TELECOMMUNICATION ALARM SURVEILLANCE AND CONTROL SYSTEM (TASC) SYSTEM MAINTENANCE—GENERICS 1 AND 2

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1. GENERAL

1.01 This section provides maintenance information for the Telecommunication Alarm Surveillance and Control (TASC) System. This information ranges from trouble isolation to the routine maintenance and testing of the system components.

1.02 This section is reissued to contain information pertaining to TASC, Generic 2.

1.03 Major components of a TASC System are the central, the remote stations, and the data network. A layout of the major components is shown in Fig. 1. General routine maintenance, testing, and isolation of problems in the TASC System are accomplished by the system operating personnel. Actual equipment repair is accomplished by the responsible TELCO maintenance group. The Hewlett-Packard equipment is repaired by either the vendor or a local minicomputer maintenance group.

2. TROUBLE RECOGNITION

2.01 The first major step in any maintenance procedure is the recognition of trouble within the system. This task is the function of the operating personnel at the attended stations.

2.02 In many applications, the only manned locations within a TASC System are the attendant positions. The operating personnel at these positions have the responsibility of reacting to the alarm output messages coming from the remote stations which are under their surveillance.

2.03 Each attendant position includes one or more terminals (consoles). In order to recognize cer-

tain trouble conditions within the system, it is very important to man the system console (terminal LU-1) or transfer LU-1 to a manned location. In applications which use the system console as an attendant position, the major responsibility for trouble recognition will be at this location. In applications where the system console is not an attendant position but merely used as a maintenance terminal which is normally unmanned, it is very important to assign responsibilities of that terminal to an attended position. This is accomplished by transferring the input/output (I/O) capability of the system console (LU-1) to an I/O terminal at the assigned attendant position.

2.04 A major part of the trouble recognition activity is performed within the central through the utilization of software failure monitors. These monitors produce appropriate output messages on the system console (LU-1) and in some cases, the messages are also sent to the appropriate terminals.

2.05 Once a problem is recognized, the next step is isolation of this problem to a specific location. These locations are the central, the terminal or data link, and the remote station or data network. Isolation of the problem is covered in Part 3.

3. TROUBLE ISOLATION

3.01 Once it is determined that a problem does exist, it is necessary to isolate the problem to a particular area. These areas are the remote station or data network, the terminal or data link, and the central. The following paragraphs will help in isolating problems within the system. In addition, a trouble isolation flowchart (Fig. 2) is provided to aid in the isolation process. When a problem occurs, start at the beginning of the flowchart and follow through answering the questions.

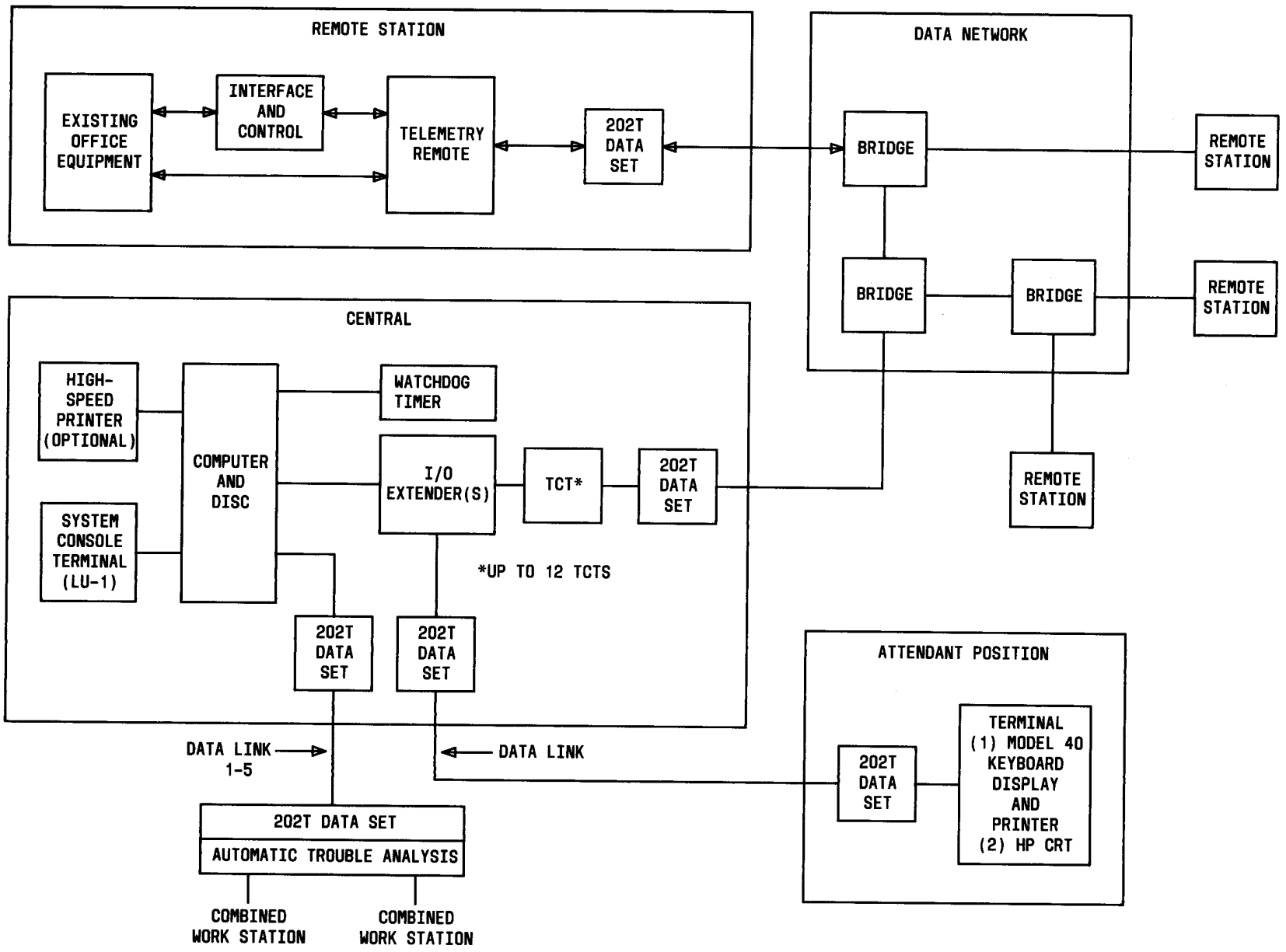


Fig. 1—Block Diagram of Major Components of TASC System

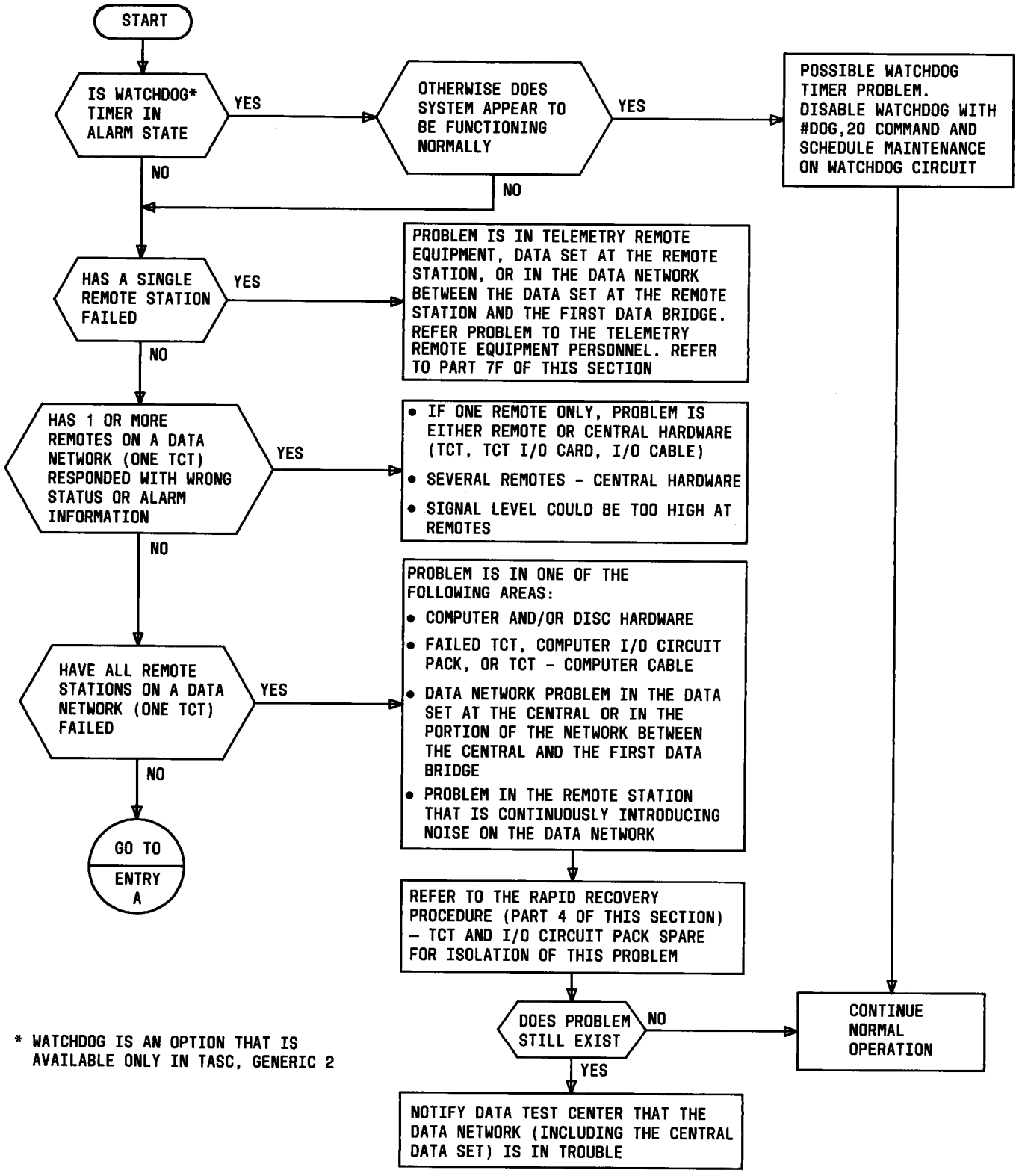


Fig. 2—Trouble Isolation Flowchart (Sheet 1 of 9)

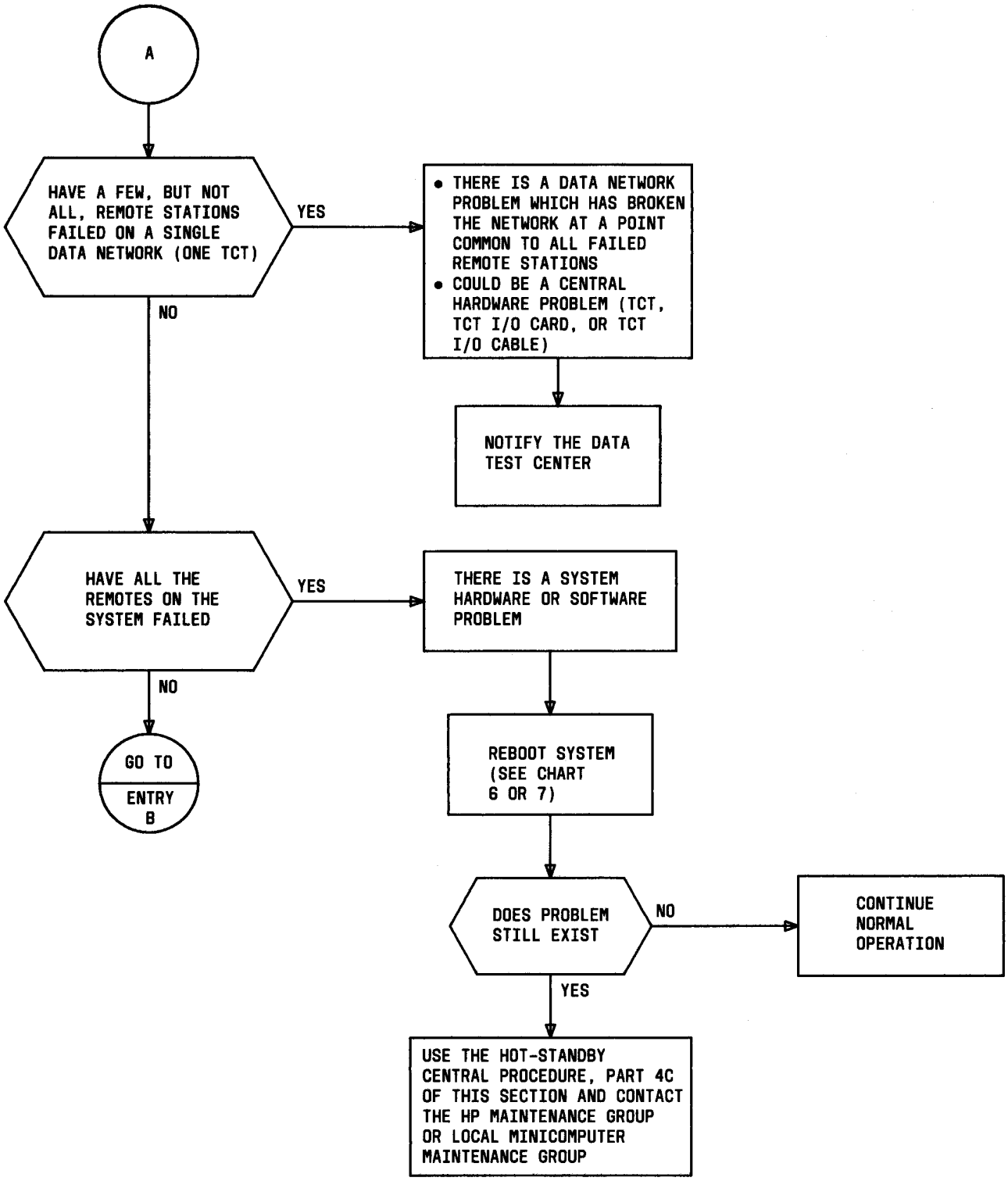


Fig. 2—Trouble Isolation Flowchart (Sheet 2 of 9)

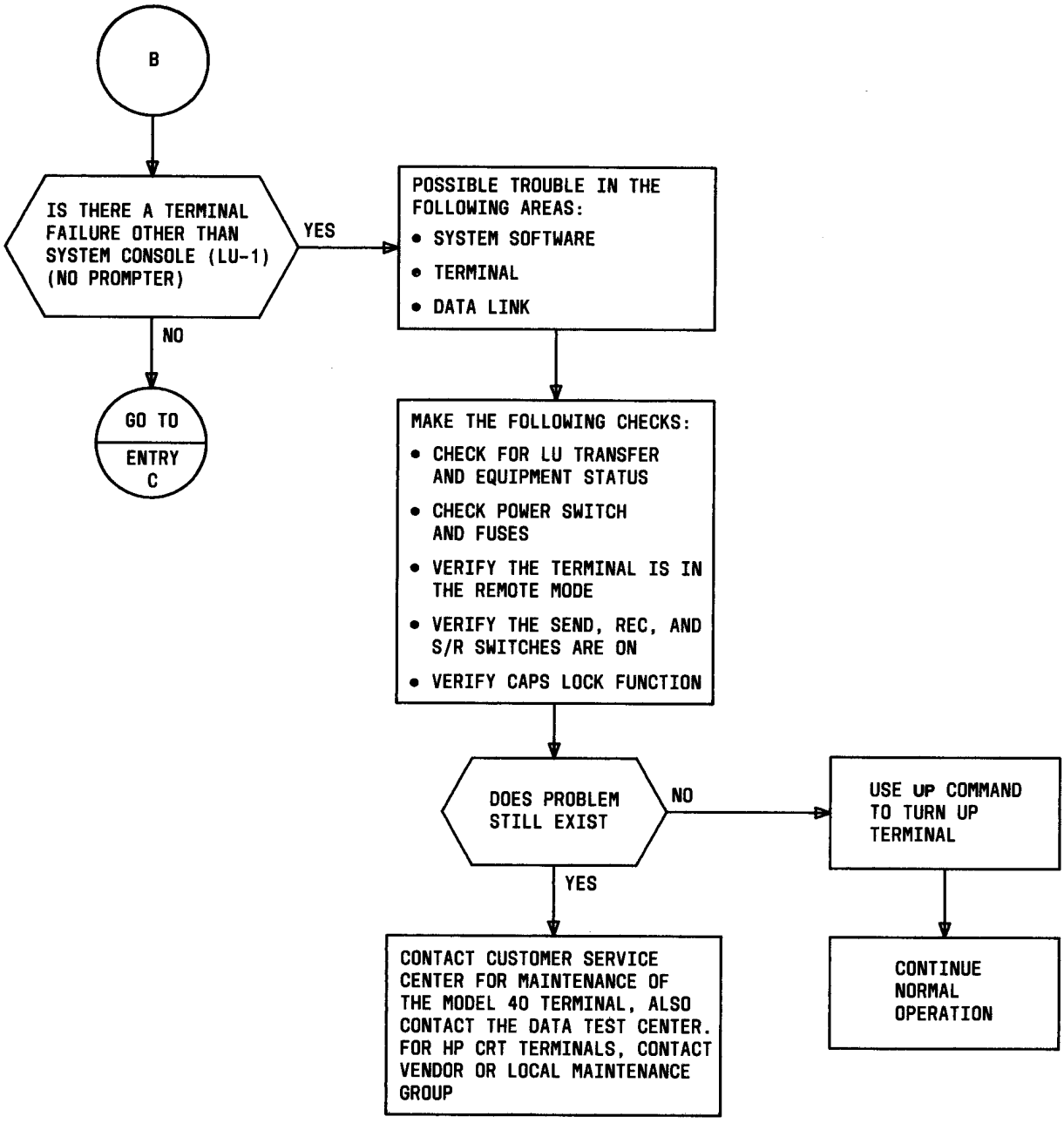


Fig. 2—Trouble Isolation Flowchart (Sheet 3 of 9)

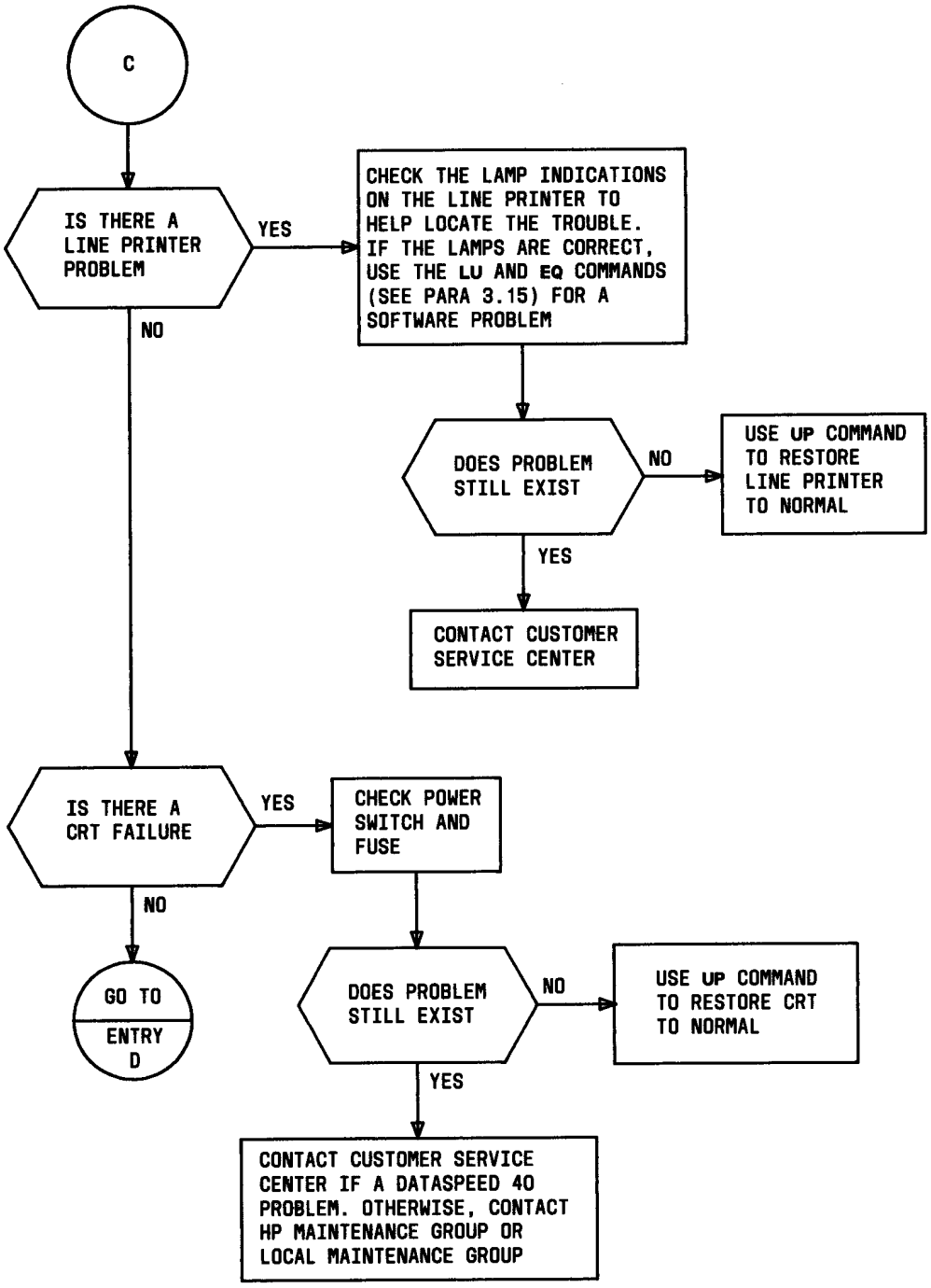


Fig. 2—Trouble Isolation Flowchart (Sheet 4 of 9)

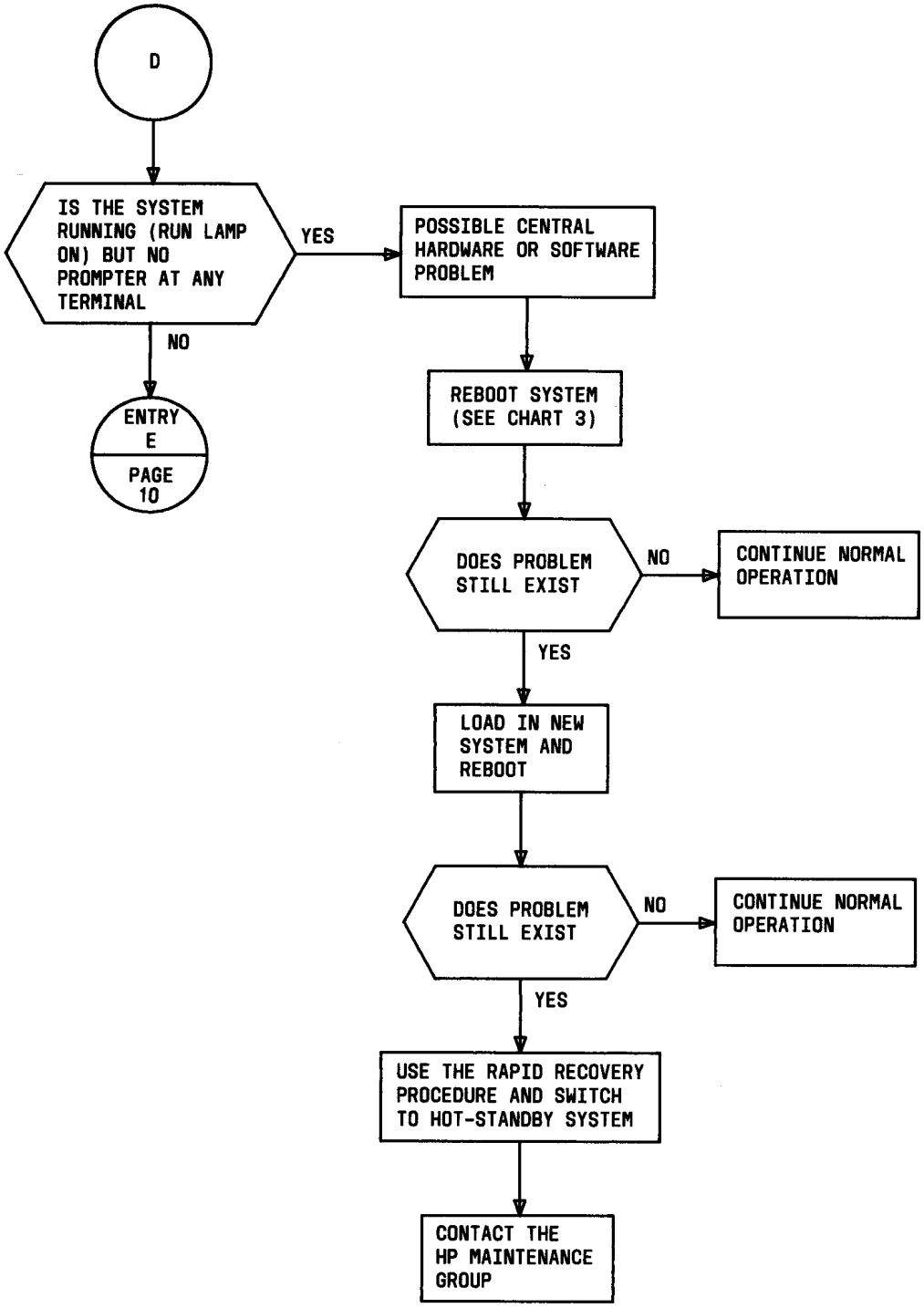


Fig. 2—Trouble Isolation Flowchart (Sheet 5 of 9)

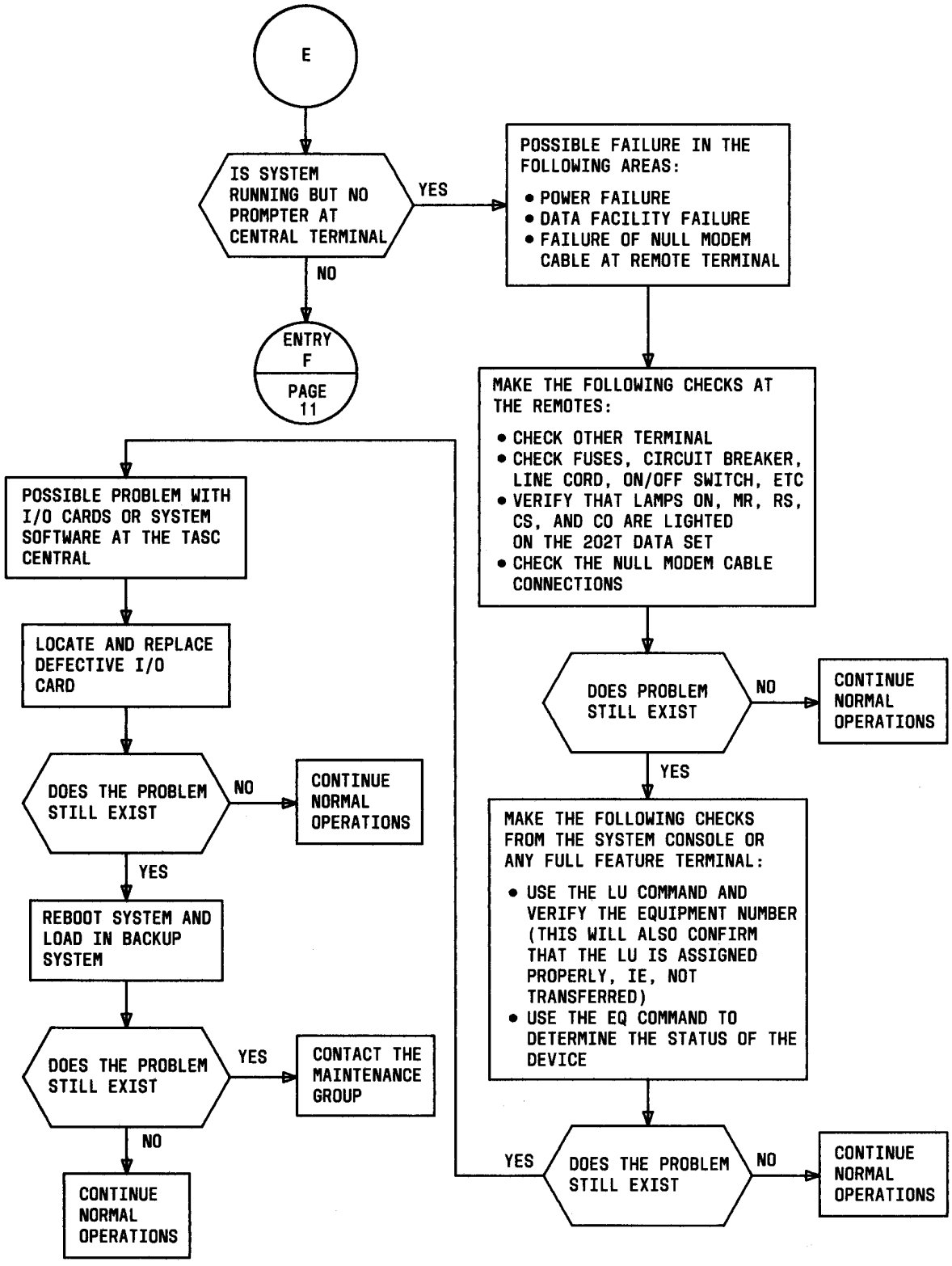


Fig. 2—Trouble Isolation Flowchart (Sheet 6 of 9)

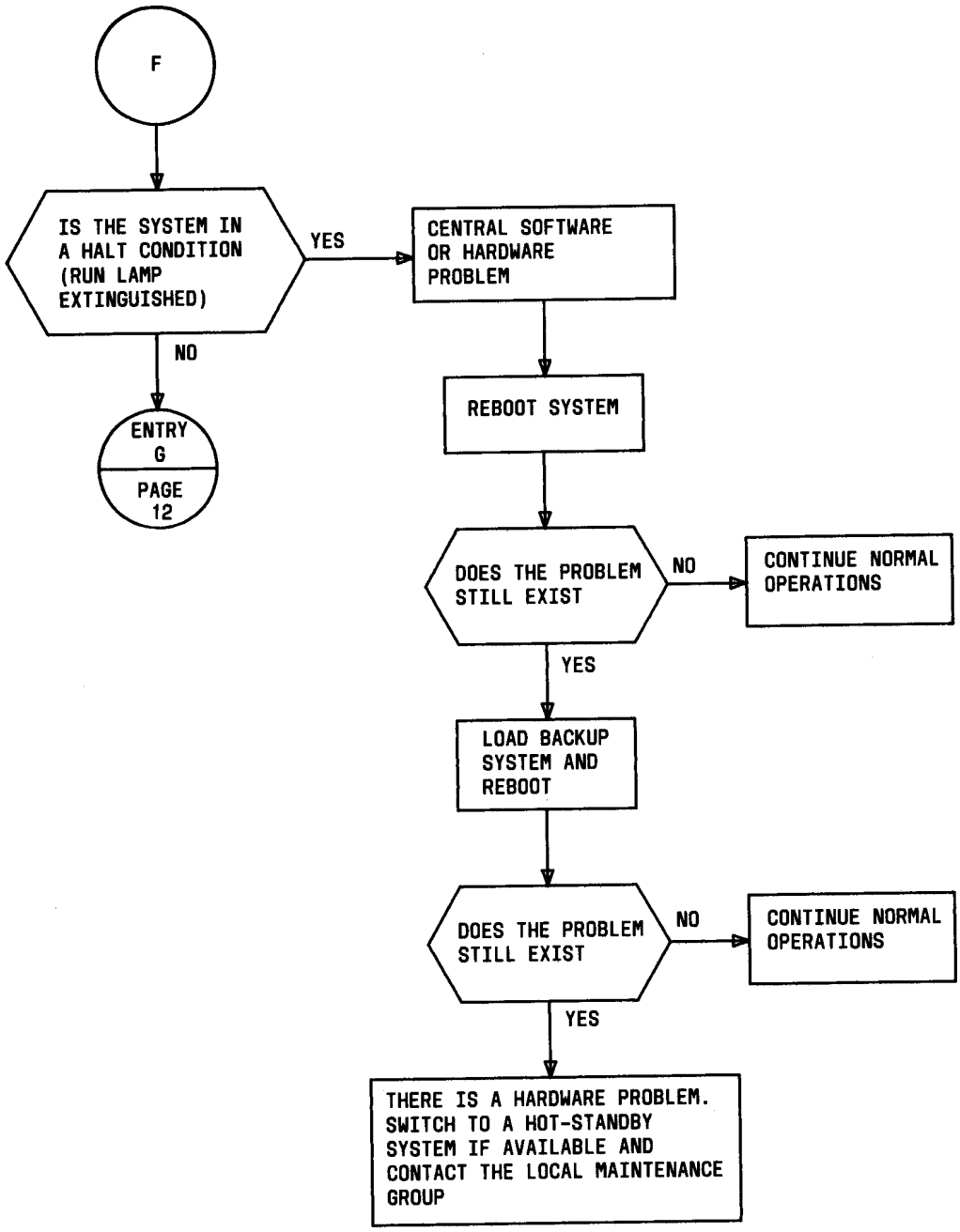


Fig. 2—Trouble Isolation Flowchart (Sheet 7 of 9)

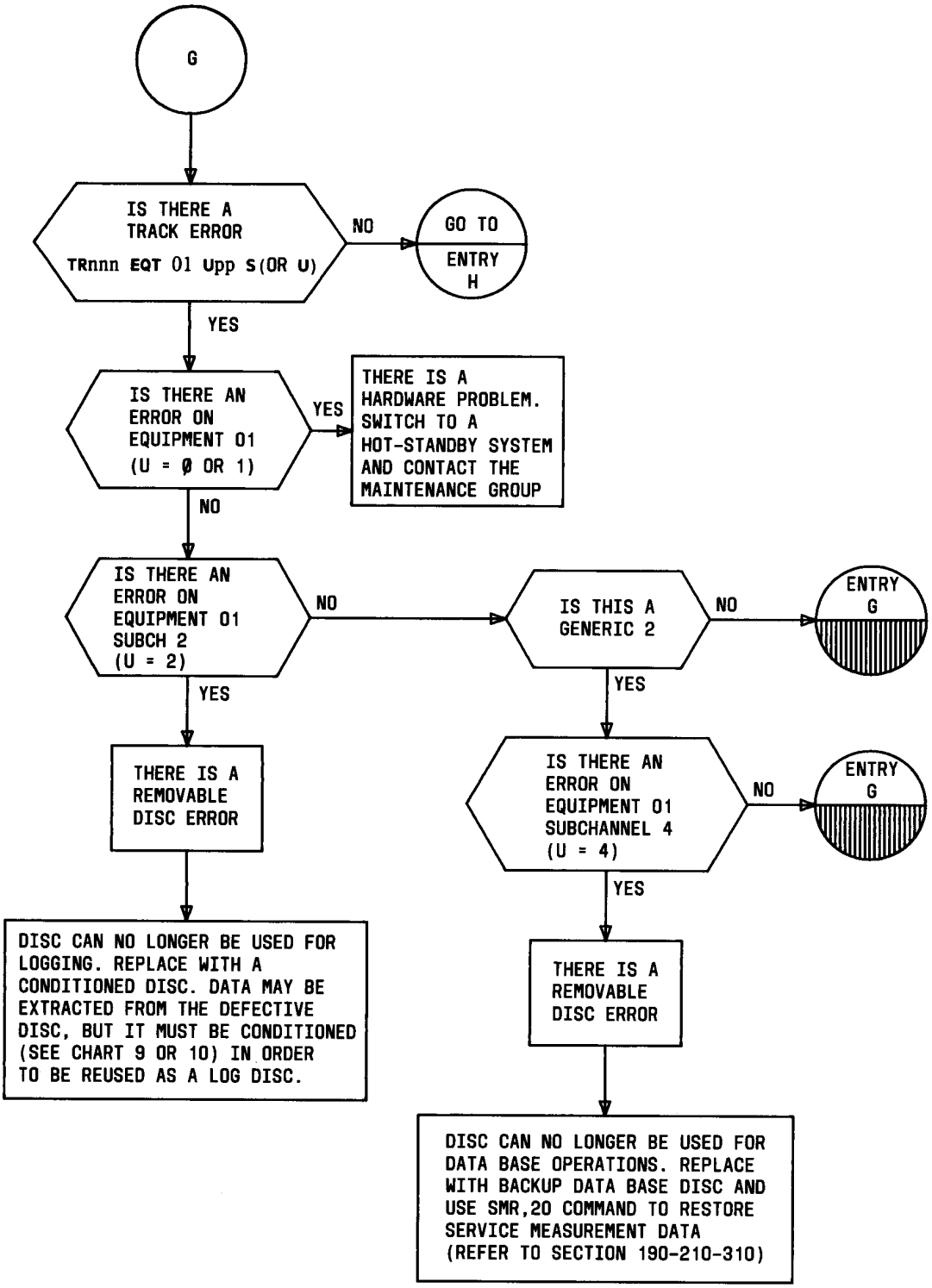


Fig. 2—Trouble Isolation Flowchart (Sheet 8 of 9)

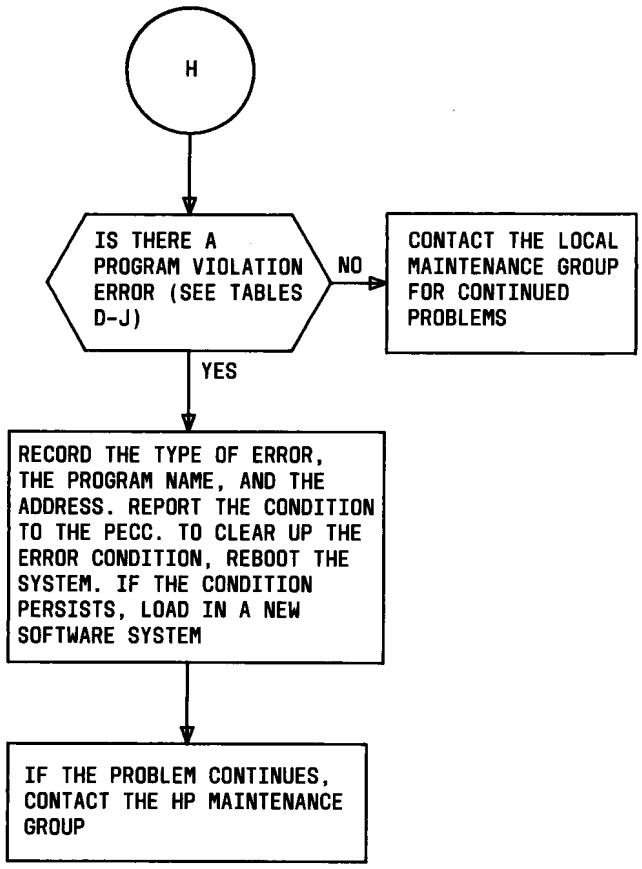


Fig. 2—Trouble Isolation Flowchart (Sheet 9 of 9)

A. System Failures

3.02 If for any reason the system should halt (RUN lamp extinguished), immediately fill out a copy of the form shown in Fig. 3. After this form is completed, reboot the system. See Chart 6 for TASC, Generic 1 (G1), bootup procedure and Chart 7 for Generic 2 (G2) bootup procedure in an attempt to recover from the failure. If the reboot fails to correct the problem, examine fuses, power cords, ON/OFF switch, etc. If this fails to uncover any defects, load in a disc platter containing a backup TASC Software System, if possible, via the fast copy procedure or COP command (see Fig. 4). Once it is verified that the system is working properly, it is recommended that the faulty disc be conditioned (see Chart 9 for G1 and Chart 10 for G2). This disc can then be used to create a backup TASC System via the COP command (see Fig. 4 for a G1 example and Section 190-210-310 for G2 example). Failure of the new system to work indicates a hardware problem. Switch to a hot-standby system (see Chart 1 for G1 and Chart 2 or 3 for G2), if available. System failures of this variety are normally repaired by the local TELCO minicomputer repair group or Hewlett-Packard maintenance force.

B. Remote Station or Data Network Failure

Remote Station Failure

3.03 The most common failure within the TASC System is related to the remote station or data network. If a remote station cannot be successfully polled, a diagnostic message will appear on the system console and at all terminals which are designated to receive output messages from the remote station. An example of this diagnostic message is as follows:

```
11:05 01/04/80
TCT UN 11 STA 13 NR SF SET
```

This message is interpreted as: station (STA) 13 on telemetry computer translator (TCT) unit number (UN) 11 has a no-response (NR) indication and the station fail (SF) has been set. In addition to this message, an SFL indication will appear for station 13 on all summary displays which include station 13. When an SF occurs, refer to Part 7G of this section.

3.04 If on any succeeding polling attempts the central is successful in communicating with the remote station, the following diagnostic message will appear:

```
11:30 01/04/80
TCT UN 11 STA 13 SF CLEAR
```

The SFL indication for station 13 will be removed on all summary displays which include station 13.

Data Network Failure

3.05 Isolation of a data network failure requires the use of the system console and the visual contact of the 202T data set. The E-telemetry station test set (KS-20937) is also used in eliminating the TASC central and TCT as a source of trouble.

3.06 The lamps on the 202T data set provide valuable visual assistance in troubleshooting TCT/data facility problems. By observing these lamps, the operating person can tell whether or not the 202T data set is sending to the remote station and if the remote station is answering (see Table A for a list of the TCT and 202T data set controls and indications and their function). The following conditions will indicate normal operation:

- The ON and MR lamps should always be lighted.
- The RS and CS lamps light momentarily when sending to the remote.
- The CO lamp will light if a response is received from the remote.

If the operating personnel can view the lamps on the 202T data set at the remote station, additional information can be obtained. For example, if the 202T data set indicated that a transmission was sent from the central (RS and CS lighted momentarily) and the CO lamp did not light at the central to indicate a successful poll response, the operating personnel at the remote can tell if the remote did receive the poll by viewing the CO lamp on the 202T data set at the remote. If the CO lamp did not light momentarily, the trouble is in the transmit leg of the data facility. If personnel are available at the central and remote locations, Table B can be used to help locate the trouble.

3.07 If a receive leg of any remote becomes noisy, it will upset the entire bridge and could cause all stations on the facility to fail. The noisy remote should be isolated and removed from the data bridge until it is repaired. This is accomplished by properly terminating the transmit and receive leg of the remote in trouble at the data bridge.

3.08 Periodic messages are automatically generated if many data transmission errors occur. These messages are printed at LU-1 and LU-6, and the LU is defined in the alarm routing table (ART). These messages indicate there is an excessive amount of noise or data level problems on the facilities to the remote station. See Fig. 5 for an example of the messages. Problems of this nature should be referred to the data test center.

3.09 To further assist in isolating a data network problem, the E-telemetry station test set can be used. The test set simulates all remotes on a TCT by connecting directly (***not*** to be connected via data source) to the TCT. To accomplish this task on any data network that has at least one E2A SAC remote, perform the procedure in Chart 4. If only E1 and E2 remotes are present, use the procedure in Chart 5.

3.10 ***A failure of only one remote station on a TCT*** usually indicates a problem with the telemetry remote equipment data set at the remote station. It may indicate a problem in the data network between the data set at the remote station and the first data bridge. This type of problem should be referred to the organization responsible for the telemetry remote equipment at the remote station (refer to Part 7G of this section).

WHEN THE COMPUTER STOPS, BEFORE YOU RESET IT, PLEASE GET THE FOLLOWING INFORMATION:

LAMP	ON STEADY	BLINKING	DIM	OFF
OVERFLOW				
EXTEND				
RUN				
INTERRUPT				
PARITY				

DEPRESS THE HALT BUTTON. USING THE REGISTER SELECT SWITCH, SELECT THE FOLLOWING REGISTERS AND READ THE CONTENTS. REGISTERS f AND s ARE READABLE ONLY ON MODEL 2113 COMPUTERS. USE MODE SWITCH FOR THESE TWO READINGS.

A _____

B _____

M _____

T _____ f _____

P _____

S _____ s _____

SELECT THE M-REGISTER, DEPRESS THE CLEAR DISPLAY, SET THE M-REGISTER TO OCTAL 001711, AND DEPRESS THE STORE BUTTON. SELECT THE T-REGISTER AND READ THE CONTENTS:

M = 001711 :: T = _____
DEPRESS INC M (EACH TIME INC M IS DEPRESSED IT ADDS 1 TO M)
M = 001712 :: T = _____
DEPRESS INC M
M = 001713 :: T = _____
DEPRESS INC M
M = 001714 :: T = _____
DEPRESS INC M
M = 001715 :: T = _____
DEPRESS INC M
M = 001716 :: T = _____
DEPRESS INC M
M = 001717 :: T = _____
DEPRESS INC M
M = 001720 :: T = _____

SELECT THE M-REGISTER, DEPRESS THE CLEAR DISPLAY, SET THE M-REGISTER TO OCTAL 001730, AND DEPRESS THE STORE BUTTON. SELECT THE T-REGISTER AND READ THE CONTENTS:

M = 001730 :: T = _____

SELECT THE M-REGISTER, DEPRESS THE CLEAR DISPLAY, SET THE M-REGISTER TO OCTAL 001736, AND DEPRESS THE STORE BUTTON. SELECT THE T-REGISTER AND READ THE CONTENTS

M = 001736 :: T = _____

Fig. 3—Example of Form for a System Halt

```
#COP

INPUT TYPE OF INFORMATION TO BE COPIED
SYSTEM,DATA BASE,FILE MANGR OR PLATTER (SY,DB,FM,PL)?:PL
                NORMAL TASC DISC ASSIGNMENT
                     REMOVABLE PLATTER
        ********************************************
        *                                          *
        *          LU#42    LOG PLATTER            *
        *                                          *
        ********************************************

                      FIXED PLATTER
        ********************************************
        *          LU#2        *       LU#3        *
        *         SYSTEM       *     DATA BASE+    *
        *                      *       FMGR        *
        ********************************************

    ALLOWABLE TRANSFERS--
        8A   DATA BASE-- LU#3 TO LU#42 OR LU#42 TO LU#3
        8B   SYSTEM----- LU#2 TO LU#42 OR LU#42 TO LU#2
        8C   FMGR------- LU#3 TO LU#42 OR LU#42 TO LU#3
        8D   PLATTER---- LU#2 + LU#3 TO LU#42 OR
                         LU#42 TO LU#2 + LU#3
     ADDITIONAL INFORMATION CAN BE FOUND IN THE "TRA" COMMAND
ENTER LU# OF PRESENT LOCATION OF THE INFORMATION
FOR PLATTER TRANSFER ENTER LU#2 OR 42
ENTER (2 OR 42) : 2
ENTER LU# FOR DESTINATION PLATTER
ENTER (2 OR 3 OR 42) :42

SOURCE DISC CONTAINS A TASC  SYSTEM.
SOURCE DISC CONTAINS A TASC  DATA BASE
SOURCE DISC CONTAINS FILE MANAGER INFORMATION.

DESTINATION DISC CONTAINS A TASC  SYSTEM
DESTINATION DISC CONTAINS A TASC  DATA BASE.
DESTINATION DISC CONTAINS FILE MANAGER INFORMATION

DO YOU WISH TO PROCEED   (Y OR N)?:Y

INFORMATION TRANSFER IN PROGRESS.


REQUEST COMPLETE
```

Fig. 4—Example of a TASC, Generic 1, Printout Which Occurs When Copying the Entire Contents of the Fixed Disc Onto the Removable Disc

3.11 ***The failure of all remote stations on a single data network (one TCT)*** may be caused by a central hardware problem, failed TCT or computer I/O circuit pack, a data network problem in the data set at the central or in the portion of the network between the central and the first data bridge, or a remote station that is continuously introducing noise on the data network. Refer to Part 4 (RAPID RECOVERY PROCEDURES) for the TCT and I/O circuit pack spare. These procedures should be used to eliminate the TCT and I/O circuit pack as the cause of the problem. If the problem still exists, the data test center should be notified that the data network (including the central data set) is in trouble.

3.12 ***A failure of a few, but not all, remote stations on a single data network (one TCT)*** is usually caused by a data network problem which has effectively broken the network at a point common to all failed remote stations. The data test center should be notified.

3.13 ***If all remotes on the system have failed,*** the problem is usually a central hardware (disc or computer) or software problem. The central should be rebooted (see Chart 6 for Generic 1 and Chart 7 for Generic 2). If the problem still exists, the hot-standby central should be utilized (see Part 4C, Hot-Standby Equipment) and contact the Hewlett-Packard maintenance group.

C. Terminal Failure(s)

3.14 ***A terminal failure other than the system console (LU-1) resulting in no prompter*** displayed may be caused by the central 'oftware, the terminal itself, or the data link.

15 When checking for a terminal failure in TASC, Generic 1, it will be necessary to use LU and EQ commands. These commands provide ırmation regarding the status of an I/O device. data will also contain what LU number (LU#) is ŗned to what EQ number (EQ#), and the state of 'evice. An example of the use of these commands ɔwn in Fig. 6. In TASC, Generic 2, the SYS,20 ıe PST commands provide information equivathat obtained with the LU and EQ commands eric 1. An example of the use of these com-'s shown in Fig. 7.

3.16 When isolating a terminal failure in this case, check for a transfer of control from the terminal in question to a different terminal using the LU command. Next, using the EQ command, check the equipment status to determine the state of the terminal. Check the power switch and fuses at the terminal, and verify the terminal is in the remote mode and the S/R switch is ON. If a problem still exists, turn down the terminal (use DN command—see Chart 8), replace the I/O circuit pack for the particular terminal, reboot, and load backup system. This step should isolate the terminal (use UP command—see Chart 8) if problem is in the software. Be sure to turn up the terminal (use UP command—see Chart 4) after replacing the circuit pack.

3.17 If the problem is not isolated at the central, additional checks should be made at the remote terminal. Possible cause of failure may be power failure, data facility (if applicable), or the null modem cable. Verify that the fuses, circuit breaker, line cord, ON/OFF switch, etc, are in good condition. Verify that the ON, MR, RS, CS, and CO lamps on the 202T data set are lighted. Check the cable connections on the null modem cable. If the problem still cannot be isolated, contact the customer service center and data test center.

3.18 There can be one high-speed line printer in the TASC System. TASC, Generics 1 and 2, each has the printer assigned in EQ #6, and in both cases the printer must be colocated with the computer. For TASC, Generic 1, the printer is an HP 2767A; in TASC, Generic 2, the printer may be either the HP 2767A or the HP 2608A. Since these two printers are driven in software by two different drivers, the TASC must be told in the Generic 2 WELCOM file which of the two printers is being used. If there is a ***failure*** of the line printer, a system cannot output to it and therefore will transfer output to the system console. Most common problems causing line printer failure are paper jams, torn paper, or no paper. Lamp indications are located on the line printer to help detect any faults. Check these lamps (see Table C for a list of line printer controls and indicators). If the lamps are found to be correct, the problem could be in the software. Use the LU and EQ commands to determine the software condition of the line printer. Contact the customer service center and the Hewlett-Packard maintenance group for problems that cannot be found or corrected. If the problem is found and corrected, the UP command must be used to restore the line printer to normal operation (see Chart 8).

TABLE A

TCT/202T DATA SET PAIRS—CONTROLS AND INDICATORS

CONTROL OR INDICATOR	FUNCTION
	TELEMETRY-TO-COMPUTER (TCT)
ACO Pushbutton and Indicator	When lighted, indicates an alarm condition. When depressed, associated lamp turns off and silences audible alarm
RESET Pushbutton	Clears the TCT circuitry to its initial power-on state
	202T DATA SET
ON Lamp	Indicates that power is applied to the data set
MR Lamp	(Modem Ready) Indicates the status of the data-set-ready signal. The lamp will be lighted when the data set is in the data mode (data-set-ready lead is true)
RS Lamp	(Request-to-Send) Indicates the status of the request-to-send lead from the customer interface. The lamp will light whenever the request-to-send lead is true or during local self-test and remote test
CS Lamp	(Clear-to-Send) Indicates the status of the clear-to-send lead from the data set. The lamp will light whenever the clear-to-send lead is true or during local self-test and remote test
CO Lamp	(Carrier On) Indicates the status of the received line-signal-detector lead from the data set. The lamp will light whenever the received line-signal-detector lead is in the true condition or during local self-test and remote test
TM Lamp	(Test Mode) Indicates that the data set is in the test mode. The lamp lights whenever one of the test pushbuttons (AL, LT, RT) is depressed. If an error is detected furing the local self-test, the TM lamp will go off
AL Pushbutton	(Analog Loopback) When latched, the TM lamp lights and the output of the data set transmitter is looped back to the receiver input for test purposes
LT Pushbutton	(Local Self-Test) When depressed, all status indicator lamps light to provide a lamp test. Also, the output of the transmitter is looped to the input of the receiver and a random 63-bit word is transmitted at 1547 bits-per-second. If an error is detected, the TM lamp will blink or go off
RT Pushbutton	(Remote Test) If the data set is operating 4-wire, a latched RT pushbutton connects the received data to send data, and carrier-on to request-to-send. This conditions the data set to operate as a repeater for remote testing purposes. If the data set is operating 2-wire, a latched RT switch conditions the data set to be remote tested from a test center

TABLE B

REMOTE STATION AND DATA NETWORK FAILURES

CENTRAL		REMOTE		DIAGNOSIS
RS AND CS LAMPS	CO LAMP	RS AND CS LAMPS	CO LAMP	
Momentary	Momentary	Momentary	Momentary	Remote OK. Check alarm processing in data base.
Momentary	Off	Momentary	Momentary	Remote OK. Check receiving leg.
Momentary	Off	Off	Momentary	Check the remote.
Momentary	Off	Off	Off	(1) Check transmitting leg. (2) Check data set.
Off	Off	Off	Off	CHECK (1) TCT file (2) STTB file (3) TCT I/O Cable (4) TCT (5) I/O card (6) Disc (7) Computer

```
1007   11:03  12/11/78   STA 011  ANKN 5XB 515
TCT UN 11 ST 11   TD SF SET

1010   11:10  12/11/78   STA 019  HOLMDEL
TCT UN 11 ST 19   PE SF SET

1023   11:20  12/11/78   STA 28  SHRN
TCT UN 11 ST 28   NR SF SET
```

Fig. 5—Example of Messages Which Occur Resulting From Many Data Transmission Errors

LU COMMAND

```
OPERATOR INPUT --- #LU,23
TASC OUTPUT ------ LU#23 = #23,U6
```

EXPLANATION OF TASC OUTPUT:

LU#23 EQUALS THE LU NUMBER
#23 EQUALS THE EQUIPMENT NUMBER
U6 EQUALS THE SUBCHANNEL

EQ COMMAND

```
OPERATOR INPUT --- #EQ,23
TASC OUTPUT ------ 33  DVR00  0  B  U6  1
```

OPERATOR INPUT EXPLANATION

23 EQUALS THE EQUIPMENT NUMBER OF THE LU IN QUESTION

TASC OUTPUT EXPLANATION

33 EQUALS THE EQUIPMENT SLOT
DVR00 EQUALS THE TYPE OF SOFTWARE DRIVER
0 CAN BE 0 OR D WHERE 0 EQUALS NO DMA, AND D EQUALS DMA
B CAN BE 0 OR B WHERE 0 EQUALS NOT BUFFERED, AND B EQUALS BUFFERED
U6 EQUALS SUBCHANNEL
1 STATE OF DEVICE CAN BE 0, 1, OR 2 WHERE 0 EQUALS AVAILABLE
1 EQUALS DOWN
2 EQUALS BUSY

Fig. 6—Example of the Use of the LU and EQ Commands in TASC, Generic 1

```
#SYS,2Ø
   5:Ø5 PM  TUE.,  8  JULY, 198Ø

            CURRENT EQT ASSIGNMENT TABLE        LU PLAN:SYSTST-MOD

EQT     LU#'S                              EQT     LU#'S
 Ø2     24,39,59                            34     34
 Ø6     38                                  35     35
 23     4Ø                                  36     36
 24     Ø1                                  37     37
 25                                         38
 26     26                                  39
 27     27                                  4Ø
 28     28                                  41     41
 29     Ø6,23,25,29                         51     51
 3Ø     3Ø                                  53     53
 31     31                                  55     55
 32     32                                  57     57
 33     33                                  59

REQUEST COMPLETE


 PST

17: 5:47:48Ø
************************************************************************
PT SZ PRGRM,T ,PRIOR*DRMT*SCHD*I/O *WAIT*MEMY*DISC*OPER * NEXT TIME  *
************************************************************************
 Ø ** ALPOL*1 *ØØØØ2  Ø **********************************17: 5:47:59Ø
 Ø ** DISTR*1 *ØØØØ1 ***************3,CL  Ø45
 Ø ** WHZAT*1 *ØØØØ1 ***** 1
 4  6 ADA1 *3 *ØØØØ3  Ø **********************************17: 6: 5: 1Ø
 6  3 ATA  *3 *ØØØØ3 ***************3,CL  Ø48
 4 1Ø DISP *3 *ØØØ43  Ø **********************************17: 6:43:1ØØ
 5  5 ILOG *3 *ØØØØ3  Ø **********************************23:59:5Ø: ØØ
 2  7 SPX  *3 *ØØØ2Ø ***************3,CL  Ø4Ø
 4 1Ø UPDT *3 *ØØØ42  Ø **********************************18: Ø: Ø: ØØ
 9  2 WDTMR*3 *ØØØ1Ø  Ø **********************************17: 6: 5:52Ø
 9  2 WITCH*3 *ØØØ99  Ø **********************************17: 6:35:3ØØ
 5 12 SMUPD*4 *ØØØØ2  Ø ********************************** Ø: 5: Ø: ØØ
 8 17 SPI  *4 *ØØØ11  Ø **********************************17: 6: Ø:34Ø
 8 16 SWTC *4 *ØØØ41 ***************3,CL  Ø36
 3  6 POLL *3 *ØØØ99 ***************3,CL  Ø47
 5 1Ø COMØØ*3 *ØØØØ9  Ø **********************************17:23:41:64Ø
************************************************************************
DOWN LU'S, 27, 28, 3Ø, 31, 32, 33, 34, 35, 36, 37, 41
************************************************************************
DOWN EQT'S, 51, 53, 55, 57, 59
************************************************************************
17: 5:47:62Ø
```

Fig. 7—Example of the Use of the PST and SYS Commands is TASC, Generic 2

TABLE C

HP LINE PRINTER CONTROLS AND INDICATORS (NOTE)

DESIGNATION	FUNCTION
POWER Indicator	When lighted, indicates that power has been applied to unit
READY Indicator	Lights when motor comes up to proper speed.
ON-LINE Indicator	Lights when line printer is in "on-line" mode with computer. Goes off when in "off-line" mode
ON-LINE/OFF-LINE Switch	Toggle switch, when toggled to ON-LINE, places the line printer in the "on-line" mode. When switch is toggled to OFF-LINE, it places line printer in the "off-line" mode
PAPER STEP Switch	Toggle switch, when the line printer is in "off-line" mode, advances the paper one step at a time
TOP OF FORM Switch	Toggle switch, when the line printer is in "off-line" mode, advances paper to the first line of next form
PRINT INHIBIT Switch and Indicator	When in on or up position, this toggle switch inhibits hammer drivers during maintenance. The indicator will light when the switch is in the on or up position
PAPER FAULT Indicator	Lights when paper is torn or missing
MASTER CLEAR Switch	Toggle switch, when toggled, initializes line printer circuitry to proper state
DRUM GATE Indicator	Lights when drum gate is unlatched
Circuit Breaker	Applies power when in the on or up position. Removes power when in the off or down position

Note: Switches/indicators 1 through 6 are located on the outside top panel of the line printer. Switches/indicators 7 through 12 are located inside the line printer cabinet just behind the front door

3.19 ***A failure of the Hewlett-Packard console*** can be caused by power failure, fuse failure, or internal circuitry failure. Check the power cord, POWER switch, and fuse. If these checks are found to be good, initiate a diagnostic self-test of the console by depressing the TAPE TEST key. This test covers a major portion of the internal circuitry. The test results in an audible beep, all lamps on the console light, the character sets are displayed on the console, and the lamps go off. If the problem still cannot be isolated, contact the customer service center and the Hewlett-Packard maintenance group. Depress the RESET terminal key to clear the display and ready the console.

D. Central Failure(s)

3.20 If the ***system is running (RUN lamp on) but no keyboard response from any terminal,*** there is a possible problem in the central hardware or software. Reboot the system. If the problem still exists, load a new system and reboot. If the problem continues, switch to a hot-standby system and contact the Hewlett-Packard maintenance group.

3.21 Track errors are detected and appear on the system console in the following format:

TR*nnn* EQTØ1, U*pp* S (or U)

Where: *nnn* =Track number

EQT = Equipment number

pp = Unit or subchannel

S = System request

U = User request

Subchannels (*pp*) are defined as follows:

Subchannel	LU for G1		LU for G2	
0	LU2	drive 0 fixed	LU2	drive 0 fixed
1	LU3	drive 0 fixed	LU3	drive 0 fixed
2	LU42	drive 0 removable	LU42	drive 1 removable
3			LU43	drive 1 fixed
4			LU44	drive 0 removable
5			LU45	drive 0 fixed, but only if HP 7906

All track errors except for subchannel 2 (on Generic 1) and subchannel 4 (on Generic 2) require switching to the backup TASC System. If the log disc (subchannel 2) exhibits track errors, the disc may be replaced and operation may continue. On Generic 2, the data base disc (subchannel 4) may exhibit track errors and can be replaced by a data base backup disc. Any track error must then be remedied by conditioning the disc per Chart 9 (Generic 1) or Chart 10 (Generic 2).

3.22 When an RTE attendant request (2-letter command such as LU, RU, etc) is in error, RTE rejects the request and prints one of the messages listed in Table D. The attendant should then correctly enter the request again.

3.23 If a program violation error (see Tables E through J) is encountered, the attendant should record the error type, the program name, and the address. The condition should then be reported to the Western Electric Product Engineering Control Center (PECC). To clear up the error condition, reboot the system. If the condition persists, load in a new software system. If after loading in a new system the trouble still exists, the Hewlett-Packard maintenance group should be notified.

3.24 When RTE discovers an error in an EXEC call, it terminates the program, releases any disc tracks assigned to the program, prints an error mes-

sage on the operator console, and executes the next program in the schedule list. An explanation of the EXEC call error messages is discussed in the following paragraphs.

3.25 An RTE aborted program will cause the following message to be printed:

name ABORTED

A memory protect violation that is not an EXEC, $LIBX, or $LIBR call will cause the following message to be printed:

MP *name address*

(The *address* is the location that caused the violation.)

When an EXEC call contains an illegal request code, the following message is printed:

RQ *name address*

(The *address* is the location that made the illegal call.)

3.26 The following errors have the same format as MP and RQ errors:

ERROR	MEANING
TI	Batch program exceeds allowed time
RE	Reentrant subroutine attempted recursion (call itself)

The general error format for other errors is:

type name address

Where:

type is a 4-character error code.
name is the program that made the call.
address is the location of the call (equal to the exit point if the error is detected after the program suspends).

Refer to Tables E through J for a listing of error codes or messages and their meanings.

3.27 Parts 2 and 3 of this section should be read at least once; then, the flowchart (Fig. 2) can be used to move quickly to the problem area.

TABLE D

RTE ERROR MESSAGES

MESSAGE	MEANING
OP CODE ERROR	Illegal command.
NO SUCH PROG	The name given is not a main program in the system.
INPUT ERROR	A parameter is illegal.
ILLEGAL STATUS	Program is not in appropriate state.
RESOURCES NOT AVAILABLE	Not enough system available memory exists for storing the program's command string. Reenter the command.

TABLE E

ERROR CODES FOR DISC ALLOCATION CALLS

ERROR CODE	MEANING
DRØ1	Insufficient number of parameters.
DRØ2	Number of tracks is less than zero, illegal logical unit, or number of tracks to release is zero or negative.
DRØ3	Attempt to release track assigned to another program.

TABLE F

ERROR CODES FOR SCHEDULE CALLS

ERROR CODE	MEANING
SCØØ	Batch program attempted to suspend (EXEC [7]).
SCØ1	Missing parameter.
SCØ2	Illegal parameter.
SCØ3	Program cannot be scheduled.
SCØ3 INT *name*	Occurs when an external interrupt attempts to schedule a program that is already scheduled. RTE-II ignores the interrupt and returns to the point of interruption.
SCØ4	*Name* is not a subordinate of the program issuing the completion call.
SCØ5	Program given is not defined.
SCØ6	No resolution code in EXECUTION TIME EXEC call (not 1, 2, 3, or 4).
SCØ7	Prohibited core lock attempted.
SC1Ø	Not enough system available memory for string passage.

TABLE G

ERROR CODES FOR I/O CALLS

ERROR CODE	MEANING
IOØØ	Illegal class number—outside table, not allocated, or bad security code.
IOØ1	Not enough parameters.
IOØ2	Illegal logical unit or less than 5 parameters and X-bit set.
IOØ3	Not used.
IOØ4	Illegal user buffer. Extends beyond FG/BG area or not enough system memory to buffer the request.
IOØ5	Illegal disc track or sector.
IOØ6	Reference to a protected track; or using load-and-go function before assigning load-and-go tracks.
IOØ7	Driver has rejected call.
IOØ8	Disc transfer longer than track.
IOØ9	Overflow of load-and-go area.

TABLE H

ERROR CODES FOR PROGRAM MANAGEMENT CALLS

ERROR CODE	MEANING
RNØØ	No option bits set in all.
RNØ1	Resource number not defined.
RNØ2	Resource number not defined.
RNØ3	Unauthorized attempt to clear a LOCAL resource number.

TABLE I

ERROR CODES FOR LOGICAL UNIT LOCK CALLS

ERROR CODE	MEANING
LUØ1	Program has one or more logical units locked and is trying to LOCK another with WAIT.
LUØ2	Illegal logical unit reference (greater than maximum number).
LUØ3	Not enough parameters furnished in the call, logical unit reference less than one, or logical unit not locked to caller.

TABLE J

INPUT/OUTPUT ERROR MESSAGES

ERROR MESSAGE	MEANING
ILLEGAL INTERRUPT	
ILL INTxx	Message printed when an illegal interrupt occurs (xx is the octal channel number). RTE-II clears the interrupt flag on the channel and returns to the point of interruption.
EQUIPMENT ERROR	
I/OETL#xE#yS#z	End-of-tape condition on LU#x, defined by EQT#y subchannel #z. Correct the condition and set I/O controller (EQT) UP (UP,EQT#).
I/OTOL#xE#yS#z	Device (LU#x) defined by EQT#y subchannel #z has timed out. Examine device. Correct problem and set I/O controller (EQT) UP (UP,EQT#).
I/ONRL#xE#yS#z	Device (LU#x) defined by EQT#y subchannel #z is not ready. Make it ready and set I/O controller (EQT) UP (UP,EQT#).
I/OPEL#xEyS#z	Parity error in data transmission form device (LU#x) defined by EQT#y subchannel #z. Examine device. Correct problem and set I/O controller (EQT) UP (UP,EQT#).

E. Watchdog Timer

3.28 The watchdog timer (optional feature only available on TASC Generic 2) is an electromechanical device mounted in the first data facility interface cabinet. It is pulsed by a computer every 25 seconds. These pulses keep the device in the quiet state. Should the computer fail to pulse the device for approximately 1 minute, the timer will time out and an alarm will be issued.

3.29 While the computer is up, the #DOG command can enable or disable the watchdog or it may query the watchdog status. The default state of the watchdog is *enabled.* It should seldom be necessary to use a keyboard command to disable the timer. The timer is automatically disabled when an #STO (stop) command is issued in preparation for system maintenance or system reboot. If there is a hard failure in the TASC central, the watchdog alarm can be silenced by the operation of a momentary key on the watchdog panel.

4. RAPID RECOVERY PROCEDURES

A. Central Reboot

4.01 At times, a malfunction or operator error may cause the system to appear *dead.* Often the system can be revived by simply rebooting the software. Follow the procedure in Chart 6 for Generic 1 or Chart 7 for Generic 2 to accomplish this bootup.

B. Software System Load and Reboot

4.02 Occasionally, it may be necessary to reload system software and reboot. If this situation occurs, use the procedure for reloading in Chart 11 for Generic 1 or Chart 12 for Generic 2. To reboot the system, use the procedure described in Chart 6 for Generic 1 or Chart 7 for Generic 2.

C. Hot-Standby Equipment

4.03 In the wake of a system failure, or hardware or software failure, it may be necessary to switch operations to a hot-standby system until the primary system is running normally. To accomplish this for a Generic 1 System, follow the procedure in Chart 1. For a Generic 2 System without switchable I/O extenders, use Chart 2. For a Generic 2 System with switchable I/O extenders, use Chart 3.

D. Utilization of TCT Spare

4.04 In case of failure in the data network, a telemetry-to-computer translator (TCT) may be defective and have to be replaced. This will require the changeover to a hot-standby TCT from the suspected defective one. To perform this changeover, see Chart 13.

E. Utilization of I/O Circuit Pack Spare

Warning: As a precautionary measure to avoid damage to the equipment, be sure to remove power from the unit before removing or replacing any circuit pack.

4.05 Spare I/O circuit packs are supplied with the hot-standby system and are to be used to replace failed circuit packs in the active system. The failed circuit packs should be returned to the factory.

5. TROUBLE DIAGNOSIS AND CORRECTION

5.01 Trouble diagnosis and correction are performed by various groups internal and external to the Bell System. Trouble recognition is accomplished most often by the terminal operators who refer the problem, after isolation, to the necessary or responsible group for repair.

A. Remote Station Personnel

5.02 In most cases the remote stations are unmanned and will require dispatching of personnel to these remote stations by the central terminal operators when the remote station equipment is suspected of failure. The remote station personnel will then make the necessary test or checks to verify that the equipment is operating properly or to isolate and correct the problem area (refer to Part 7G of this section). Failed circuit packs should be returned to Western Electric for repair.

B. Data Test Center

5.03 The data test center personnel are responsible for the data network and data link problems which develop. This includes the checkout and/or replacement of the data set.

C. Customer Service Center

5.04 The TASC System utilizes a DATASPEED® 40 as one of its terminal types. The customer service center is responsible for the maintenance of this equipment with its associated data set, if provided, and the repair of the terminal when it fails.

D. Vendor (Hewlett-Packard) Maintenance Contract or Local TELCO Minicomputer Maintenance Group

5.05 Several items of equipment used in the TASC System are manufactured by an outside supplier (Hewlett-Packard). Some operating companies carry a service contract from the vendor which makes the vendor responsible for the maintenance of the equipment. Other companies have established their own local maintenance group and will maintain the outside vendor equipment as well as Western Electric-manufactured equipment.

E. Western Electric Factory—TCT

5.06 If a TCT is suspected of failure, the problem is diagnosed and/or corrected by replacing the faulty TCT with a spare. The failed unit is then returned to the Western Electric factory for repair.

6. ROUTINE MAINTENANCE

A. Disc Drive

6.01 Routine maintenance on the disc drive concerns the cleaning of the disc drive air filter. Refer to the procedure in Chart 14 for an HP 7905 disc drive, or to Chart 15 for the HP 7906 disc drive.

B. Tape Reader

6.02 For the procedure to clean the tape reader, see Chart 16 and Fig. 8.

C. Line Printer

6.03 Verify the line printer has an adequate amount of paper available to the unit. Also check to see that the paper is flowing properly through the unit without jamming. Check further to see that the inked ribbon is providing a readable print. Replace paper and/or ribbon when necessary (see Section 190-210-300, Central Terminal Operations for Generic 1).

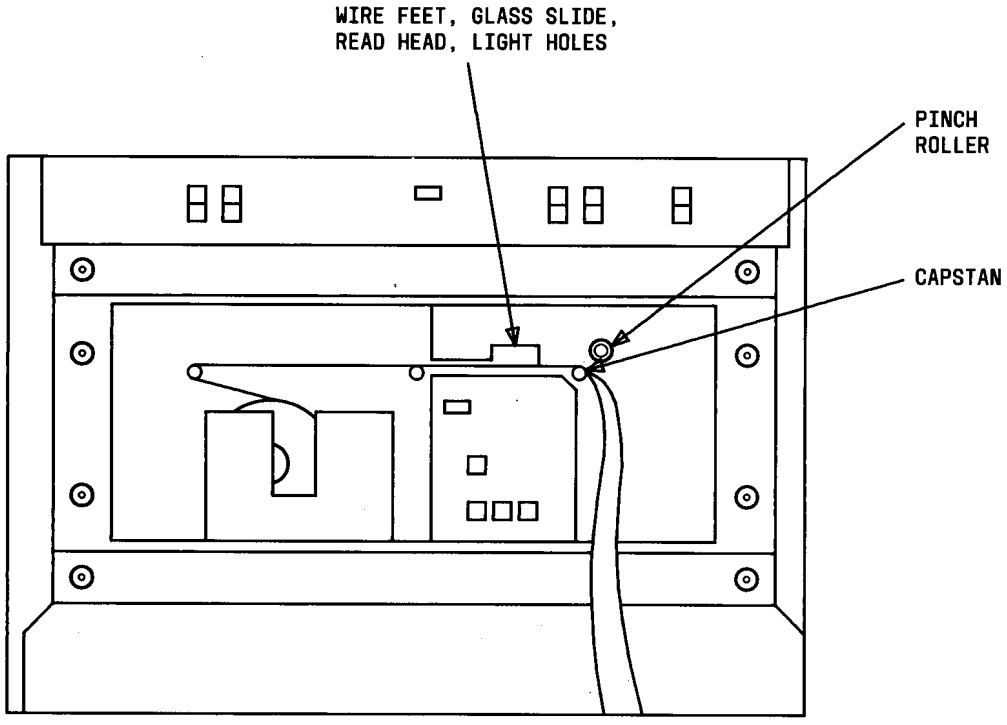


Fig. 8—Areas to be Cleaned on the Hewlett-Packard Tape Reader

D. Computer Battery Pack

6.04 The battery pack on the HP 2112A computers is a 4-ampere/hour, 12-volt unit that can sustain main memory for 2 hours. It is important to the health of this particular battery pack that it be fully discharged and recharged on a periodic basis. The recommended interval is 6 months. To discharge the battery, remove it from the computer and connect it to a 6-ohm load for 2 hours. The load must be capable of continuous heat dissipation of 25 watts (two 93-type lamps in parallel is ideal). The battery pack will recharge in 24 hours after it is reinstalled on the computer.

E. Central Power Fail Recovery

6.05 To ensure that the computer battery packs will provide a proper power-fail recovery when needed, it is necessary that a power-fail recovery routine be induced periodically. This can be done during a routine bootup by turning off the line switch on the computer for a few seconds before setting the clock. The line switch is located on the rear of the HP 2112A computer, but is located behind the front panel on the HP 2112B and HP 2113B computers.

6.06 After the line switch on the computer is turned on, the console (LU-1) should show a message logged on station 257 that the power failed at a certain time and date and that the system clock should be reset. If the computer remains shut off in a halt mode, a proper power-fail recovery did not take place.

6.07 When the power-fail recovery routine fails, the problem can be diagnosed by checking the following:

(1) The battery ON switch on the rear of the HP 2112A computer is set to ON or the battery switch on the battery pack for the HP 2112B or HP 2113B computer is set for INT (internal).

(2) Fuses F1 and F2 on the rear of the HP 2112A computer or F1 on the battery pack for the HP 2112B and HP 2113B computers.

(3) If the batteries are charged to 12 volts.

(4) The toggle switches on the rear of the main printed circuit assembly at the bottom of the computer are always set to the righthand position (as viewed from the rear).

(5) If the problem is not solved, refer the problem to the minicomputer group.

7. TESTING PROCEDURES

A. TCT and Data Set

7.01 The TCT/202T data set can be tested by following the flowchart in Fig. 2. If a problem is found while testing, replace the defective unit with a spare TCT or data set.

7.02 A quick check of the 202T data set can be performed by depressing and holding the LT pushbutton. All of the data set lamps should light. If some do not light, the data set is defective. Also, with the LT pushbutton depressed, observe the TM lamp for 15 seconds. If the TM lamp blinks or goes off, the data set is defective.

B. Remote Terminal Trouble Sectionalization

7.03 Chart 20 is a test procedure which can be used to isolate trouble conditions on terminals connected to the TASC central. The problems could make themselves noticeable in one of three ways: (1) as garbled transmission, (2) as interrupted data, or (3) the terminal goes dead. This test is applicable when using 202T- or 212A-type data sets for the data link connection.

7.04 Since TASC terminals work in an echoplex mode (the character is not printed by the terminal, but is echoed back through the computer interface), tests can be made to ascertain the location of the problem.

C. Hewlett-Packard CRT Terminal

7.05 The Hewlett-Packard CRT uses a self-test method of allowing the CRT to perform a diagnostic test of a major portion of its internal circuitry. Two types of self-tests are possible: one checks out the CRT excluding the two tape transports, and the other checks out the entire station including the tape transports. Use Chart 17 to test the Hewlett-Packard CRT terminal.

D. DATASPEED 40 Testing

7.06 The DATASPEED 40 terminal and optional printers can be tested by Charts 18 and 19. Chart 18 provides a procedure to test the DATASPEED 40 console only, or the console in conjunction with the optional printer. Chart 13 provides a procedure to test the DATASPEED 40 printer only.

E. Remote Acceptance Testing

7.07 Remote acceptance testing is a procedure designed to test new remote terminals as they are added to the existing system. The following activities must be completed and equipment must be available before the procedure can be started:

(1) The TASC central (hardware and software) must be installed and tested by Western Electric.

(2) The central hardware must include a Hewlett-Packard terminal interface for 300-baud DDD (J1P034A, L12) which connects to a data set (103A or equivalent) and an answering unit (804B or equivalent).

(3) A portable data terminal (keyboard and printer) which can be acoustically coupled to the DDD network and operated at 300 baud, full duplex, must be provided.

(4) The remote must be installed and tested by Western Electric.

(5) The interface and control equipment including cabling to the E2A SAC remotes must be installed and tested by Western Electric. This includes all modifications to each source circuit within the existing office equipment. Cabling to the interface and control equipment or to the E2A SAC remote involved in the modifications must also be installed and tested by Western Electric.

(6) The data network which includes the wire center must be installed and tested by the local operating personnel data service organization.

(7) The operating personnel must have completed the TASC training course.

(8) The necessary data base information (STAT, STTB, TCT, ALM, SDR, and SPI files) for the wire center must be in the TASC central.

7.08 After all preliminary activities have been completed, the remote acceptance testing can begin. The goals of this testing are as follows:

(1) To determine if the existing office equipment can provide the proper indications and accept control

(2) To verify if all parts of the newly installed and tested TASC System function properly.

This procedure requires two operating personnel at the remote office. During this activity, the portable data terminal is used in the wire center to provide a TASC operator position which is polling only the remote office under test.

7.09 Each indication provided to TASC should be simulated as far into the existing office equipment as possible in order to verify that this information can be provided to TASC. As each indication is introduced, it must be verified that the proper new message appears on the terminal and that a cleared message occurs when the condition is removed. Each control should be operated at the terminal, and the existing office equipment should be observed for the proper action. Note that care must be taken during the procedure so that problems do not occur with the working office equipment.

F. E-Telemetry Testing Program (ETEST)

7.10 The ETEST program tests telemetry hardware, data networks, and remotes within the TASC System. This test provides access to the complete TASC System data network which may include E-telemetry and C1-telemetry stations. The ETEST program is the only vehicle that provides the actual telemetry data from a remote station to the attendant. This test is a useful tool in troubleshooting telemetry-related problems on existing networks.

7.11 The ETEST program will perform the following telemetry test operations:

(a) Alarm reports (E1, E2, E2A APR)

(b) Status display reports (E2, C1, and E2A APR)

(c) Status group reports (all E-telemetry remotes)

(d) Miscellaneous E2A operations

(e) Remote switches (all E-telemetry and C1 remotes).

The central attendant can request one telemetry operation at a time (eg, a status group report, or the operation of a remote switch). Each request can be executed once or repeatedly at specified time intervals. If the requested telemetry operation is successful, ETEST will output the number of words transmitted to the remote and the number of words received. These transmitted and received words are listed in octal (one word per line).

7.12 If it is necessary to interpret the 16 information bits with regard to some connecting functions or circuits, it should be noted that there are several methods of representing and labeling the data. The labeling methods used are as follows:

(1) ETEST prints the data as six octal digits with the least significant digits to the right. Starting from the right and moving toward the left, the first five octal digits represent three bits each, and the leftmost digit, which may be Ø or 1, represents the 16th bit.

(2) A rarely used method identifies the bits as B15 through BØ, where BØ is the least significant bit. One example of this labeling is shown on the display register of the computer itself.

(3) This method of labeling, related mainly to alarm polling replies, status display reports, data base, etc, refers to the least significant bit as bit 1 and the most significant as bit 16. If there are multiple 16-bit words being returned from a remote, the second word will contain bits 17 through 32, etc.

(4) This method of labeling and representation is used mainly in BSPs and CDs related to TCTs, E-telemetry remotes, and test sets. In this method, the 16-bit field represents only bits 2 through 17 of a longer series of bits that include parity bits and other administrative data (see Fig. 9). The bits are generally written with the least significant bits shown first (to the left) because those are the bits that are transmitted first in the data transmission.

7.13 If the requested telemetry operation is unsuccessful, ETEST will output an ERR diagnostic number along with the assigned error code (EC). Refer to Table K for a list of the ERR diagnostic numbers and the assigned error code.

7.14 Because ETEST does minimal checking of attendant inputs, care must be exercised when ETEST is used from an operational TASC central. Status group reports, status display reports, and C1 scan requests can clear alarms. Therefore, the attendant must be aware of the effects of these commands before there is an attempt to execute them.

7.15 The following is a list of ETEST program requirements:

(a) All inputs and outputs will be affected on the system console (LU-1).

(b) The STTB and TCT files for the station to be tested must be formatted and booted into the TASC System.

(c) The ETEST can be scheduled with the following input format:

RU,ETEST,*opcode,station #(1-256),param, resolution,multiple*

Example: RU,ETEST,2,1,1,2,5

Refer to Table L for the correct OPCODE and PARAM codes to be entered. The resolution and multiple entry codes define the time intervals at which ETEST will run when scheduled in the appropriate manner. *Resolution* defines the units in which the time is specified, where:

Ø = none

1 = tens of milliseconds

2 = seconds

3 = minutes

4 = hours

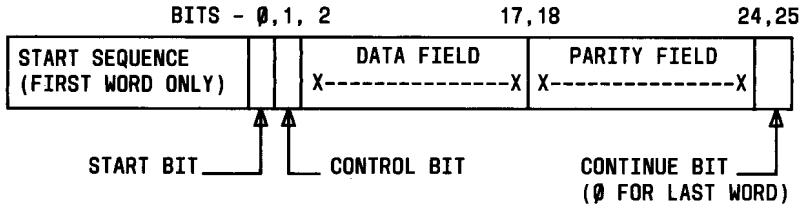


Fig. 9—Basic E-Telemetry Word Format for Words Between the Central and Remote

TABLE K

ERROR MESSAGES (NOTES 1 AND 2)

ERR #	ERROR CODE (EC)	STATUS
ØØ	—	Successful operation
Ø1	PE	Parity error
Ø2	TD	Tone dropout
Ø3	NR	No response from remote
Ø4	DO	Data overrun
Ø5	TW	Time-out of TCT word control
Ø6	MF	TCT malfunction
Ø7	TO	I/O time-out before computer received flag from TCT
08	UN	Unassigned TCT unit #_, stat#_
Ø9	IO	Illegal operation for this station
1Ø	PS	SF set for this C1 remote
11	CE	The C1 interface for this remote is in the manual mode
12	HW	C1 interface hardware problem
13	—	Invalid C1 order code
14	TP	Timing problem

Note 1: Telemetry error diagnostics—TCT UN##STA#EC= Where EC is the error code defined in the table.

Note 2: Other diagnostics which could occur during C1 request:

- *program name* **C1/TELEM 3 MIN TIMOUT-ALPOL did** not complete a C1 operation within 3 minutes.
- *program name* **ILLEGALLY SHEDULED** – The attendant or another program sheduled a program to which TELEM is connected. TELEM is waiting for ALPOL to complete.

Multiple defines the number of these units required. For example, #RU,ETEST,-,-,-,2,5, will cause the specified operation to repeat every 5 seconds.

(d) The OPCODE, station number, and third parameter must always be specified in the message format. The PARAM further defines the testing operation. If resolution and multiple are not specified, the requested operation will occur only once.

Example: RU,ETEST,2,1,1

(e) The repetitive testing mode can be halted with the following entry:

OF,ETEST,1

(f) When OPCODE 7 with PARAM Ø or 1 has been used to perform an all Øs test, the release (OPCODE 7, PARAM 2) test operation must be performed before beginning to poll the station.

(g) If an all 1s test is sent to a remote that is in regular service (ie, polled and not cut off in any way), TASC will generate pages of alarms, fill up the log with untruths, spoil the history counts, and generally create havoc and confusion. For this reason, do not use OPCODE 7 without first ceasing the polling on the station to be tested. In addition, an all Øs test could be executed at a remote and by mistake the remote could be left in that mode. CAUTION must be exercised in this case.

7.16 Using a working central, ETEST can be used to perform seven different telemetry functions. The results of this activity are presented in the examples in Fig. 10 through 16 of this section. An explanation of the input and output information is presented with the example. These examples should be reviewed and used as reference material for understanding the ETEST I/O format.

G. Remote Equipment Maintenance

7.17 The following sections provide maintenance information for the various TASC remote equipment.

SECTION	REMOTE EQUIPMENT
190-205-502	SCOTS Remote Maintenance
201-653-505	SCOTS-C1 Interface Remote
201-631-501	C1 Alarm and Control System
201-639-504	E1 Remote
201-644-504	E2 Remote
201-653-107	E2A CDO Satellite Remote
201-653-504	E2A SAC Remote
201-653-522	E2A APR Remote

TABLE L

OPCODE AND PARAM (NOTES 1 AND 2)

OPCODE #	PARAM	OPERATION
1	None	Alarm report on alarm reporting stations (E1/E2 & E2A APR) (Note 1)
2	Group # (1 - 16)	Status group report
3	Display # (1 - 64)	Status display report
	Order Code	C1 scan (Note 2)
4	Switch # (1 - 4096)	E - telemetry momentary switch (E1, E2, or E2A APR)
5	Switch # (1 - 224)	Latch an E2A switch
	(-) Switch (1 - 224)	Release an E2A switch
6	Data Word	E2A data output to device Ø
7	Ø	E2A all Øs test
7	1	E2A all 1s test
7	2	E2A release test (clear test)

Note 1: Since PARAM is not used for OPCODE 1 operations, one may simply enter the OPCODE and the station number. For repetitive operations the "null" PARAM is indicated by two commas as in the following example:

RU,ETEST,1,22,,2,5

Note 2: For C1 remotes PARAM specifies a C1 order code. An order code can have 1, 2, or 4 digits. To determine PARAM for a 4-digit code, the following formula can be used:

PARAM = A + (16xB) + (256xC) + (4096xD)

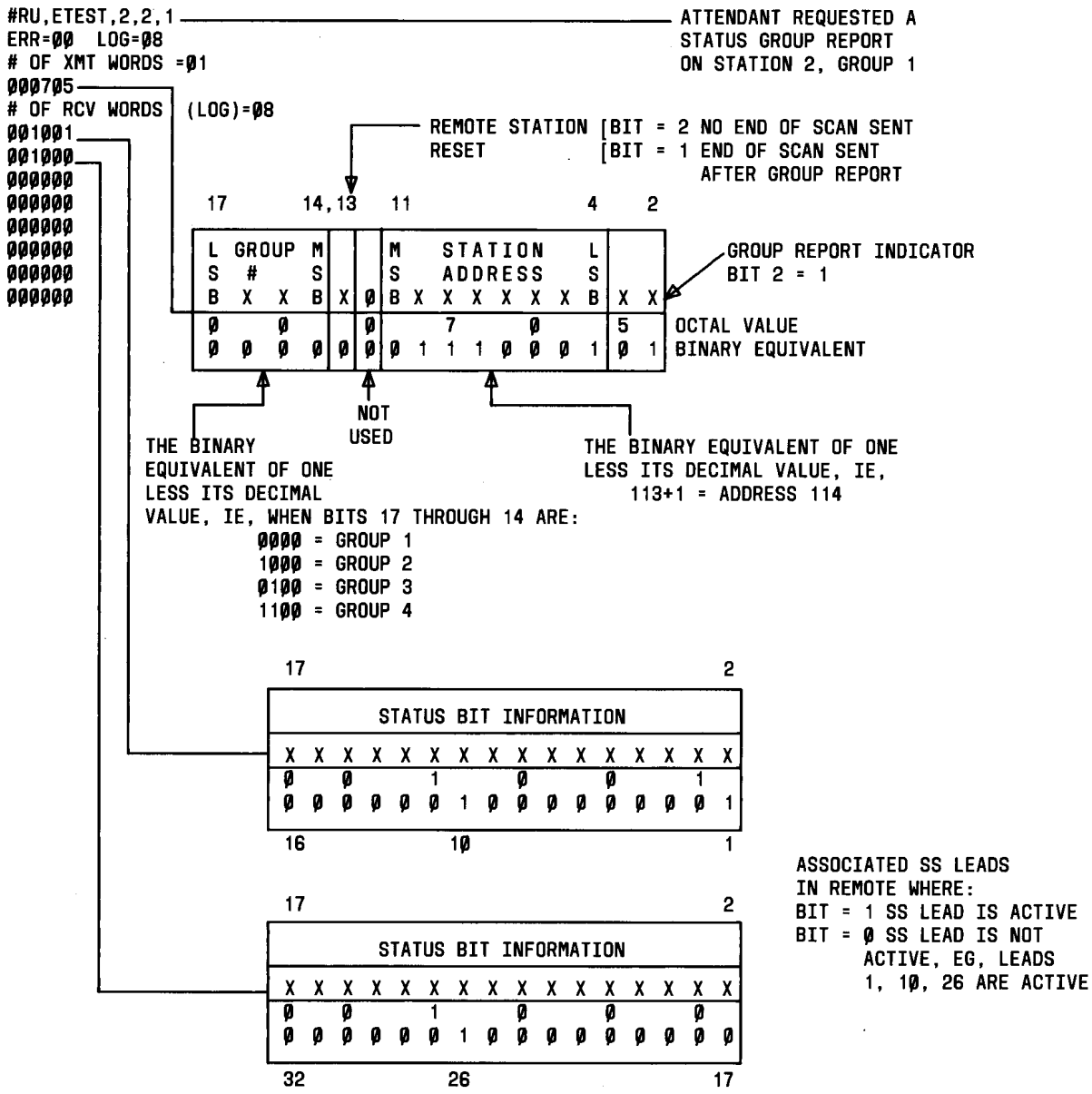
Where: A = 1st digit code
B = 2nd digit code
C = 3rd digit code
D = 4th digit code

In 1- and 2-digit codes, the unused digit B, C, or D will default to zero.

An example: STATION RECORD TABLE (SRT) FILE
******** ******* ***** **** ****

Sta No. 0022				(A)	(B)	
SDR No.	OX	OY	CATALOG	SCAN	ORDER	CODE
0001	0591	0024	0001	0001	0010	

PARAM = A + (16xB) + (256xC) + (4096xD)
1 + (16x10) + 0 + 0
161
RU,ETEST,3,22,161



NOTE:
ETEST WILL TRANSMIT THE (END OF SCAN) BIT IF THE ATTENDANT ADDS 16 TO THE GROUP NUMBER, EG, A GROUP REPORT WITH THE (END OF SCAN) BIT SENT FOR GROUP 1 IS: RU,ETEST,2,2,17. ETEST WILL RETURN STATUS INFORMATION ON ALL STRAPPED SUBGROUPS FOR EACH REQUESTED GROUP. THE ABOVE EXAMPLE SHOWS THAT STATION 2, GROUP 1 HAS 8 SUBGROUPS STRAPPED IN GROUP 1.

Fig. 10—Example of ETEST Status Group Report (E2A)

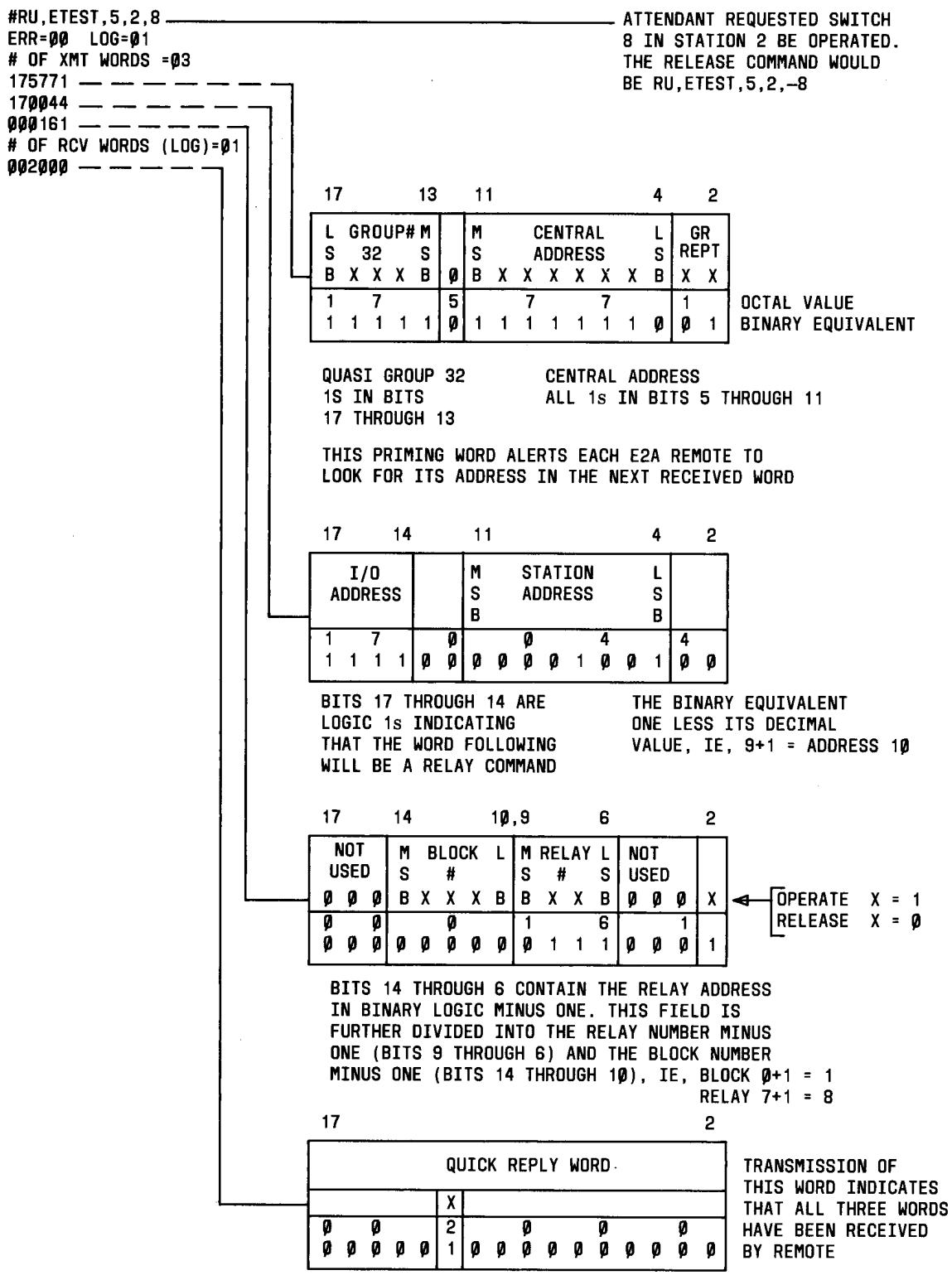
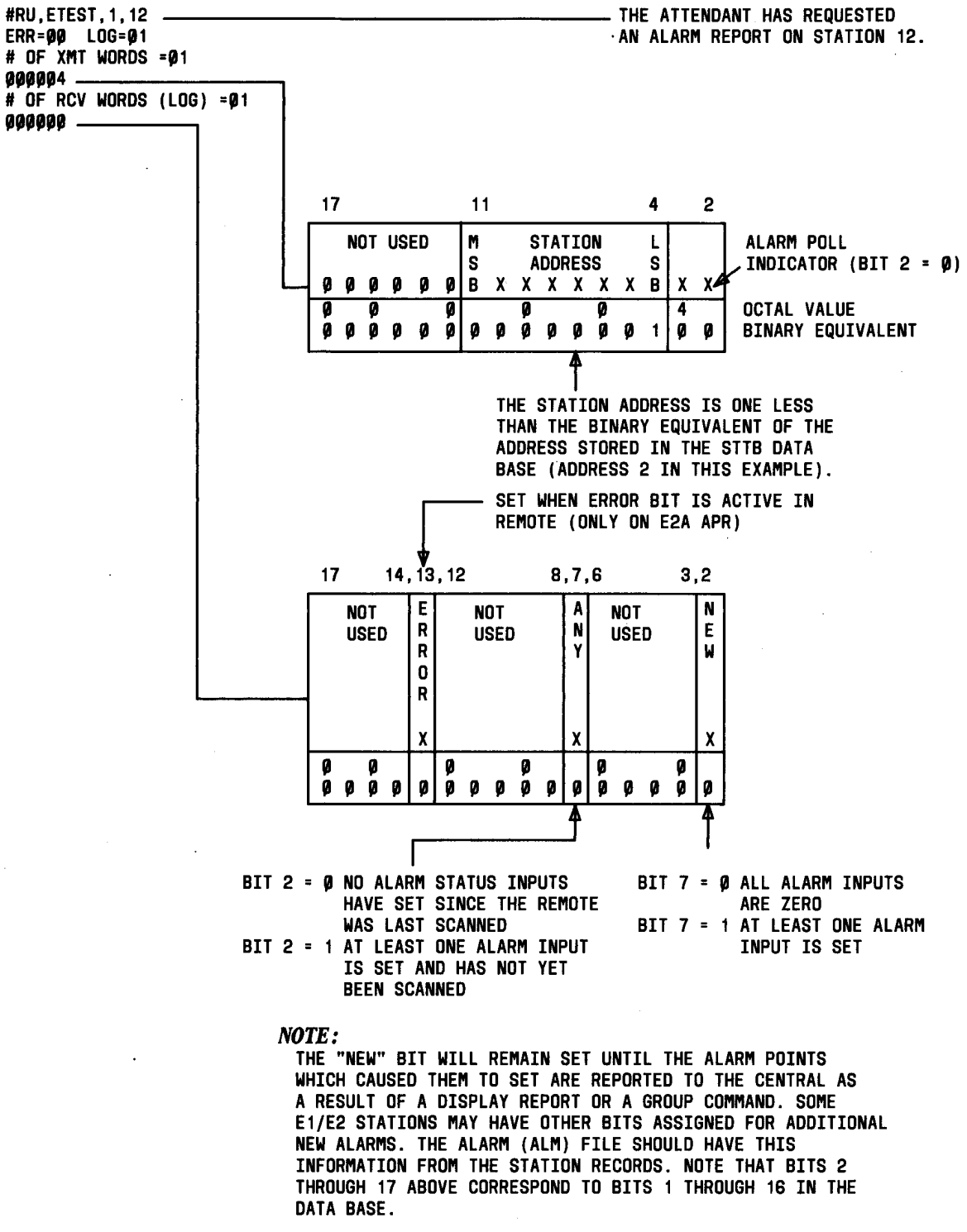
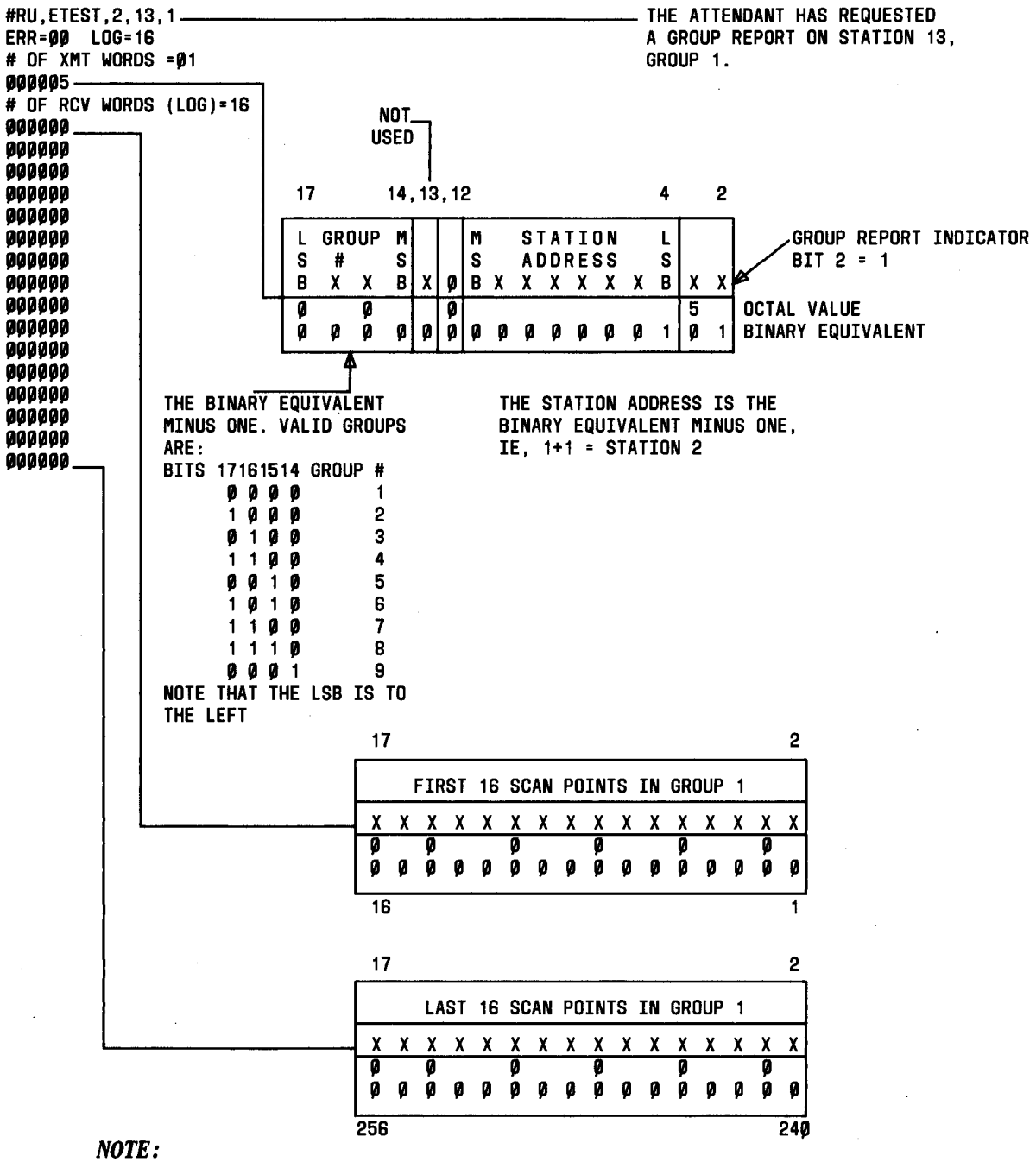


Fig. 11—Example of ETEST Switch Command (E2A SAC)



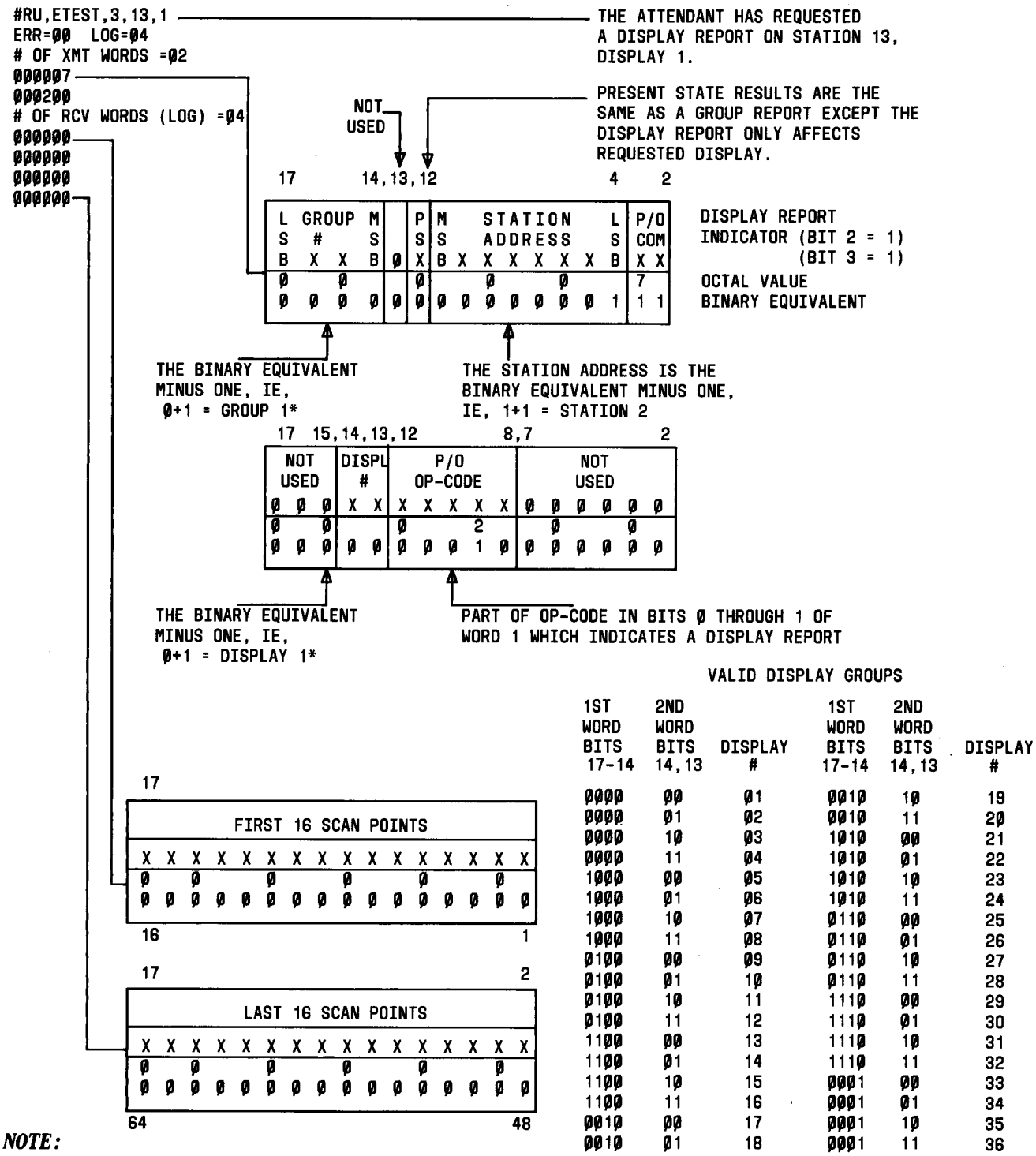
NOTE:
THE "NEW" BIT WILL REMAIN SET UNTIL THE ALARM POINTS WHICH CAUSED THEM TO SET ARE REPORTED TO THE CENTRAL AS A RESULT OF A DISPLAY REPORT OR A GROUP COMMAND. SOME E1/E2 STATIONS MAY HAVE OTHER BITS ASSIGNED FOR ADDITIONAL NEW ALARMS. THE ALARM (ALM) FILE SHOULD HAVE THIS INFORMATION FROM THE STATION RECORDS. NOTE THAT BITS 2 THROUGH 17 ABOVE CORRESPOND TO BITS 1 THROUGH 16 IN THE DATA BASE.

Fig. 12—Example of ETEST Remote Alarm Report (E2, E2, E2A APR)



NOTE:
THE GROUP REPORT RESPONSE IS 16 WORDS IN LENGTH; AND FOR UNEQUIPPED SCAN POINTS, THE DATA RETURNED WILL BE Ø. STATION 13 E ADDRESS IS DECIMAL 2 IN THE STTB FILE.

Fig. 13—Example of ETEST Status Group Display (E2A APR)

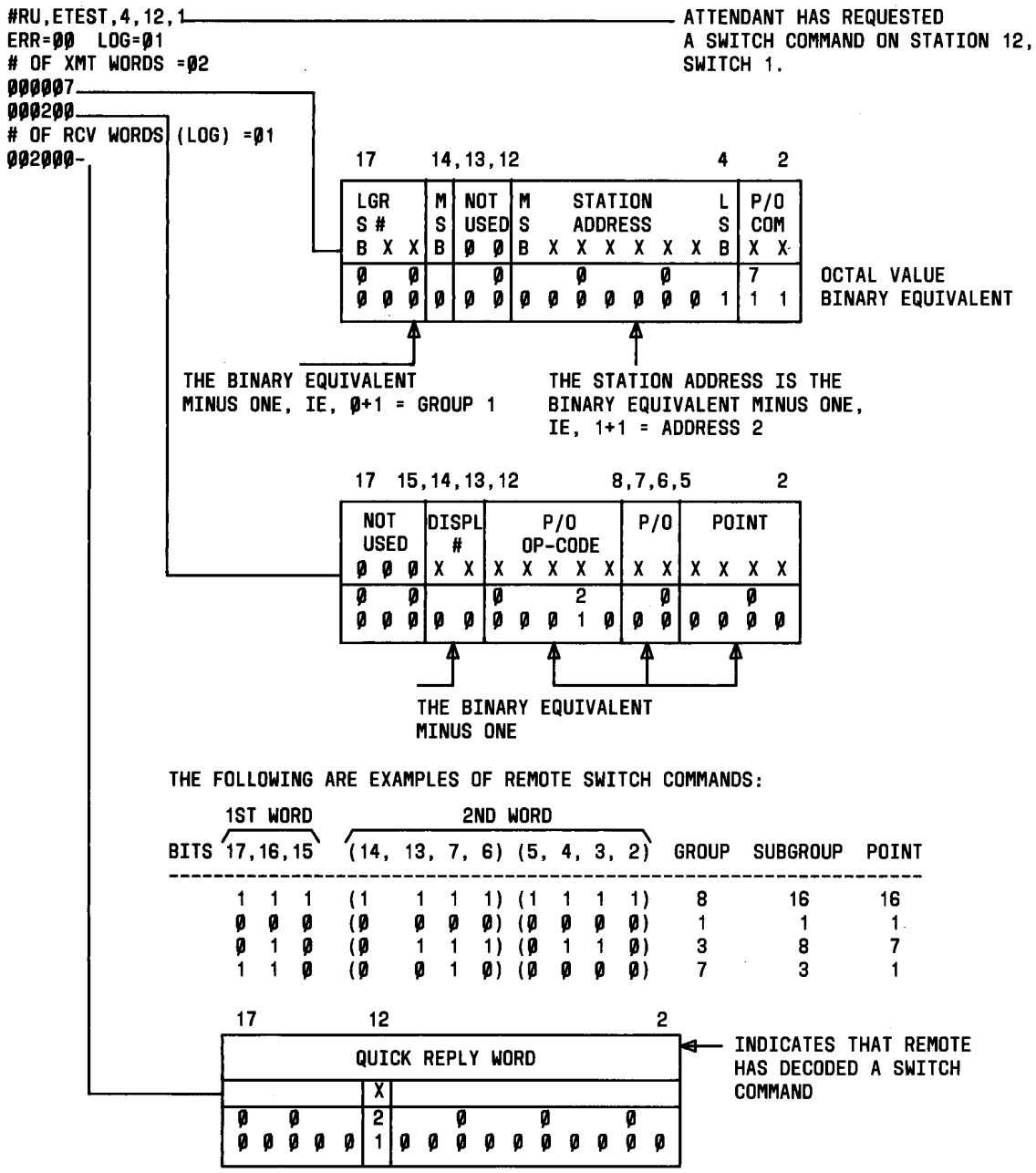


VALID DISPLAY GROUPS

1ST WORD BITS 17-14	2ND WORD BITS 14,13	DISPLAY #	1ST WORD BITS 17-14	2ND WORD BITS 14,13	DISPLAY #
ØØØØ	ØØ	Ø1	ØØ1Ø	1Ø	19
ØØØØ	Ø1	Ø2	ØØ1Ø	11	2Ø
ØØØØ	1Ø	Ø3	1Ø1Ø	ØØ	21
ØØØØ	11	Ø4	1Ø1Ø	Ø1	22
1ØØØ	ØØ	Ø5	1Ø1Ø	1Ø	23
1ØØØ	Ø1	Ø6	1Ø1Ø	11	24
1ØØØ	1Ø	Ø7	Ø11Ø	ØØ	25
1ØØØ	11	Ø8	Ø11Ø	Ø1	26
Ø1ØØ	ØØ	Ø9	Ø11Ø	1Ø	27
Ø1ØØ	Ø1	1Ø	Ø11Ø	11	28
Ø1ØØ	1Ø	11	111Ø	ØØ	29
Ø1ØØ	11	12	111Ø	Ø1	30
11ØØ	ØØ	13	111Ø	1Ø	31
11ØØ	Ø1	14	111Ø	11	32
11ØØ	1Ø	15	ØØØ1	ØØ	33
11ØØ	11	16	ØØØ1	Ø1	34
ØØ1Ø	ØØ	17	ØØØ1	1Ø	35
ØØ1Ø	Ø1	18	ØØØ1	11	36

NOTE:
DISPLAY REPSPONSE IS FOUR WORDS IN LENGTH AND WILL RETURN Øs FOR UNEQUIPPED SCAN POINTS.
STATION 13 E ADDRESS IS DECIMAL 2 IN THE STTB FILE.
* NOTE THAT THE LSB IS TO THE LEFT

Fig. 14—Example of ETEST Status Display Report (E2, E2A APR)



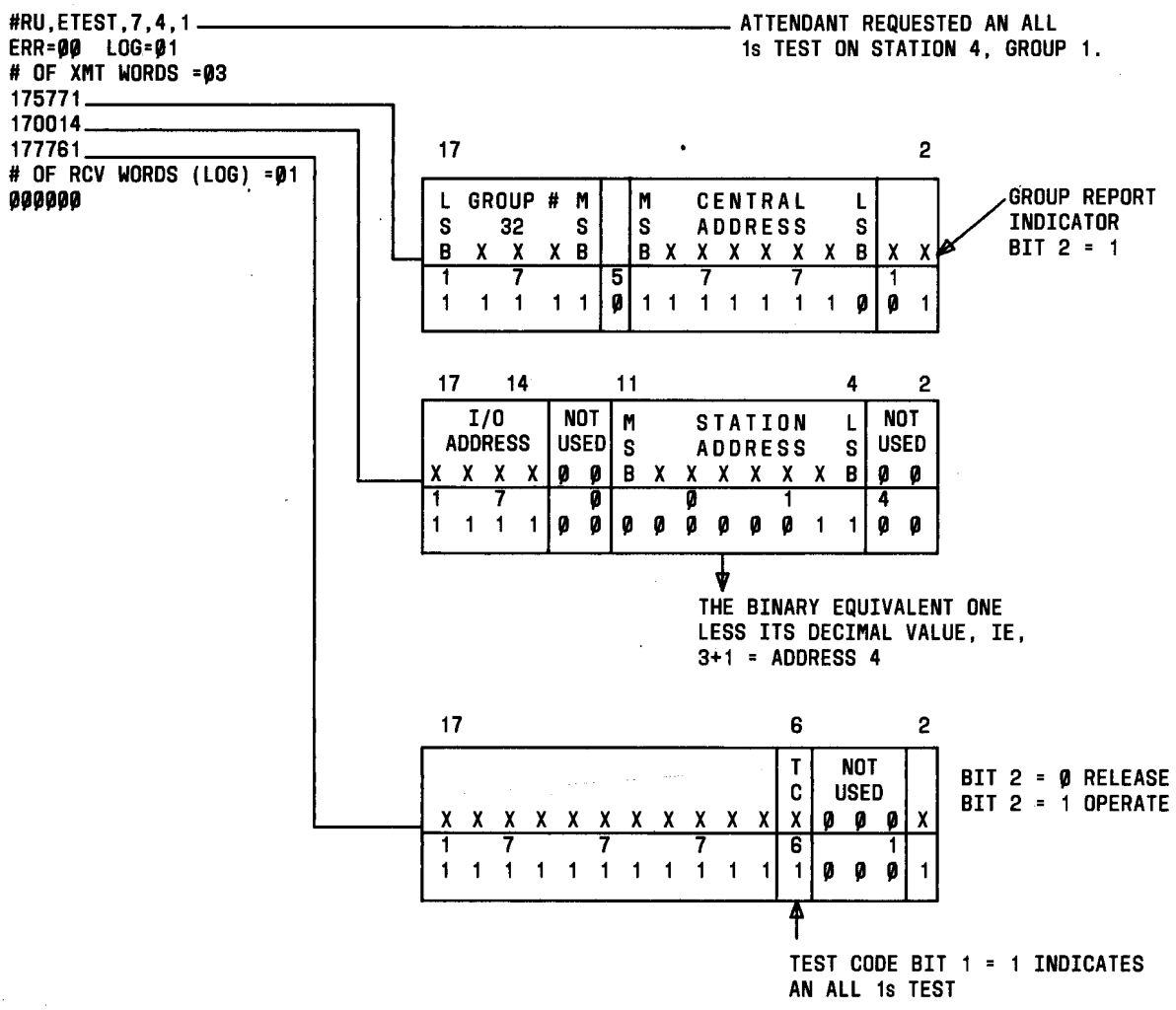
THE FOLLOWING ARE EXAMPLES OF REMOTE SWITCH COMMANDS:

BITS	1ST WORD 17,16,15	2ND WORD (14, 13, 7, 6)	2ND WORD (5, 4, 3, 2)	GROUP	SUBGROUP	POINT
	1 1 1	(1 1 1 1)	(1 1 1 1)	8	16	16
	Ø Ø Ø	(Ø Ø Ø Ø)	(Ø Ø Ø Ø)	1	1	1
	Ø 1 Ø	(Ø 1 1 1)	(Ø 1 1 Ø)	3	8	7
	1 1 Ø	(Ø Ø 1 Ø)	(Ø Ø Ø Ø)	7	3	1

NOTE:

THE RELAY COMMAND WILL OPERATE A SWITCH FOR 3ØØ MS. IT IS DETERMINED BY THE GROUP NUMBER, SUBGROUP NUMBER, AND THE POINT AS SHOWN IN THE ABOVE EXAMPLE. EACH FIELD IS CODED IN THE BINARY MINUS ONE LOGIC AND CAN MAKE UP TO 4Ø96 POSSIBLE SWITCHES. IT SHOULD BE NOTED THAT IF NONEXISTENT SWITCHES ARE ADDRESSED, NO CHECK WILL BE MADE AND THE RESPONSE WILL BE THE SAME AS THAT OF AN EXISTING SWITCH. STATION 12 E ADDRESS IS DECIMAL 2 IN THE STTB FILE.

Fig. 15—Example of ETEST Switch Command (E1, E2, E2A APR)




```
#RU,ETEST,2,4,1 ———— ATTENDANT REQUESTED A STATUS
ERR=ØØ  LOG=Ø8       GROUP REPORT ON STATION 4,
# OF XMT WORDS =Ø1    GROUP 1.
ØØØØ15
# OF RCV WORDS (LOG)=Ø8
177777 ———— DECODING IS THE SAME AS EXAMPLE 1 EXCEPT
177777      THAT ALL EQUIPPED SUBGROUPS ARE SHOWN AS
177777      ALL 1s.
177777
177777
177777
177777
177777
```

Fig. 16—Example of Status Command Test (E2A)

8. REFERENCES

SECTION	TITLE
190-210-300	Telecommunications Alarm Surveillance and Control System (TASC)—Central Terminal Operations—Generic 1
190-210-310	Telecommunications Alarm Surveillance and Control System (TASC)—Central Terminal Operations—Generic 2
865-100-100	E-Telemetry Systems—EIMS
865-100-101	E-Telemetry Systems—Data Network Engineering

CHART 1

PROCEDURE TO TRANSFER FROM ACTIVE SYSTEM TO HOT-STANDBY SYSTEM —GENERIC 1

The following procedure transfers operation from a TASC computer and disc to a hot-standby computer and disc.

APPARATUS:

None

STEP	PROCEDURE
	Note: The fixed platter of the hot-standby disc should contain the latest TASC System, data base, and file manager. Allow it to spin up as you continue with the following tests:
1	Remove the log platter from the TASC System disc drive and insert it into the hot-standby disc drive.
2	If the TASC computer and disc drive are to be taken out of service, the master power switch on the front or rear of the bay should be set to the OFF position.
3	If the TASC computer and disc drive are to remain in service after the transfer, the system master power switch on the front or rear of the HP cabinet should be left ON. This will also insure that the hot-standby disc drive remains on-line during the transfer. The computer and I/O extenders should be powered down per Steps 4 and 5.
4	Remove power from the computer by inserting the key into the computer. (a) On an HP 2112A computer, rotate the key to the standby position and turn off the white power switch and the black battery switch (both switches located on the rear of the HP 2112A computer). (b) On an HP 2112B or HP 2113B computer, rotate the key to open the front panel and shut off the white power switch.
5	Remove line power from the I/O extender(s). (a) For type A extender, power switch is located at right rear of the unit. (b) For type B extender, remove the front panel and turn off the white power switch at the left front.
6	Unplug and remove the battery packs on the TASC and standby computers.

CHART 1 (Contd)

STEP	PROCEDURE
7	Unplug the I/O extender cables on the I/O buffer cards located in equipment slots 24 and 25 of the TASC computer. Be sure to mark these cables with the slot numbers from which they are removed.
8	Unplug the I/O extender power control input cable from the TASC computer.
9	Unplug the I/O extender ribbon cable from the TASC computer (note the red tracer on the left side of the ribbon).
10	Fish the cables, removed in Steps 7, 8, and 9, out through the hole in the rear of the TASC computer cabinet and back through the hole in the rear of the I/O extender cabinet.
11	Fish the cables out through a hole on the opposite side of the rear of the I/O extender cabinet and back through the nearest hole in the hot-standby computer cabinet.
12	Plug the ribbon cable into the bottom rear of the hot-standby computer. Be sure to keep the red tracer to the left.
13	Plug the power control input cable into the POWER CONT jack on the hot-standby computer.
14	Plug the I/O extender cables into the I/O extender buffer cards located in slots 24 and 25. (Be sure to place them in the proper slots as previously marked.)
15	Remove the cable from the line printer interface card (if equipped) located in equipment slot 13 of the TASC computer cabinet.
16	Connect the cable removed in Step 15 to the line printer interface card in equipment slot 13 of the standby computer.
17	If the TASC System is equipped with a processor-to-processor link such as ATA, remove the cable from the link interface card located in equipment slot 20 of the TASC computer.
18	Connect the cable removed in Step 17 to the link interface card in the standby computer.
19	Replace the battery pack on each computer and plug in the battery cables.
20	Turn on power to the I/O extender(s): (a) Located in rear of type A I/O extender (b) Located in front of type B I/O extender.

CHART 1 (Contd)

STEP	PROCEDURE
21	Turn on power to the computer(s) by inserting key. (a) For HP 2112A CPU, turn on the white power switch and black battery switch (located in rear); turn key to R or reset and then to operate (located on front panel). (b) For HP 2113B CPU, set the white power switch to ON (located behind front panel); replace panel and turn key to the LOCK position.
22	Boot up and follow established local practices to restore the TASC System operation.

CHART 2

PROCEDURE TO TRANSFER FROM ACTIVE SYSTEM TO HOT-STANDBY SYSTEM GENERIC 2—NO SWITCHABLE I/O EXTENDERS

The following procedure transfers operation from a TASC computer and disc to a hot-standby computer and disc.

APPARATUS:

None

STEP	PROCEDURE
	Note: The fixed platter of drive 0 of the hot-standby disc drives should contain the latest TASC System.
1	Remove the data base and log platters from the TASC System disc drives and insert them into the hot-standby disc drives. Allow them to spin up as you continue below.
2	If the TASC computer and disc drives are to be taken out of service, the master power switch on the front or rear of the bay should be set to the OFF position.
3	If the TASC computer and disc drives are to remain in service after the transfer, the system master power switch on the front or rear of the HP cabinet should be left ON. This will also insure that the hot-standby disc drives remain on-line during the transfer. The computer and I/O extenders should be powered down per Steps 4 and 5.
4	Remove power from the computer by inserting the key into the computer. (a) On an HP 2112A computer, rotate the key to the standby position and turn off the white power switch and the black battery switch (both switches located on the rear of the HP 2112A computer). (b) On an HP 2112B or HP 2113B computer, rotate the key to open the front panel and shut off the white power switch.
5	Remove line power from the I/O extender(s). (a) For type A extender, power switch is located at right rear of the unit. (b) For type B extender, remove the front panel and turn off the white power switch at the left front.
6	Unplug and remove the battery packs on the TASC and standby computers.

CHART 2 (Contd)

STEP	PROCEDURE
7	Unplug the I/O extender cables on the I/O buffer cards located in equipment slots 24 and 25 of the TASC computer. Be sure to mark these cables with the slot numbers from which they are removed.
8	Unplug the I/O extender power control input cable from the TASC computer.
9	Unplug the I/O extender ribbon cable from the TASC computer (note the red tracer on the left side of the ribbon).
10	Fish the cables, removed in Steps 7, 8, and 9, out through the hole in the rear of the TASC computer cabinet and back through the hole in the rear of the I/O extender cabinet.
11	Fish the cables out through a hole on the opposite side of the rear of the I/O extender cabinet and back through the nearest hole in the hot-standby computer cabinet.
12	Plug the ribbon cable into the bottom rear of the hot-standby computer. Be sure to keep the red tracer to the left.
13	Plug the power control input cable into the POWER CONT jack on the hot-standby computer.
14	Plug the I/O extender cables into the I/O extender buffer cards located in slots 24 and 25. (Be sure to place them in the proper slots as previously marked.)
15	Remove the cable from the line printer interface card (if equipped) located in equipment slot 15 of the TASC computer cabinet.
16	Connect the cable removed in Step 15 to the line printer interface card in equipment slot 15 of the standby computer.
17	If the TASC System is equipped with a processor-to-processor link in equipment slots 21 or 22, remove the cables from the link interface cards located in equipment slot 21 and/or 22 of the TASC computer.
18	Connect the cable removed in Step 17 to the link interface card in the standby computer.
19	If the TASC is equipped with a terminal connected directly to the processor in slot 20, remove that cable from the interface card.
20	Connect the cable removed in Step 19 to the appropriate interface card in the standby processor.
21	Replace the battery pack on each computer and plug in the battery cables.

CHART 2 (Contd)

STEP	PROCEDURE
22	Turn on power to the I/O extender(s): (a) Located in rear of type A I/O extender (b) Located in front of type B I/O extender.
23	Turn on power to the computer(s) by inserting key. (a) For HP 2112A CPU, turn on the white power switch and black battery switch (located in rear); turn key to R or reset and then to operate (located on front panel). (b) For HP 2112B or HP 2113B CPU, set the white power switch to ON (located behind front panel); replace panel and turn key to the LOCK position.
24	Boot up and follow established local practices to restore the TASC System operation.

CHART 3

PROCEDURE TO TRANSFER FROM ACTIVE SYSTEM TO HOT-STANDBY—GENERIC 2—SWITCHABLE I/O EXTENDERS

The following procedure transfers operation from a TASC, Generic 2, computer to its hot standby. The systems must be equipped with switchable I/O extenders.

APPARATUS:

None

STEP	PROCEDURE

Note: The fixed platter of disc drive Ø of the hot standby should contain the latest TASC System.

1 Remove the data base and log platters from the TASC System and insert them into the standby system. Allow them to spin up as you continue with the remainder of the procedure.

2 Although most of the switching of equipment will be accomplished through the use of the SIO function later in the procedure, there may be some equipment that will have to be rearranged because of the fact that it is connected directly to the computer main frame and not to the switchable I/O extenders. These are listed below:

High-speed printer	LU-6	Mainframe slot 15
Terminal	LU-41	Mainframe slot 20
ATA link	LU-57,58	Mainframe slot 21
ATA link	LU-59,60	Mainframe slot 22

It is possible that both (or neither) of the regular and standby systems are equipped with a high-speed printer and/or an LU-41 terminal. It is also possible that the ATA links are simply not equipped. If rearrangements are required, perform Steps 2 through 21 of Chart 1 and then continue here with Step 3. If no rearrangements are necessary, continue with Step 3.

3 After both disc drives in the standby system show DRIVE READY, reboot the system.

CHART 3 (Contd)

STEP	PROCEDURE
4	One of the questions asked by the computer at bootup time is as follows: SHOULD TERMINALS, TCT FACILITIES AND ATA LINKS CONNECTED TO THE I/O EXTENDERS BE SWITCHED TO THIS CENTRAL (Y OR N)? Obviously, the answer is Y. Then, continue bootup in the normal fashion. ***Warning:*** If the regular or standby system is on-line and the system which is not on-line is being booted up, the answer should be N. If a switch is really needed, the answer to the question can be Y.

CHART 4

TCT TEST PROCEDURE FOR ANY DATA NETWORK WITH ONE OR MORE E2A SAC REMOTES

APPARATUS:

KS-20937 E-telemetry Station Test Set

STEP	PROCEDURE

1 Stop polling remotes.

2 Disconnect cable from data set and connect the E-telemetry test set cable from test set to TCT.

3 Set test set switches to the following positions:

SWITCH	POSITION
POWER	ON
MESSAGE LENGTH WORDs	2
SYSTEM	E2A
BIT RATE	1200/600*
PARITY	B
MODE	ANSWER
DISPLAY WORD ERROR	OFF
DISPLAY WORD SELECT	3

4 On the test set, set WORDS 1 and 2 switches to the following positions:

SWITCH	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WORD 1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
WORD 2	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1

1 = switch up
Ø = switch down

*Must agree with the STTB file

CHART 4 (Contd)

STEP	PROCEDURE

5 At LU-1, enter RU,ETEST,2,*station number*,1.

Note: The *station number* is the number of any E2A SAC station assigned in the STTB file to the TCT being tested. (Refer to Part 7E of this section for an explanation of ETEST.)

6 Verify the CRT displays the following:

#RU,ETEST,2,*x*,1
ERR=ØØ LOG=Ø2
# OF XMT WORDS =Ø1
ØØØØØ5 (Varies according to station address and group number.)
OF RCV WORDS (LOG) =Ø2
Ø52525
125252

Note: The received digits indicate the TCT is capable of receiving and transferring, to the computer, the proper bits of information. If the received words are different from those displayed in the message in this step, check the TCT, TCT I/O cable, or the I/O circuit pack.

7 At LU-1, enter the following:

RU,ETEST,6,*station number*,Ø52525B

Note: The *station number* is the number of any E2A SAC station assigned in the STTB file to the TCT being tested.

8 Verify the following message is displayed on the CRT:

ERR=ØØ LOG=Ø1
# OF XMT WORDS =Ø3
175771
ØØØØØ4 (Varies according to station address and group number.)
Ø52525
OF RCV WORDS (LOG) =Ø1
Ø52525

Note: If the received words are different from those in this step, go to Step 13 of this chart.

9 Verify that the INFORMATION lamps located on the E-telemetry test set agree with the following. If the display lamps differ from this, go to Step 13.

LAMP	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
CONDITION	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0

1 = lamp lighted
Ø = lamp off

CHART 4 (Contd)

STEP	PROCEDURE

10 At LU-1, enter the following:

RU,ETEST,6,*station number*,125252B

Note: The *station number* is the number of any E2A SAC station assigned in the STTB file to the TCT being tested.

11 Verify the following is displayed on the CRT. If the received messages are different from the following, go to Step 13.

#RU,ETEST,6,*x*,125252B
ERR=ØØ LOG=Ø1
# OF XMT WORDS =Ø3
175771
ØØØØØ4 (Varies according to station address and group number.)
125252
OF RCV WORDS (LOG) = Ø1
Ø52525

12 Verify the INFORMATION lamps located on the E-telemetry test set agree with the following:

LAMP	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
CONDITION	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1

1 = lamp lighted
Ø = lamp off

13 If any errors were found in Step 8, 9, 11, or 12, check the TCT, TCT I/O cable, or the I/O interface circuit pack.

14 If more information is needed concerning the TCT, refer to Section 201-653-504 (SAC Remote and TCT Tests).

CHART 5

TCT TEST PROCEDURE FOR A DATA NETWORK WITH NO E2A SAC REMOTES

APPARATUS:

KS-20937 E-telemetry Station Test Set

STEP	PROCEDURE
1	Stop polling remotes.
2	Disconnect cable from data set and connect the E-telemetry test set cable from test set to TCT.
3	Set test set switches to the following positions:

SWITCH	POSITION
POWER	ON
MESSAGE LENGTH WORDs	1
SYSTEM	E1/E2
BIT RATE	1200/600*
PARITY	B
MODE	ANSWER
DISPLAY WORD ERROR	ON
DISPLAY WORD SELECT	1

4 On the test set, set WORD 1 switches to the following positions:

SWITCH	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WORD 1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0

* Must agree with the STTB file

CHART 5 (Contd)

STEP	PROCEDURE

5 From the E1 or E2 stations assigned to this TCT, select a station that is known to have problems communicating with the central terminal. At LU-1 enter the following:

#RU,ETEST,1,*station number*

6 Verify the CRT displays the following:

#RU,ETEST,1,*xxx*
ERR=ØØ LOG=Ø2
# OF XMT WORDS=Ø1
ØØØØØ4 (Varies according to station address and group number.)
OF RCV WORDS (LOG) = 1
Ø52525

Note: The received digits indicate the TCT is capable of receiving and transferring, to the computer, the even-numbered bits of information. If the received words are different from those displayed in the message in this step, check the TCT, TCT I/O cable, or the I/O circuit pack.

7 On the test set, change WORD 1 switches 2 through 17 to the following:

SWITCH	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WORD 1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1

8 Repeat Step 5.

9 Verify the CRT displays the following:

#RU,ETEST,1,*xxx*
ERR=ØØ LOG=Ø2
# OF XMT WORDS = Ø1
ØØØØØ4 (Varies according to station address and group number.)
OF RCV WORDS (LOG) = Ø1
125252

Note: The received digits indicate the TCT is capable of receiving and transferring, to the computer, the odd-numbered bits of information. If the received words are different from those displayed in the message in this step, check the TCT, TCT I/O cable, or the I/O circuit pack.

10 If the trouble has not yet been found, select a particular display report or group report that does not function properly. Use ETEST to execute the request.

CHART 5 (Contd)

STEP	PROCEDURE
11	Verify that the transmit word(s) generated by **ETEST** correspond exactly to the INFORMATION lamps on the test set (use Fig. 11 and 12 as an aide in relating the bit patterns).
12	If display reports are being used, verify both WORD 1 and WORD 2.
13	Verify that there is no parity error indicated on the test set.

CHART 6

TASC BOOTUP PROCEDURE FOR GENERIC 1

APPARATUS:

None

STEP	PROCEDURE
1	Verify power is applied to the following units: HP minicomputer HP CRT console HP disc drive HP I/O extender.
2	On the front panel of the disc drive unit, verify the DRIVE READY lamp is lighted.
3	On the disc drive, set the UPPER and LOWER DISC PROTECT switches to the position away from the dot or down position (unprotect).
4	On the disc drive unit, set the FORMAT switch to the position near the dot or rightmost position.
5	On the minicomputer, depress and release the HALT pushbutton.
6	On the minicomputer, select the S-register.
7	On the minicomputer, depress and release the CLEAR DISPLAY pushbutton.

CHART 6 (Contd)

STEP	PROCEDURE

8 Set the S-register to one of the following addresses:

COMPUTER MODEL	ADDRESS
2112A (See note)	41402 or 51402 octal
2112B (See note)	41402, 51402 51402, or 111402 octal
2113B	11402 octal

Note: The octal number to be used with this computer may be one of several. Consult the HP representative or the HP computer manual for the correct number to be used with your model.

9 On the minicomputer, depress and release the following pushbuttons in the order they are listed:

STORE
PRESET
IBL
RUN.

10 Verify the minicomputer halts with 102077 stored in the T-register.

11 On the minicomputer, depress and release the RUN pushbutton.

12 Verify the CRT console displays the following message:

SET TIME

13 Verify the CRT console displays SYSTEM BOOTUP plus a list of disabled I/O devices.

14 Using the console keyboard, set the system clock with the present date and time (based on a 24-hour clock). Use the following format:

CLK,*year,month,day,hour,minute*

Example: CLK,81,4,20,14,15

Note: If the TASC System requires a reboot just prior to midnight, Steps 15 through 19 should be followed. Otherwise, continue this procedure at Step 19.

15 At LU-1, transfer back to the RTE modes (*) by typing %, CR.

16 Type RU, ILOG. A message will appear showing the time and date and a REQUEST COMPLETE indicating the log disc has closed out the previous day's data.

17 Return to the TASC mode (#) by entering RU, ENABL.

CHART 6 (Contd)

18 After bootup completes, set the clock to the proper time.

19 Verify the following messages are displayed on the CRT:

SPI DATA BASE LOADER
PASS 1 COMPLETED
PASS 2 COMPLETED
PASS 3 COMPLETED
PASS 4 COMPLETED
SPI DATA BASE LOAD COMPLETED
HR/MIN DATE
CLOCK UPDATED FROM HR/MIN/SEC TO HR/MIN/SEC
HR/MIN DATE

Caution: DO NOT reboot the system at this time. Rebooting may destroy all file manager (FMGR) files. (File manager area is being packed.)

Note: Step 15 will take 5 to 25 minutes to complete. This is dependent on the amount of data base which is to be entered into the system at the time of reboot.

20 After a short period, the following message will be outputted on the console; answer accordingly.

RESTORE SYSTEM PARAMETERS (Y OR N)

Note: If this message is answered YES (Y), all A/B routing, L/H thresholding, and all SCO-BCO will be restored to their prereboot state. If answered NO (N), the system will default to all A-type routing and L-type thresholding. All SCOs-BCOs will be cleared.

21 The following message will be outputted on the console; answer accordingly.

BEGIN POLLING ALL STATIONS (Y OR N)

Note: If the answer is YES (Y), all stations formatted in the STTB file will be polled. If the answer is NO (N), all stations will not be polled.

22 Verify that the following message is displayed on the console:

DATA BASE TASC - *data base label* DATA READY

CHART 7

TASC BOOTUP PROCEDURE FOR GENERIC 2

APPARATUS:

None

STEP	PROCEDURE
1	Verify power is applied to the following units: HP minicomputer HP CRT console HP disc drive HP I/O extender.
2	Verify the fixed disc contains TASC System software and the removable disc a history cartridge.
3	Verify the DRIVE READY lamp is lighted on the front panel of the disc drive.
4	For a *dead* system, depress and release the HALT pushbutton on the minicomputer. For a *live* system, use the STO (STOP) command.
	On both disc drives:
5	Set the UPPER DISC PROTECT to unprotect or down position.
6	Set the LOWER DISC PROTECT to unprotect or down position.
7	Set the FORMAT switch to protect or software position (nondot position).
	On the minicomputer:
8	Select the S-register on the minicomputer.
9	Depress and release CLEAR DISPLAY pushbutton on minicomputer.
10	Set the S-register to one of the following addresses:

COMPUTER MODEL	ADDRESS
2112A and some 2112B	41402 or 51402 octal
Some 2112B	51402 octal
Some 2112B	111402 octal
All 2113B	111402 octal

CHART 7 (Contd)

STEP	PROCEDURE

11 Depress and release, in order, the following pushbuttons:

STORE
PRESET
IBL
RUN.

12 Verify the CRT displays SET TIME along with a list of disabled I/O devices. For example:

```
SET TIME

 :SYDN,25
 :SYDN,27
 :SYDN,28
 :SYDN,31
 :SYDN,32
 :SYDN,33
 :SYDN,34
 :SYDN,35
 :SYDN,36
 :SYDN,37
 :SYDN,38
 :SYDN,39
 :SYDN,40
 :SYDN,41
 :CN,23,30B,01466B
 :CN,23,32B
 :CN,24,30B,01471B
 :CN,24,31B,1
 :CN,26,30B,02471B
 :CN,26,31B,1
 :CN,29,30B,00471B
 :CN,29,31B,1
 :CN,30,30B,01466B
 :CN,30,32B
 :RU,SW10,-1,0,0,0,0
 :RU,SYSIN,0,0,0,0
WATCHDOG IS  ENABLED  AND UP
SYSTEM BOOT-UP
 :SV,4
 :DC,-43
FMGR 054
 :DC,-42
FMGR 054
 :MC,-44
FMGR 012
 I/O TO L30 E30 S 0
```

CHART 7 (Contd)

STEP	PROCEDURE

13 If the TASC central was down just before midnight the previous day, set the clock to 23:59 of the previous day so that the ILOG program can conclude events for yesterday under the proper date. Use the following format:

CLK,YR,MO,DAY,23,59

(Where YR MO and DAY are the previous day's year, month, and day, respectively; then go to Step 17.) See the CLK command in Section 190-210-310 for exact details.

Note: If the TASC control was not down just before midnight (23:59) the previous day, then skip this step and go to Step 16.

14 At the LU-1, transfer back to the RTE modes (*) by typing %, CR.

15 Type RU, ILOG. A message will appear showing the time and date and a REQUEST COMPLETE indicating the log disc has closed out the data for the previous day.

16 Return to the TASC mode (#) by entering RU, ENABL.

17 After the bootup completes, set the clock to the proper time.

Note: If Step 13 was used, skip this step and go to Step 18.

18 After a short period, the following message will be outputted on the console:

BEGIN POLLING ALL STATIONS (Y OR N)

If answered YES (Y), all stations formatted in the STTB file will be polled.

If answered NO (N), no stations will be polled.

19 After a short period, the following message will be outputted on the console:

RESTORE SYSTEM PARAMETERS (Y OR N)

If answered YES (Y), all timers, LU routing plans, L/H thresholding, history data and all SCOs-BCOs will be restored to their prereboot state. If answered NO (N), the system will default to the standard one-to-one LU assignments, L-type thresholding, and all SCOs-BCOs will be cleared. This results in all timers being cancelled, and all history data will be cleared. The operator may be asked to see if the backup service measurement data should be transferred to the data area on the system data base. This question should almost always be answered NO(N). The exception to this answer

CHART 7 (Contd)

STEP	PROCEDURE

would be if the data base disc (LU-44) was not the same disc used when the system was up (ie, LU-44 was damaged, physically or due to track/data errors). The backup for service measurement resides on LU-42, and it must be the disc used at the time the system was last in operation. If a mismastch occurs between the backup of service measurement or the data base (LU-42 and LU-44), valuable service measurement data can be lost or never recorded. In addition, a message will be outputted for each SCO and BCO which is being cleared.

Example:

0005 16:00 03/26/80 STA 01 DESM WTACD 515 SCO#01 REDBANK-1 CLEAR SYSTEM BOOT-UP TRANSFER ALARMS TO CENTRAL

20 Verify a message similar to the following is displayed on the CRT.

```
DO YOU WANT TO TRANSFER THE BACKUP SERVICE
MEASUREMENT DATA (ON LU-42) ONTO THE DATA
AREA?  (Y or N)

0581  13:45  05/13/80  STA  257  BOSTON

CURRENT LU PLAN:NIGHTS


NO NEW SERVICE MEASUREMENT EDITS
SERVICE MEASUREMENT DATA FILE PACK STARTED

NO PACKING REQUIRED


SERVICE MEASUREMENT DATA AREA READY

SPI DATA BASE LOADER
PASS #1 COMPLETED
PASS #2 COMPLETED
PASS #3 COMPLETED
PASS #4 COMPLETED

SPI DATA BASE LOAD COMPLETED
```

CHART 7 (Contd)

STEP	PROCEDURE

```
0584  13:46  05/13/80  STA  257  BOSTON

FILES WILL BE DESTROYED IF THE COMPUTER IS STOPPED
OR HALTED AT THIS TIME.  ALLOW BOOT-UP PROCESS TO
CONTINUE TO COMPLETION.

0586  13:47  05/13/80  STA  257  BOSTON

FMGR PACK OPERATION COMPLETED

0589  13:48  05/13/80  STA  257  BOSTON

SYSTEM BOOTUP COMPLETED
```

Note 1: Step 17 will take from 5 to 25 minutes to complete. This is dependent on the amount of data base which is to be entered into the system at the time of reboot.

Note 2: Diagnostic messages could be outputted during this time. See Table M for an explanation of these messages.

21 Verify the following messages are displayed on the console:

DATA BASE TASC—(DATA BASE LABEL)

READY

22 Verify the system clock indicates the correct time and date. If not, set the system clock with the present date and time (based on a 24-hour clock) using the following format:

CLK,YEAR,MONTH,DAY,HOUR,MINUTES

Example: CLK,80,3,26,15,55

Note: This step is only necessary if the system clock was set using the format in Step 13.

Using the MCO, OCC, and BEG commands, assign/delete appropriate indicators to or from the system status summary displays.

TABLE M

DIAGNOSTIC MESSAGES ASSOCIATED WITH BOOTUP (NOTE)

1. **STATION NOT FORMATTED** — SDRs for this station have been formatted, but no SPI data base exist. All formatted SDRs without SPI data base will be defaulted to all A-type processing.
2. **GROUP NOT FORMATTED** — No SPI data base exists for the outputted group number. All SDRs assigned to that group will be defaulted to A-type processing.
3. **GROUP FORMATTED NOT POLLED** — Outputted group number has SPI data base formatted, but group does not exist in the ALM file.
4. **STATION FORMATTED NOT POLLED** — Outputted station is not in the STTB file, or not a status polled station, or there are no groups formatted in the ALM file.
5. **SDR NOT FORMATTED** — A high-order SDR was not formatted; eg, SDRs 1, 2, and 4 are formatted or 1 and 4 are formatted.
6. **CORRUPT FILE LOAD ABORTED** — Data base corrupted, backup to known good data base, then reboot.
7. **RECIPE/RECIPE CONFLICT** — Satellite assigned to a HUB, but SPI, does not show SAT processing.
8. **STTB/RECIPE CONFLICT** — Satellite formatted in SPI, but STTB does not indicate that it is a SAT station.
9. **SPI/DIR OVERFLOW, LOAD ABORTED** — SPI exceeded capacity. Backup to known good data base.
10. **SDR OTHER THAN #1 FORMATTED FOR A SATELLITE** —SDR #1 and only #1 can be formatted for satellite stations.
11. **MORE THAN ONE SDR FORMATTED FOR SATELLITE** – Only one SDR can be formatted per satellite.
12. **SDR NOT FORMATTED TO SAT** — No HUB SPI file formatted but SAT processing is linked to the SDR. Check the STTB file.

Note: These messages normally are outputted on LU-1; but if a hard copy is required, it may be obtained by setting the clock from any qualified terminal that is equipped with a printer after the message system bootup appears on that terminal.

CHART 8

PROCEDURE TO TURN DOWN OR TURN UP A TERMINAL

APPARATUS:

None

STEP	PROCEDURE

Turndown Procedure

- Using the console keyboard, enter

#DN,*equipment number*

to set I/O device down.

Turnup Procedure

- Using the console keyboard, enter

#UP,*equipment number*

to make I/O device controller available.

Obtain TASC Prompt

- Using the console keyboard, enter

*RU,ENABL,LU NUMBER

Note: This command is used to go from the RTE mode (*) to the TASC mode (#).

CHART 9

PROCEDURE FOR CONDITIONING A DISC TO SPARE DEFECTIVE TRACK(S)—GENERIC 1

APPARATUS:

Fast-copy Tape (ED-1P412-40, G1)

STEP	PROCEDURE
1	Depress the HALT pushbutton located on the HP minicomputer.
2	Insert the disc to be conditioned into the disc drive.
3	Insert the fast-copy tape (ED-1P412-40, G1) into the tape reader.
4	On the disc drive unit, perform the following functions: (a) Set the UPPER DISC PROTECT switch to the dot (protect) or up position. (b) Set the LOWER DISC PROTECT switch to the dot (protect) or up position. (c) Set the FORMAT switch to the dot (unprotect) or rightmost position.
5	On the minicomputer, store ØØ12ØØ octal in the S-register.
6	Depress in order the PRESET, IBL, and RUN pushbuttons.
7	Verify a HALT at 1Ø2Ø77 octal in the T-register. ***Note:*** If an error occurred in this step, consult Table N for a description of the condition.
8	Store ØØ2ØØØ octal in the P-register.
9	Store 1ØØØØ1 octal in the S-register.
10	Depress and release the PRESET and RUN pushbuttons.
11	Verify a HALT at 1Ø2ØØ1 octal in the T-register. ***Note:*** If an error occurred in this step, consult Table N for a description of the condition.
12	Store 1ØØØØ1 octal in the S-register.
13	Depress and release the PRESET and RUN pushbuttons.
14	Verify a HALT a 1Ø2Ø44 octal in the T-register. ***Note:*** If an error occurred in this step, consult Table N for a description of the condition.

CHART 9 (Contd)

STEP	PROCEDURE
15	On the disc drive, set the UPPER DISC PROTECT switch to the nondot (unprotect) or down position, then depress and release the RUN pushbutton..
16	Verify a HALT at 1Ø2Ø7Ø octal in the T-register after approximately 1 minute. ***Conditioning is complete.***
	Note: If an error occurred in this step, consult Table N for a description of the condition.
17	If another disc is to be conditioned, insert disc and go to Step 9.
18	Depress the RUN pushbutton.

TABLE N

ERROR CONDITIONS (NOTE)

The following halt conditions can occur with the following meanings:

HALT ØlB – INPUT "FROM" PLATTER AND PUSH RUN
HALT 22B – DISC ERROR, PUSH RUN FOR TEN MORE TRIES
HALT 32B – FORMAT SWITCH NOT IN FORMAT - FIX & PUSH RUN
HALT 33B – DISC NOT READY - FIX AND PUSH RUN
HALT 34B – DATA PROTECT SET ON "TO" DISC - IRRECOVERABLE
HALT 40B – NO MORE SPARE TRACKS AVAILABLE ON "TO" DISC - IRRECOVERABLE
HALT 41B – UNDEFINED ERROR CODE – HARDWARE PROBLEM
HALT 42B – UNIMPLEMENTED DISC ERROR - SHOULD NEVER OCCUR - HARD
HALT 44B – CLEAR DRIVE PROTECT SWITCH ON "TO" SUBCHANNEL - PUSH RUN
HALT 55B – WRONG STARTING ADDRESS (DO YOU HAVE THE RIGHT COPY?)
HALT 66B – DRIVE PROTECT NOT SET ON "TO" DISC-FIX AND PUSH RUN
HALT 70B – DATA PROTECT SWITCH NOT SET ON "FROM" DISC - FIX & PUSH RUN
HALT 73B – SETUP PLATTER GREATER THAN 5, "TO" & "FROM" PLATTERS THE SAME OR ON SAME REMOVABLE PACK - IRRECOVERABLE
HALT 77B – COPY COMPLETE

Note: HALT ØlB appears as $1Ø2ØØ1_8$ on the minicomputer display register. Likewise, all the halt codes in this table are prefixed by 1Ø2Ø.

CHART 10

PROCEDURE FOR CONDITIONING A DISC TO SPARE DEFECTIVE TRACK(S)—GENERIC 2

APPARATUS:

Fast-copy Tape (ED-1P414-30, G1)

STEP	PROCEDURE
1	Depress the HALT pushbutton located on the HP minicomputer.
2	Insert the disc to be conditioned into disc drive 1 (the log disc position).
3	Insert the fast-copy tape (ED-1P414-30, G1) into the tape reader.
4	On the minicomputer, store ØØ12ØØ octal in the S-register.
5	Depress in order the PRESET, IBL, and RUN pushbuttons.
6	Verify a HALT at 1Ø2Ø77 octal in the T-register. ***Note:*** If an error occurred in this step, consult Table N for a description of the condition.
7	On both disc drive units, perform the following functions: (a) Set the UPPER DISC PROTECT switch to the dot (protect) or up position. (b) Set the LOWER DISC PROTECT switch to the dot (protect) or up position. (c) Set the FORMAT switch to the dot (unprotect) or rightmost position.
8	Store ØØ2ØØØ octal in the P-register.
9	Store ØØØØØ3 octal in the S-register.
10	Depress and release the PRESET and RUN pushbuttons.
11	Verify a HALT at 1Ø2ØØ1 octal in the T-register. ***Note:*** If an error occurred in this step, consult Table N for a description of the condition.
12	Store ØØØØØ1 octal in the S-register.
13	Depress and release the PRESET and RUN pushbuttons.

CHART 10 (Contd)

STEP	PROCEDURE
14	Verify a HALT at 1Ø2Ø44 octal in the T-register.
	Note: If an error occurred in this step, consult Table N for a description of the condition.
15	***Caution: Read this step completely and understand what is required.***
	(a) Press RUN.
	(b) Restore all four DISC PROTECT switches to the nondot position (unprotected).
16	The conditioning will be complete in approximately 30 seconds. The computer will then halt with 1Ø2Ø7Ø in the T-register.
17	If another disc is to be conditioned, repeat process starting at Step 7.

CHART 11

PROCEDURE TO RELOAD AND READY TASC SOFTWARE—GENERIC 1

APPARATUS:

Fast-copy Tape (ED-1P412-40, G1) TASC System Software Disc Cartridge

STEP	PROCEDURE
1	Verify appropriate power is applied to the following units: HP minicomputer HP disc drive HP tape reader HP CRT console.
2	On the minicomputer, depress and release the HALT pushbutton.
3	Insert the TASC System software disc cartridge into the disc drive (log disc position).
4	Insert the fast-copy tape (ED-1P412-40, G1) into the tape reader.
5	On the disc drive, set both the UPPER and LOWER DISC PROTECT switches to protect or up positions.
6	On the minicomputer, store ØØ12ØØ octal in the S-register.
7	Depress and release, in order, the following pushbuttons: PRESET IBL RUN.
8	Verify the minicomputer halts with 1Ø2Ø77 octal in the P-register.
9	Store ØØ2ØØØ octal in the P-register.
10	Store ØØØØØØ octal in the S-register.
11	Depress and release the PRESET and RUN pushbuttons, in that order.
12	Verify the minicomputer halts with 1Ø2ØØ1 octal in the T-register. ***Note:*** If an error occurred in this step, consult Table N for a description of the condition.
13	Store ØØØØØ1 octal in the S-register.

CHART 11 (Contd)

STEP	PROCEDURE
14	Depress and release the RUN pushbutton.
15	Verify the minicomputer halts with 1Ø2Ø44 octal in the T-register.
	Note: If an error occurred in this step, consult Table N for a description of the condition.
16	On the disc drive, set the lower (fixed disc) DISC PROTECT switch to unprotect or down position.
17	On the minicomputer, depress and release the RUN pushbutton.
18	Verify the minicomputer halts with 1Ø2Ø77 octal in the T-register.
	Note: If an error occurred in this step, consult Table N for a description of the condition.
19	On the disc drive, set the UPPER DISC PROTECT switches to unprotect or down position.
20	Remove the TASC System software cartridge and insert an appropriate history cartridge.
21	Boot up the TASC System.

CHART 12

PROCEDURE TO RELOAD AND READY TASC SOFTWARE—GENERIC 2

APPARATUS:

Fast-copy Tape (ED-1P414-30, G1) TASC System Software Disc Cartridge

STEP	PROCEDURE
1	Verify appropriate power is applied to the following units: HP minicomputer HP disc drive HP tape reader HP CRT console.
2	On the minicomputer, depress and release the HALT pushbutton.
3	Insert the TASC System software disc cartridge into disc drive 1.
4	Insert the fast-copy tape (ED-1P414-30, G1) into the tape reader.
5	On both disc drives, set both UPPER and LOWER DISC PROTECT switches to protect or up positions and set the FORMAT switch to the dot position.
6	On the minicomputer, store ØØ12ØØ octal in the S-register.
7	Depress and release, in order, the following pushbuttons: PRESET IBL RUN.
8	Verify the minicomputer halts with 1Ø2Ø77 octal in the P-register.
9	Store ØØ2ØØØ octal in the P-register.
10	Store ØØØØØØ octal in the S-register.
11	Depress and release the PRESET and RUN pushbuttons, in that order.
12	Verify the minicomputer halts with 1Ø2ØØ1 octal in the T-register. ***Note:*** If an error occurred in this step, consult Table N for a description of the condition.
13	Store ØØØØØ3 octal in the S-register.

CHART 12 (Contd)

STEP	PROCEDURE
14	Depress and release the RUN pushbutton.
15	Verify the minicomputer halts with 1Ø2Ø44 octal in the T-register.
	Note: If an error occurred in this step, consult Table N for a description of the condition.
16	On disc drive Ø, set the lower (fixed disc) DISC PROTECT switch to unprotect or down position.
17	On the minicomputer, depress and release the RUN pushbutton.
18	After approximately 2 minutes, verify that the minicomputer halts with 1Ø2Ø77 octal in the T-register.
	Note: If an error occurred in this step, consult Table N for a description of the condition.
19	On both disc drives, set the UPPER and LOWER DISC PROTECT switches to unprotect or down position.
20	Remove the TASC System software cartridge and insert an appropriate history cartridge.
21	Boot up the TASC System.

CHART 13

PROCEDURE TO CHANGE TO A HOT-STANDBY TCT FROM A DEFECTIVE ONE

APPARATUS:

Spare TCT from Hot-Standby System

STEP	PROCEDURE
1	Cease polling of all remotes on the defective TCT.
2	Set key-operated switch on the computer to the STANDBY position (power is removed from the I/O bus).
3	Remove both cables from the rear of the defective TCT and connect them to the rear of the hot-standby TCT.
4	Set the key-operated switch on the computer to the OPERATE position.
5	Set clock to proper time via the CLK command.
6	Resume polling stations on the TCT.

CHART 14

PROCEDURE FOR CLEANING THE HP 7905 DISC DRIVE AIR FILTER

APPARATUS:

Vacuum Cleaner

STEP	PROCEDURE
1	Remove power from the disc drive.
2	Open disc drive air inlet screen by pushing in on its bottom edge.
3	Remove air filter from air inlet screen.
4	Vacuum both sides of the filter to remove dust particles. If a vacuum is not available, wash filter in warm water. ***Warning: Perform all cleaning on the filter in an area isolated from the disc drive in order to prevent dust particles from entering drive mechanism. If water is used, make sure filter is completely dry before reinstalling.***
5	Reinstall the filter in air inlet screen and close the air inlet screen.
6	Restore power to the disc drive.

CHART 15

PROCEDURE FOR CLEANING THE HP 7906 DISC DRIVE AIR FILTER

APPARATUS:

None

STEP	PROCEDURE
1	Remove power from the disc drive.
2	Remove the prefilter grill assembly (if applicable).
3	Pull filter element out of the prefilter duct and check filter for contamination.
4	Replace filter element if necessary. When replacing, be sure airflow arrows are pointing up.
5	Put the prefilter grill assembly back in place.
6	Restore power to the disc drive.

CHART 16

PROCEDURE FOR CLEANING TAPE READER

APPARATUS:

Soft-bristle brush or dry, clean cloth

STEP	PROCEDURE
	Using the brush or cloth and using Fig. 8 as a guide, perform the following functions:
1	Clean area around read head.
2	Clean glass slide.
3	Clean light holes.
4	Clean pinch roller.
5	Clean drive capstan.
6	Clean wire foot.

CHART 17

HEWLETT-PACKARD CRT SELF-TEST

This self-test is a method by which the CRT performs a diagnostic test of a major portion of its internal circuitry. Two types of tests are possible. One test checks the CRT excluding the two tape transports, and the other test checks the entire station including the tape transports. Both checks are covered in this step procedure.

APPARATUS:

Two Tape Cartridges (blank or with unusable data)

STEP	PROCEDURE
	Self-Test CRT Excluding Tape Transports
1	Execute test by depressing TAPE TEST key.
2	Verify that the following action occurs: Keyboard indicators—blink Audible indicator—beeps Various screen patterns—displayed.
3	Verify that legible characters are displayed in the patterns. If the message is ROM TEST FAIL or RAM TEST FAIL, there is a malfunction. ***Note:*** The test pattern cannot be recorded via the tape transport.
4	Depress the RESET TERMINAL to resume operation if an error occurred. ***Note:*** The station operation will not be reliable if the self-test fails.
	Self-Test CRT Including Tape Transport ***Caution: The following self-test will write on the tape cartridges in the two tape transports. Insert cartridges which do not have data to be preserved.***
5	Insert a tape cartridge into the left tape transport and one into the right tape transport of the CRT unit.

CHART 17 (Contd)

STEP	PROCEDURE
6	Depress the gold key and then the TAPE TEST key. The test generated in Steps 1 through 4 is performed and data is written and read on the tape cartridges. If a malfunction is detected, the eject button will light on the defective transport and the test will terminate with one of the following messages being displayed: NO TAPE RUNOFF PROTECTED READ FAIL
7	If a malfunction occurred, the reliability of the CRT cannot be assured. Depress the RESET TERMINAL button to exit from test.
8	Replace the indicated failed tape cartridge and rerun the test to determine if the tape cartridge was faulty or if indeed the CRT has failed.

CHART 18

VERIFICATION OF DATASPEED 40 CONSOLE ONLY, OR CONSOLE AND OPTIONAL PRINTER

APPARATUS:

None

STEP	PROCEDURE
1	On the DATASPEED 40 console, set the POWER switch to ON (switch is located under left corner of display screen).
2	On the DATASPEED 40 console, set the MONITOR switch to ON (switch is located under left corner of display screen).
3	Momentarily depress the LOCAL key on the keyboard and verify that the indicator on the key lights.
4	Allow 1 minute for warmup, and then adjust the BRIGHTNESS control until the scan lines which cover the screen just disappear (control is located just under the right corner of the display screen).
5	Type several lines of characters using the keyboard and verify that the characters are displayed properly on the screen (depress the NEW LINE key before entering each new line).
	The following steps apply only if a DATASPEED 40 printer is connected with the CRT.
6	On the DATASPEED 40 printer, set the POWER switch to ON (switch is located at left rear corner of printer).
7	Type several lines of characters using the console keyboard.
8	Terminate the test by depressing and holding the CNTL key and then at the same time depressing C key.
9	Release both keys and momentarily depress the HOME key.
10	Momentarily depress the PRINT LOCAL key (key is located on upper part of keyboard).
11	Verify that the printer prints the text which was displayed on the screen.
12	When printing, the SEND key will be lighted. When printing is completed, the LOCAL key will light (repeat Step 10, if necessary, for verification).

CHART 19

VERIFICATION OF DATASPEED 40 PRINTER ONLY

APPARATUS:

None

STEP	PROCEDURE
1	Open the top cover of the DATASPEED 40 printer by depressing inward on the latch release buttons (located on top of the cover).
2	Set the following switches to the positions indicated:

SWITCH	POSITION
FORMS	ON
LF	1
OFF	TEST

3	Close the cover by lifting it and pushing the center of the latch.
4	Insure that there is paper in the printer.
5	Set both printer and pedestal POWER switch to ON (one switch is located at the left rear of the printer and the other is on the front under the pedestal top).
6	Momentarily depress the IN SERVICE button and verify that the lamp on the button lights.
7	Momentarily depress the PAPER button and verify that the paper advances.
8	Momentarily depress the FORM ADVANCE button and verify that the printer advances the paper to a new page.
9	Open the top cover again and set the TEST switch to the ON position.
10	Close the cover and verify that the printer begins printing.
11	When printing has stopped, verify that the printed characters are clear and legible.
12	Open the top cover and set the TEST switch to OFF.

CHART 20

PROCEDURE FOR ISOLATING TROUBLE CONDITIONS ON TERMINALS

APPARATUS:

None

STEP	PROCEDURE
1	Place the terminal in local mode (release remote key on HP terminal).
2	Type some printable characters on the terminal keyboard.
3	Check the printed characters to ensure that they are correctly displayed on the CRT terminal and printer, if one is used. ***Note:*** If terminal does not respond correctly, the terminal is malfunctioning or it is not optioned properly.
4	If terminal is responding properly, place the terminal in S/R or REMOTE mode.
5	Operate the AL (analog loopback) test key on the data set connected to the terminal.
6	Type some printable characters on the terminal keyboard.
7	If the terminal CRT does not show a correct response, perform a maintenance check on the following: (a) The terminal interface with data set (b) The cable between terminal and data set (c) The data set associated with the terminal.
8	If terminal is operating properly, release the AL test key on the near-end data set.
9	Request the RL (202T data set) or DL (212A data set) test key at the data set connected to the central be operated.
10	Type some printable characters on the terminal keyboard.

CHART 20 (Contd)

STEP	PROCEDURE
11	If the CRT terminal does not show a correct response, do a maintenance check on the following: (a) The data facility between the data sets (b) The data set connected to the central.
12	If the CRT terminal shows a proper response, do a maintenance check on the following: (a) The cable between the central data set and the computer I/O card. (b) Check the I/O card and its options. (c) Check that the TASC software is enabling the I/O port. ***Note:*** This test procedure requires that optioning, correct equipment, and connections be checked before assuming the hardware is defective.