FD-2240A
6.3MB OPTICAL LINE TERMINATING MULTIPLEXER
OPERATION

1. GENERAL

1.01   This section is a cover sheet for the NEC America, Inc., FD-2240A 6.3MB
        Optical Line Terminating Multiplexer Operation. This section is reproduced
        with permission of NEC America, Inc., and is equivalent to NEC practice NECA
        365-407-301, Issue 3.

1.02   Whenever this section is reissued the reason(s) for reissue will be listed in
        this paragraph.

1.03   This section provides operating information for the FD-2240A 6.3MB Optical
        Line Terminating Multiplexer (6.3MB O-LTM).

1.04   If corrections are required in the attached document, use Form-3973 as
        described in Section 000-010-015.

1.05   If equipment design and/or manufacturing problems should occur, refer to
        Section SW 010-522-906 for procedures on filing an Engineering complaint.

2. ORDERING PROCEDURE

2.01   To order additional copies of this practice, use NECA 365-407-811SW as the
        section number.

3. REPAIR/RETURN

3.01   Malfunctioning units may be returned to NEC America, Inc., for repair.

Attachment: NEC America, Inc.
              FD-2240A 6.3MB Optical Line
              Terminating Multiplexer
              Operation

PROPRIETARY

FD-2240A 6.3MB OPTICAL LINE TERMINATING MULTIPLEXER

OPERATION

FD-2240A

6.3MB OPTICAL LINE TERMINATING MULTIPLEXER

OPERATION

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ILLUSTRATIONS

TABLES

1. INTRODUCTION

1.01 This practice provides operating information for the FD-2240A 6.3MB
      Optical Line Terminating Multiplexer. The information includes des-
criptions of control and indicator functions as well as instructions for
starting, operating, and stopping the equipment.

1.02 Issue 3 of this practice supersedes Issue 2 of NECA 365-407-300. The practice provides expanded coverage and corrects errors and omissions in the superseded document.

1.03 Whenever this practice is reissued, the reason for reissue will be listed in this paragraph.

2. GENERAL

2.01 Once the FD-2240A is in operation, no attention is required. If a unit fails, the equipment will automatically issue the appropriate alarm indications. If the equipment has a redundant configuration, the FD-2240A automatic switching system will automatically place the redundant unit(s) online. If the equipment is nonredundant, automatic switching function is not available.

2.02 After automatic switching occurs, the faulty unit can be replaced without interrupting service. It is not necessary to repeat the starting procedure after the unit is replaced. The equipment continues to operate in online mode with the newly installed unit acting as the redundant standby.

2.03 Manual control of the FD-2240A is usually necessary only during equipment maintenance. Refer to NECA 365-407-500 for detailed maintenance instructions and procedures.

3. CONTROLS AND INDICATORS

3.01 Refer to Figure 3-1 for unit locations. Figures 3-2 through 3-10 show the controls and indicators utilized during operation and testing of the FD-2240A and describes the function of each. All controls and indicators are located on the front of the plug-in units.
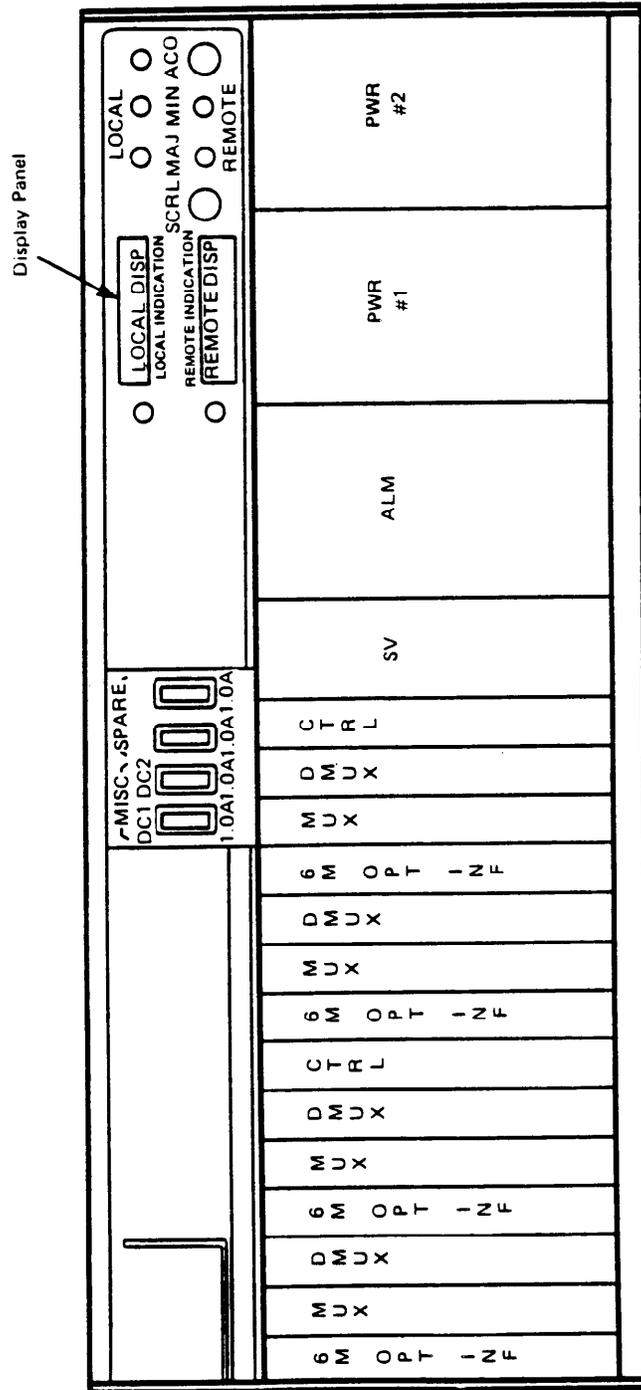
NOTE: 1. DS2 INF Unit may be mounted in place of 6M OPT INF.
2. Only one unit can be mounted in case of AC PWR unit.

Figure 3-1 FD-2240A Unit Locations

A. ALM Unit
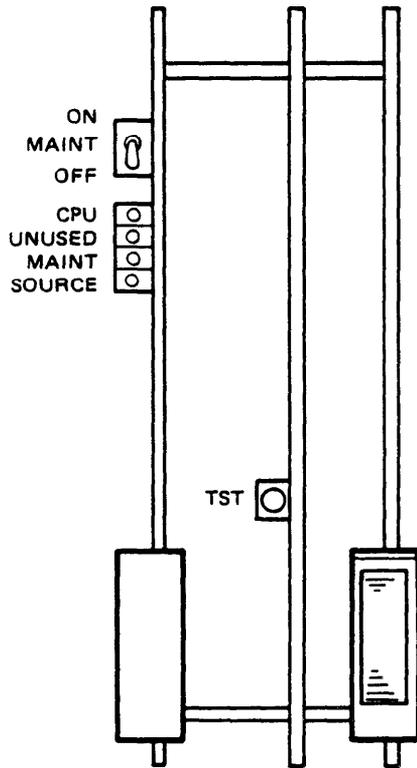
CPU, red LED:
    Indicates ALM unit CPU failure when lit.

UNUSED amber LED:
    Indicates TST switch is ON when lit.

MAINT, red LED:
    Indicates MAINT switch is ON when lit.

SOURCE, green LED:
    Indicates presence of DC primary power when lit.

MAINT, two position toggle switch:
    Enables manual control switching (manual switch
    and remote loopback switch).

TST, momentary-action pushbutton switch:
    Lights all equipment LED (except ALM unit
    SOURCE LED and PWR unit PWR ON LED),
    when depressed.

N 50052

Figure 3-2 ALM Unit (0A00) Controls and Indicators (Sheet 1 of 2)

CPU, red LED:
    Indicates ALM unit CPU failure when lit.

MAINT, red LED:
    Indicates MAINT switch is ON when lit.

SOURCE, green LED:
    Indicates presence of DC primary
    power when lit.

MAINT, two position toggle switch:
    Enables manual control switching (manual switch
    and remote loopback switch)

TST, momentary-action pushbutton switch:
    Lights all equipment LED (except ALM unit
    SOURCE LED and PWR unit PWR ON LED),
    when depressed.

RESET, momentary-action pushbutton switch:
    Resets CPU on ALM unit when depressed.

◆ Figure 3-2   ALM Unit (0A01, AA00, 0B00, AB00) Controls and Indicators (Sheet 2 of 2) ◆

B. ALM Display Panel
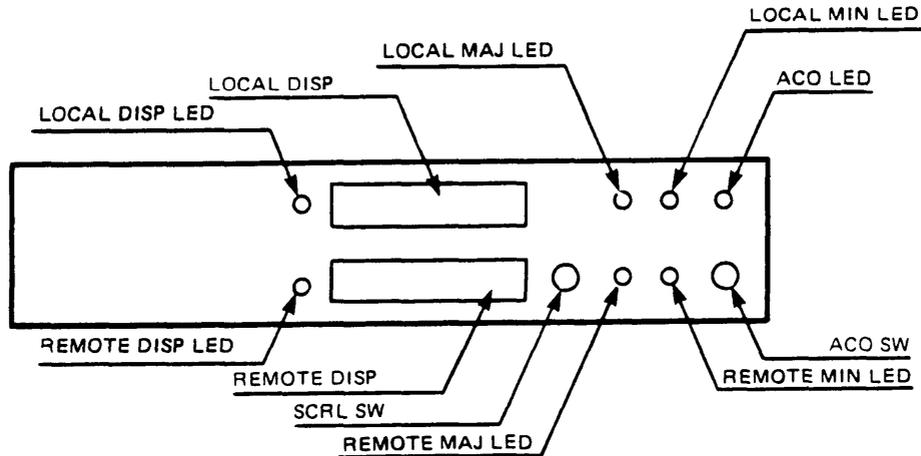
ACO, amber LED:
   Indicates ACO is activated when lit.
ACO, momentary-action pushbutton switch:
   CO AUD or AUD/VIS alarm indication is released when depressed.
SCRL, momentary-action pushbutton switch:
   Scrolls displayed indications on LOCAL DISP and REMOTE DISP when depressed.
LOCAL MAJ, red LED:
   Indicates major alarm occurrence in local FD-2240A when lit.
LOCAL MIN, amber LED:
   Indicates minor alarm occurrence in local FD-2240A when lit.
REMOTE MAJ, red LED:
   Indicates major alarm occurrence in remote FD-2240A when lit.
REMOTE MIN, amber LED:
   Indicates minor alarm occurrence in remote FD-2240A when lit.
LOCAL DISP, eight-character display:
   Indicates alarms and status of local FD-2240A. Normally indicates the most significant alarm or
   status information. Refer to Tables 3-1 and 3-3.
REMOTE DISP, eight-character display:
   Indicates alarms and status of remote FD-2240A. Refer to Tables 3-2 and 3-3.
LOCAL DISP, red LED:
   Flickers when MAJ ALM item is displayed on LOCAL DISP.
REMOTE DISP, red LED:
   Flickers when MAJ ALM item is displayed on REMOTE DISP.

Figure 3-3 Alarm Display Panel Controls and Indicators

Table 3-1
Alarm Display Panel Local Display LED
Indication and Character Display

LOCAL DISP LED	LOCAL DISP CHARACTERS	FAILURE
Flickers	PWR MAJ	Both PWR (DC) units or PWR (AC) unit fail
Flickers	FUSE	MISC DC2 fuse for protection switching relays blown
Flickers	(a) PKG	One or more units of online system incorrectly equipped
Flickers	(a) MUX	Online MUX unit multiplexer circuit failure
Flickers	(a)OPT OUT	Online 6M OPT INF unit optical output loss
Flickers	(a) OPT IN	Online 6M OPT INF unit optical input loss
Flickers	(a)DS2 OUT	Online DS2 INF unit output loss
Flickers	(a) DS2 IN	Online DS2 INF unit input loss
Flickers	(a) DMUX	Online DMUX unit demultiplexer circuit failure
Flickers	(a) CH OUT	DS1 CH output failure on online DMUX unit
Flickers	(a)MAJ ERR	Online 6M OPT INF unit major error
Flickers	(b)CTL CPU	CTRL unit CPU failure
Out	PWR MIN	One PWR (DC) unit fails
Out	(a) PKG	One or more units of offline system incorrectly equipped
Out	(a) MUX	Offline MUX unit multiplexer circuit failure
Out	(a)OPT OUT	Offline 6M OPT INF unit optical output loss
Out	(a) OPT IN	Offline 6M OPT INF unit optical input loss

Table 3-1
Alarm Display Panel Local Display LED
Indication and Character Display (Cont'd)

LOCAL DISP LED	LOCAL DISP CHARACTERS	FAILURE
Out	(a)DS2 OUT	Offline DS2 INF unit output loss
Out	(a) DS2 IN	Offline DS2 INF unit input loss
Out	(a) DMUX	Office DMUX unit demultiplexer circuit failure
Out	(a) CH OUT	DS1 CH output failure on offline DMUX unit
Out	(a)MAJ ERR	Offline 6M OPT INF unit major error
Out	(a)OFFLINE	Offline MUX unit or offline DMUX unit failure
Out	(a)LD BIAS	LD bias current alarm
Out	SV	SV unit failure
Out	(b)MON CHK	CTRL unit self-monitoring circuit failure
Out	(a) A DS1	One DS1 CH input loss on MUX unit
Out	(a) DS1'S	More than one DS1 CH input loss on MUX unit
Out	(a)AIS RCV	Reception of AIS
Out	(a)RMT ALM	Major alarm occurring in remote system

(a) Indicates system, 1, 2, 3 or 4.

(b) Indicates system 1 or 3.

Table 3-2

Alarm Display Panel Remote Display LED

Indication and Character Display

| LOCAL DISP LED	LOCAL DISP CHARACTERS	FAILURE
Flickers	(b) CTRL	CTRL unit or MISC DC2 fuse failure
Flickers	(a) MUX	Online MUX unit multiplexer circuit failure
Flickers	(a)OPT OUT	Online 6M OPT INF unit optical output loss
Flickers	(a) OPT IN	Online 6M OPT INF unit optical input loss
Flickers	(a) DMUX	Online DMUX unit demultiplexer cirucit or DS1 CH output failure
Flickers	(a)MAJ ERR	Online 6M OPT INF unit major error
Out	PWR MIN	One PWR unit failure
Out	(a) MUX	Offline MUX unit failure
Out	(a)OPT OUT	Offline 6M OPT INF unit optical output loss
Out	(a) OPT IN	Offline 6M OPT INF unit optical Input loss
Out	(a) DMUX	Offline DMUX unit or DS1 CH output failure
Out	(a)MAJ ERR	Office 6M OPT INF unit major error
Out	(a)OFFLINE	Offline MUX unit or offline DMUX unit failure
Out	(a)ALM CCT	ALM unit circuit failure
Out	(a) SV	SV data reception failure on local SV unit
Out	(a) CH IN	DS1 CH input loss on MUX Unit

(a) Indicates system 1, 2, 3, or 4.

(b) Indicates system 1 or 3.

Table 3-3

Alarm Display Panel Character Displays

CHARACTERS		CONDITION
LOCAL DISP	REMOTE DISP	
SCROLL	**END***	Scroll mode ends after all failures are displayed
NEC*	FD-2400A	Indicates when TST SW is depressed

C. CTRL Unit
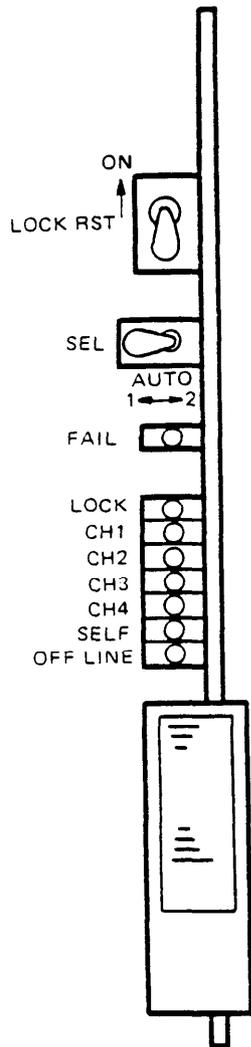
LOCK RST, momentary toggle switch:
    Locked condition of SEL switch is released when ON.

NOTE: MAINT switch must be set to ON before operating
       this switch.

SEL, three position toggle switch:
    Middle position ; Selects automatic redundant
                       switching
    Position 1   ; Manually sets system 1 or 3 online.
    Position 2   ; Manually sets system 2 or 4 online.

NOTE: MAINT switch must be set to ON before operating
       this switch.

FAIL, red LED:
    Indicates unit failure when lit.

LOCK, red LED:
    Indicates that redundant switch is locked when lit
    (If high speed is optical, the switch is not locked).

CH1 to CH4, red LED:
    Indicates bit comparison failure in monitoring
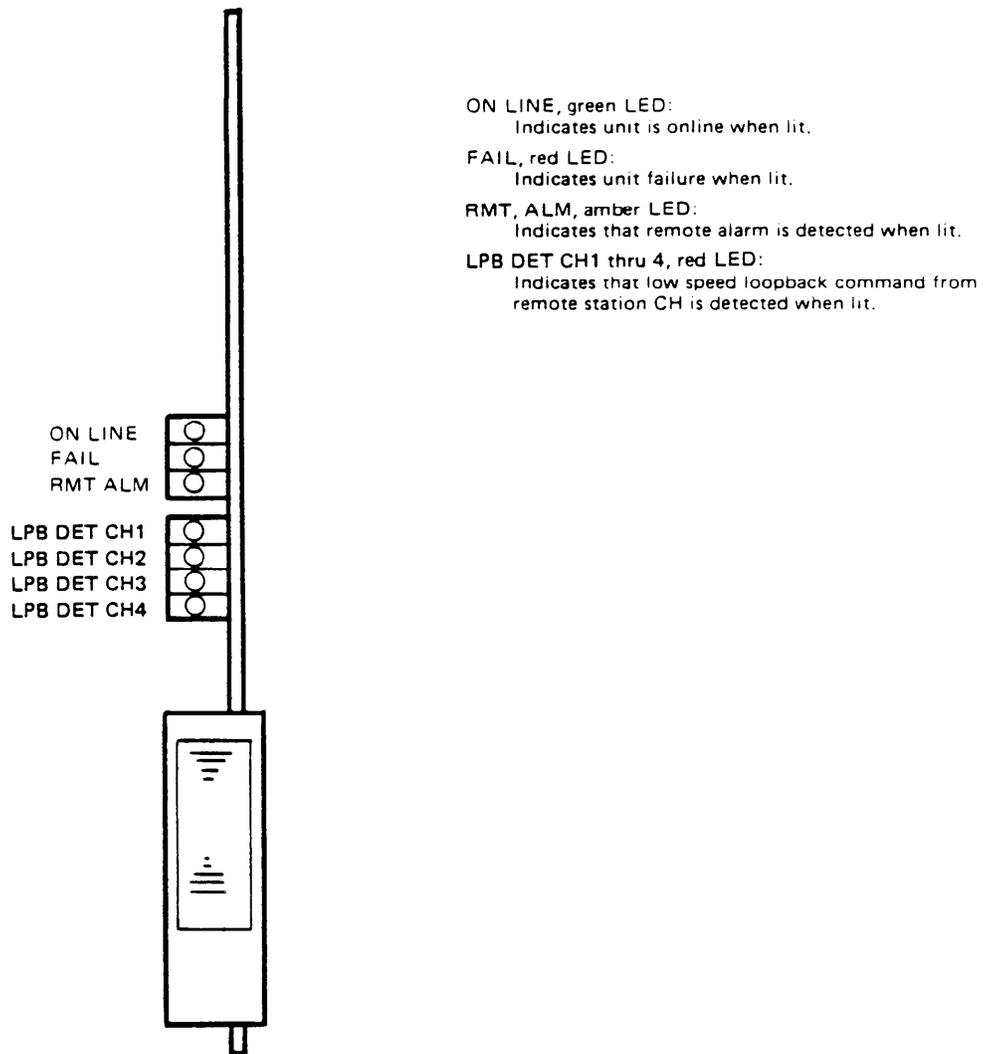   channel when lit.

SELF, red LED:
    Indicates failure in self-monitoring circuit when lit.

OFF LINE, red LED:
    Indicates bit error rate failure during offline
    monitoring when lit.

NOTE: In nonredundant configuration, this unit is not used.

Figure 3-4 CTRL Unit (X0316A/A1/B, X7387A/B) Controls and Indicators

D. DMUX Unit

ON LINE, green LED:
    Indicates unit is online when lit.

FAIL, red LED:
    Indicates unit failure when lit.

RMT, ALM, amber LED:
    Indicates that remote alarm is detected when lit.

LPB DET CH1 thru 4, red LED:
    Indicates that low speed loopback command from
    remote station CH is detected when lit.

ON LINE
FAIL
RMT ALM

LPB DET CH1
LPB DET CH2
LPB DET CH3
LPB DET CH4

◆ Figure 3-5   DMUX Unit (X0301A/A1/A2/B/B2) Indicators ◆

E. DS2 INF Unit

ON LINE, Green LED:
    Indicates that the unit is on line when lit.

FALL, red LED:
    Indicates unit failure when lit.

AIS, amber LED:
    Indicates that alarm indication signal (AIS)
    of DS2 level is received when lit.

ON LINE
FAIL
AIS
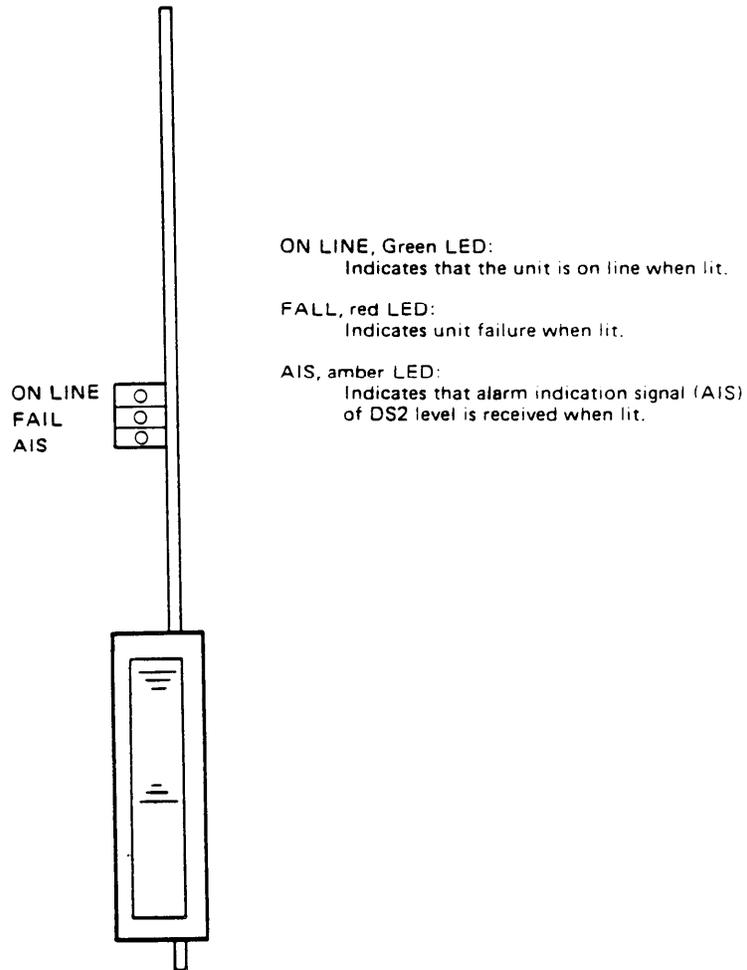
◆ Figure 3-6   DS2 INF Unit (X0308A/A1/B) Indicators ◆

F. MUX Unit
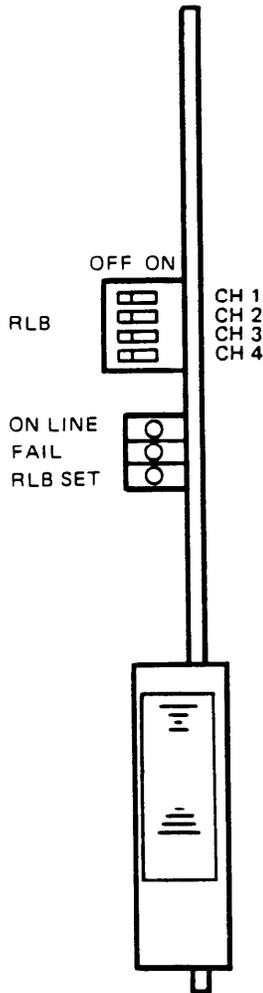
RLB, piano switch:
       ON: Sends loopback command to remote
                     station when set to ON.
       OFF: Normal status

NOTE: 1. Before setting RLB switch to ON, ALM unit
               MAINT SW must be ON.
          2. CH NOs corresponding to RLB SWs are CH1
               through CH4 from the top.
          3. Nos. 1 through 4 shown at right side of RLB
               SWs do not indicate CH NOs.

ON LINE, green LED:
      Indicates unit is online when lit.
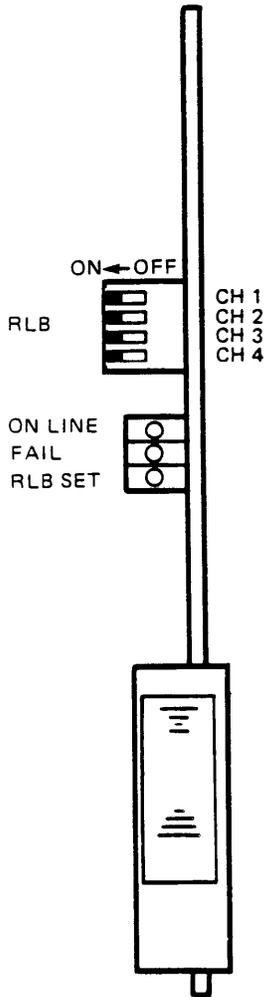
FAIL, red LED:
      Indicates unit failure when lit.

RLB SET, red LED:
      Indicates that RLB switch is ON when lit.

OFF ON
CH 1
CH 2
RLB
CH 3
CH 4

ON LINE
FAIL
RLB SET

◆Figure 3-7 MUX Unit (X0300A/B) Controls and Indicators ◆

F. MUX Unit

RLB, piano switch:
    ON: Sends loopback command to remote
           station when set to ON.
    OFF: Normal status

NOTE: 1. Before setting RLB switch to ON, ALM unit
            MAINT SW must be ON.
          2. CH NOs corresponding to RLB SWs are CH1
            through CH4 from the top.

ON LINE, green LED:
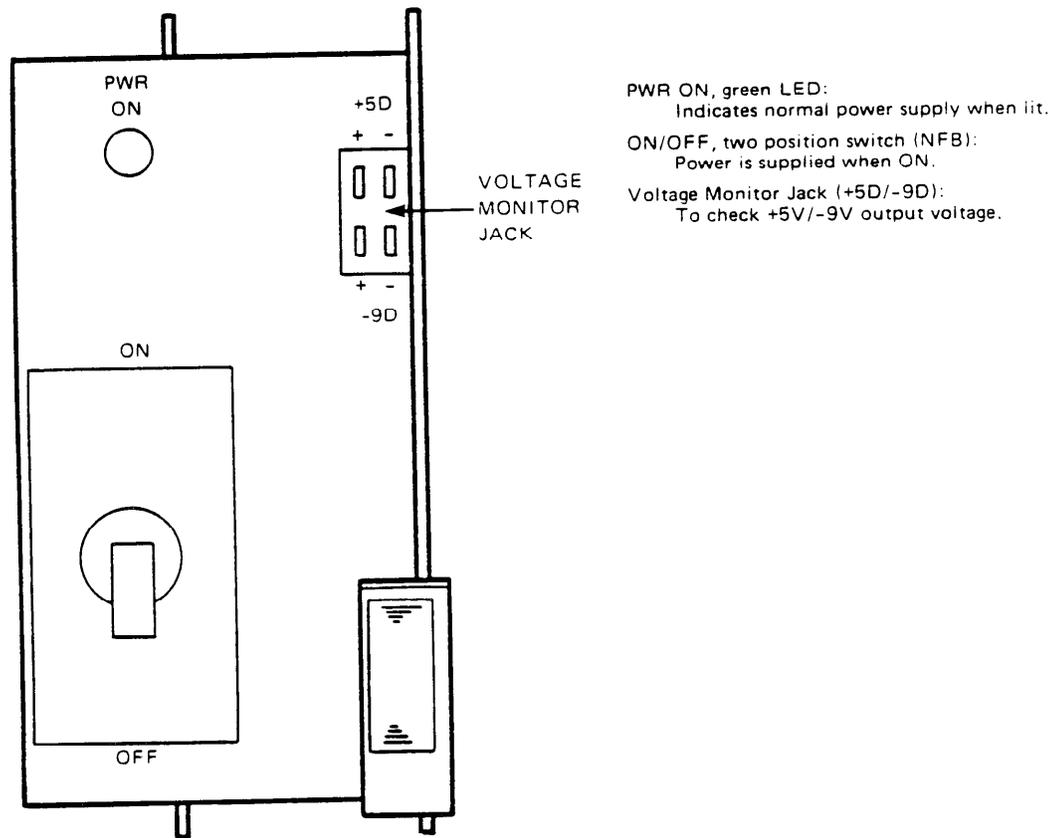   Indicates unit is online when lit.

FAIL, red LED:
    Indicates unit failure when lit.

RLB SET, red LED:
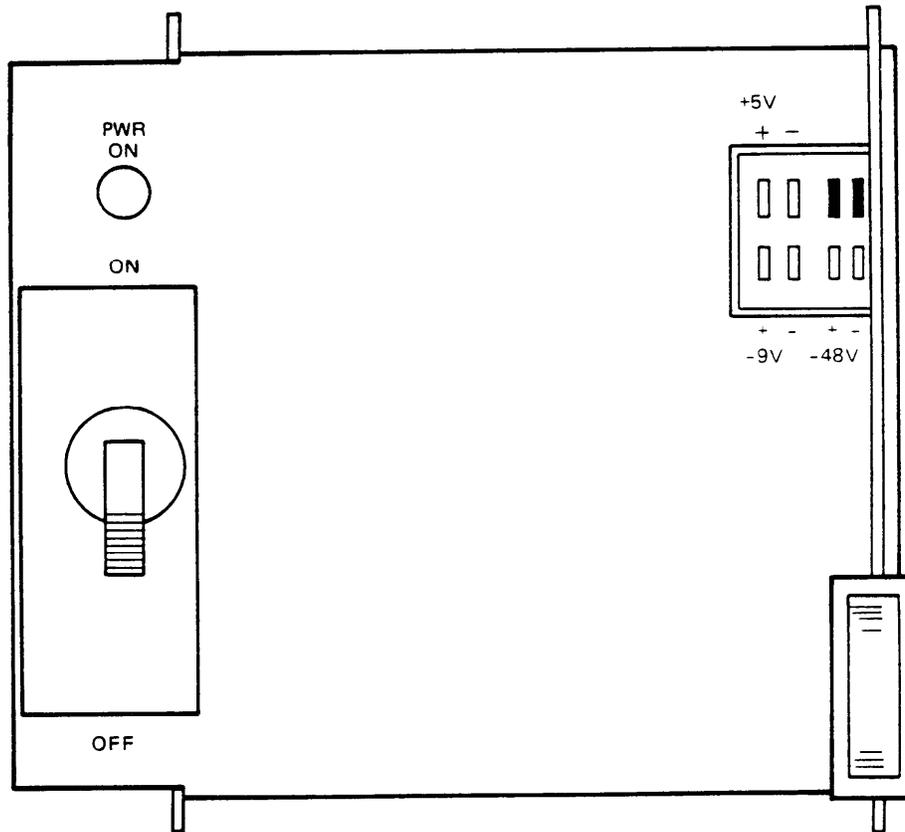   Indicates that RLB switch is ON when lit.

♦ Figure 3-7A MUX Unit (X0300A2/B2) Controls and Indicators ♦

G. PWR Unit

PWR ON, green LED:
Indicates normal power supply when lit.

ON/OFF, two position switch (NFB):
Power is supplied when ON.

Voltage Monitor Jack (+5D/-9D):
To check +5V/-9V output voltage.

◆ Figure 3-8   PWR Unit (X0319A/B) for DC Control and Indicator (Sheet 1 of 2) ◆
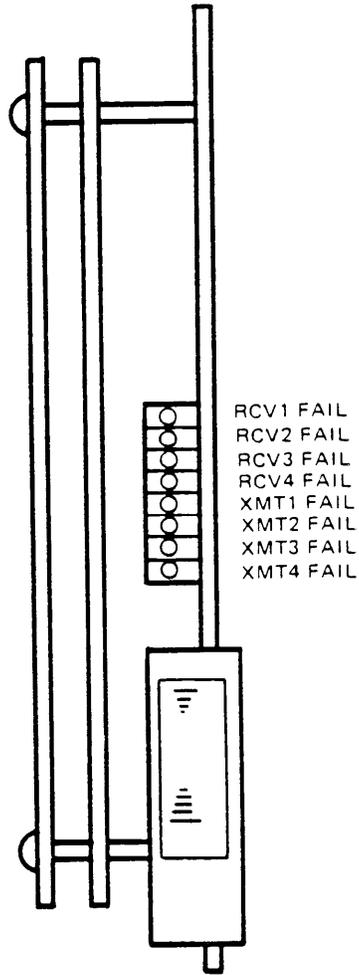
PWR ON, green LED:
   Indicates normal power supply when lit.

ON/OFF, circuit breaker (NFB):
   Power is supplied when ON.

Voltage Monitor Jack:
   To check +5V/-9V/-48V output voltage.

◆ Figure 3-8   PWR Unit (X1914A) for AC Control and Indicator (Sheet 2 of 2) ◆
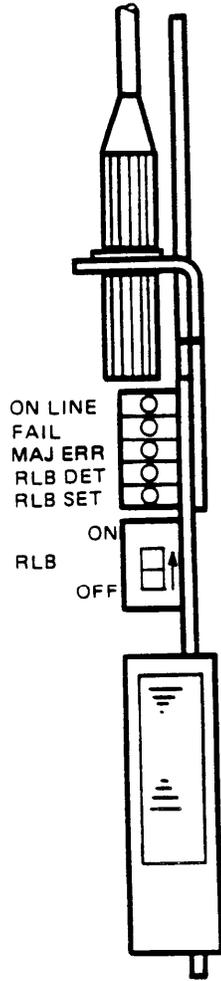
H. SV Unit

RCV1 to RCV4 FAIL, red LED:
    Indicates the corresponding system RCV SV data
    failure when lit.

XMT1 to XMT4 FAIL, red LED:
    Indicates the corresponding system XMT SV data
    failure when lit.

RCV1 FAIL
RCV2 FAIL
RCV3 FAIL
RCV4 FAIL
XMT1 FAIL
XMT2 FAIL
XMT3 FAIL
XMT4 FAIL

◆ Figure 3-9 SV Unit (X0315A) Indicators ◆

I. 6M OPT INF Unit

ON LINE, green LED:
    Indicates unit is on-line when lit.

FAIL, red LED:
    Indicates unit failure when lit.

MAJ ERR, red LED:
    Indicates detection of bit error rate more than
    preset value in the input signal when lit.

NOTE: Bit error rate detection level can be set to

    1×10^{-3}, 1×10^{-4} or 1×10^{-5}
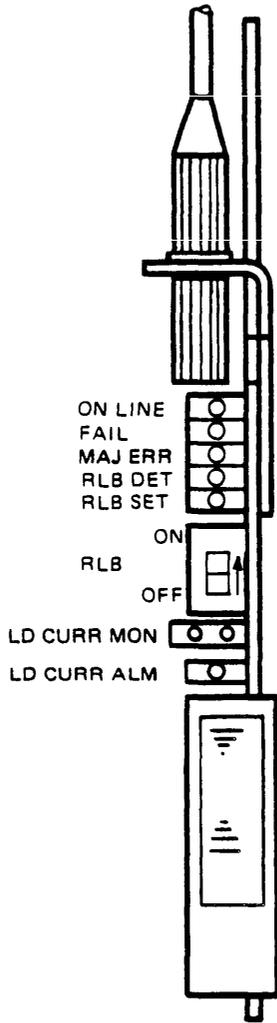
RLB DET, red LED:
    Indicates detection of high speed loopback command
    signal bit from remote station when lit.

RLB SET, red LED:
    Indicates that RLB switch is ON when lit.

RLB, DIP switch
    ON: Sends loopback command at high speed level
           to remote station when set to ON.
    OFF: Normal status

NOTE: Before setting RLB SW to ON,
       ALM unit MAINT SW must be ON.

ON LINE
FAIL
MAJ ERR
RLB DET
RLB SET

ON
RLB
OFF

Figure 3-10 6M OPT INF Unit (X0306 Grp: 0E00/0F00/0F01) Controls and Indicators (Sheet 1 of 2)

ON LINE, green LED:
Indicates unit is on-line when lit.

FAIL, red LED:
Indicates unit failure when lit.

MAJ ERR, red LED:
Indicates detection of bit error rate more than preset value in the input signal when lit.

NOTE: Bit error rate detection level can be set to
1×10^{-3}, 1×10^{-4} or 1×10^{-5}

RLB DET, red LED:
Indicates detection of high speed loopback command signal bit from remote station when lit.

RLB SET, red LED:
Indicates that RLB switch is ON when lit.

RLB, DIP switch:
ON: Sends loopback command at high speed level to remote station when set to ON.

OFF: Normal status

NOTE: Before setting RLB SW to ON, ALM unit MAINT SW must be ON.

LD CURR MON:
Monitor jack for LD current

NOTE: Measure the output voltage (mV) of this jack and convert it into LD current (mA) as below:
$$LD \text{ current (mA)} = \frac{mV}{10}$$

LD CURR ALM, amber LED:
Lit when over 120mA LD current flows.
Measured voltage at LD CURR MON shows more than 1.2V then.

Figure 3-10 6M OPT INF Unit (X0307 Grp: 0B00/0C00/0C01) Controls and Indicators (Sheet 2 of 2)

4. OPERATION

4.01 Once the equipment is in operation, no attention is required. If MUX, DMUX, or 6M OPT INF unit fails, online operation is automatically switched to the redundant system. This allows replacement of failed unit with spare unit without affecting in-service lines. The line, once switched to redundant system, cannot be restored to the original system without manual switching function or when another failure occurs.

A. Manual Switching

4.02 Switching at XMT and RCV sides is link-work. If switching is done at local station, the switching will also be done at remote station. Manual switching is controlled by the CTRL unit SEL switch. The equipment must first be placed in maintenance mode by setting ALM unit MAINT switch to ON position.

4.03 For manual control switching, proceed as follows:

(1) Set ALM unit MAINT switch to ON position. MAINT LED is lit.

(2) Set CTRL unit SEL switch to position 1 or 2 (system 1 or 2 online). (Refer to Figure 3-4.)

(3) Set MAINT switch to OFF position.

(4) Set SEL switch to middle position.

B. Automatic Switching

4.04 Automatic switching function is available only when the equipment is in redundant configuration.

4.05 During normal operation (CTRL unit SEL switch set to middle position) switching takes place automatically when a unit failure is detected by the CTRL unit.

4.06 Automatic switching takes place when any of the following conditions occur:

- Online MUX unit counter failure

- Online 6M OPT INF unit output signal loss

- Online transmit monitoring failure detected by the CTRL unit (XMT online monitoring)

- Online DMUX unit counter failure

- Online DMUX unit frame synchronization loss

- Online 6M OPT INF unit input signal loss

- Online receive monitoring failure detected by the CTRL unit (RCV online monitoring)

- High speed receive bit-by-bit error detection

- Low speed output signal loss

- Low speed channel output failure resulting in 1.544 Mb/s data loss or incorrect stuffing

C. DS1 Level Remote Loopback

4.07 When loopback circuitry between local and remote equipment is required for installation testing, etc, remote loopback at DS1 (1.544 Mb/s) level is provided by operation of the MUX unit RLB switch for appropriate channel. Refer to Figure 3-7.

4.08 This remote loopback can be performed only when MUX unit ON LINE LED is lit and is available for both optical and DS2 signals at high speed (6.312M/s) side.

4.09   The following are operational procedures for RLB switch:

◗NOTE 1:   Channel is out-of-service when remote loopback is performed.

NOTE 2:   When Group 0A02/0B02 is used as the MUX unit, the ON direction of RLB switch is reversed to that of Group 0A00. Refer to Fig. 3-7A.◗

(1)   Set ALM unit MAINT switch to ON position. MAINT LED is lit.

(2)   Set the MUX unit RLB switch to ON for corresponding channel. MUX unit RLB SET LED and remote DMUX unit RLB DET LED are lit. (DMUX unit detects RLB command.) See Figure 4-1.

(3)   Verify that the signal is looped back and perform signalling test.

(4)   Set MUX unit RLB switch to OFF. RLB SET LED and RLB DET LED go out.

(5)   Repeat steps 2 through 4 for remaining channels.

(6)   Set MAINT switch to OFF. MAINT LED goes out.

D.   High Speed Remote Loopback

4.10   The 6M OPT INF unit RLB switch provides high speed level (6.312 Mb/s) remote loopback circuitry between stations. This partitions the optical transmission line between the opposite stations. Refer to Figure 4-2. Remote loopback is used for installation testing.
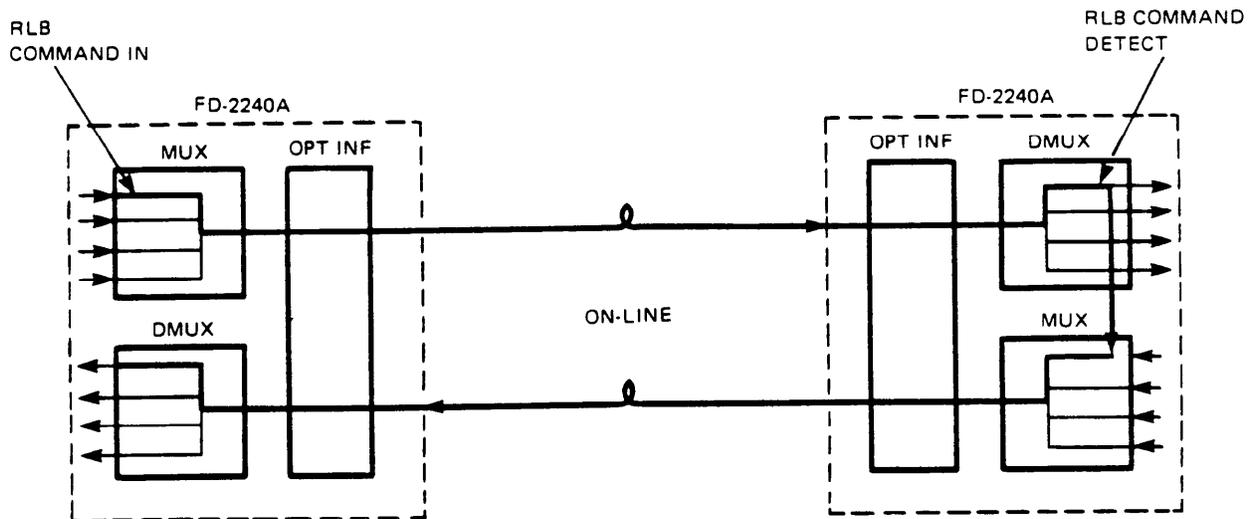
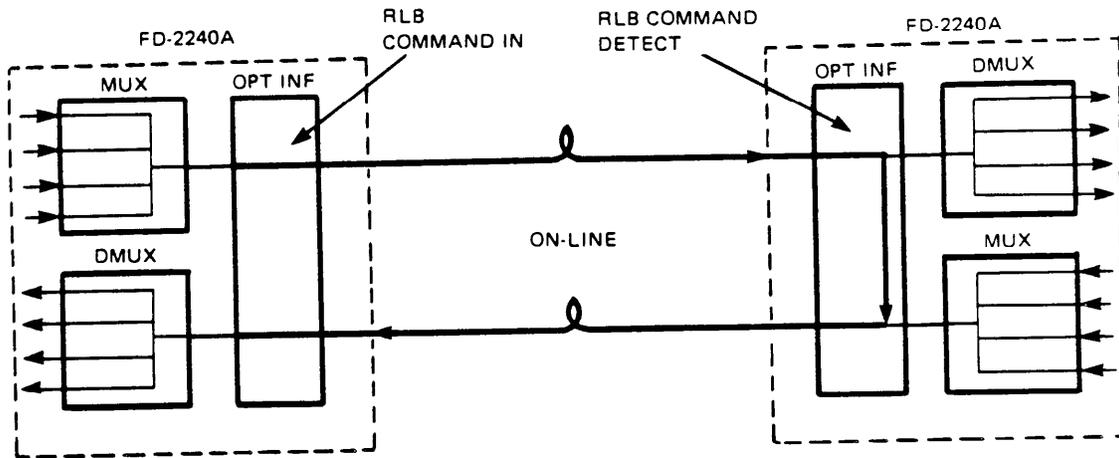Figure 4-1 DS1 Level Remote Loopback Configuration (O-LTM Configuration)

Figure 4-2 High Speed Remote Loopback Configuration

4.11 The following are operational procedures for RLB switch:

    NOTE: Since all signals in four in-service channels are looped back by this remote loopback, the channels are not available.

(1) Set ALM unit MAINT switch to ON position. MAINT LED is lit.

(2) Set the 6M OPT INF unit RLB switch to ON position. RLB SET LED on this unit and RLB DET LED at the opposite station are lit.

(3) Verify that the signal is looped back or perform the necessary testing.

(4) Set RLB switch to OFF position.

(5) Set MAINT switch to OFF position.

E. Alarm Cutoff

4.12 Operation of Alarm Cutoff (ACO) switch on the alarm display panel releases CO audible (AUD) alarms, and visual (VIS) alarms if selected.

F. Alarm Test

4.13 Checking LED indicators on each unit and the alarm display panel (except PWR ON LED and ALM unit SOURCE LED), character displays, and CO alarms is done by ALM unit TST switch operation. These tests are performed for maintenance or installation test.

4.14 The following are operational procedures for TST switch:

(1) Verify that only green LED are lit on each unit.

(2) While depressing ALM unit TST switch, verify the following indications:

- All unit and display panel LED are lit.

- Alarm display panel character displays are as follows:

        LOCAL DISP : **NEC***
        REMOTE   : FD-2240A

(3) Release TST switch. Verify that only green LED are lit on each unit.

G. Lock Reset

4.15 The CTRL unit LOCK RST switch function is available only when high speed side is DS2 interface.

4.16 If switching of online to/from offline is activated more than three times in 10 minutes, the line is fixed to either side and will not switch further. In order to reset such status by manual switching, the LOCK RST switch is used. A time can be set to reset the locked status automatically by CTRL unit option receptacle.

4.17 The following are operational procedures for LOCK RST switch:

(1) Verify that CTRL unit LOCK LED is lit.

(2) Set ALM unit MAINT switch to ON position. MAINT LED is lit.

(3) Set CTRL unit LOCK RST momentary toggle switch to ON position. LOCK LED goes out.

(4) Set MAINT switch to OFF. MAINT LED goes out.

H. Character Displays

4.18 The alarm display panel character displays are independently provided so that alarms occurring in equipment can be displayed for local and remote stations. Character displays indicate the following alarm conditions:

- Alarm displayed are classified as system alarms and equipment common (COM) alarms. System alarms are identified by system number. The COM alarms are PWR MAJ, FUSE, PWR MIN, and SV. See Tables 3-1 and 3-2.

- Displays indicate the highest priority alarm occurring in each system. The display also stores the three highest priority alarms in order.

- For CTRL unit alarms, Systems 1 and 2 are indicated as System 1 and Systems 3 and 4 are indicated as System 3. Actual display indications are [b]CTL CPU, [b] MON CHK, and [b] CTRL, where [b] stands for either 1 or 3.

- Whether during the scroll or not, when alarm is released, alarm display disappears. If another alarm still exists at that time, the next priority alarm will be displayed 5 seconds after the first alarm display goes out.

- The alarm display duration during quick scroll is 1 second with 0.1 second blank time between displays.

I. Scroll Switch

4.19 When multiple alarms occur, operation of display panel Scroll Switch (SCRL SW) checks all items which are not currently displayed. The SCRL SW can be operated for single or quick scroll.

4.20 The SCRL SW operation in normal status (non-alarm status) provides displays in the following order: *-COM-SYS1-SYS2-SYS3-SYS4-*. If an alarm occurs, the scroll starts from the system where alarm occurs and then continues in the above order. Scroll displays always indicate the alarm occurring in the same system at local and remote locations.

Single Scroll Operation

4.21 When single scroll display is required, operate SCRL SW as follows:

(1) Depress SCRL SW once. This permits scroll mode.

(2) Depress SCRL SW again. A single display is scrolled.

(3) Continue switch operation. When the scroll finishes one round, *SCROLL* **END*** appears. See Table 3-2.

(4) Depress SCRL SW again. Displays return to the original state before scroll.

> NOTE: Stopping the scroll is done by stopping switch operation .If 5 minutes pass without switch operation, displays return to the original state before scroll.

Quick Scroll Operation

4.22 When quick scroll display is required, operate SCRL SW as follows:

(1) Depress SCRL SW once. This permits scroll mode.

(2) Depress and hold SCRL SW. Display indications are scrolled continuously. When the scroll finishes one round, *SCROLL* **END*** appears. Release switch.

(3) Depress SCRL SW again. Displays return to original state before scroll.

> NOTE: Stopping the scroll is done by stopping switch operation. If the stop duration exceeds 30 msec, the displays stop. If switch operation is resumed within 30 msec after stopping, the scroll is continued. If 5 minutes pass without switch operation, the state before the scroll returns.

5. STARTING EQUIPMENT

5.01 Use the following procedures to start equipment that has been operated before. For initial operation after installation or relocation, refer to NECA 365-407-204.

5.02 The start-up procedures are as follows:

(1) Set PWR unit ON/OFF switches to ON position.

(2) Set all ALM unit switches to OFF position.

(3) Set MUX and 6M OPT INF units RLB switches to OFF position.

(4) Set ALM unit MAINT switch to ON position. Verify MAINT LED is lit.

(5) Press and hold ALM unit TST switch. Verify that all LED are lit. Release TST switch.

(6) Set MAINT switch to OFF position. Verify that MAINT LED goes out.

6. STOPPING EQUIPMENT

6.01 To stop equipment for testing or maintenance, set PWR unit ON/OFF switches to OFF position.