E1 STATUS REPORTING AND CONTROL SYSTEM

OPERATION

CONTENTS PAGE

1. GENERAL

1.01 This section describes the normal operating procedures for the E1 Status Reporting and Control System as used for reporting alarms and status indications and operating remote switches.

1.02 This section constitutes a revision and renumbering of material formerly in Section 201-639-301, Issue 1. This revision consists of updating to be in accordance with latest equipment and providing specific operating instructions.

1.03 A typical E1 central station (Fig. 1) contains alarm display, status group report, and remote switching panels.

1.04 The alarm display panel (Fig. 2) indicates the results of the automatic alarm polling mode. The display consists of a column of 16 lamps for each remote station. If an alarm is reported by a remote station, it will be displayed in the appropriate column on the alarm display panel.

1.05 When an alarm is indicated, the alarm polling mode may be interrupted manually and a group report mode initiated to determine the particular status indication(s) causing the alarm.

1.06 The group report panel (Fig. 3) is used to manually select a remote station and to request a complete status group report. The entire group report is displayed on the panel for analysis.

1.07 The remote switch panel (Fig. 4) is used to manually select a remote station and to send a switching command to that station. Each switch command is displayed on the remote switching panel before being transmitted.

1.08 All central station transmissions are received by all remote stations on the same data facility. Each remote station has a discrete address and only responds to transmissions containing the proper address. System operation is controlled from the central station, and remote station transmissions are always replies to central station transmissions.

1.09 The remote station equipment (Fig. 5) may include a local control panel which is used for local control of that remote station. This control panel (Fig. 6) is used as an aid in maintaining the E1 remote station equipment and to provide local

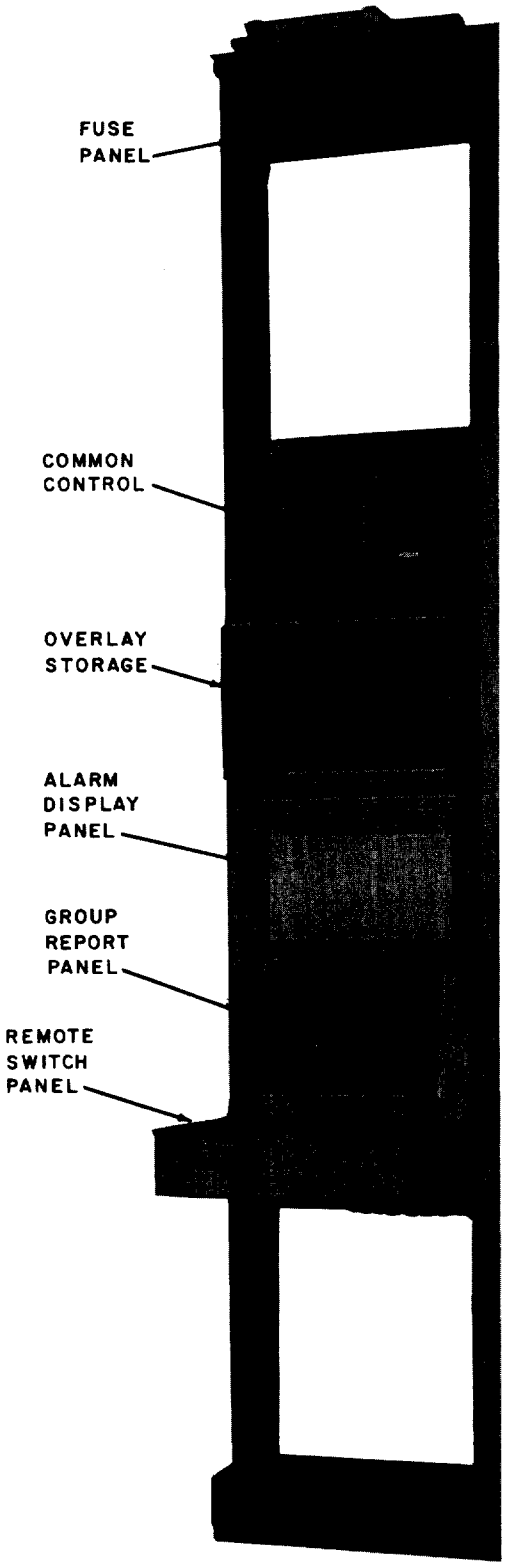


Fig. 1—Typical Central Station

control during repair of a failed data facility. The local control panel has three modes of operation: the standby mode, the query status mode, and the operate switch mode.

2. OPERATING PROCEDURES—CENTRAL STATION

ALARM POLLING

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

2.02 The E1 central station contains two alarm relays. One will operate and provide a closed contact to the office alarm system when a major alarm condition exists. The other relay will provide a similar indication when a minor alarm condition exists. Optional connections are available behind the alarm display panel to associate the major alarm relay with all lamps indicating major alarms and the minor alarm relay with all lamps indicating minor alarms. There are two types of alarm conditions reported—status point alarms and station failure alarms.

A. Status Point Alarms

2.03 The lamps on the alarm display panel may represent individual status indications or alarm groups. If alarm grouping is used, a number of status indications at a remote station are combined to give two common indications. One of these indicates whether one or more of the status indications within an alarm group are in the abnormal state ("any" alarm). The other indicates when any one of these indications changes from the normal to the abnormal state ("new" alarm). This provides the central with an indication when any of the alarms are present and when a new alarm occurs. A typical alarm lamp assignment for a remote station is shown in Fig. 7.

2.04 Assuming that an alarm condition is associated with the major alarm relay and the lamp assignment shown in Fig. 7 is used, the following

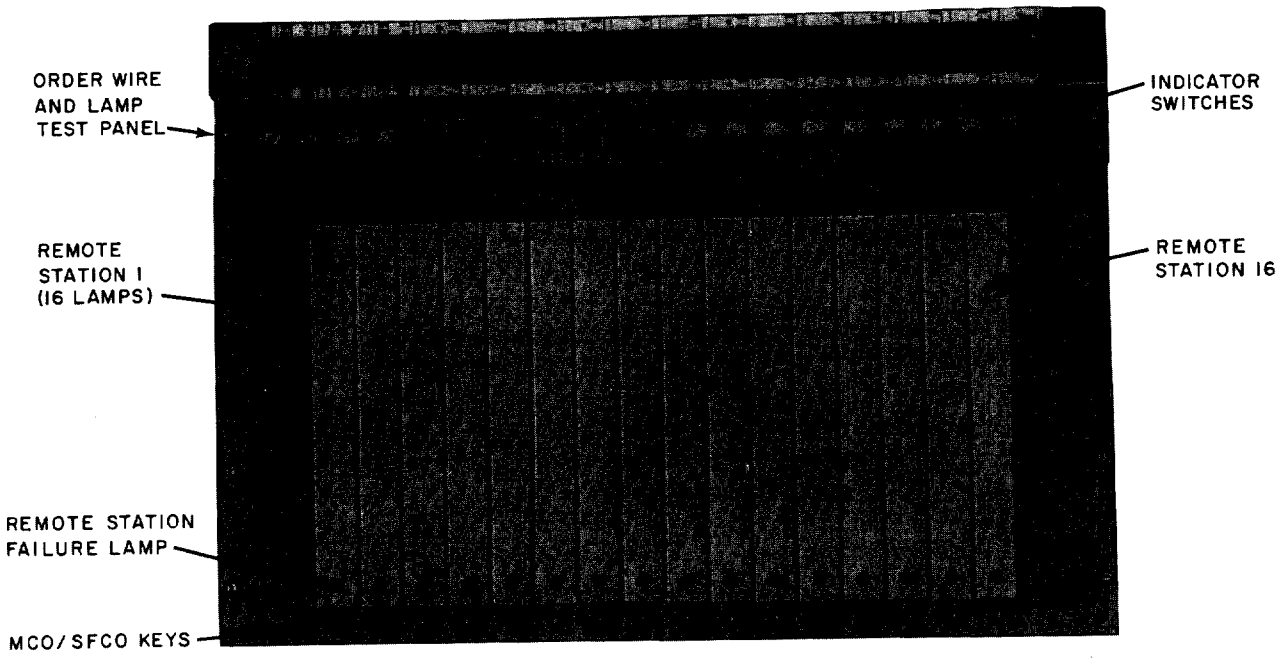


Fig. 2—Alarm Display Panel

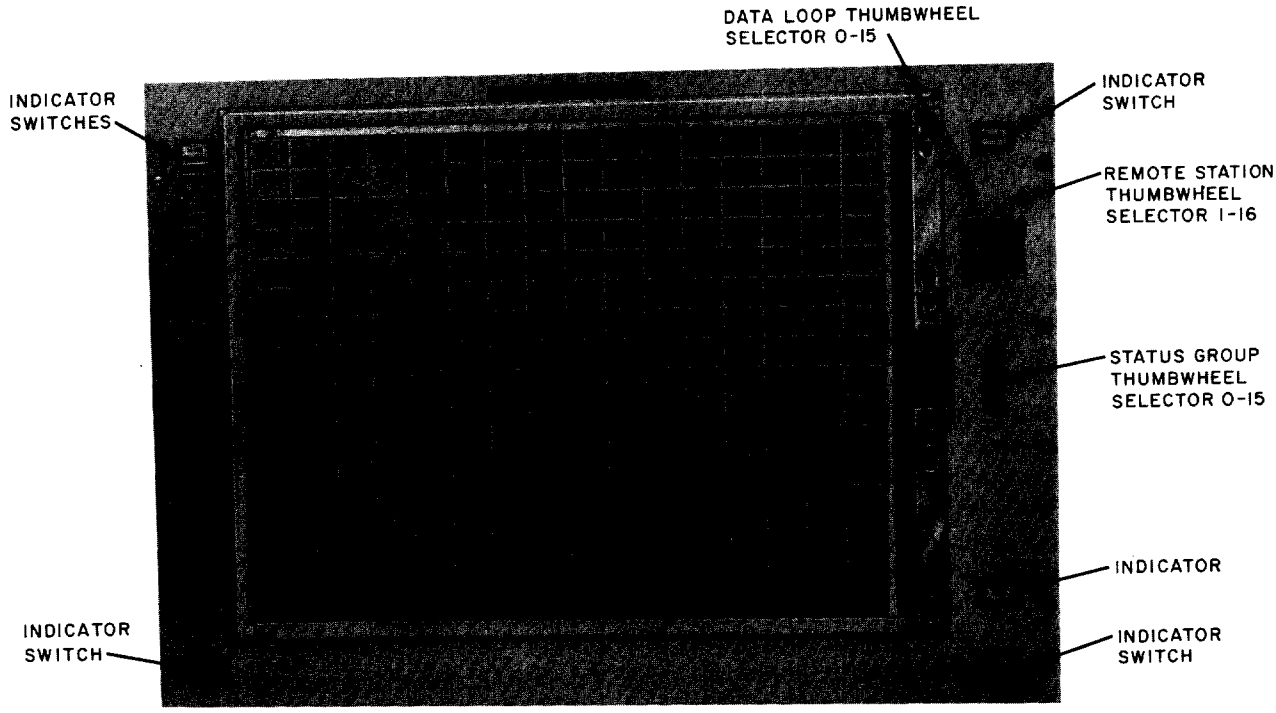


Fig. 3—Group Report Panel

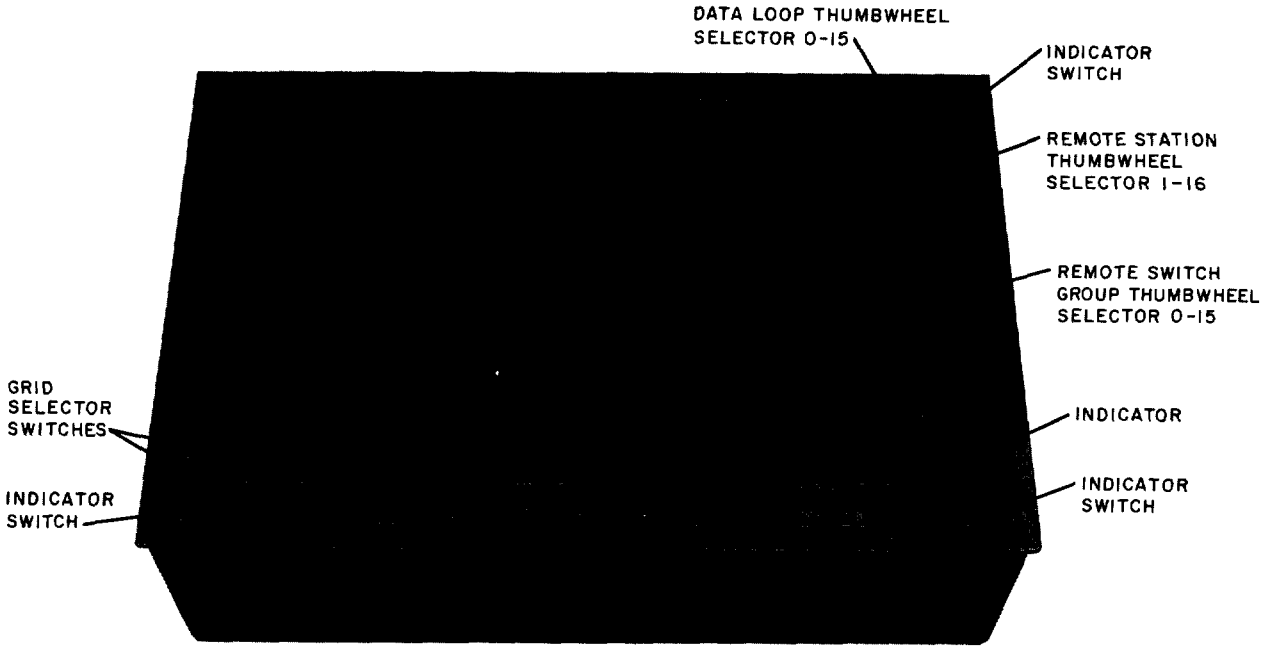


Fig. 4—Remote Switch Panel

procedures would apply when an alarm condition was detected during polling.

(1) The major alarm sounds and the MAJ ALM lamp lights on the group report panel.

(2) The "new" and "any" lamps associated with the alarm group or category in which the alarm condition was detected both light.

(3) Depress the MAJ ALM/ACO switch on the group report panel. This silences the audible alarm and extinguishes the MAJ ALM lamp. The ACO lamp lights.

(4) Perform a group report operation on the status group associated with the alarm group or category. This operation will determine the status point(s) in the abnormal state. It also extinguishes the "new" lamp and the ACO lamp. The "any" lamp will remain lighted as long as the status point remains in the abnormal state. If another new alarm occurs within this alarm group, the "new" lamp will again light and an office alarm will be initiated. Since an alarm already exists in the alarm group, the "any" lamp will remain lighted. The above procedures starting at Step 3 should be performed to handle the alarm.

2.05 For a minor alarm condition, the procedures are the same as described for a major alarm except the MN ALM/ACO switch and lamps are involved.

B. Station Failure Alarm

2.06 When a remote station fails to respond to a central station polling request or when a transmission error is detected by the parity check circuit, the central station polls that remote station again. That remote station is polled until a valid reply is received or until an established time interval (350 milliseconds) has elapsed. If the remote station has not transmitted a valid reply at the end of the timing period, the central station indicates a station failure.

2.07 Assuming that a station failure is associated with the major alarm relay, the following procedures apply.

(1) The major alarm sounds and the MAJ ALM lamp lights on the group report panel.

(2) The STATION FAIL lamp associated with the failed remote station lights on the alarm display panel.

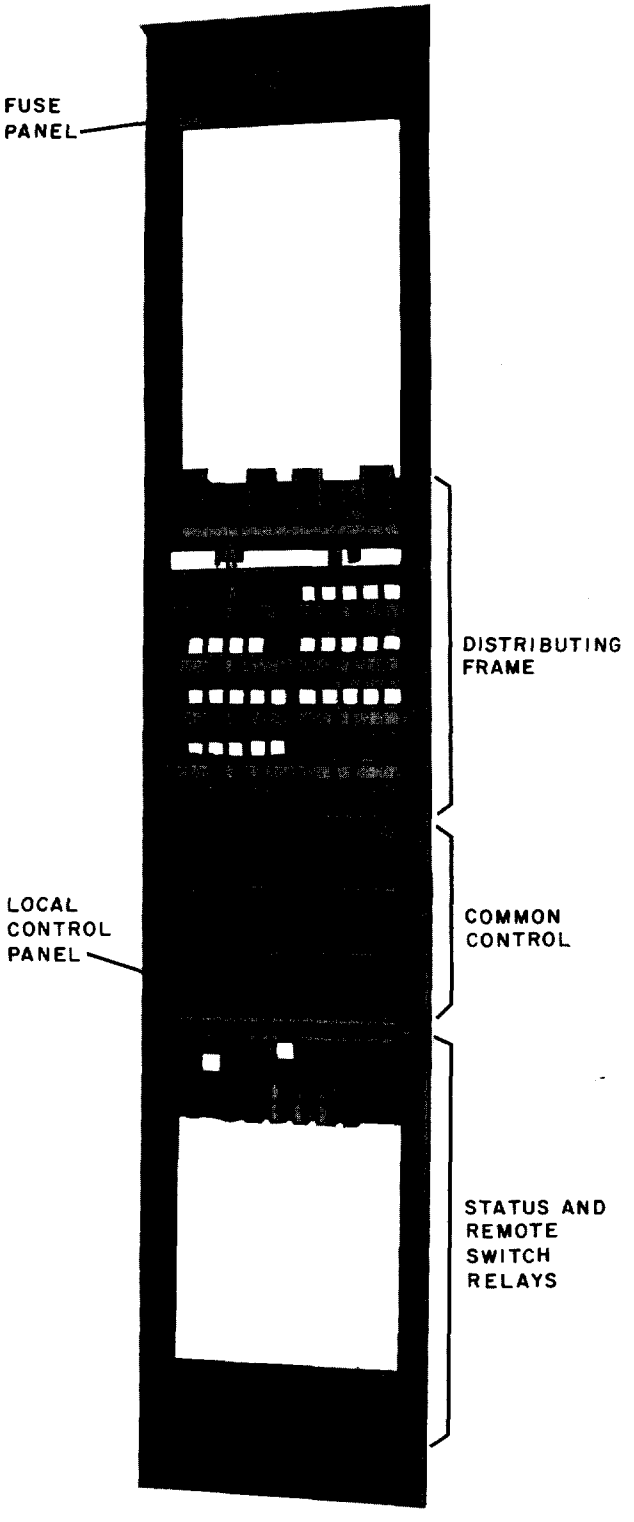


Fig. 5—Typical Remote Station

(3) Depress the MAJ ALM/ACO switch. This silences the audible alarm and extinguishes the MAJ ALM lamp. The ACO lamp lights.

(4) Operate the MCO/SFCO key on the alarm display panel to the SFCO position and back again to the normal position. The STATION FAIL lamp will extinguish and remain extinguished if the remote station responds with a valid reply the next time it is polled.

(5) If the station continues to fail, operate the MCO/SFCO key to the SFCO position and depress the MAJ ALM/ACO switch. The MAJ ALM lamp will extinguish. The STATION FAIL lamp will remain lighted until the MCO/SFCO key is placed in the normal position. The SFCO position is an acknowledgment by the operator that the station has failed due to a problem at the remote station or a problem in the data facility to that station. This prevents the failed station from continually sounding an audible alarm.

(6) If a station failure is associated with the minor alarm relay, the procedures are the same as described for a major alarm except the MN ALM/ACO switch and lamps are involved.

STATUS GROUP REPORTING

2.08 The status group report panel contains control switches and 256 indicating lamps. These lamps represent a status report group. A group status report may be initiated by using microswitches activated by an overlay (overlay addressing) or by using thumbwheel selector switches (selector switch addressing). Table A shows the method for coding the overlay notches. These two methods are described in the following steps.

A. Overlay Addressing

(1) Determine the status group to be reported.

(2) Obtain the notched overlay associated with the selected status group and station from the overlay bin.

(3) Check to see that the ACTIVE lamp in the ACTIVE/STANDBY switch is lighted. If the STANDBY lamp is lighted, momentarily

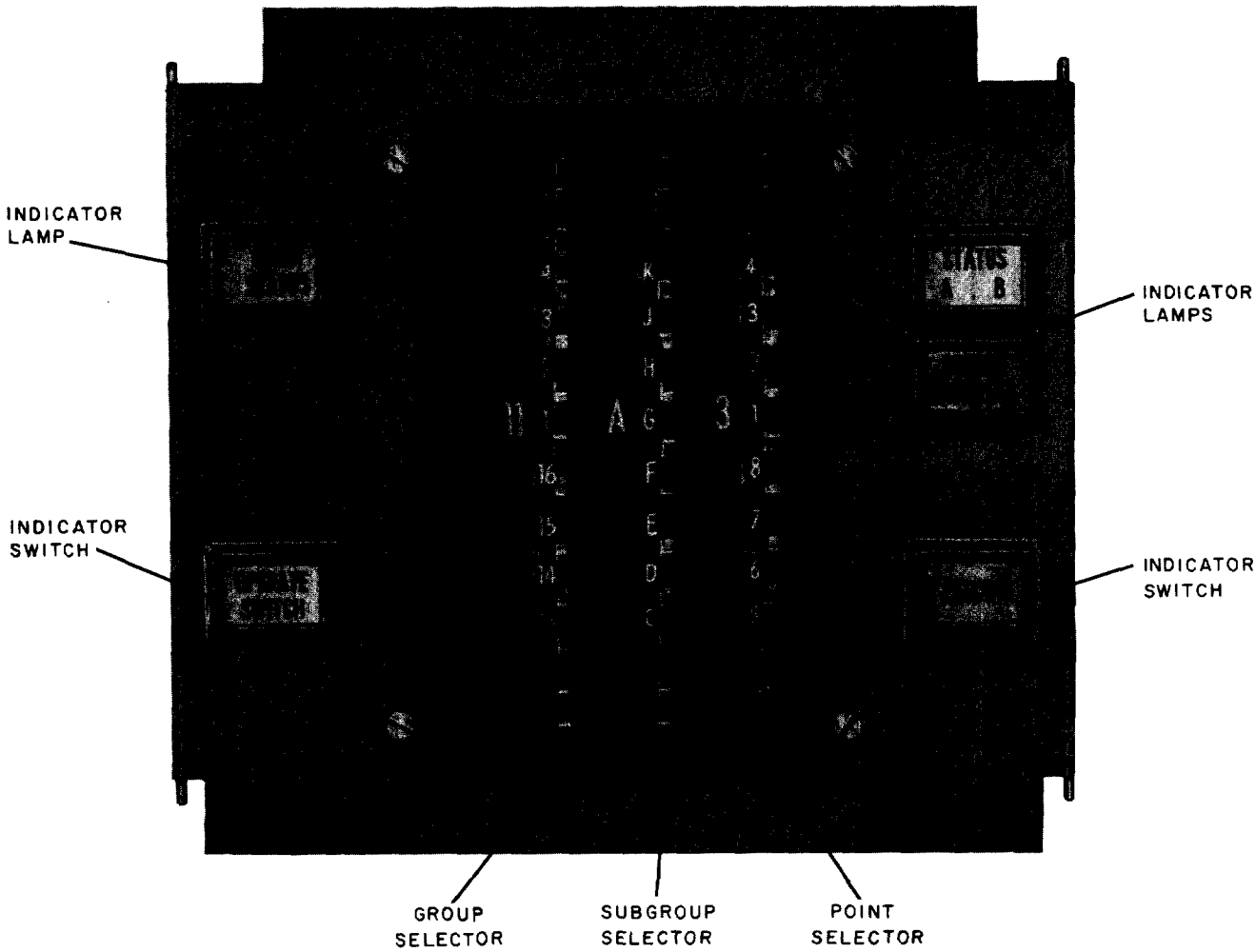


Fig. 6—Remote Station Local Control Panel

depress the switch to bring the console to the ACTIVE condition.

(4) Using the raised tabs, slide the two locking bars on the right of the panel inward. This should make the bars somewhat loose.

(5) Using the raised tab on the long metal bar, move the entire locking apparatus to the right.

(6) Place the selected overlay on the group report panel and slide to the left so the left side of the overlay extends under the metal lip on the left side of the panel.

(7) Push the notched right side of the overlay down so the entire overlay is flush against the panel. Make sure the vertical and horizontal lines of the overlay coincide with the lines of the panel itself.

(8) Move the entire locking apparatus to the left so the long metal bar is covering the notched edge of the overlay. The notches on the overlay are coded and operate microswitches which select the remote station, the data facility, and the status group to be reported.

(9) Using the raised tabs, slide the two locking bars outward with hand pressure only. This should make the bars tight and lock the overlay notches and microswitches.

(10) Depress the REPORT switch. If no error occurs, the requested group of up to 256

status indications will be reported and displayed on the panel for analysis. The REPORT switch is lighted during the report operation. A lighted status lamp indicates an abnormal condition exists for the status point marked on the overlay. System operation automatically returns to the alarm polling mode upon completion of the group report.

(11) If the ERROR lamp lighted after the REPORT key was depressed, it indicates an error. Disregard any displayed status indications. Depress the REPORT switch again to resend the request. Operation of the REPORT switch extinguishes the ERROR lamp.

(12) Continual errors indicate system malfunction, improper seating of overlay, or incorrect overlay.

(13) After taking appropriate action (logging trouble, etc.), depress the CLEAR switch. This operation extinguishes the status indicator lamps.

(14) Using the raised tabs, slide the two locking bars inward as far as possible. Slide the entire locking apparatus to the right and remove the overlay.

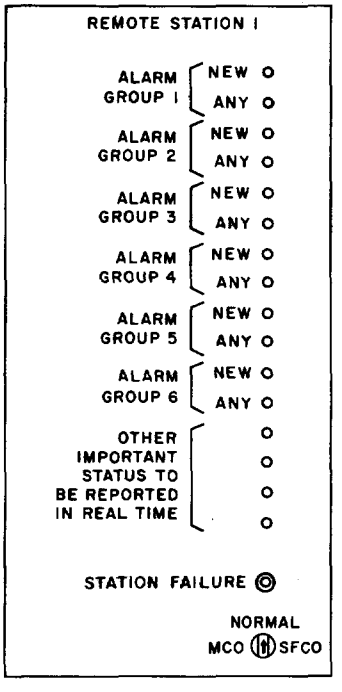


Fig. 7—Alarm Display Typical Lamp Assignment

B. Selector Switch Addressing

(1) Determine the status group to be reported.

(2) Check to see that the ACTIVE lamp in the ACTIVE/STANDBY switch is lighted. If the STANDBY lamp is lighted, momentarily depress the switch to bring the console to the ACTIVE condition.

(3) Select the overlay associated with the selected status group.

(4) Place the overlay on the group report panel and slide to the left so the left edge of the overlay extends under the metal lip on the left side of the panel. Push the overlay down flush against the panel. If the microswitch locking apparatus is mounted on the panel, move the entire apparatus to the right before pushing the overlay down.

(5) Select the data facility and remote station on the LOOP STA thumbwheel selectors.

(6) Select the status group on the SI GRP thumbwheel selector.

(7) Depress the MANUAL switch to inhibit the overlay microswitches and enable the selector switches.

(8) Depress the REPORT switch. If no error occurs, the requested group of up to 256 status indications will be reported and displayed on the panel for analysis. The REPORT key is lighted during the report operation. A lighted status lamp indicates an abnormal condition exists for the status point marked on the overlay. The MANUAL switch releases after the report operation is complete, reverting control back to the overlay coding. System operation automatically returns to the alarm polling mode upon completion of the group report.

(9) After taking appropriate action (logging trouble, etc.), depress the CLEAR switch. This action extinguishes the status indication lamps.

(10) If the ERROR lamp lighted when the REPORT switch was depressed, it indicates an error. Disregard any displayed status indications. Depress the MANUAL switch and then the REPORT switch to resend the request. Operation of the REPORT switch extinguishes the ERROR lamp.

(11) Continual errors indicate system malfunction.

(12) Remove the overlay from the group report panel.

REMOTE SWITCHING

2.09 The remote switch panel contains control switches and indicating lamps for initiating the momentary closure of relay contacts at remote stations. A switch operate command may be initiated by using microswitches activated by an overlay (overlay addressing) or by using thumbwheel selector switches (selector switch addressing). The two methods are described in the following steps.

A. Overlay Addressing

(1) Check to see that the ACTIVE lamp in the ACTIVE/STANDBY switch is lighted. If the STANDBY lamp is lighted, momentarily depress the switch to bring the console to the ACTIVE condition.

(2) Determine the proper remote switch group and station.

(3) Obtain the overlay associated with the remote switch group and station.

(4) Using the raised tabs, slide the two locking bars on the right of the panel inward. This should make the bars somewhat loose.

(5) Using the raised tab on the long metal bar, move the entire locking apparatus to the right.

(6) Place the selected overlay on the remote switching panel and slide to the left so the left side of the overlay extends under the metal lip on the left side of the panel.

(7) Push the notched right side of the overlay down so the entire overlay is flush against the panel. Make sure the vertical and horizontal lines of the overlay coincide with the lines on the panel itself.

(8) Move the entire locking apparatus to the left, so the long metal bar is covering the notched edge of the overlay. The notches on the overlay are coded and operate microswitches which select the remote station, the data facility, and the remote switch group.

(9) Using the raised tabs, slide the two locking bars outward with hand pressure only. This should make the bars tight and lock the overlay notches and microswitches.

(10) From the markings on the overlay, locate the square on the overlay which corresponds to the remote switch to be operated.

(11) Depress the lettered (A to S) switch on the left of the panel and the numbered (1 to 16) switch on the bottom of the panel whose X and Y coordinates correspond to the selected remote switch. The operated switch lamps and the lamp at the coordinate are lighted.

(12) Depress the SEND switch. The SEND lamp is lighted. After the operate switch command has been sent, the SEND lamp is extinguished. System operation automatically returns to the alarm polling mode upon completion of the remote switch operation.

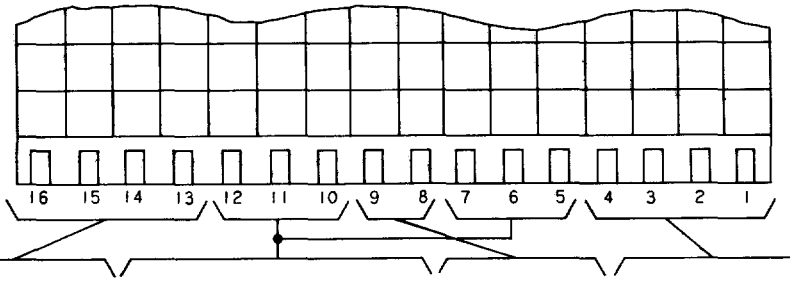
(13) If the ERROR lamp lighted after the SEND switch was depressed, it indicates an error. Depress the SEND switch again. This resends the operate switch command and extinguishes the ERROR lamp.

(14) Depress the CLEAR switch. This operation extinguishes all lamps and releases the operated switches.

(15) Continual errors indicate system malfunction, improper seating of overlay, or incorrect overlay.

TABLE A

OVERLAY KEYING INDEX



GROUP REPORT OR REMOTE SWITCH GROUP NO.				
NO.	16	15	14	13
1	X	X	X	X
2		X	X	X
3	X		X	X
4			X	X
5	X	X		X
6		X		X
7	X			X
8				X
9	X	X	X	
10		X	X	
11	X		X	
12			X	
13	X	X		
14		X		
15	X			
16				

INDEX FOR STATION NO.						
STATION NO.	5	6	7	10	11	12
11	X	X	X	X	X	X
12		X	X	X	X	X
13	X		X	X	X	X
14			X	X	X	X
15	X	X		X	X	X
16		X		X	X	X
17	X			X	X	X
18				X	X	X
21	X	X	X		X	X
22		X	X		X	X
23	X		X		X	X
24			X		X	X
25	X	X			X	X
26		X			X	X
27	X				X	X
28					X	X

GROUP REPORT OR REMOTE SWITCH OVERLAY IDENT.		
	9	8
GROUP REPORT		X
REMOTE SWITCH	X	

LOOP NO.				
LOOP NO	1	2	3	4
1	X	X	X	X
2		X	X	X
3	X		X	X
4			X	X
5	X	X		X
6		X		X
7	X			X
8				X
9	X	X	X	
10		X	X	
11	X		X	
12			X	
13	X	X		
14		X		
15	X			
16				

X - INDICATED MATERIAL SHOULD BE REMOVED.

(16) If the remote switch is associated with a status indication, a group report should be performed to insure operation of the switch.

(17) Using the raised tabs, slide the two locking bars inward. Slide the entire locking apparatus to the right and remove the overlay.

B. Selector Switch Addressing

(1) Determine the remote switch group and station.

(2) Check to see that the ACTIVE lamp in the ACTIVE/STANDBY switch is lighted. If the STANDBY lamp is lighted, momentarily depress the switch to bring the console to the ACTIVE condition.

(3) Obtain the overlay associated with the remote switch group.

(4) Place the overlay on the remote switch panel and slide to the left so the left edge of the overlay is under the metal lip on the left side of the panel. Push the overlay down flush against the panel. If the microswitch locking apparatus is mounted on the panel, move the entire apparatus to the right before pushing the overlay down. Make sure the vertical and horizontal lines of the overlay coincide with the lines on the panel itself.

(5) Select the data facility and remote station on the LOOP STA thumbwheel selectors.

(6) Select the remote switch group on the RS GRP thumbwheel selector.

(7) From the markings on the overlay, locate the square which corresponds to the remote switch to be operated.

(8) Depress the lettered (A to S) switch on the left of the panel and the numbered (1 to 16) switch on the bottom of the panel whose X and Y coordinates correspond to the selected remote switch. The operated switch lamps and the lamp at the coordinate are lighted.

(9) Depress the MANUAL switch to inhibit the overlay microswitches and enable the selector switches.

(10) Depress the SEND switch. The SEND lamp is lighted. After the operate switch command has been sent, the SEND and the MANUAL lamps are extinguished. System operation automatically returns to the alarm polling mode upon completion of the remote switch operation.

(11) If the ERROR lamp lighted after the SEND switch was depressed, it indicates an error. Depress the MANUAL switch and then the SEND switch again to resend the command. Operation of the SEND switch extinguishes the ERROR lamp.

(12) Depress the CLEAR switch. This extinguishes all lamps and releases the switches.

(13) Continual errors indicate system malfunction.

(14) If the remote switch is associated with a status indication, a group report should be performed to insure operation of the switch.

(15) Remove the overlay from the remote switch panel.

LAMP TEST

2.10 An order wire and lamp test panel (Fig. 2) is located just above the alarm display panel on the central station bay. The panel has switches to light the lamps on the alarm display panel and the group report panel to detect burned out lamps. The procedure is as follows.

(1) Depress and hold the ALARM DISPLAY LP TST1 switch. Observe that all the lamps in vertical columns 1 through 4 are lighted and then release the switch. All lamps are extinguished.

(2) Repeat Step 1 for all other ALARM DISPLAY LP TST- and GROUP REPORT DISPLAY MEMORY LP TST- switches as shown in Table B.

TABLE B

ALARM DISPLAY	
DEPRESS SWITCH	LAMPS LIGHTED IN VERTICAL COLUMNS
LP TST1	1, 2, 3, 4
LP TST2	5, 6, 7, 8
LP TST3	9, 10, 11, 12
LP TST4	13, 14, 15, 16
GROUP REPORT DISPLAY MEMORY	
DEPRESS SWITCH	LAMPS LIGHTED IN HORIZONTAL ROWS
LP TST1	1, 2, 3, 4
LP TST2	5, 6, 7, 8
LP TST3	9, 10, 11, 12
LP TST4	13, 14, 15, 16

(3) Depress and hold the COM switch. The ACTIVE/STANDBY, MAJ ALM/ACO, MIN ALM/ACO lamps are lighted. Release the switch and observe that the lamps are extinguished.

3. OPERATING PROCEDURES— REMOTE STATION

STANDBY MODE

3.01 The standby mode is the normal mode of the local control panel. In this mode the panel is electrically disconnected from the remote station equipment. With the EXECUTE switch released, the QUERY STATUS lamp will normally be lighted and the panel will be in the standby mode.

QUERY STATUS MODE

3.02 The query status mode is used to determine the status of a single status indication point. The procedure is as follows.

(1) Determine the status group, subgroup, and point to be checked.

(2) Select the group on the thumbwheel selector on the left.

(3) Select the subgroup on the thumbwheel selector in the middle.

(4) Select the status point on the thumbwheel selector on the right.

(5) Depress and hold the EXECUTE switch. If the remote station is working with the central station, the local control waits until the remote becomes idle. The ACTION COMPLETE lamp then lights momentarily. The STATUS A lamp lighted if the status point is an open or logic 0. The STATUS B lamp lighted if the status point is a ground or logic 1.

(6) Release the EXECUTE switch. The STATUS A or B lamp is extinguished.

OPERATE SWITCH MODE

3.03 The operate switch mode is used to operate a local switch. The procedure is as follows.

(1) Determine the switch to be operated and the group number and subgroup letter of the switch.

(2) Select the group on the thumbwheel selector on the left.

(3) Select the subgroup on the thumbwheel selector in the middle.

(4) Select the point on the thumbwheel selector on the right.

(5) Depress and hold the OPERATE SWITCH switch. The QUERY STATUS lamp is extinguished.

(6) With the OPERATE SWITCH switch still depressed, depress the EXECUTE switch. The OPERATE SWITCH lamp is lighted. If the remote station is working with the central station, the local control waits until the remote station becomes idle. The ACTION COMPLETE lamp then lights momentarily.

(7) Verify that the proper switch was made.

(8) Release the EXECUTE and OPERATE SWITCH switches. The OPERATE SWITCH lamp is extinguished and the QUERY STATUS lamp lights. This indicates a return to the standby mode.