peripheral printer in SSS
and PSSB)

I

IOU - AN/GYK-12 Computer Input/Output Unit

K

KB - Alphanumeric Keyboard

L

LSS - L-3050 Support Software (General Utility Programs)

M

MADCAP - Maintenance and Diagnostic Control and Activation Program
(MADCAP Operating System used as basic building block
for POS)

MCMU - Mass Core Memory Unit (131 k words, 32 bits plus parity
per word)

MEOF - MADCAP End of File

MIOD - (TOS²) Message Input/Output Device

MIOP - Machine Input/Output Program

MLU - Memory Load Unit (part of ARMN, includes TTC,

O

OCC - (TOS²) Operator Control Console

OCCCE/OCCCED - (OCC) Compose Edit (lower) Display

OCCRD - (OCC) Receive (upper) Display

OCCSA - (OCC) Switch Assembly

P

PCG - Power Converter Group

PEBU - Peripheral Equipment Buffer Unit

PLAN 1 - PLANIT Overlay 1 Program Module

PLAN 2 - PLANIT Overlay 2 Program Module

PLAN 3 - PLANIT Overlay 3 Program Module

PLAN 4 - PLANIT Overlay 4 Program Module

PLAN 5 - PLANIT Overlay 5 Program Module

PLAN 6 - PLANIT Overlay 6 Program Module

PLAN 7 - PLANIT Overlay 7 Program Module

PLAN 8 - PLANIT Overlay 8 Program Module

P

(Continued)

PLANIT - Programming Language for Interactive Teaching

Note: This is also the name given to the PLANIT MAIN program module.

POS - PLANIT Operating System

PSSB - (TACFIRE) Programming Support System B

PUP - PLANIT Utility Program

R

RAM - Random Access Memory (drum)

RAMCHECK - RAM track check program

RANFI - RAM Fault Isolation program, part of AN/GYK-12 system software (not a part of PLANIT system)

RD - Read-only Display on the ACC or OCC (same as ACCRD or OCCRD)

RMMU - Removable Media Memory Unit (Same as ARMM)

S

SA - (ACC/OCC) Switch Assembly

SSS - (TOS²) Software Support System

START - AN/GYK-12 PLANIT System Start program module

T

TACFIRE - Tactical Fire Direction System (U. S. Army Artillery)

TACPOL - Tactical Procedure Oriented Language (programming language for the AN/GYK-12 computer)

TMIOP - Terminal MIOP

TOS² - Tactical Operating System Operable Segment

TTC - (ARMM/MLU) Tape Transport Cartridge

V

VFIED - (TACFIRE) Variable Format Message Entry Device

APPENDIX J
ACC PATCH AND DISPLAY
OPERATING INSTRUCTIONS

This appendix describes what the operator will observe and what the operator may do if the ACC PATCH AND DISPLAY routine is selected. The routine enables the operator to inspect and/or change program or data locations. This may be done either during the system load (two opportunities) or immediately after pressing the COMPUTER RESTART pushbutton (a PLANIT HOT START).

The first opportunity during system loading is immediately after bootstrap loading the PLANIT Operating System (POS). At this time the operator may patch and/or display the POS program and POS data.

The second opportunity during system loading is after all of the modules have been loaded but before control is turned over to the program START. At this time any core resident program may be patched and/or displayed.

Additional opportunities are provided each time the COMPUTER RESTART pushbutton is pressed (a PLANIT HOT START). At this point the operator may patch and/or display any core resident program and any core resident data including PLANIT data.

OPERATING INSTRUCTIONS

The initial RD and C/ED displays are intended to provide the minimum instructions required to operate the PATCH AND DISPLAY routine (see figures J-1 and J-2).

** PATCH AND DISPLAY **
MODES: X - QUIT
 D - DISPLAY
 P - PATCH
ENTER CHOICE, THEN PRESS C/E CMPTR ACTION

Figure J-1 Initial RD Screen Display

MODE:X PAGE:001 ADR:000 PATCH:00000,0000
P000 7F3F7,0000 (FFFF 0000) (ZZZZ)
ABOVE LINE IS SAMPLE DISPLAY
P000 IS PAGE ADDRESS
7F3F7,0000 IS INSTRUCTION FORMAT
FFFF 0000 IS HALFWORD FORMAT
ZZZZ IS ASCII FORMAT

Figure J-2 Initial C/ED Screen Display

The top line of the C/ED screen is set up as a skeleton to be filled in before pressing the C/E CMPTR ACTION pushbutton. The TAB key may be used to position the cursor immediately following a colon for filling in the skeleton. The fields in the skeleton and permissible values are as follows:

- a. MODE - The operator enters D for display, P for patch or X for quit. The quit option causes the resumption of normal processing.
- b. PAGE - The operator enters a 3 digit hexadecimal page address. The legal values for page are from 000 to XXX, where XXX depends on the memory configuration. Each 8K memory contains 4 pages and each MCMU contains 64 pages. The maximum legal value for a 1-MCMU system would be 03F hexadecimal (63 decimal counting from zero).
- c. ADR - The operator enters the halfword address to be patched or displayed (000 to FFF). During the display mode, the lower halfword indicator (an odd address) is ignored and all displays will begin on the even address (upper halfword). The ADR value will automatically increment by 6 fullwords in the display mode and by 1 fullword in the patch mode. This facilitates paging through memory in the display mode or patching sequential addresses in the patch mode.
- d. PATCH - The patch field will always be initialized as a 5-digit and 4-digit set of zeros separated by a comma. This corresponds to the typical 5-digit instruction format followed by a 4-digit operand format patch. The operator may use this suggested format or compose a patch field according to the following rules:
 - 1) Each data field specifies one halfword (16 bits) of data.
 - 2) Data fields are separated by commas and the last is terminated by a blank.
 - 3) The data field may contain a 5-digit instruction format patch or from a 1 to 4-digit hexadecimal number which will be converted into a right justified 16-bit binary number.

Examples:

PATCH:0,1,2,3,4,5,6,7

causes 8-halfwords to
be stored beginning at ADR.

PATCH:3

causes a single halfword to
be stored at ADR.

DISPLAY

Each time the C/E CMPTR ACTION pushbutton is pressed for either the patch or display mode, six fullwords will be displayed in each of the three formats.

ERRORS

The bottom line of the RD display will display any error messages and the previously requested operation will not be performed. The error messages are as follows:

- a. LEV 2 ERR, PRESS RESET - The cause of this error is most likely a page address which does not exist in the memory configuration. If the patch mode was entered after PLANIT was active (MASTER RESET HOT START) then press MASTER RESET to recover, otherwise the system will have to be reloaded.
- b. MODE INVALID - Illegal mode was selected, try again.
- c. PAGE INVALID - Illegal digits in PAGE field, try again.
- d. ADR INVALID - Illegal digits in ADR field, try again.
- e. PATCH INVALID - Illegal patch field, try again.

APPENDIX K

FULL TERMINAL CONTROL LESSONS

Certain lessons may make use of enhanced commands to take over "complete control" of the terminal (ACC/OCC, VFMED or MIOD) and thereby nullify the operating procedures described in Appendixes B, C and D. The lesson should inform you of the change to the "complete control" mode and advise you of the ground rules for continuing the lesson.

Some of the features which the "complete control" lesson may utilize are as follows:

1. Capability to utilize the full 7-line and/or 14-line display editor (DE) screen sizes of all supported terminal types.
2. Capability to utilize both the RD and C/E D screens of the ACC/OCC.
3. Capability to control and utilize all of the ACC/OCC, VFMED and MIOD terminal switches, indicators, display formats and modes of operation.
4. Capability to utilize the ACC copy ELP separately on in conjunction with the ACC.