E2 STATUS REPORTING AND CONTROL SYSTEM
MANUAL ALARM CENTRAL
OPERATING PROCEDURES

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1. GENERAL

1.01 This section describes the operating procedures for the manual alarm central used with an E2 Status Reporting and Control System. The manual alarm central, referred to simply as central, is used for reporting alarms and status indications and for operating remote switches.

1.02 This section is reissued to include Part 3 on trouble isolation and sectionalization and to make minor textual changes. Since this reissue constitutes a general revision, marginal arrows ordinarily used to indicate changes have been omitted.

1.03 An E2 manual alarm central (Fig. 1) contains an alarm display panel and a status display and remote switch control panel.

1.04 The alarm display panel (Fig. 2) indicates the results of the automatic alarm polling mode. A panel can contain two sets of eight vertical columns of electromagnetic indicators, with each column representing a remote station. There are seven indicators per vertical column. Six of the indicators represent alarms from that remote station and one represents the remote station failure. An additional panel may be furnished for a central serving more than 16 remote stations. Figure 2 shows only one such panel.

1.05 When an alarm is indicated, the alarm polling mode may be interrupted manually and the status display report mode initiated. This pinpoints the alarm to a specific status indication.

1.06 The status display and remote switch control panel (Fig. 3) is used for both the status display reporting operation and the remote switching operation. This panel will be referred to as the control panel in the remainder of this section.

1.07 For initiating a status display report, the control panel is used to manually select a remote station (also referred to in this section simply as remote) and to request a particular status display report from that remote. The report is displayed on the status display for analysis. The display is an 8-by-8 matrix of electromagnetic indicators. A parity error in transmission or failure to reply to the manual alarm central causes the ERROR lamp on the control panel to light.

1.08 When a remote switch operation is to be performed, the control panel is used to manually select a remote station in order to initiate the remote switch command. The remote performs a momentary contact closure for the switch selected and sends a reply informing the central that the remote switch command was received. This reply does *not* verify that the momentary closure was made. The only way to verify the remote switch operation is to perform a status display report for the switch. This verification is valid only if the

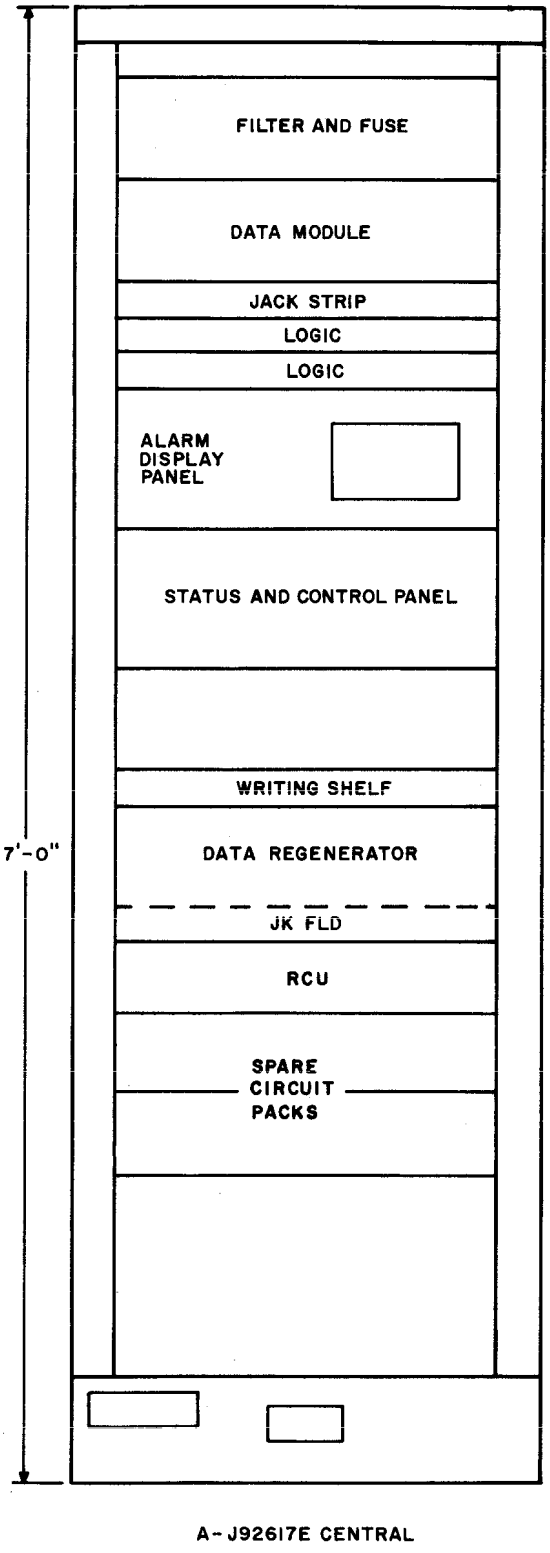


Fig. 1—Typical Manual Alarm Central

switch is also wired as a status. If a parity error occurs in transmission or if the manual alarm central does not receive verification that the remote station received the command correctly, the ERROR lamp lights.

1.09 Manual alarm central transmissions are received by all remotes on the same data network. Each remote has a discrete address and responds only to transmissions containing the proper address. System operation is controlled by commands transmitted from the manual alarm central.

2. OPERATING PROCEDURES

A. Alarm Polling

2.01 Alarm polling is an automatic mode of operation where the manual alarm central transmits a word to a remote, requesting alarm information. After that remote responds, the manual alarm central automatically polls the next remote. This sequence continues until all remotes have been polled. The cycle is then started again automatically. Thus, alarm polling is continuous unless it is interrupted by one of the other modes.

2.02 There are two types of alarm conditions reported to the manual alarm central and displayed on the alarm display panel: monitored equipment alarms and E2 station failure alarms. The monitored equipment alarms are conditioned at the remote to respond to a NEW alarm and an ANY alarm indication. The NEW alarm indication is retired when the central reports the status display containing the status point which is in the alarm state. The ANY alarm indication remains until the alarm in the monitored equipment is retired. The station failure alarm indicates that a remote station has failed to respond to a request from the central. Chart 4 describes the operation of the station failure alarms. (See also 2.04.)

2.03 A 16-station alarm display panel, where the 16 stations are on the same data network, consists of a panel containing a maximum of 16 columns of indicators. Each column is permanently associated with a particular remote and contains six indicators representing alarm or status indications and one indicator representing remote station failure.

2.04 Provided on the alarm display panel is an MCO/SFCO key for each remote station. The SFCO position inhibits activation of the office

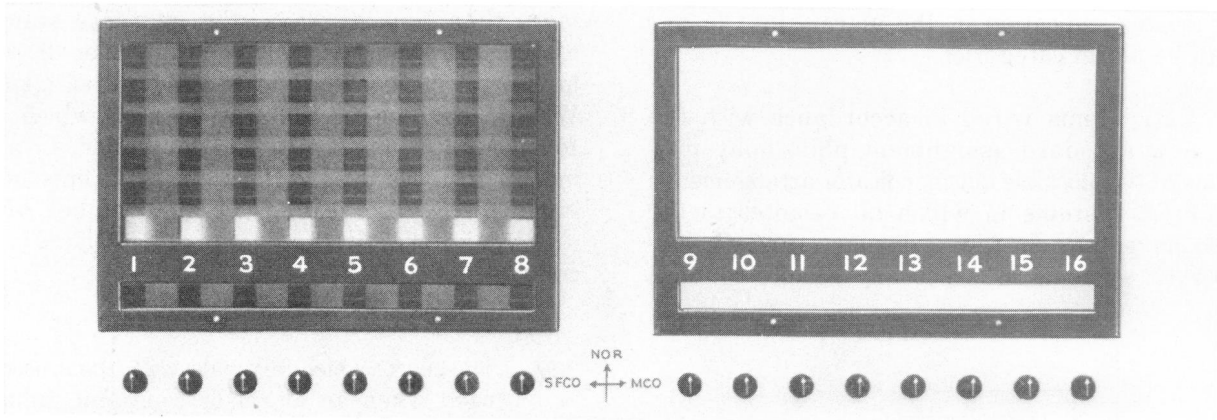


Fig. 2—Typical Alarm Display Panel

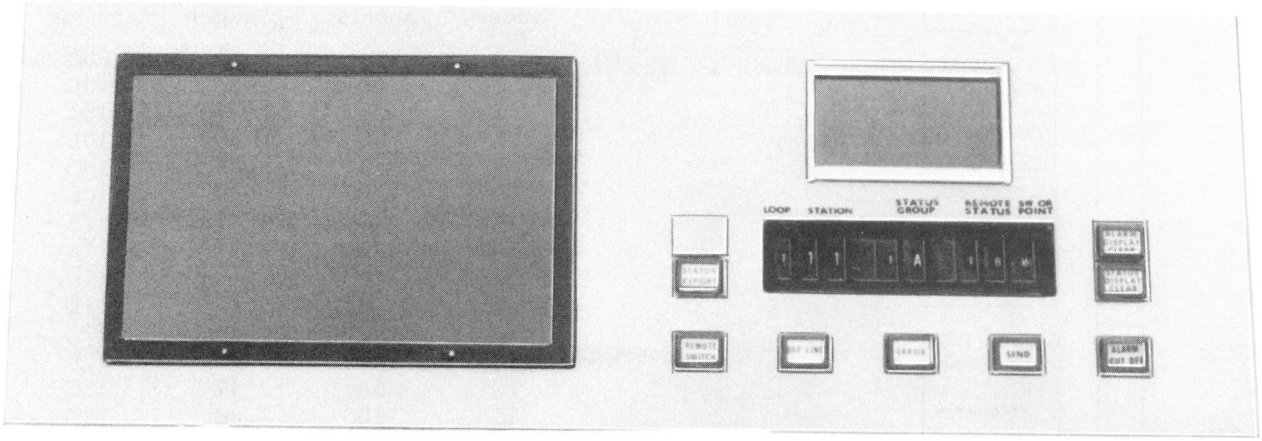


Fig. 3—Typical Status Display and Remote Switch Control Panel

audible alarm in the event of a station failure. This position does not inhibit *new* alarms from displaying or activating audible alarms. The MCO position inhibits activation of the office audible alarm upon receipt of a *new* alarm from that station. The MCO position does not inhibit visual indications from being presented on the alarm display panel and does not inhibit audible alarms caused by station failure.

CAUTION: The MCO position should be used only when a remote station is being manned by qualified personnel who assume responsibility for alarms when they occur in the station.

2.05 A number of two-state status indications at a remote may be combined to form alarm categories. The indicators on the alarm display panel are paired and associated with an alarm category (Fig. 4). One indicator is called an *any* alarm and indicates whether one or more of the categories are in the alarm state. The other indicators are assigned as *new* alarms and indicate when any one of the status indications in that alarm category changes from the no-alarm state to the alarm state. The assignment of the six indicators in a column is optional. For example, instead of pairing indicators, it is possible to have five of the indicators represent *new* alarms and one indicator to represent an *any* alarm. For the latter case, the *any* indicator would be set as long as there

was a status indication in the alarm state in any of the five alarm categories.

2.06 E2 systems wired in accordance with the new standard assignment philosophy may have one of two possible alarm indicator arrangements; one for E2 systems in which all remotes in the system have four or fewer displays (Fig. 5), and one for E2 systems in which any remote contains more than four displays (Fig. 6). The standard assignment philosophy relates information displayed in the alarm poll word to specific status displays. When a system incorporates remotes which have four or more displays, a display called an alarm index display is used. The bit assignments in this index display correspond to the number of the display in which the alarm occurred via the conversion shown in Table A.

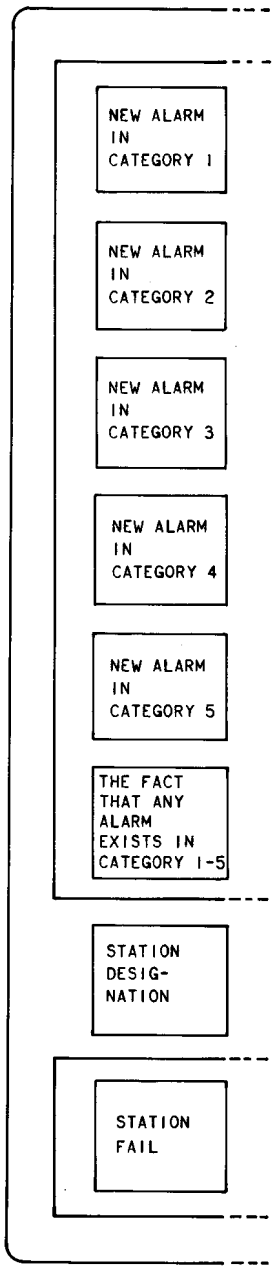


Fig. 4—Alarm Display—Typical Indicator Assignment

2.07 The charts which follow describe the procedures used when an alarm or a station failure is indicated.

TABLE A

CONVERSION OF ALARM INDEX DISPLAY NUMBERS

INDICATOR NUMBER	DISPLAY ADDRESS	INDICATOR NUMBER	DISPLAY ADDRESS
5	2A	35	9C
6	2B	36	9D
7	2C	37	10A
8	2D	38	10B
9	3A	39	10C
10	3B	40	10D
11	3C	41	11A
12	3D	42	11B
13	4A	43	11C
14	4B	44	11D
15	4C	45	12A
16	4D	46	12B
17	5A	47	12C
18	5B	48	12D
19	5C	49	13A
20	5D	50	13B
21	6A	51	13C
22	6B	52	13D
23	6C	53	14A
24	6D	54	14B
25	7A	55	14C
26	7B	56	14D
27	7C	57	15A
28	7D	58	15B
29	8A	59	15C
30	8B	60	15D
31	8C	61	16A
32	8D	62	16B
33	9A	63	16C
34	9B	64	16D

Example: If indicator 12 is lighted in the new Alarm Index Display 1A, there is a new alarm somewhere in display 3D.

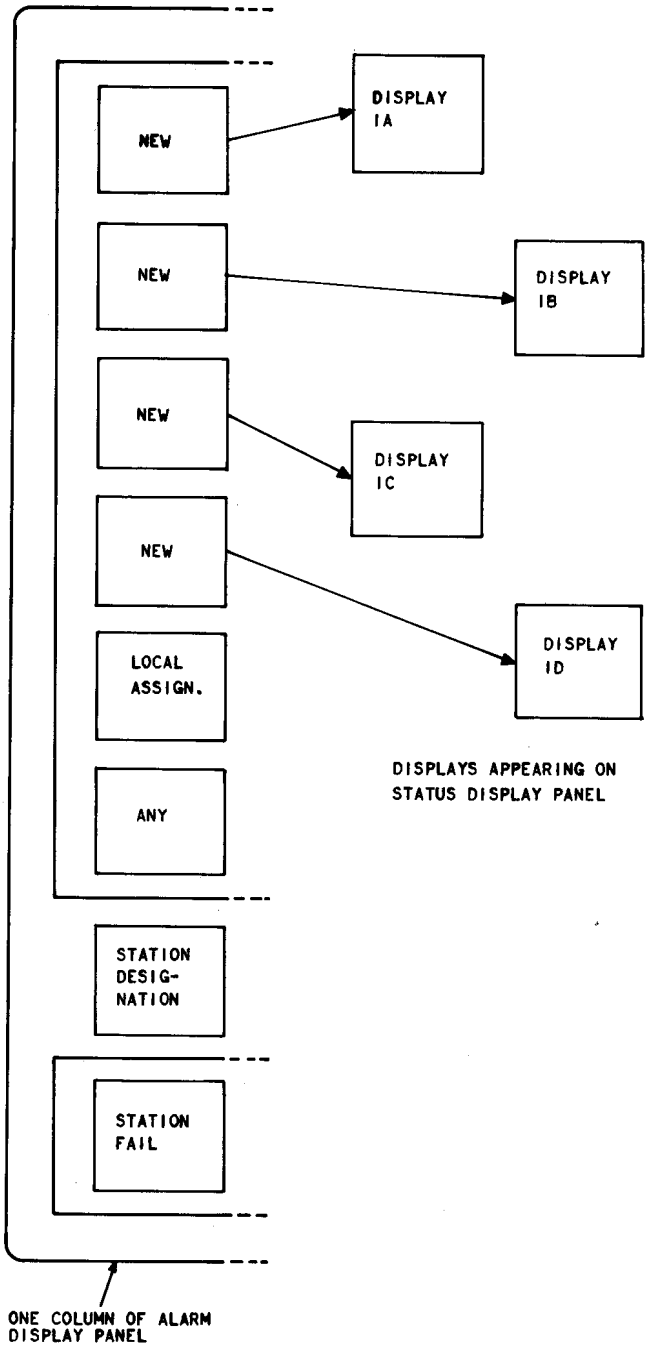


Fig. 5—Alarm Display for E2 Systems in Which All Stations Have Four Status Displays (New Assignment Philosophy)

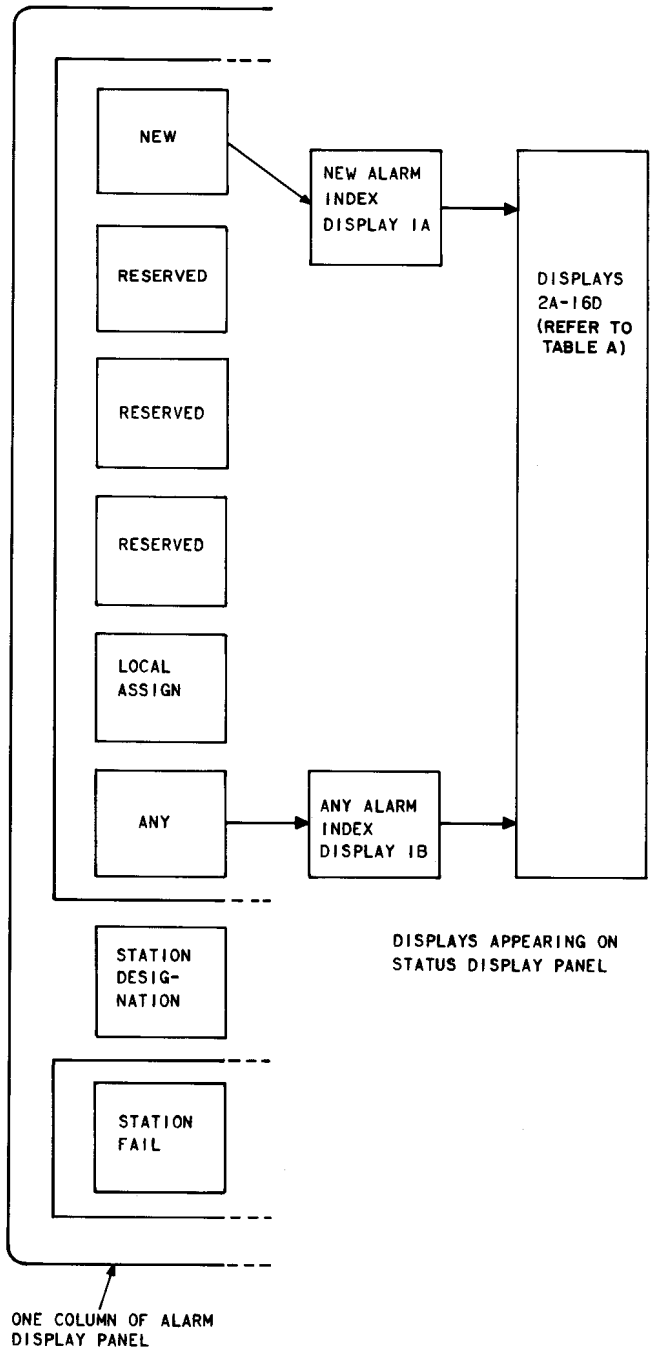


Fig. 6—Alarm Display for Stations Having More Than Four Status Displays (New Assignment Philosophy)

CHART 1

ALARM INDICATIONS

STEP	PROCEDURE

When an alarm indication is reported to the manual alarm central, the *new* alarm indicator for that alarm category and the *any* alarm indicator are set (show a yellow flag). The major or minor alarm sounds.

1 Depress the ALARM CUT OFF pushbutton on the control panel. The audible alarm is silenced. The ALARM CUT OFF lamp is lighted.

2 Initiate a status display report for the alarm category in which the *new* alarm is indicated (see 2.08 through 2.10 and Chart 3). The remote station number is designated on the panel just above the station failure indicator.

3 Depress the ALARM CUT OFF pushbutton on the control panel. The ALARM CUT OFF pushbutton is released. The ALARM CUT OFF lamp is extinguished.

Note 1: As the remote is polled again, all the indicators for it are automatically updated. That is, the *any* indicator remains set as long as the trouble exists, but the *new* indicator is cleared. However, if a different alarm situation is detected on this poll, the *new* indicator is set again and the major or minor sounds. If a display report is not initiated between the alarm poll which detected an alarm situation and the next alarm poll for that station, the *new* indicator remains set until the proper display is scanned.

Note 2: All the indicators on the alarm display panel may be reset by depressing the ALARM DISPLAY CLEAR pushbutton. On the next alarm poll cycle, the remote station having alarms again sets the *new* and *any* indicators. The function of the ALARM DISPLAY CLEAR pushbutton is to clear the panel indicators at the manual alarm central. However, it does not clear the alarm indication at the remote station. A status display report must be initiated for the affected status display to clear the *new* indication at the remote station.

CHART 2

STATION FAILURE

STEP	PROCEDURE
	When a remote station fails to respond to an alarm polling request with a valid reply within an established time interval, the SF (station failure) indicator is set on the alarm display panel and the major alarm sounds.
1	Depress the ALARM CUT OFF pushbutton on the control panel. The audible alarm is silenced. The ALARM CUT OFF lamp is lighted.
2	Depress the ALARM DISPLAY CLEAR pushbutton on the control panel. The SF indicator clears.
3	Depress the ALARM CUT OFF pushbutton on the control panel. The ALARM CUT OFF lamp is extinguished.
4	Turn the MCO/SFCO key on the alarm display panel to the SFCO position if the remote station continues to fail, to keep the audible alarm from sounding. The SF indicator is set. After the trouble has been cleared, return the MCO/SFCO key to the normal position and press the ALARM DISPLAY CLEAR pushbutton to clear the SF indicator.

B. Status Display Reporting

2.08 In the status display reporting mode, the operator can, through the use of the control panel, select any group of 64 status points at a remote station for simultaneous display on the 8-by-8 status display panel. The operator may request a particular display report as a result of an alarm indication received during an alarm poll or simply to watch one or more points in a display.

2.09 Each status display has a discrete address which contains a group number and a letter, A through D. Thumbwheel switches are provided on the control panel to select the proper address.

2.10 Selection of the proper status display from an alarm report depends upon the arrangement of the particular system. In E2 systems having an alarm report arrangement as in Fig. 4, the operator must consult the station records. In E2 systems with an arrangement as shown in Fig. 5, each alarm indicator has an associated detailed status display. In stations having many displays arranged as in Fig. 6, each alarm indicator has an associated index display which in turn points to a detailed status display.

CHART 3

STATUS DISPLAY REPORTING

STEP	PROCEDURE
1	Select the data network and the remote station on the LOOP STATION thumbwheel switches.
2	Select the desired status display on the STATUS GROUP thumbwheel switches.
3	Depress the STATUS REPORT pushbutton. The STATUS REPORT lamp is lighted.
4	Depress the SEND pushbutton. Status indications for the selected display are then displayed on the panel for analysis. The SEND pushbutton is lighted during the report operation. ***Note 2:*** If the ERROR lamp is lighted when the SEND lamp extinguishes, the displayed information is incorrect. Re-initiate the report by depressing the SEND pushbutton again. This should correct the display.
5	Depress the STATUS DISPLAY CLEAR pushbutton. All display indicators are reset.

C. Remote Switching

2.11 Control switches are provided on the control panel for initiating the momentary closure of specific relay contacts at remote stations. The procedures for carrying out this operation are described in the following steps to be performed at the central.

CHART 4

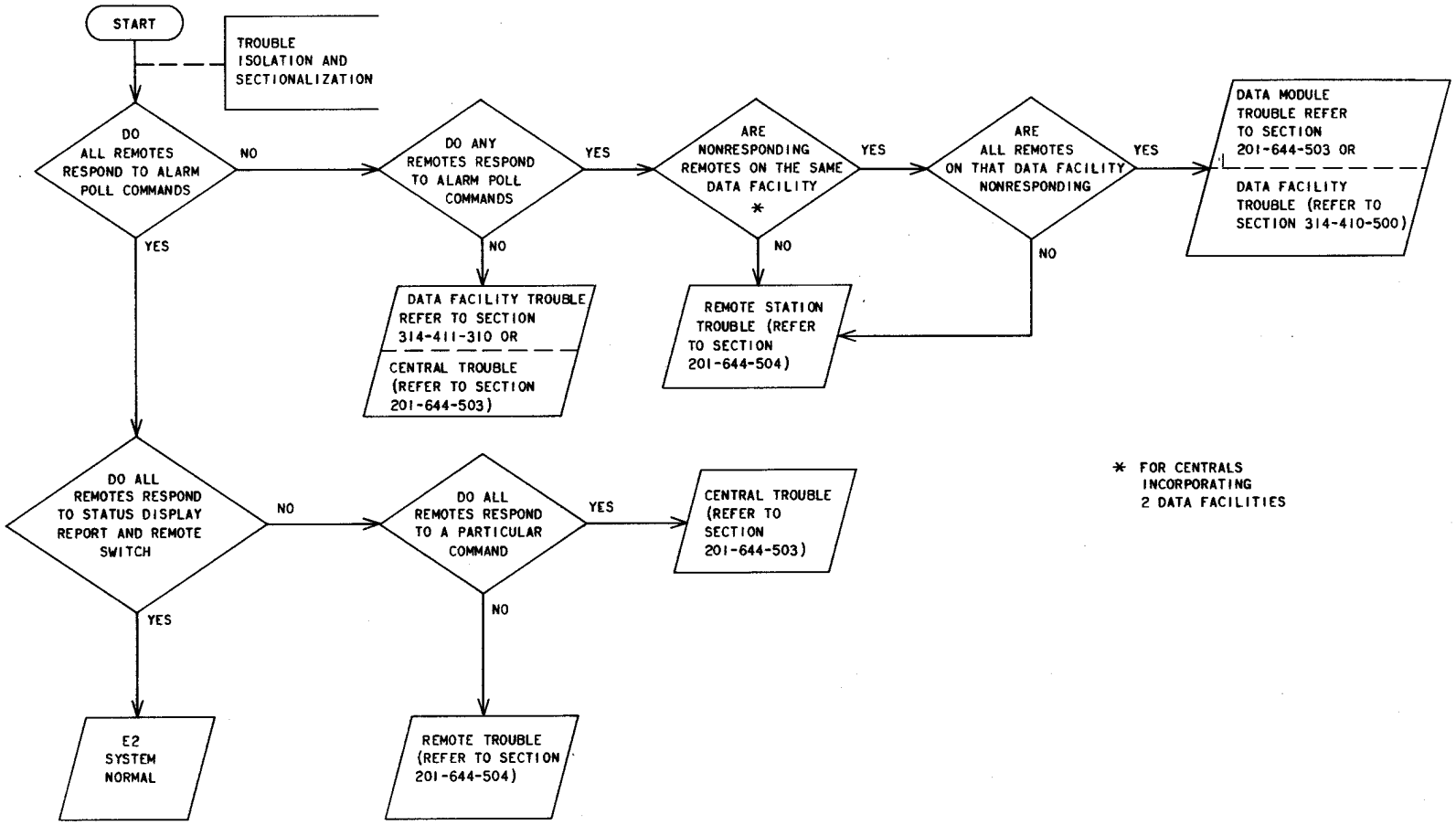
REMOTE SWITCH

STEP	PROCEDURE
1	Select the data network and the remote station on the LOOP STATION thumbwheel selectors.
2	Select the remote switch address on the three thumbwheel switches designated REMOTE SW or STATUS POINT.
	Caution: Check that the proper switch address is selected.
3	Depress and hold the REMOTE SWITCH pushbutton.
4	With the REMOTE SWITCH pushbutton held operated, depress the SEND pushbutton. Release both pushbuttons. The REMOTE SWITCH and SEND lamps light and remain lighted during the operate remote switch sequence.
5	If the ERROR lamp is lighted when the REMOTE SWITCH and SEND lamps extinguished, the information was not received correctly. Repeat Step 4.
6	If the remote switch is wired as a status, initiate a status display report to determine that the proper switch has operated.

3. TROUBLE ISOLATION AND SECTIONALIZATION

3.01 Flowchart 1 (FC1) is a trouble isolation and sectionalization flowchart for use at the Manual Alarm Central. The purpose of this flowchart is to isolate a problem to the central equipment, the data network, or the remote equipment.

3.02 When a trouble condition occurs, the central operator should perform the operations, indicated by the FC1.



Flowchart 1—Trouble Isolation