# E3 ALARM SYSTEM
# E3 CENTRAL (J1P030A)
# OPERATION

CONTENTS





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## 1. GENERAL

**1.01** This section describes the operating procedures for the central used with the E3 Alarm System. The E3 Alarm System provides small-scale centralization of alarm-monitoring activities associated with electromechanical switching systems, transmission systems, building and power equipment, and other associated equipment.

**1.02** This section is reissued to include operating procedures for slave centrals and master centrals. Since this reissue is a general revision, arrows ordinarily used to indicate changes have been omitted.

**1.03** The E3 central can perform one of three roles. It may be used in a stand-alone E3 Alarm System (a single central and its associated remote network). It may also be used in a master-slave configured E3 Alarm System (multiple centrals, each with an associated remote network, with the master central controlling the slave centrals). The only difference in the centrals is the microprocessor program wih which they are equipped. (Refer to Section 201-647-100 for more detail on E3 Alarm System configurations.)

**1.04** The central consists of a display panel, keyboard, and printer. The information provided on the display panel (Fig. 1) is in the form of numerals and English headings which are lit by light-emitting diodes (LEDs). It provides a summary of the addresses and statuses of a maximum of 64 remote offices (256 master centrals), selected functions, states of scan points for a selected remote, and indicates the remote, display, and control selected. The keyboard (Fig. 2) permits the central operator to interrogate the system, to establish various system displays, to operate or release control points, to release audible alarms, to clear remote fail conditions, and to remove alarms from the new alarm category. The printer automatically provides a hard copy log of alarm summary and system status.

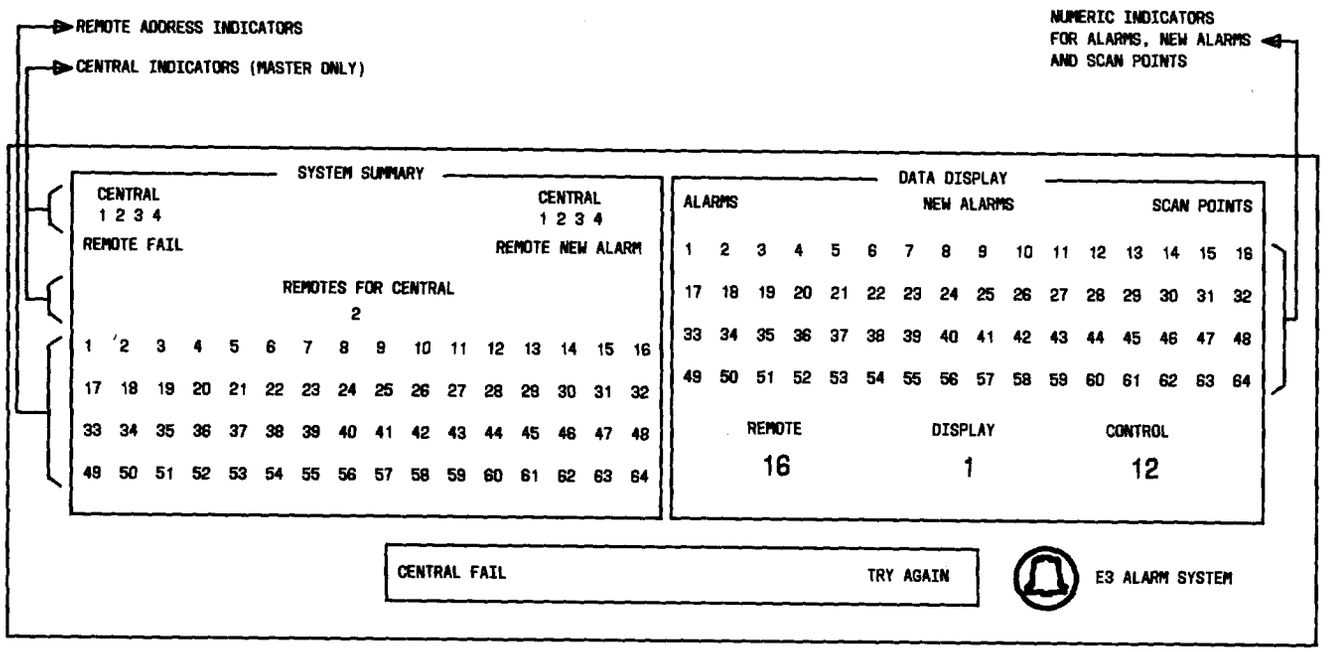
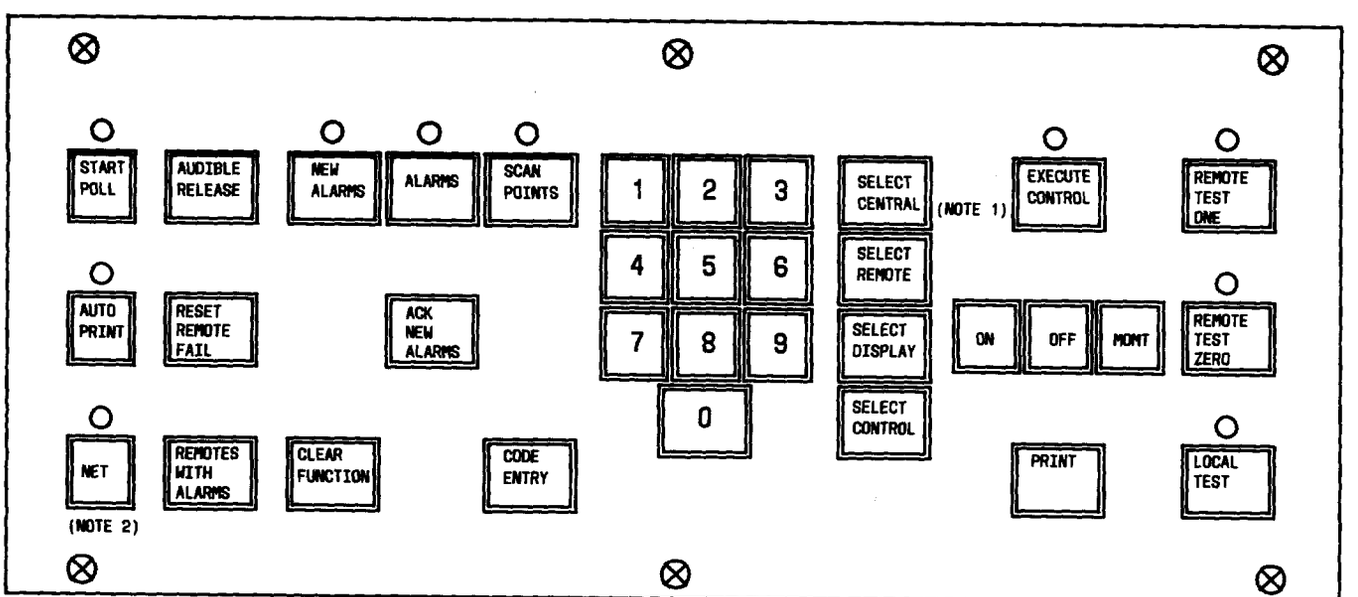



**Fig. 1—Central Display Panel (Master)**




NOTE 1 - KEYCAP BLANK STAND - ALONE AND SLAVE
NOTE 2 - KEYCAP BLANK STAND - ALONE AND MASTER

**Fig. 2—Central Keyboard (Master)**

1.05 The E3 central performs the following automatic functions:

(a) Polls each E2A status and command (SAC) remote every 20 seconds for E2A SAC and community dial office (CDO) satellite remote scan point data. The master central also polls its slave centrals for new events.

(b) Processes scan point data to determine reportable new alarm conditions.

(c) Reports new alarms by displaying the remote address, printing the alarm information, sounding the central audible alarm, and activating the office alarm circuit.

(d) Reports remote fail conditions by displaying the remote address, printing failure information, sounding the central audible alarm, and activating the office alarm circuit.

(e) Generates a remote terminal alarm release command when required.

(f) Inhibits alarm surveillance of an office when the office is in the local mode (alarms not transferred to the E3 Alarm System).

(g) Provides new alarm data, standing alarm data, control point activity, and periodic system summary data to the printer for automatic logging.

1.06 The E3 central performs the following functions in response to keyboard entries by the operator:

(a) Displays new alarms, standing alarms, or real-time scan point states of a selected remote

(b) Displays the addresses of remotes with standing alarms

(c) Operates, releases, or momentarily operates a remote relay

(d) Prints data being displayed

(e) Prints alarm point threshold values for a selected remote or all remotes

(f) Enters and changes time-of-day parameters and threshold values

(g) Tests a remote terminal

(h) Clears keyboard entries

(i) Tests display and keyboard indicators

(j) Prints error counts from data facilities

(k) Releases audible alarms

(l) Clears remote fail conditions

(m) Removes alarms from the new alarm category.

1.07 The stand-alone central polls each E2A SAC remote in the system every 20 seconds for E2A SAC and CDO satellite remote scan points. When an alarm is detected, the central audible alarm sounds; the office alarm is activated; and the central will display the remote with the new alarm. If the printer is in the automatic mode, the remote with the new alarm information will be printed out. The central

will also retain this data for viewing on the display panel until acknowledged by the central operator taking the appropriate keyboard action.

**1.08** The slave central polls the E2A SAC remotes in its remote network every 20 seconds for E2A SAC and CDO satellite remote scan point data. When in the local (nonnetted) mode, the slave central handles office alarms the same as a stand-alone central. A transferred (netted) slave central provides no local alarm notification but transfers all alarm information to the master central for operator notification.

**1.09** The master central handles its remote network the same as a stand-alone central. In addition, it polls each slave central in the master-slave network every 20 seconds for alarm and print data. Master central operator notification of slave network alarms is much the same for its own remote network alarms.

**1.10** A scan point that has been acknowledged as a new alarm and continues to stand in at a remote is called a standing alarm. Alarm information is updated in the central every 20 seconds.

**1.11** A remote (or central in the master-slave configuration) that fails to respond to polling, or the detection of a data error, will cause the controlling central to increment a no-response counter. Successful responses will decrement the counter. If the count of failures reaches seven, a remote (or central) failure will be indicated on the central display panel. The failure indication will continue until the problem is cleared and the central operator clears the indication by the proper keyboard action.

**1.12** As long as the remote (or central) remains failed, keyboard operations involving that remote (or central) cannot be made.

## 2. OPERATING PROCEDURES FOR STAND-ALONE CENTRAL OR SLAVE CENTRAL

**2.01** The operation of stand-alone and slave centrals is basically the same. The differences will be noted as they occur.

### A. Display Panel

**2.02** The display panel (Fig. 1) is divided functionally into two sections called SYSTEM SUMMARY and DATA DISPLAY. The SYSTEM SUMMARY section continuously indicates the address and status of the system remotes. It contains two indicators called REMOTE FAIL and REMOTE NEW ALARM and 64 numeric address indicators, one for each E2A SAC and each CDO satellite remote. The DATA DISPLAY section indicates the selected function; the state of each point for the selected function; and the remote, display, and control point selected.

**2.03** The central will automatically report new alarms from one or more remotes by flashing the remote address indicator(s), flashing the REMOTE NEW ALARM indicator, operating the central audible alarm, and activating the office alarm circuit. Remote failures are reported at the central by continuously lighting the remote address indicator and REMOTE FAIL indicator, operating the central audible alarm, and activating the office alarm circuit. A REMOTE FAIL display takes precedence over a REMOTE NEW ALARM display when both reports are present for the same remote. New alarm reports and remote fail reports originating from different remotes are displayed simultaneously in the SYSTEM SUMMARY display. If the condition that caused a REMOTE FAIL display spontaneously clears and the central detects a new alarm for that remote, the central will flash the REMOTE NEW ALARM indicator and sound the audible alarm. When the central operator clears the remote fail report of the remote with the new alarm, the central will report the new alarm by flashing the remote address indicator. The SYSTEM SUMMARY address indicators also identify remotes with standing alarms. These alarms are displayed by holding the REMOTES WITH ALARMS key depressed. This action causes the address indicator of each remote with standing alarms to light.

**2.04** The DATA DISPLAY section of the display panel (Fig. 1) is time-shared by all remotes in the system on a selected basis. It displays the states of a maximum of 256 scan points from a remote in four separate displays (display numbers 1, 2, 3, and 4) and in three categories (new alarms, standing alarms, and scan points). The central operator selects a remote by keying in the numeric address of the remote and depressing the SELECT REMOTE key. When a remote is selected, the DATA DISPLAY is dedicated to that remote, and display 1 is automatically selected by the central. The type of data to be viewed and the other three displays can be selected by the appropriate keyboard action. Types of data that can be selected are as follows:

(a) A remote's new alarms—NEW ALARMS indicator lighted

(b) A remote's standing alarms—ALARMS indicator lighted

(c) Real-time state of a remote's alarms and status points—SCAN POINTS indicator lighted.

In addition, the REMOTE, DISPLAY, and CONTROL indicators light to indicate the selected remote address, display number, and control point number.

**2.05** Two indicators called CENTRAL FAIL and TRY AGAIN are also provided on the display panel. The CENTRAL FAIL indicator lights when ac power is initially applied, when ac power fails and returns, or if an internal timer is not periodically reset by the cycling program. The TRY AGAIN indicator lights in response to improper keyboard entries. The indicator flashes until an entry is made which corrects the erroneous entry or the CLEAR FUNCTION key is depressed.

**2.06** The slave central display functions as described previously when the central is in its local mode. When transferred, the slave central display is blank except for a single-numeric indicator in the SYSTEM SUMMARY section. This numeric indicator will indicate the slave central number (2 through 4) in the master-slave network.

### B. Keyboard

**2.07** The keyboard contains a number of keys, some with an associated LED that lights when the key is depressed. These keys permit the central operator to interrogate the system, establish various system displays, operate and release remote relays, and perform general administrative functions. Table A gives a brief description of the function performed by each key.

**TABLE A**

**STAND-ALONE CENTRAL OR SLAVE CENTRAL KEYBOARD FUNCTION**

| KEY | FUNCTION |
|---|---|
| START POLL | Starts central operation after the power is turned on. Inactive at other times. |
| LOCAL TEST | Lights all visual indicators (except CENTRAL FAIL) and sounds the audible alarm. Active only when held down. |
| AUDIBLE RELEASE | Turns off the central audible alarm and any office alarm connected to the central external alarm interconnect circuit for the current alarm. |
| RESET REMOTE FAIL | Clear the remote fail address indicator(s) in the SYSTEM SUMMARY display corresponding to remote(s) that are communicating properly with the central. |
| REMOTES WITH ALARMS | Lights the address indicators in the SYSTEM SUMMARY display for all remotes having standing alarms. Active only when held down. |
| ACK (acknowledge) NEW ALARMS | Causes alarm points to be removed from the new alarm category. |
| NEW ALARMS | Causes only new alarms to be displayed in the DATA DISPLAY. |
| ALARMS | Causes only standing alarms to be displayed in the DATA DISPLAY. |
| SCAN POINTS | Causes real-time display of all alarm and status points in the DATA DISPLAY. |
| 0 THROUGH 9 NUMERIC KEYS | Used to define remote, display, or control point numbers in conjunction with SELECT function key. Used to enter time-of-day and threshold values in conjunction with the CODE ENTRY key. Used to enable printing of data transmission error counts in conjunction with the CODE ENTRY key. |
| SELECT REMOTE | Selects a remote for interrogation or control when operated after a numeric entry (1-64). Automatically selects display 1. |
| SELECT DISPLAY | Selects a particular display of a previously selected remote after entering the desired display number (1-4). |

TABLE A (Contd)

STAND-ALONE CENTRAL OR SLAVE CENTRAL KEYBOARD FUNCTION

| KEY | FUNCTION |
|---|---|
| SELECT CONTROL | Selects a particular control point of a previously selected remote after entering the desired control point number (1-64). Automatically selects SCAN POINTS function. |
| ON, OFF, MOMT | Causes a selected control point to be operated, released, or momentarily operated in a selected remote when operated simultaneously with the EXECUTE CONTROL key. |
| EXECUTE CONTROL | Causes a selected control to be executed in a selected remote when operated simultaneously with the ON, OFF, or MOMT key. Automatically selects SCAN POINTS function. |
| CODE ENTRY | Used for special entries when the 0-9 numeric keys are used to enter time-of-day parameters or change alarm point threshold values. Also used to print data transmission error counts. |
| CLEAR FUNCTION | Cancels all entries selected in conjunction with the DATA DISPLAY, time-of-day entries, and alarm threshold value entries. |
| PRINT | Causes all information in the SYSTEM SUMMARY and DATA DISPLAY (except control point selected) to be output on the printer. Also causes address of remote(s) with standing alarms and remotes in the local mode to be output on the printer. |
| AUTO PRINT | Enables printer to automatically log new alarms and an hourly summary of system status. |
| REMOTE TEST ONE | Operates in conjunction with a selected remote. Causes all scan points in the selected remote to be forced ***on*** or to logic ones. Automatically selects SCAN POINTS function. |
| REMOTE TEST ZERO | Same as REMOTE TEST ONE, except all points are forced ***off*** or to logic zeros. |
| NET (Slave central only) | Causes surveillance and control of the remote network to be taken over by the master central. Disables all other keyboard functions. |

### C. Printer Messages

**2.08** The read-only printer (teletypewriter) collocated with the E3 central provides the operator with an automatic log of system events as they occur. In addition, a manual mode is used to log system events and status on request.

**2.09** All printer messages use English headings, and most messages are self-explanatory. Remote addresses, displays, controls, and scan points are identified in a message by decimal numbers identical to those used on the central display panel. Local office records are used to translate the decimal numbers to the English names associated with the offices and the monitored points in the offices. All critical messages contain the time of day corresponding to the time the message is printed. The calendar month and day is provided on appropriate messages to aid in maintaining the chronological order of the output message (eg, the hourly system summary contains the date as well as the time).

**2.10** The AUTO PRINT and PRINT keys on the keyboard control the mode of the printer. Messages under control of the AUTO PRINT key are identified in the message listing which follows in paragraph 2.13. The PRINT key is used to log events as they are currently displayed on the central display panel and to obtain certain system summary information on demand. Figure 3 is a typical printer message with an explanation of the message content.

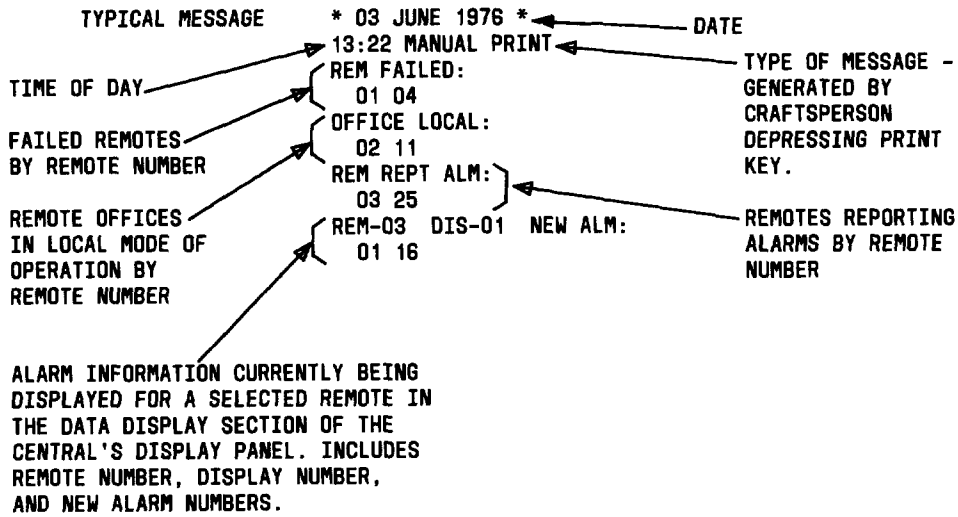



**Fig. 3—Printer Message**

**2.11** Following is a list of abbreviations associated with the E3C:

ALM—Alarm

AUTO—Automatic

BCH—Bose-Chaduri-Hocquenghen (a 7-bit error detection code associated with each word in a central/remote transmission)

CENT—Central

CTL—Control

DIS—Display

MOMT—Momentary

PT—Point

REM—Remote

REPT—Reporting

SP—Status Point

TRFR—Transferred

**2.12** The ranges of parameters printed by the E3C are as follows:

Remote Numbers—01 to 64

Display Numbers—01 to 04

Point Numbers—01 to 64

Control Numbers—01 to 64

Threshold Values—01 to 15

Error Counts—00 to 99

Date-Months—Jan to Dec

Date-Days—01 to 31

Time-Hours—00 to 23

Time-Minutes—00 to 59

**2.13** Following is a list of the E3C printed messages with typical examples:

(1) Message type: System started, clock not set

Actual message:

SYSTEM STARTED, CLOCK NOT SET

Stimulus: Generated when the START POLL key is depressed after the ac power switch has been turned on, or after ac power has been lost and then restored.

Action required:

(a) Check that the START POLL indicator lamp is flashing and the CENTRAL FAIL indicator is extinguished. If not, see Section 201-647-501 for maintenance procedures.

(b) Enter the calendar and time-of-day parameters in accordance with the procedure of Chart 8.

(2) Message type: Clock reset

Actual message:

* 03 JUNE 1976 *
08:00 CLOCK RESET

Stimulus: Generated after the time-of-day termination code has been entered on the central keyboard per Chart 8.

(3) Message type: New alarm

Typical message:

13:02 NEW ALM: REM-01 DIS-01 PT-16

Stimulus: Generated when ***Auto Print*** function is active and the central determines that a remote has a new alarm. A new alarm is declared when an alarm point satisfies its assigned type 1, 2, or 3 threshold processing (refer to Section 201-647-100 or 201-647-101 for explanation).

Action required:

(a) Acknowledge new alarm in accordance with Chart 1.

(b) Administrative action determined by local procedures.

(4) Message type: Remote fail

Typical message:

13:02 REM FAIL: REM-15

Stimulus: Generated when ***Auto Print*** function is on and the central determines that an E2A SAC or CDO satellite remote has failed to communicate properly. An E2A SAC remote is declared failed when the counter recording successes and failures reaches a value of seven. A CDO satellite is declared failed when the central detects that the satellite communication check bit (bit 16) is not in the proper state.

Action required: Attempt to clear remote fail indications in accordance with Chart 2. If necessary, notify supervisor of remote fail condition.

(5) Message type: Control on, off, or momentary

Typical messages when ***Auto Print*** function is on:

08:00 CTL ON: REM-01 CTL-01
09:00 CTL OFF: REM-01 CTL-01
10:00 CTL MOMT: REM-01 CTL-04

Typical messages when ***Auto Print*** function is off:

* 18 SEPT 1976 *
06:30 CTL ON: REM-01 CTL-01
or

07:30 CTL OFF: REM-02 CTL-01
or
08:30 CTL MOMT: REM-03 CTL-04

Stimulus: Generated after the EXECUTE CONTROL key is depressed simultaneously with either the ON, OFF, or MOMT key in accordance with the procedure of Chart 6.

(6) Message type: System summary

Typical Message:

* 03 JUNE 1976*
16:00 SYSTEM SUMMARY
REM FAILED:
01 04 12
OFFICE LOCAL:
02 11
STANDING ALM:
REM-03 DIS-01:
01 12
REM-25 DIS-01:
01

Stimulus: Generated automatically every hour on the hour when ***Auto Print*** function is on.

Action required: If the system summary contains a remote fail condition, the operator should attempt to clear condition by operating RESET REMOTE FAIL key located on the central keyboard. No other specific response is required. The message provides system summary data automatically, and response to message content will be determined by local operating procedures.

(7) Message type: Manual print

Typical message:

*03 June 1976 *
13:22 MANUAL PRINT
REM FAILED:
01 04
OFFICE LOCAL
02 11
REM REPT ALM:
03 25
REM-03 DIS-01 NEW ALM:
01 16

Stimulus: Generated when PRINT key is depressed.

Action required: No specific action is required. The message provides a system summary on demand and a hard copy of data being displayed on the DATA DISPLAY section of the central display panel.

(8) Message type: Change threshold value program active

Typical message:

* 03 JUNE 1976 *
08:30 CHANGE THRESHOLD VALUE PROGRAM ACTIVE

Stimulus: Generated after the threshold change initialization code has been entered on the central keyboard in accordance with the procedure of Chart 9. The message is repeated if the change threshold value program is active and a period of 5 minutes elapses between keyboard entries, or between the time the printer stops printing and a keyboard entry is made. The central ceases its normal alarm-reporting functions when the change threshold value program is active.

Action required: The operator may change alarm point threshold values and/or print alarm point threshold values in accordance with the procedure of Chart 9 or 10.

(9) Message type: Record of a selected remote, or all remotes, alarm point threshold values

Typical message:

REM-64 DIS-01
01-01 02-04 03-04 04-04 05-04 06-04 07-04 08-04
09-04 10-04 11-04 12-04 13-04 14-04 15-SP 16-SP

Stimulus: ***When*** and only ***when*** the change threshold value program is active. A record of alarm threshold values is generated by keyboard action in accordance with the procedure of Chart 10.

Action required: Verify that alarm points have the desired threshold value. If not, enter the desired values in accordance with the procedure of Chart 9.

(10) Message type: No threshold values in the selected display

Actual message:

NO THRESHOLD VALUES IN THE SELECTED DISPLAY

Stimulus: Generated ***when*** and only ***when*** the change threshold value program is active. The message is generated if an attempt is made to print the threshold values of a display that does not contain alarm points with threshold processing.

Action required: Determine from local records the remotes and their displays that contain alarm points with threshold processing. Select the desired display.

(11) Message type: System started

Actual message:

SYSTEM STARTED

Stimulus: Generated after the threshold change value program termination code has been entered on the central keyboard in accordance with the procedure of Chart 9.

Action required: Check that the START POLL key indicator lamp is flashing. If not, see Section 201-647-501 for maintenance procedures.

(12) Message type: Office local, office transferred

Typical messages:

08:00 OFFICE LOCAL: REM-03

17:00 OFFICE TRFR: REM-03

Stimulus: The appropriate message is generated when the ***Auto Print*** function is on and a local office operator operates the office transfer switch to either the local or transfer position. The office transferred message is also generated when the E3 central operator turns the office transfer control on. The E3 central operator cannot put an office in the local mode.

Action required: Verify that the office is in the desired mode of operation.

(13) Message type: Auto print on, auto print off

Typical messages:

* 03 JUNE 1976*
04:40 AUTO PRINT ON

* 03 JUNE 1976*
04:50 AUTO PRINT OFF

Stimulus: The appropriate message is generated automatically each time the AUTO PRINT key is depressed. The ***Auto Print*** function is automatically turned on when the START POLL key is depressed after the power switch has been turned on.

Action required: ***Auto Print*** function on is the recommended mode of operation. Verify that the AUTO PRINT key indicator is lighted.

(14) Message type: Reminder to check battery replacement dates

Actual message:

** CHECK BATTERY REPLACEMENT DATES **

Stimulus: Generated automatically each month on the first day of the month.

Action required: Check battery replacement dates, and replace battery A or B if necessary in accordance with Section 201-647-501 (Maintenance).

(15) Message type: Threshold memory test failed

Actual message:

*** THRESHOLD MEMORY TEST FAILED ***

Stimulus: Generated when the central does not successfully execute the automatic threshold memory test. The test is executed automatically when either the START POLL key is activated or the threshold value change program is exited.

Action required: See paragraph 4.01, Initial Turnup of System, for correct procedure.

(16) Message type: Lost data

Typical message:

```
* 04 JULY 1976 *
15:02 LOST DATA
```

Stimulus: Message is generated if ***Auto Print*** function is on and the number of system events exceeds the capacity of the central to record them on the printer.

Action required: The E3 central maintains system events for viewing on the central display panel independent of the state of the printer. In response to the lost data message, the operator should observe the SYSTEM SUMMARY display and, if necessary, the DATA DISPLAY; then log events for each remote, either manually or with the PRINT function.

(17) Message type: Data transmission error counts

Typical message:

```
* 18 SEPT 1976 *
11:10 BCH ERROR AND IMPROPER RESPONSE COUNTS:
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

Stimulus: Generated in response to keyboard action by an operator in accordance with the procedure of Chart 12. Each time the counts are printed, the error counters are reset to zero.

Action required if a large number of errors is observed:

(a) Refer to Section 201-647-500 for troubleshooting the data network, data set, or E2A remote.

(b) Refer to Section 201-647-501 for troubleshooting the E2 central.

***Note:*** If all or most BCH and/or improper response counts are high, troubleshoot the E3 central first.

Message explanation: The E3 central maintains a count of five possible error conditions that may occur when the central communicates with an E2A SAC remote. The five error conditions are as follows:

(1) An E2A response message with a BCH error in one or more of its words

(2) An E2A response message with wrong numbers of words

(3) No E2A response message

(4) No clear-to-send signal from the central data set

(5) Premature loss of carrier signal at the end of an E2A response message.

Two counters for each E2A SAC remote record the occurrences of error conditions. A BCH-error counter maintains a cumulative count of error conditions (1) and (2). An improper-response counter maintains a cumulative count of all five error conditions. The contents of the BCH-error counter and the improper-response counter of each E2A SAC remote are printed in this message. The message contains 2 rows and 24 columns of 2-digit numbers. The first row shows the BCH-error counts and the second row shows the

improper-response counts. Each column corresponds to an E2A SAC remote number. Counting from left to right, the first 2-digit wide column contains the contents of the two counters for remote number 1 (BCH is in row 1 and improper response is in row 2); the second column contains the two counts for remote number 2, etc, to the last column which corresponds to remote number 24.

When evaluating the results of performing the data transmission error count check, an error count ***significantly higher*** than the others generally indicates a problem with the corresponding remote or its interconnecting data network. There is no specific number of errors which indicate a problem; thus the reports are qualitative rather than quantitative.

(18) Messge type: Central local and central transferred (slave central only)

Typical messages:

* 18 MAY 1977*
08.01 CENT LOCAL

* 19 MAY 1977 *
17:05 CENT TRFR

Stimulus: The appropriate message is generated when the NET key is depressed. A lighted LED above the key indicates the transferred mode.

Action required: Slave central operator should contact the master central operator prior to changing the central mode.

## 3. OPERATING PROCEDURES FOR MASTER CENTRAL

### A. Display Panel

**3.01** The display panel (Fig. 1) is divided functionally into two sections called SYSTEM SUMMARY and DATA DISPLAY. The SYSTEM SUMMARY section continuously indicates the status of the system centrals and selectively the status of the system remotes. Two fields (CENTRAL 1, 2, 3, 4 REMOTE FAIL and CENTRAL 1, 2, 3, 4 REMOTE NEW ALARM) indicate central status. Central 1 is the master central and centrals 2 through 4 are the slave centrals. When a central is selected, by keyboard entries, the 64 numeric remote address indicators present the status of its remotes. The selected central is indicated by a numeric indicator with the heading REMOTES FOR CENTRAL.

**3.02** The master central automatically reports new alarms by flashing its CENTRAL (1 through 4) REMOTE NEW ALARM indicators, sounding the central audible alarm, and activating the office alarm circuit. The flashing heading number (1 through 4) identifies which central has a remote with a new alarm. When the master central operator has selected the indicated central, a flashing remote address indicator will identify the exact remote. Slave central and remote failures are reported by continuously lighting the CENTRAL (1 through 4) REMOTE FAIL indicator, sounding the central audible alarm, and activating the office alarm circuit. The heading number (1 through 4) identifies the central. Remote failures are identified by a steadily lit remote address indicator after the indicated central has been selected by keyboard operation. A slave central failure is identified when the master central operator receives a flashing TRY AGAIN indication while attempting to select the central. Failure reports will take precedence over new alarm reports when both are present for the same central or remote. New alarm reports and failure reports for different centrals and for different remotes of a selected central are displayed simultaneously in the SYSTEM SUMMARY display. If the condition that caused a failure report clears and the central detects a new alarm for that central network, the central will flash the CENTRAL REMOTE NEW ALARM indicator and sound the audible alarm. When the master central operator clears the failure indication, the central will report the new alarm as described previously. The SYSTEM

SUMMARY section also identifies remotes with standing alarms. These remotes are indicated when a central is selected and the REMOTES WITH ALARMS key is depressed and held. This action causes the remote address indicator to light for each remote, of the selected central, with standing alarms.

**3.03** The DATA DISPLAY section of the display panel (Fig. 1) is time-shared by all remotes in the system on a selected basis. It displays the states of up to 256 scan points from a remote in four separate 64-point displays (display numbers 1, 2, 3, and 4) and in three categories (new alarms, standing alarms, and scan points). To select a remote for display, the central operator performs the following:

(a) Selects a central by keying in its numeric address and depressing the SELECT CENTRAL key—REMOTES FOR CENTRAL and central number appear (SYSTEM SUMMARY section)

(b) Selects the remote by keying in its numeric address and depressing the SELECT REMOTE key—REMOTE and number entered, and DISPLAY 1 appear.

After a remote is selected, the DATA DISPLAY is dedicated to it. The category of data to be viewed and display 2, 3, or 4 can be selected by keyboard action. The categories of data and key operation required are as follows:

(1) A remote's new alarms—operate the NEW ALARMS key—NEW ALARMS heading lighted

(2) A remote's standing alarms—operate the ALARMS heading lighted

(3) Real-time state of a remote's scan points—operate SCAN POINTS key—SCAN POINTS heading lighted.

**3.04** The display panel also contains two indicators called CENTRAL FAIL and TRY AGAIN. The CENTRAL FAIL indicator applies only to operation of the master central. It lights when ac power is initially applied, in event of a dc power problem, or when an internal timer is not periodically reset by the program. The TRY AGAIN indicator lights in response to improper keyboard entries. It will flash until a correct entry is made or the CLEAR FUNCTION key is depressed.

### B. Keyboard

**3.05** The keyboard contains a number of keys, some with an associated LED which lights when the key is depressed. These keys permit the central operator to interrogate the system, establish various system displays, operate and release remote relays, and perform general administrative functions. Table B gives a brief description of the function performed by each key.

**TABLE B**

**MASTER CENTRAL KEYBOARD FUNCTIONS**

| KEY | FUNCTION |
|---|---|
| START POLL | Starts central operation after the power is turned on. Inactive at other times. |
| LOCAL TEST | Lights all visual indicators (except CENTRAL FAIL) and sounds the audible alarm. Active only when held down. |
| AUDIBLE RELEASE | Turns off the central audible alarm and any office alarm connected to the central external alarm interconnect circuit. |
| RESET REMOTE FAIL | Clears the remote fail address indicator(s) in the SYSTEM SUMMARY display corresponding to remote(s) that are communicating properly with the central. |
| REMOTES WITH ALARMS | Lights the address indicators in the SYSTEM SUMMARY display for all remotes having standing alarms. Active only when held down. |
| ACK (acknowledge) NEW ALARMS | Causes alarm points to be removed from the new alarm category. |
| NEW ALARMS | Causes only new alarms to be displayed in the DATA DISPLAY. |
| ALARMS | Causes only standing alarms to be displayed in the DATA DISPLAY. |
| SCAN POINTS | Causes real-time display of all alarm and status points in the DATA DISPLAY. |
| 0 THROUGH 9 NUMERIC KEYS | Used to define central, remote, display, or control point numbers in conjunction with SELECT function keys. Used to enter time-of-day and threshold values in conjunction with the CODE ENTRY key. Used to enable printing of data transmission error counts in conjunction with the CODE ENTRY key. |
| SELECT CENTRAL | Selects a central for interrogation or control when operated after a numeric entry (1-4). |
| SELECT REMOTE | Selects a remote of a previously selected central for interrogation or control when operated after a numeric entry (1-64). Automatically selects display 1. |

**TABLE B (Contd)**

**MASTER CENTRAL KEYBOARD FUNCTIONS**

| KEY | FUNCTION |
|---|---|
| SELECT DISPLAY | Selects a particular display of a previously selected remote after entering the desired display number (1-4). |
| SELECT CONTROL | Selects a particular control point of a previously selected remote after entering the desired control point number (1-64). Automatically selects SCAN POINTS function. |
| ON, OFF, MOMT | Causes a selected control point to be operated released, or momentarily operated in a selected remote when operated simultaneously with the EXECUTE CONTROL key. |
| EXECUTE CONTROL | Causes a selected control to be executed in a selected remote when operated simultaneously with the ON, OFF, or MOMT key. Automatically selects SCAN POINTS function. |
| CODE ENTRY | Used for special entries when the 0-9 numeric keys are used to enter time-of-day parameters or change alarm point threshold values. Also used to print data transmission error counts. |
| CLEAR FUNCTION | Cancels all entries selected in conjunction with the DATA DISPLAY, time-of-day entries, and alarm threshold value entries. |
| PRINT | Causes all information in the SYSTEM SUMMARY and DATA DISPLAY (except control point selected) to be output on the printer. Also causes address of remote(s) with standing alarms and remotes in the local mode, for the selected central, to be output on the printer. |
| AUTO PRINT | Enables printer to automatically log new alarms and an hourly summary of system status. |
| REMOTE TEST ONE | Operates in conjunction with a selected remote. Causes all scan points in the selected remote to be forced ***on*** or to logic ones. Automatically selects SCAN POINTS function. |
| REMOTE TEST ZERO | Same as REMOTE TEST ONE, except all points are forced ***off*** or to logic zeros. |

### C. Printer Messages

**3.06** The read-only printer (teletypewriter) collocated with the E3 central provides the operator with an automatic log of system events as they occur. In addition, a manual mode is used to log system events and status on request.

**3.07** All printer messages use English headings and most messages are self-explanatory. Remote addresses, displays, controls, and scan points are identified in the message by decimal numbers identical to those used on the central display panel. Local office records are used to translate the decimal numbers to the English names associated with the offices and the monitored points in the offices. All critical messages contain the time of day corresponding to the time the message is printed. The calendar month and day is provided on appropriate messages to aid in maintaining the chronological order of the output message (eg, the hourly system summary contains the date as well as the time).

**3.08** The AUTO PRINT and PRINT keys on the keyboard control the mode of the printer. Messages under control of the AUTO PRINT key are identified in the message listing which follows. The PRINT key is used to log events as they are currently displayed on the central display panel and to obtain certain system summary information on demand. Figure 4 is a typical printer message with an explanation of the message content.

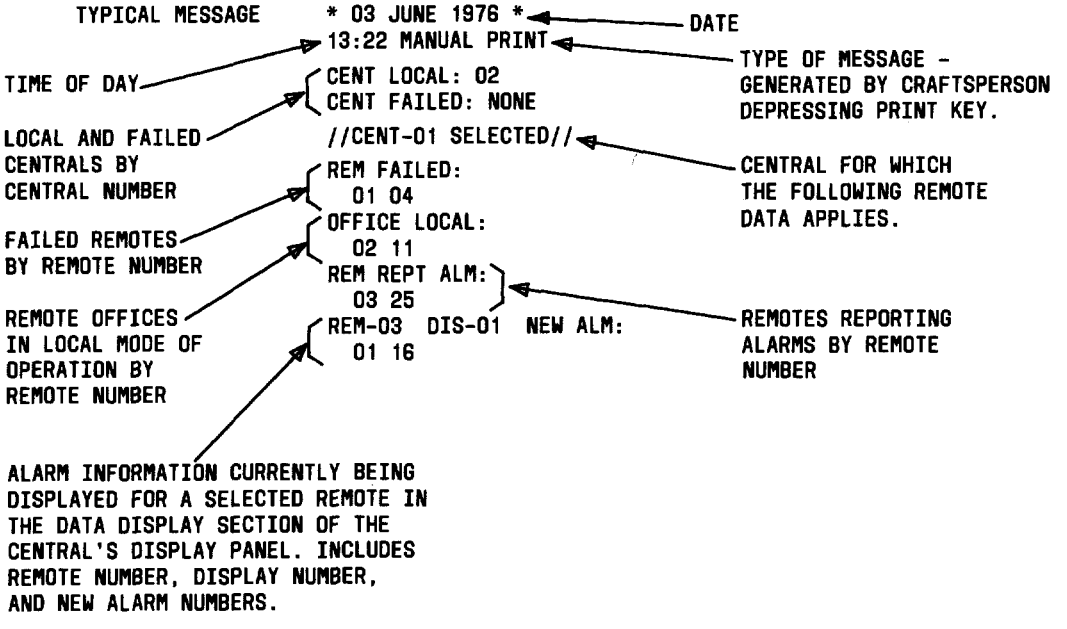



**Fig. 4—Typical Printer Message for Central**

**3.09** Following is a list of E3C abbreviations:

ALM—Alarm

AUTO—Automatic

BCH—Bose-Chaduri-Hocquenghen (error-checking code—see paragraph 2.11)

CENT—Central

CTL—Control

DIS—Display

MOMT—Momentary

PT—Point

REM—Remote

REPT—Reporting

SP—Status Point

TRFR—Transferred

**3.10** The ranges of E3C printed parameters are as follows:

Central Numbers—01 to 04

Remote Numbers—01 to 64

Display Numbers—01 to 04

Point Numbers—01 to 64

Control Numbers—01 to 64

Threshold Values—01 to 15

Error Counts—00 to 99

Date-Months—Jan to Dec

Date-Days—01 to 31

Time-Hours—00 to 23

Time-Minutes—00 to 59

**3.11** Following is a list of the master E3C printed messages with typical examples:

(1) Message type: System started, clock not set

Actual message:

SYSTEM STARTED, CLOCK NOT SET

Stimulus: Generated when the START POLL key is depressed after the ac power switch has been turned on, or after ac power has been lost and then restored.

Action required:

(a) Check that the START POLL indicator lamp is flashing and the CENTRAL FAIL indicator is lighted. If not, see Section 201-647-501 for maintenance procedures.

(b) Enter the calendar and time-of-day parameters in accordance with the procedure of Chart 8.

(2) Message type: Clock reset

Actual message:

* 03 JUNE 1976 *
08:00 CLOCK RESET

Stimulus: Generated after the time-of-day termination code has been entered on the central keyboard per Chart 8.

(3) Message type: New alarm

Typical message:

13:02 NEW ALRM:CENT-02 REM-01 DIS-01 PT-16

Stimulus: Generated when ***Auto Print*** function is active and the central determines that a remote has a new alarm. A new alarm is declared when an alarm point satisfies its assigned type 1, 2, or 3 threshold processing (refer to Section 201-647-100 or 201-647-101 for explanation).

Action required:

(a) Acknowledge new alarm in accordance with Chart 1.

(b) Administrative action determined by the local procedures.

(4) Message type: Remote fail

Typical message:

13:02 REM FAIL:CENT-01 REM-15

Stimulus: Generated when ***Auto Print*** function is on and central determines that an E2A SAC or CDO satellite remote has failed to communicate properly. An E2A SAC remote is declared failed when the counter recording success and failures reaches a value of seven. A CDO satellite is declared failed when the central detects that the satellite communication check bit (bit 16) is not in the proper state.

Action required: Attempt to clear remote fail indications in accordance with Chart 2. If necessary, notify supervisor of remote fail condition.

(5) Message type: Central fail

Typical message:

11:10 CENT FAIL, DATA LOST:CENT-02

Stimulus: Generated when ***Auto Print*** function is on and master central determines that a slave central has failed to communicate properly. A slave central is declared failed when the counter recording communication failures and successes reaches a value of seven.

Action required: Attempt to clear the central fail indication in accordance with Chart 2.

(6) Message type: Control on, off, or momentary

Typical messages when ***Auto Print*** function is on:

08:00 CTL ON:CENT-04 REM-01 CTL-01
or
09:00 CTL OFF:CEN-04 REM-01 CTL-01
or
10:00 CTL MOMT:CENT-04 REM-01 CTL-04

Typical messages when ***Auto Print*** function is off:

* 18 SEPT 9176 *
06:30 CTL ON:CENT-01 REM-01 CTL-01
or
07:30 CTL OFF:CENT-01 REM-02 CTL-01
or
08:30 CTL MOMT:CENT-01 REM-03 CTL-04

Stimulus: Generated after the EXECUTE CONTROL key is depressed simultaneously with either the ON, OFF, or MOMT key in accordance with the procedure of Chart 6.

(7) Message type: System summary

Typical messages:

* 03 JUNE 1976 *
16:00 SYSTEM SUMMARY
CENT LOCAL: 03
CENT FAILED: NONE
//CENT-01 SUMMARY//
REM FAILED:
01 04 12
OFFICE LOCAL:
02 11
STANDING ALM:
REM-03 DIS-01:
01 12
REM-25 DIS-01:
01
//CENT-02 SUMMARY//
REM FAILED: NONE
OFFICE LOCAL: NONE
STANDING ALM:
REM-42 DIS-01:
02 10

Stimulus: Generated automatically every hour on the hour when ***Auto Print*** function is on.

Action required: If the system summary contains a remote fail condition, operating personnel should attempt to clear condition by selecting each affected central and operating RESET REMOTE FAIL key located on the central keyboard. No other specific response is required. The message provides system summary data automatically, and response to message content will be determined by local operating procedures.

(8) Message type: Manual print

Typical messages:

```
* 03 JUNE 1976 *
13:22 MANUAL PRINT
CENT LOCAL: 02
CENT FAILED: NONE
//CENT-01 SELECTED//
REM FAILED:
01 04
OFFICE LOCAL:
02 11
REM REPT ALM:
03 25
REM-03 DIS-01 NEW ALM:
01 16
```

Stimulus: Generated when PRINT key is depressed.

Action required: No specific action is required. The message provides a system summary on demand and a hard copy of data being displayed on the DATA DISPLAY section of the central display panel.

(9) Message type: Change threshold value program active

Typical message:

```
* 03 June 1976 *
08:30 CHANGE THRESHOLD VALUE PROGRAM ACTIVE
```

Stimulus: Generated after the threshold change initialization code has been entered on the central keyboard in accordance with the procedure of Chart 9. The message is repeated if the change threshold value program is active and a period of 5 minutes elapses between keyboard entries or between the time the printer stops printing and a keyboard entry is made. The central ceases its normal alarm-reporting functions when the change threshold value program is active.

Action required: The operator may change alarm point threshold values and/or print alarm point threshold values in accordance with the procedure of Chart 9 or 10.

(10) Message type: Record of a selected remote or all remotes, alarm point threshold values

Typical message:

```
REM-64 DIS-01
01-01 02-04 03-04 04-04 05-04 06-04 07-04 08-04
09-04 10-04 11-04 12-04 13-04 14-04 15-SP 16-SP
```

Stimulus: Generated ***when*** and only ***when*** the change threshold value program is active. A record of alarm threshold values is generated by keyboard action in accordance with the procedure of Chart 10.

Action required: Verify that alarm points have the desired threshold values. If not, enter the desired values in accordance with the procedure of Chart 9.

(11) Message type: No threshold values in the selected display

Actual message:

NO THRESHOLD VALUES IN THE SELECTED DISPLAY

Stimulus: Generated ***when*** and only ***when*** the change threshold value program is active. The message is generated if an attempt is made to print the threshold values of a display that does not contain alarm points with threshold processing.

Action required: Determine from local records the remotes and their displays that contain alarm points with threshold processing. Select the desired display.

(12) Message type: System started

Actual message:

SYSTEM STARTED

Stimulus: Generated after the threshold change value program termination code has been entered on the central keyboard in accordance with the procedure of Chart 9.

Action required: Check that the START POLL key indicator lamp is flashing. If it is not, refer to Section 201-647-501 for maintenance procedures.

(13) Message type: Office local, office transferred

Typical messages:

08:00 OFFICE LOCAL:CENT-02 REM-03

17:00 OFFICE TRFR:CENT-02 REM-03

Stimulus: The appropriate message is generated when the ***Auto Print*** function is on and a local office operator operates the office transfer switch to either the local or transfer position. The office transferred message is also generated when the E3 central operator turns the office transfer control on. The E3 central operator cannot put an office in the local mode.

Action required: Verify that the office is in the desired mode of operation.

(14) Message type: Central local, central transferred

Typical messages:

07:30 CENT LOCAL: CENT 02

22:00 CENT TRFR: CENT 02

Stimulus: The appropriate message is generated when the ***Auto Print*** function is on and the NET key is operated at the indicated slave central.

Action required: Verify that the central is in the desired mode of operation.

(15) Message type: Auto print on, auto print off

Typical messages:

```
* 03 JUNE 1976 *
04:40 AUTO PRINT ON

* 03 JUNE 1976 *
04:50 AUTO PRINT OFF
```

Stimulus: The appropriate message is generated automatically each time the AUTO PRINT key is depressed. The ***Auto Print*** function is automatically turned on when the START POLL key is depressed after the power switch has been turned on.

Action required: ***Auto Print*** function on is the recommended mode of operation. Verify that the AUTO PRINT key indicator is lighted.

(16) Message type: Reminder to check battery replacement dates

Actual message:

```
** CHECK BATTERY REPLACEMENT DATES **
```

Stimulus: Generated automatically each month on the first day of the month.

Action required: Check battery replacement dates, and replace battery A or B, if necessary, in accordance with Section 201-647-501 (Maintenance).

(17) Message type: Threshold memory test failed

Actual message:

```
*** THRESHOLD MEMORY TEST FAILED ***
```

Stimulus: Generated when the central does not successfully execute the automatic threshold memory test. The test is executed automatically when either the START POLL key is activated or the threshold value change program is exited.

Action required: See Section 201-647-501 for maintenance procedures.

(18) Message type: Lost data

Typical message:

```
* 04 JULY 1976 *
15:02 LOST DATA
```

Stimulus: Message is generated if ***Auto Print*** function is on and the number of system events exceeds the capacity of the central to record them on the printer.

Action required: The E3 central maintains system events for viewing on the central display panel independent of the state of the printer. In response to the lost data message, the operator should observe the SYSTEM SUMMARY display and, if necessary, the DATA DISPLAY; then log events for each remote, either manually or with the PRINT function.

(19) Message type: Data transmission error counts

Typical message:

```
* 13 OCT 1977 *
08:56 BCH ERROR AND IMPROPER RESPONSE COUNTS:
REM NETWORK:
05 05 05 05 00 05 00 00 00 05 00 00 00 00 00 00 00 00 00 00 00 00 00 00
05 05 05 05 00 05 00 00 00 05 00 00 00 00 00 00 00 00 00 00 00 00 00 00
CENT NETWORK:
00 00 00
08 00 00
```

Stimulus: Generated in response to keyboard action by an operator in accordance with the procedure of Chart 12. Each time the counts are printed, the firmware error counters are reset to zero.

Action required if a large number of errors is observed:

(a) Refer to Section 201-647-500 for troubleshooting the data network, data set, or E2A remote.

(b) Refer to Section 201-647-501 for troubleshooting the E3 central.

***Note:*** If all or most BCH and/or improper response counts are high, troubleshoot the E3 central first.

Message explanation: The E3 master central maintains a count of five error conditions that may occur when the central communicates with a slave central or an E2A SAC remote in its remote network. The five error conditions are as follows:

(1) A response message with a BCH error in one or more of its words

(2) A response message with the wrong number of words

(3) No response message

(4) No clear-to-send signal from the master central data sets

(5) Premature loss of carrier signal at the end of a response message.

Two counters for each master central E2A SAC remote and for each slave central are used to record occurrences of error conditions. A BCH-error counter maintains a cumulative count of error conditions (1) and (2). An improper-response counter maintains a cumulative count of all five error conditions. The contents of the two counters are printed in this message and are divided into two parts; first, those that apply to he remote network, then those that apply to the slave central network. The remote network portion of the message contains 2 rows and 24 columns of 2-digit numbers. The first row shows the BCH-error counts and the second row shows the improper-response counts. Each column corresponds to an E2A SAC remote number. Counting from left to right, the first 2-digit wide column contains the contents of the two counters for remote number 1 (BCH is in row 1 and improper response is in row 2); the second column contains the two counts for remote number 2, etc, to the last column which corresponds

to remote number 24. The central network portion of the message is formatted in a similar manner to that of the remote network but contains only three columns. Counting from left to right, the first column contains the contents of the two counters for slave central number 1, the second column the counts for slave central number 2, and the third column the counts for slave central number 3.

When evaluating the results of performing the data transmission error count check, an error count ***significantly higher*** than the others generally indicates a problem with the corresponding remote or slave central, or with its interconnecting data network. There is no specific number of errors which indicate a problem; thus the reports are qualitative rather than quantitative.

## 4. GENERAL OPERATING PROCEDURES

**4.01** The following procedures apply to all three E3 central configurations: stand-alone, slave, and master. In some procedures a master central will require additional operating steps. These steps will be designated (master only) and should be ignored when operating stand-alone or slave centrals.

### *Initial Turnup of System*

(1) Locate CP114 at the back of the central console and operate switch three (S3) to the on (down) position.

(2) Operate the ac power switch located on the bottom right side of the central console to the on position (the switch lights when in the on position). Observe that all key lamps light, CENTRAL FAIL indicator lights, and the central audible alarm sounds. Depress the AUDIBLE RELEASE key to silence the alarm.

(3) Depress the START POLL key and observe the following:

(a) START POLL key indicator lamp is flashing and all key lamps go out except the AUTO PRINT key lamp.

(b) The CENTRAL FAIL indicator on the display panel goes out.

(c) Printer message indicated SYSTEM STARTED, CLOCK NOT SET. Step 5 sets clock (also refer to Part 2C, Message 1).

***Note:*** At this time all alarm points with threshold processing will be initialized to a default value of four (4).

(4) Operate S3 on CP114 to the off (up) position.

(5) Initialize the time-of-day clock according to the procedure of Chart 8.

(6) Initialize and record alarm threshold values for all remotes to the desired values according to the procedure of Chart 9.

(7) Record the alarm point values in accordance with the procedure of Chart 11.

### *Restarting System After Maintenance Turndown or ac Power Failure*

(1) Locate CP114 at the back of the central console and verify that switch three (S3) is in the off (up) position. If it is not, operate S3 to the off position.

(2) If necessary, operate the ac power switch located on the right side of the central console to the on position (switch lights when on).

(3) Depress the START POLL key and observe the following indications:

(a) START POLL key indicator lamp is flashing.

(b) The CENTRAL FAIL indicator on the display panel is out.

(c) Printer message indicates SYSTEM STARTED, CLOCK NOT SET. Step 4 sets clock (also refer to Part 2C, Message 1).

***Caution: Any time the system is started by activating the START POLL key and S3 on CP114 is in the on (down) position, all alarm points with threshold processing will be set to a threshold value of four (4).***

(4) Reset the time-of-day clock according to the procedure of Chart 8.

***Clearing Display and Keyboard Indicators***

(1) Depress the CLEAR FUNCTION key.

(2) Observe that all indicators in the DATA DISPLAY and keyboard lamps associated with the previously selected data display function go out.

***TRY AGAIN Indicator***

(1) Enter a function on the keyboard to correct the previous entry, or

(2) Depress the CLEAR FUNCTION key. The TRY AGAIN indicator goes out.

***LOCAL TEST Key***

(1) Depress and hold the LOCAL TEST key.

(2) Observe that all indicators on the display panel and keyboard light except the CENTRAL FAIL indicator and that the central audible alarm sounds. The number 8 will appear under the REMOTE, DISPLAY, and CONTROL indicators in the DATA DISPLAY.

(3) Release the LOCAL TEST key.

(4) All indicators go out.

(5) Depress the AUDIBLE RELEASE key to silence the central audible alarm.

***CENTRAL FAIL Indicator***

(1) The CENTRAL FAIL indicator should go out when the START POLL key is depressed.

(2) If the CENTRAL FAIL indicator does not go out, refer to Section 201-647-501, E3 Central Maintenance.

## CHART 1

## NEW ALARM REPORTS

| STEP | PROCEDURE |
|---|---|
| 1 | Depress the AUDIBLE RELEASE key to silence the central and the office audible alarms.<br><br>***Note:*** When the ***Auto Print*** function is on, the new alarm information is automatically logged on the printer when it is detected by the central (refer to Part 2C, Message 3). If the ***Auto Print*** function is off or if the central is not equipped with a printer, manually record the time, remote address, and the scan point number of each new alarm. |
| 2 | Depress the RESET REMOTE FAIL key to enable new alarm reports from previously failed terminals. |
| 3 | Depress the NEW ALARMS key. The key indicator lights. |
| 4 | (Master only) Select the address of the central with new alarms on the 1 through 4 keys and depress the SELECT CENTRAL key. |
| 5 | Select the address of the remote with the new alarms using the 0 through 9 keys and the SELECT REMOTE key.<br><br>***Note:*** DISPLAY 1 should automatically appear in the DATA DISPLAY. |
| 6 | Observe the DATA DISPLAY. The NEW ALARMS indicator lights. Verify that the REMOTE and the DISPLAY numbers are the ones selected. If the numbers are not correct, repeat Steps 5 and 6. |
| 7 | If necessary, manually record any new alarms in the DATA DISPLAY. Depress the ACK NEW ALARMS key. The new alarms indicators (numbers), remote address indicator, and REMOTE NEW ALARM indicator go out if no new alarms remain. However, if any additional new alarms have occurred since depressing the NEW ALARMS key (Step 3), they will be displayed immediately after depressing the ACK NEW ALARMS key. |
| 8 | Select the next display using the 0 through 9 keys, then depress the SELECT DISPLAY key. Repeat Steps 6, 7, and 8 until the flashing remote indicator in the SYSTEM SUMMARY for the selected remote goes out. |
| 9 | Depress the CLEAR FUNCTION key. All remaining indicators in the DATA DISPLAY and the NEW ALARMS key indicator go out. |

## CHART 2

## REMOTE FAIL CONDITION

| STEP | PROCEDURE |
|---|---|
| 1 | Operate the AUDIBLE RELEASE key to silence the central and the office audible alarms.<br><br>***Note:*** When the ***Auto Print*** function is on, the remote fail information is automatically logged on the printer when it is detected by the central (refer to Part 2C, Message 4). |
| 2 | (Master only) Select the address of the central with a remote failure on the 1 through 4 keys and depress the SELECT CENTRAL key. If this results in a TRY AGAIN indication, the central has failed, and the RESET REMOTE FAIL key should be depressed. |
| 3 | Observe the SYSTEM SUMMARY display. The REMOTE FAIL and the remote address indicators of the failed remote light. |
| 4 | If the central is not equipped with a printer, log the time and address of the failed remote. |
| 5 | Depress the RESET REMOTE FAIL key. The remote address indicator goes out if the condition which caused the failure has cleared. The REMOTE FAIL indicator will also go out if no additional remotes are failed. |
| 6 | If the remote condition does not clear, follow local procedures to clear the trouble condition. |

## CHART 3

## SYSTEM ALARM SUMMARY

| STEP | PROCEDURE |
|---|---|
| 1 | (Master only) Select the desired central. |
| 2 | Depress and hold the REMOTES WITH ALARMS key. |
| 3 | Observe the SYSTEM SUMMARY display. The remote address indicators of all remotes with standing alarms light. |
| 4 | Release the REMOTE WITH ALARMS key. The remote address indicator(s) goes out. |
| 5 | Depress the PRINT key to record the address of the remote with standing alarms (refer to Part 2C, Message 6). If the central is not equipped with a printer, manually log the addresses of remotes with standing alarms. |
| 6 | (Master only) Repeat Steps 1 through 5 for remaining centrals. |

## CHART 4

## STANDING ALARM DISPLAY

| STEP | PROCEDURE |
|---|---|
| 1 | Depress the ALARMS key. The key indicator lights. |
| 2 | (Master only) Select the desired central using the 1 through 4 keys and the SELECT CENTRAL key. |
| 3 | Select the desired remote using the 0 through 9 keys, then depress the SELECT REMOTE key. If necessary, select the desired display using the 0 through 9 keys and the SELECT DISPLAY key.<br><br>***Note:*** DISPLAY 1 will automatically appear in the DATA DISPLAY. |
| 4 | Observe the DATA DISPLAY; the ALARMS indicator should light. Verify that the lighted REMOTE and DISPLAY indicator numbers are the ones selected. |
| 5 | Observe the numeric indicators that are lighted in the DATA DISPLAY to determine the standing alarms of the selected remote. |
| 6 | Depress the PRINT key to record the standing alarms (refer to Part 2C, Message 7). If the central is not equipped with a printer, manually record the time, remote address, display number, and standing alarms. |
| 7 | Repeat Steps 3 through 6 until all displays in the selected remote have been observed. |
| 8 | (Master only) Repeat Steps 2 through 7 for remaining centrals of interest. |
| 9 | Depress the CLEAR FUNCTION key. All remaining indicators in the DATA DISPLAY and the ALARMS key indicator go out. |

## CHART 5

## SCAN POINT DISPLAYS

| STEP | PROCEDURE |
|---|---|
| 1 | Depress the SCAN POINTS key. The key indicator lights. |
| 2 | (Master only) Select the desired central using the 1 through 4 keys on the SELECT CENTRAL key. |

**CHART 5 (Contd)**

| STEP | PROCEDURE |
|---|---|
| 3 | Select the desired remote using the 0 through 9 keys, then depress the SELECT REMOTE key. If necessary, select the desired display using the 0 through 9 keys and the SELECT DISPLAY key.<br><br>***Note:*** DISPLAY 1 will automatically appear in the DATA DISPLAY. |
| 4 | Observe the DATA DISPLAY; the SCAN POINTS indicator should light. Verify that the lighted REMOTE and DISPLAY indicator numbers are the ones selected. |
| 5 | Observe the numeric indicators that are lighted in the DATA DISPLAY to determine the state of each alarm and status point in the selected display. |
| 6 | Depress the PRINT key to record the alarm and status point data on the printer. If the central is not equipped with a printer, manually record the time, remote address, display number, and the state (on or off) of the alarm and status points of interest. |
| 7 | Repeat Steps 3 through 6 until all displays in the selected remote have been observed. |
| 8 | (Master only) Repeat Steps 2 through 7 for all centrals of interest. |
| 9 | Depress the CLEAR FUNCTION key. All indicators in the DATA DISPLAY and the ALARMS key indicator go out. |

**CHART 6**

**OPERATING A REMOTE CONTROL POINT**

| STEP | PROCEDURE |
|---|---|
| 1 | (Master only) Select the desired central using the 1 through 4 keys and the SELECT CENTRAL key. |
| 2 | Select the desired remote address using the 0 through 9 keys, then depress the SELECT REMOTE key. |
| 3 | Select the desired control point number using the 0 through 9 keys, then depress the SELECT CONTROL key. |
| 4 | Observe the DATA DISPLAY for the following indications:<br><br>(a) The lighted REMOTE and CONTROL point numbers are the ones selected. If they are not, repeat Steps 1 and 2. |

CHART 6 (Contd)

| STEP | PROCEDURE |
|---|---|
| | (b) The SCAN POINTS indicator lights.<br><br>(c) DISPLAY 1 lights.<br><br>***Note:*** The control operation has not been performed at this point. |
| 5 | If the control verification scan point to be operated is in a display other than DISPLAY 1, select the appropriate display number using the 0 through 9 keys, then depress the SELECT DISPLAY key. Observe that the correct display number appears in the DATA DISPLAY. |
| 6 | If the select control point is wired at the remote location for verification of remote control operation, perform Steps 7 through 11. If it is not, perform Steps 7 through 11, omitting Step 9. |
| 7 | Simultaneously operate the EXECUTE CONTROL and the ON, OFF, or MOMT keys as required for the particular control point.<br><br>***Note:*** This action transmits the proper command to the control point relay at the remote location. |
| 8 | Observe the lamp associated with the EXECUTE CONTROL key; it should light, then go out when the key is depressed. This indicates the successful completion of the control point command between the central and the remote. |
| 9 | Observe the control verification status point in the DATA DISPLAY for the correct indication as follows:<br><br>(a) ON key operation—control point numeric indicator lights<br><br>(b) OFF key operation—control point numeric indicator goes out<br><br>(c) MOMT key operation—control point numeric indicator lights, then goes out. |
| 10 | The printer will automatically log the necessary information (refer to Part 2C, Message 5). If the central is not equipped with a printer, manually log the time, central address, remote address, control point number, and the type of operation. |
| 11 | Depress the CLEAR FUNCTION key. All indicators in the DATA DISPLAY and the EXECUTE CONTROL key indicator lamp go out. |

4.02 ***Testing a Remote:*** Normal alarm reporting from other remotes in the system will not be affected while the procedure of Chart 7 is being performed. However, alarm reporting from the remote under test is inhibited during the short interval required to execute the test. If a test key is depressed and held, the remote under test will remain in the test mode (alarm reporting inhibited) until

the test key is released. In addition, the central will automatically select the SCAN POINTS function when a test key is depressed.

**CHART 7**

**TESTING A REMOTE**

| STEP | PROCEDURE |
|---|---|
| 1 | (Master only) Select the desired central using the 1 through 4 keys and depress the SELECT CENTRAL key. |
| 2 | Select the address of the remote to be tested using the 0 through 9 keys, then depress the SELECT REMOTE key.<br><br>***Note:*** DISPLAY 1 will automatically appear in the DATA DISPLAY. |
| 3 | Observe the DATA DISPLAY. Verify that the lighted REMOTE and DISPLAY numbers are the ones selected. |
| 4 | Depress the REMOTE TEST ONE key and observe the following indications:<br><br>(a) The lamp associated with the REMOTE TEST ONE key lights and goes out within 15 seconds. The keyboard is inactive while the lamp is lighted.<br><br>(b) All scan point indicators light momentarily (for approximately 15 seconds). Manually log all scan points that do not light as the printer will not record these. |
| 5 | Depress the REMOTE TEST ZERO key and observe the following indications:<br><br>(a) The lamp associated with the REMOTE TEST ZERO key lights and goes out within 15 seconds. The keyboard is inactive while the lamp is lighted.<br><br>(b) Any scan point indicators that are lighted in the DATA DISPLAY go out momentarily (for approximately 15 seconds). Log all scan points that do not go out as the printer will not record these. |
| 6 | If the selected remote has more than one display, select the next display number using the 0 through 9 keys, then depress the SELECT DISPLAY key. |
| 7 | Repeat Steps 4, 5, and 6 until all scan points in the selected remote have been tested. |

**4.03** ***Time-of-day clock:*** The time-of-day clock is set initially when the E3 Alarm System is turned up for service. If the system is turned down for any reason (such as maintenance or a power failure), the time of day must be reset.

## CHART 8

## INITIALIZING OR RESETTING THE SYSTEM TIME-OF-DAY CLOCK

| STEP | PROCEDURE |
|---|---|
| | ***Note:*** All code entries are made using the 0 through 9 numeric and CODE ENTRY keys. |
| 1 | Enter the initialization code 9999, then depress the CODE ENTRY key. |
| 2 | Enter code 19 or 20 followed by the last two digits of the year number (00 to 99), then depress the CODE ENTRY key. |
| 3 | Enter code 11 followed by the month number (01 to 12), then depress the CODE ENTRY key. |
| 4 | Enter code 22 followed by the day of the month number (01 to 31), then depress the CODE ENTRY key. |
| 5 | Enter code 33 followed by the hour of the day (00 to 23), then depress the CODE ENTRY key. |
| 6 | Enter code 44 followed by the minutes of the hour (00 to 59), then depress the CODE ENTRY key. |
| 7 | Enter the termination code 8888, then depress the CODE ENTRY key. |
| | ***Note 1:*** Any of the above parameters can be changed after entering the initialization code and before entering the termination code. Simply reenter the desired parameter. For example, to change the day of the month, repeat Step 4. |
| | ***Note 2:*** To change any parameter after entering the termination code, repeat Step 1, then repeat the steps associated with the parameter to be changed. For example, to change the month, repeat Steps 1, 3, and 7. |

**4.04** Change the threshold values of a remote's points. When the procedure of Chart 9 is performed, the E3 central will stop its normal remote polling cycle. Polling stops when the initialization code is entered and resumes when the termination code is entered. The central audible alarm sounds and a printer statement occurs when the threshold change initialization code is entered. If a period of 5 minutes elapses between keyboard entries or between the time the printer stops and a keyboard entry, the operator will be alerted by a printer statement and the central audible alarm. A master central controls only its own remote network threshold values.

## CHART 9

## INITIALIZING OR CHANGING THE THRESHOLD VALUE OF A REMOTE'S ALARM POINT(S)

| STEP | PROCEDURE |
|---|---|
| 1 | Locate CP114 at the back of the central console and operate switch S3 to the on (down) position. |
| 2 | Enter the initialization code 7777 using the 0 through 9 keys, then depress the CODE ENTRY key. |
| 3 | The audible alarm sounds and the printer prints out the statement CHANGE THRESHOLD VALUE PROGRAM ACTIVE (refer to Part 2C, Message 8). |
| 4 | Depress the AUDIBLE RELEASE key to silence the audible alarm. |
| 5 | Select the desired remote address using the 0 through 9 keys, then depress the SELECT REMOTE key. |
| 6 | Observe that the REMOTE number lighted in the DATA DISPLAY is the one selected and that DISPLAY 1 is lighted. |
| 7 | If the alarm points to be changed are in a display other than display number one, enter the desired display number on the 0 through 9 keys, then depress the SELECT DISPLAY key. |
| 8 | If the central is equipped with a printer and it is desired to have a record of the alarm point(s) threshold value in the selected display of the selected remote, depress the PRINT key (refer to Part 2C, Message 9).<br><br>***Note 1:*** It is advisable to print and retain a record of threshold values whenever value changes are made.<br><br>***Note 2:*** Printing can be stopped at any time by depressing the CLEAR FUNCTION key. |
| 9 | Enter code 11 on the 0 through 9 keys. Enter the number (01 through 64) of the alarm point to be changed on the 0 through 9 keys, then depress the CODE ENTRY key and observe the DATA DISPLAY for the following indications:<br><br>(a) The selected alarm point number is lighted (1 through 64 indicators).<br><br>(b) The selected alarm point present threshold value will be displayed in the DATA DISPLAY where a control point number is normally displayed (to the right of the display number). |
| 10 | Enter code 22 on the 0 through 9 keys. Enter the new threshold value (01 through 15) on the 0 through 9 keys, then depress the CODE ENTRY key. Observe that the new threshold value replaces the old threshold value in the DATA DISPLAY. |

CHART 9 (Contd)

| STEP | PROCEDURE |
|---|---|
| 11 | Repeat Steps 9 and 10 for each alarm point to be changed. |
| 12 | If a record of the alarm point threshold value changes is desired, depress the PRINT key. |
| 13 | Repeat Steps 7, 9, 10, and 11 for the remaining displays of interest in the selected remote. |
| 14 | Repeat Steps 5 through 7, 9 through 11, and 13 for all remotes with threshold value changes. |
| 15 | If a record of the alarm point threshold values for all remotes is desired, depress the AUTO PRINT key. |
| | ***Note:*** Printing can be stopped at any time by depressing the CLEAR FUNCTION key. |
| 16 | When all desired changes are complete, operate S3 located on CP114 to the off (up) position. |
| 17 | Enter the termination code 6666, then depress the CODE ENTRY key. |

## CHART 10

## PRINT ALARM THRESHOLD VALUES FOR A SELECTED REMOTE OR ALL REMOTES

| STEP | PROCEDURE |
|---|---|
| 1 | Locate CP114 at the back of the central console and operate switch three (S3) to the on (down) position. |
| 2 | Enter the initialization code 7777 using the 0 through 9 keys, then depress the CODE ENTRY key. The audible alarm will sound and printer will print the statement CHANGE THRESHOLD VALUE PROGRAM ACTIVE (refer to Part 2C, Message 8). |
| 3 | Select the desired remote address using the 0 through 9 keys, then depress the SELECT REMOTE key. Observe that the REMOTE number lighted in the DATA DISPLAY is the one selected and that DISPLAY 1 is lighted. |
| 4 | If a display other than display number one is desired, enter the desired display number on the 0 through 9 keys, then depress the SELECT DISPLAY key. Observe that the correct display number is lighted in the DATA DISPLAY. |
| 5 | Depress the PRINT key. The printer will print out the alarm point threshold values of the selected remote and display (refer to Part 3C, Message 10). |

**CHART 10 (Contd)**

| STEP | PROCEDURE |
|---|---|
| | ***Note:*** Printing can be stopped at any time by depressing the CLEAR FUNCTION key. |
| 6 | Repeat Steps 3, 4, and 5 for each remote or display to be printed. |
| 7 | If it is desired to print the alarm threshold values for all remotes in the system, perform Step 8; otherwise, proceed to Step 9. |
| 8 | Depress the AUTO PRINT key. The key indicator lamp lights, and the printer prints the alarm threshold values for all remotes in the system (refer to Part 3C, Message 10). |
| | ***Note:*** Printing can be stopped at any time by depressing the CLEAR FUNCTION key. |
| 9 | When all desired alarm point threshold value information has been obtained, operate S3 on CP114 to the off (up) position. |
| 10 | Enter the termination code 6666 using the 0 through 9 keys, then depress the CODE ENTRY key. |

**CHART 11**

**MANUAL PRINT REPORTS**

| STEP | PROCEDURE |
|---|---|
| | **System Information Report** |
| 1 | Depress the PRINT key. |
| 2 | The printer will output a message containing certain system information (refer to Part 2C, Message 7 for stand-alone and slave centrals, and to Part 3C, Message 8 for master centrals). |
| | **Data Display Report** |
| 3 | Depress the key associated with the type of information desired: NEW ALARMS, ALARMS, or SCAN POINTS. The key indicator lights. |
| 4 | Select the desired remote address using the 0 through 9 keys, then depress the SELECT REMOTE key. Select the desired display using the 0 through 9 keys, then depress the SELECT DISPLAY key. |
| 5 | Depress the PRINT key. The printer will output a message containing the displayed DATA DISPLAY information, and system summary information (refer to Part 3C, Message 8). |

CHART 11 (Contd)

| STEP | PROCEDURE |
|---|---|
| 6 | Depress the CLEAR FUNCTION key. All indicators in the DATA DISPLAY and in the NEW ALARMS, ALARMS, or SCAN POINTS indicator go out. |

CHART 12

DATA TRANSMISSION ERROR COUNT REPORT

| STEP | PROCEDURE |
|---|---|
| 1 | Enter the initialization code 5555 using the 0 through 9 keys, then depress the CODE ENTRY key.<br><br>***Note 1:*** This action resets the data transmission error counters (BCH and improper response) for each E2A SAC remote and slave E3C to zero, and the error count is restarted. Disregard the error count printout that the printer produces at this time.<br><br>***Note 2:*** A master central controls only its own data transmission error counts. |
| 2 | At the end of the test interval (a 1-hour interval is recommended) enter the initialization code 5555 using the 0 through 9 keys, and depress the CODE ENTRY key. |
| 3 | The printer will output a message (refer to Part 2C, Message 17 for stand-alone and slave centrals or Part 3C, Message 19 for master E3 centrals) containing the transmission errors accumulated during the test interval. |

CHART 13

NETTED AND UNNETTED MODES (Slave E3 Central Only)

| STEP | PROCEDURE |
|---|---|
| 1 | Depress the NET key to transfer the E3 central into the netted (slave) mode.<br><br>***Note:*** While in the netted mode, the NET key is the only active key. |
| 2 | Depress the NET key again to transfer the E3 central back into the unnetted mode. |