FD-2240A
6.3MB OPTICAL LINE TERMINATING MULTIPLEXER
UNIT INSTALLATION AND ADJUSTMENT

1. GENERAL

1.01 This section is a cover sheet for the NEC America, Inc., FD-2240A 6.3MB Optical Line Terminating Multiplexer Unit Installation and Adjustment. This section is reproduced with permission of NEC America, Inc., and is equivalent to NEC practice NECA 365-407-203, 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 a description of the inspection and adjustment of the FD-2240A 6.3MB Optical Line Terminating Multiplexer (6.3MB O-LTM) unit strapping insertion, and removal of units.

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 365-407-809SW 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
Unit Installation and Adjustment

PROPRIETARY

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NEC PRACTICE

NEC

NECA 365-407-203
Issue 3, December 1986

FD-2240A 6.3MB OPTICAL LINE TERMINATING MULTIPLEXER UNIT INSTALLATION AND ADJUSTMENT

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FD-2240A
6.3 MB OPTICAL LINE TERMINATING MULTIPLEXER
UNIT INSTALLATION AND ADJUSTMENT

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1. INTRODUCTION

1.01 This practice describes inspection and adjustment of FD-2240A 6.3MB O-LTM unit strapping, insertion and removal of units.

1.02 Issue 3 of this practice supersedes Issue 2 of NECA 365-407-203. The practice provides expanded coverage and corrects errors and omissions in the superseded document.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. PRECAUTION

2.01 After cabling of the FD-2240A has been completed, the stage is to install the units in the shelf and to perform test of electrical operations. Before this stage, however, it is required to check and verify the strapping positions on the units and reset them, if necessary.

2.02 When the equipment is shipped, all straps have been already set at factory (Factory Adjustment). It is, however, necessary to check the positions because sometimes they are loosened or dropped out during transportation or to change their positions in accordance with the system configuration at the site.

3. UNIT MOUNTING AND REMOVAL

3.01 The units should be installed in the proper positions in the shelf. Code number and unit designation are shown at the rear of the unit. Refer to Figure 3-1 for component unit of various system configuration.

CAUTION

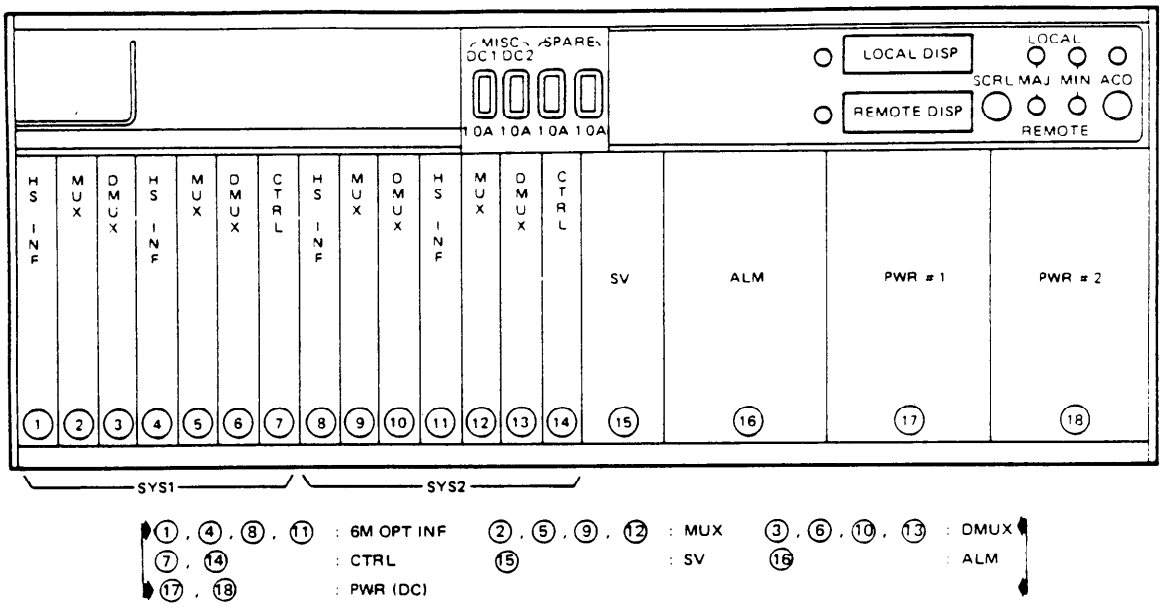
1. When handling the plug-in units, use care and avoid touching the connector pins to prevent contamination and damage which could result in poor electrical connection and performance.

2. When installing the plug-in units, fit them in the shelf slots and push into the shelf until it locks firmly in place. Never push controls and indicators on the units.

3. When handling the plug-in unit, attention should be paid not to touch the adjacent units. Handle the unit with both hands, if necessary. Handle heavy weighted and thick PWR unit with special care.

4. When inserting/removing the plug-in units, be sure to place ON/OFF switch on the PWR unit in OFF position.

5. Be especially careful not to touch the surface of the optical connectors on the 6M OPT INF unit with your bare hands.



(A) Optical Interface of Redundant Configuration for DC Application

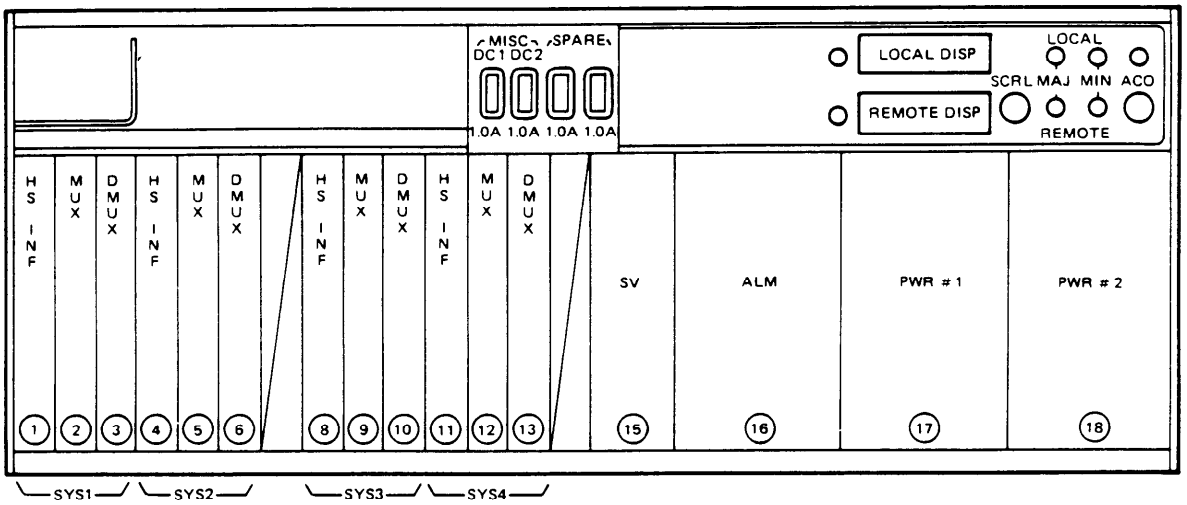
COMPONENT UNIT

DESIGNATION	APPELLATION	CODE	REMARKS	QUANTITY	
				REDUNDANT	
				1 SYS	2 SYS
MUX	Multiplexer unit (DS1)	E32-482-X0300-0A00 E32-482-X0300-0A02	-48V	2	4
		E32-482-X0300-0B00 E32-482-X0300-0B02	-24V		
DMUX	Demultiplexer unit (DS1)	E32-482-X0301-0A00	-48V	2	4
		E32-482-X0301-0A01 E32-482-X0301-0A02	-48V		
		E32-482-X0301-0B00 E32-482-X0301-0B02	-24V		
HS INF	6M optical interface unit	E32-852-X0306-0E00	LED-PIN, MM	2	4
		E32-852-X0306-0F00	LED-PIN, SM		
		E32-852-X0306-0F01	LED-PIN, SM		
		E32-852-X0307-0B00	LD-APD, MM		
		E32-852-X0307-0C00	LD-APD, SM		
		E32-852-X0307-0C01	LD-APD, SM		
CTRL	Control unit	E32-001-X0316-0A00	-48V, OPT	1	2
		E32-001-X0316-0A01 ◖E32-001-X7387-0A00◗	-48V, OPT		
ALM	Alarm unit	E32-107-X0314-0A00	-48V, PARALLEL	1	1
		E32-107-X0314-0A01	-48V, PARALLEL		
		E32-107-X0314-AA00	-48V, SERIAL		
		E32-107-X0314-0B00	-24V, PARALLEL		
		E32-107-X0314-AB00	-24V, SERIAL		
SV	Supervisory unit	E32-080-X0315-0A00		1	1
PWR	Power unit	E32-014-X0319-0A00	-48V	2	2
		E32-014-X0319-0B00	-24V		

◖Note: The following shows the combination of CTRL, MUX, and DMUX units to be mounted:

CTRL (X0316A/A1),	MUX (X0300A),	DMUX (X0301A/A1)
CTRL (X0316A/A1),	MUX (X0300B),	DMUX (X0301B)
CTRL (X7387A),	MUX (X0300A2),	DMUX (X0301A2)
CTRL (X7387A),	MUX (X0300B2),	DMUX (X0301B2)
CTRL (X7387A),	MUX (X0300A2),	DMUX (X0301A/A1)
CTRL (X7387A),	MUX (X0300B2),	DMUX (X0301B)◗

◖Figure 3-1 FD-2240A Unit Location and Component Units (Sheet 1 of 8)◗



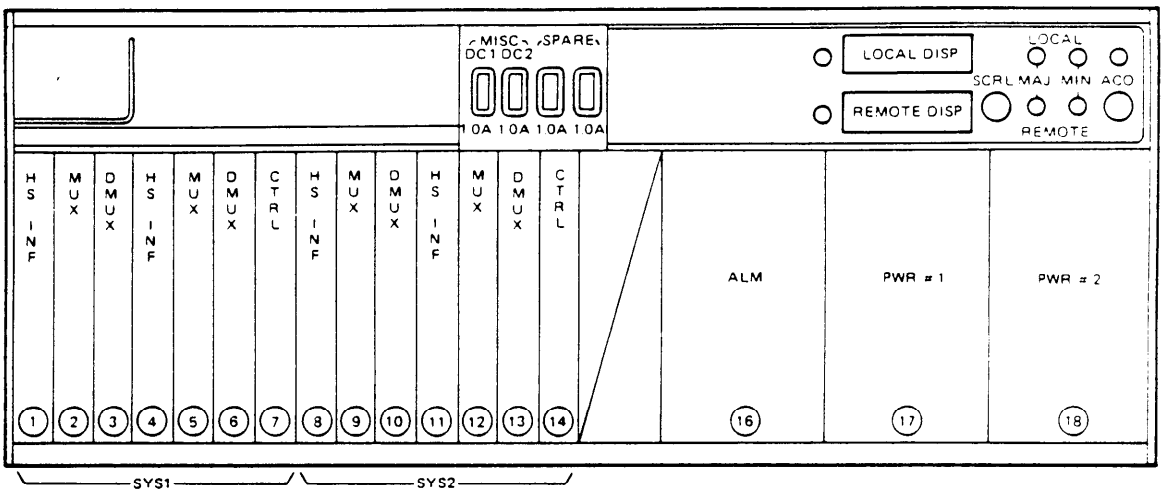
(1), (4), (8), (11) : 6M OPT INF
(2), (5), (9), (12) : MUX
(3), (6), (10), (13) : DMUX
(15) : SV
(16) : ALM
(17), (18) : PWR (DC)

(B) Optical Interface of Non-redundant Configuration for DC Application

COMPONENT UNIT

DESIGNATION	APPELLATION	CODE	REMARKS	QUANTITY NON-REDUNDANT 1 SYS	2 SYS	3 SYS	4 SYS
MUX	Multiplexer unit (DS1)	E32-482-X0300-0A00 ◆E32-482-X0300-0A02◆	-48V	1	2	3	4
		E32-482-X0300-0B00 ◆E32-482-X0300-0B02◆	-24V				
DMUX	Demultiplexer Multiplexer	E32-482-X0301-0A00	-48V	1	2	3	4
		E32-482-X0301-0A01 ◆E32-482-X0301-0A02◆	-48V				
		E32-482-X0301-0B00 ◆E32-482-X0301-0B02◆	-24V				
HS INF	6M optical interface unit	E32-852-X0306-0E00	LED-PIN, MM	1	2	3	4
		E32-852-X0306-0F00	LED-PIN, SM				
		E32-852-X0306-0F01	LED-PIN, SM				
		E32-852-X0307-0B00	LD-APD, MM	1	2	3	4
		E32-852-X0307-0C00	LD-APD, SM				
		E32-852-X0307-0C01	LD-APD, SM				
ALM	Alarm unit	E32-107-X0314-0A00	-48V, PARALLEL	1	1	1	1
		E32-107-X0314-0A01	-48V, PARALLEL				
		E32-107-X0314-AA00	-48V, SERIAL				
		E32-107-X0314-0B00	-24V, PARALLEL				
		E32-107-X0314-AB00	-24V, SERIAL				
SV	Supervisory unit	E32-080-X0315-0A00		1	1	1	1
PWR	Power unit	E32-014-X0319-0A00	-48V	2	2	2	2
		E32-014-X0319-0B00	-24V				

◆ Figure 3-1 FD-2240A Unit Location and Component Units (Sheet 2 of 8) ◆



◖①, ④, ⑧, ⑪ : DS2 INF , ②, ⑤, ⑨, ⑫ : MUX , ③, ⑥, ⑩, ⑬ : DMUX ◗
◖⑮ : CTRL , ⑯ : ALM , ⑰, ⑱ : PWR (DC) ◗

(C) Bipolar Interface of Redundant Configuration for DC Application

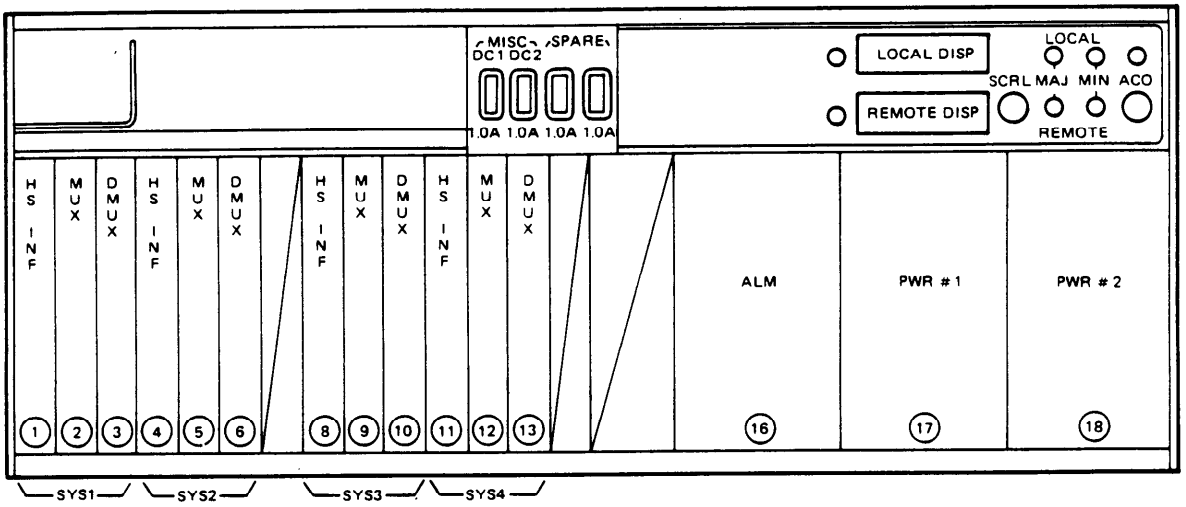
COMPONENT UNIT

DESIGNATION	APPELLATION	CODE	REMARKS	QUANTITY REDUNDANT 1 SYS	QUANTITY REDUNDANT 2 SYS
MUX	Multiplexer unit (DS1)	E32-482-X0300-0A00 E32-482-X0300-0A02	-48V	2	4
		E32-482-X0300-0B00 E32-482-X0300-0B02	-24V		
DMUX	Demultiplexer unit (DS1)	E32-482-X0301-0A00	-48V	2	4
		E32-482-X0301-0A01 E32-482-X0301-0A02	-48V		
		E32-482-X0301-0B00 E32-482-X0301-0B02	-24V		
HS INF	DS 2 interface units	E32-409-X0308-0A00	-48V	2	4
		E32-409-X0308-0A01	-48V		
		E32-409-X0308-0B00	-24V		
CTRL	Control unit	E32-001-X0316-0B00 ◖E32-001-X7387-0B00◗	-48V, BP	1	2
ALM	Alarm unit	E32-107-X0314-0A00	-48V, PARALLEL	1	1
		E32-107-X0314-0A01	-48V, PARALLEL		
		E32-107-X0314-AA00	-48V, SERIAL		
		E32-107-X0314-0B00	-24V, PARALLEL		
		E32-107-X0314-AB00	-24V, SERIAL		
PWR	Power unit	E32-014-X0319-0A00	-48V	2	2
		E32-014-X0319-0B00	-24V		

◖Note: The following shows the combination of CTRL, MUX, and DMUX units to be mounted: ◗

CTRL (X0316B),	MUX (X0300A),	DMUX (X0301A/A1)
CTRL (X0316B),	MUX (X0300B),	DMUX (X0301B)
CTRL (X7387B),	MUX (X0300A2),	DMUX (X0301A2)
CTRL (X7387B),	MUX (X0300B2),	DMUX (X0301B2)
CTRL (X7387A),	MUX (X0300A2),	DMUX (X0301A/A1)
CTRL (X7387A),	MUX (X0300B2),	DMUX (X0301B)

◖**Figure 3-1 FD-2240A Unit Location and Component Units (Sheet 3 of 8)**◗



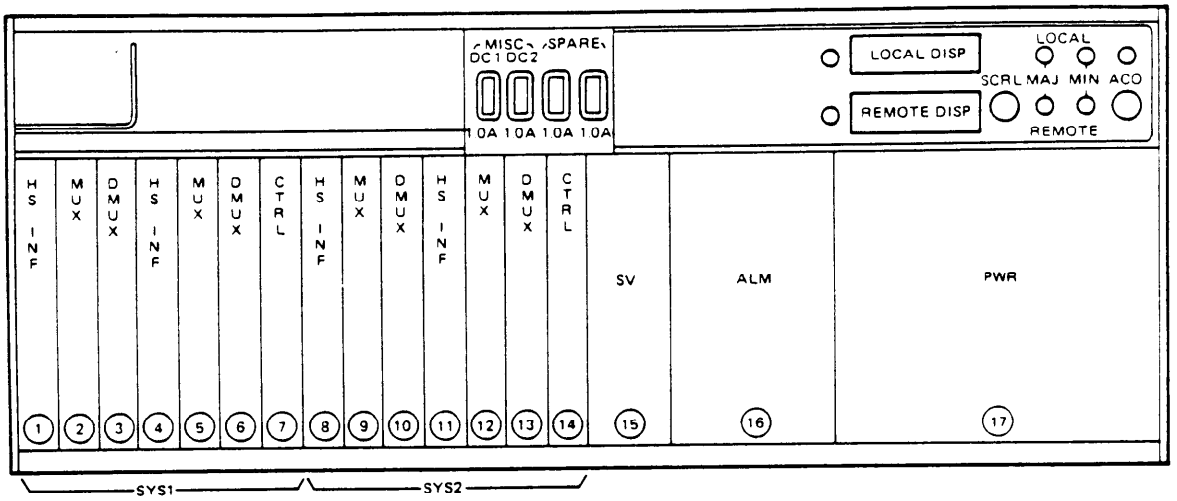
①, ④, ⑧, ⑪ : DS2 INF
②, ⑤, ⑨, ⑫ : MUX
③, ⑥, ⑩, ⑬ : DMUX
⑯ : ALM
⑰, ⑱ : PWR (DC)

(D) Bipolar Interface of Non-redundant Configuration for DC Application

COMPONENT UNIT

DESIGNATION	APPELLATION	CODE	REMARKS	QUANTITY			
				NON-REDUNDANT			
				1 SYS	2 SYS	3 SYS	4 SYS
MUX	Multiplexer unit (DS1)	E32-482-X0300-0A00 ◗E32-482-X0300-0A02◖	-48V	1	2	3	4
		E32-482-X0300-0B00 ◗E32-482-X0300-0B02◖	-24V				
DMUX	Demultiplexer Multiplexer	E32-482-X0301-0A00	-48V	1	2	3	4
		E32-482-X0301-0A01 ◗E32-482-X0301-0A02◖	-48V				
		E32-482-X0301-0B00 ◗E32-482-X0301-0B02◖	-24V				
HS INF	DS 2 interface unit	E32-409-X0308-0A00	-48V	1	2	3	4
		E32-409-X0308-0A01	-48V				
		E32-409-X0308-0B00	-24V				
ALM	Alarm unit	E32-107-X0314-0A00	-48V, PARALLEL	1	1	1	1
		E32-107-X0314-0A01	-48V, PARALLEL				
		E32-107-X0314-AA00	-48V, SERIAL				
		E32-107-X0314-0B00	-24V, PARALLEL				
		E32-107-X0314-AB00	-24V, SERIAL				
PWR	Power unit	E32-014-X0319-0A00	-48V	2	2	2	2
		E32-014-X0319-0B00	-24V				

◗ Figure 3-1 FD-2240A Unit Location and Component Units (Sheet 4 of 8) ◖



① , ④ , ⑧ , ⑪ : 6M OPT INF , ② , ⑤ , ⑨ , ⑫ : MUX , ③ , ⑥ , ⑩ , ⑬ : DMUX
⑦ , ⑭ : CTRL , ⑮ : SV ⑯ : ALM
⑰ : PWR (AC)

(E) Optical Interface of Redundant Configuration for AC Application

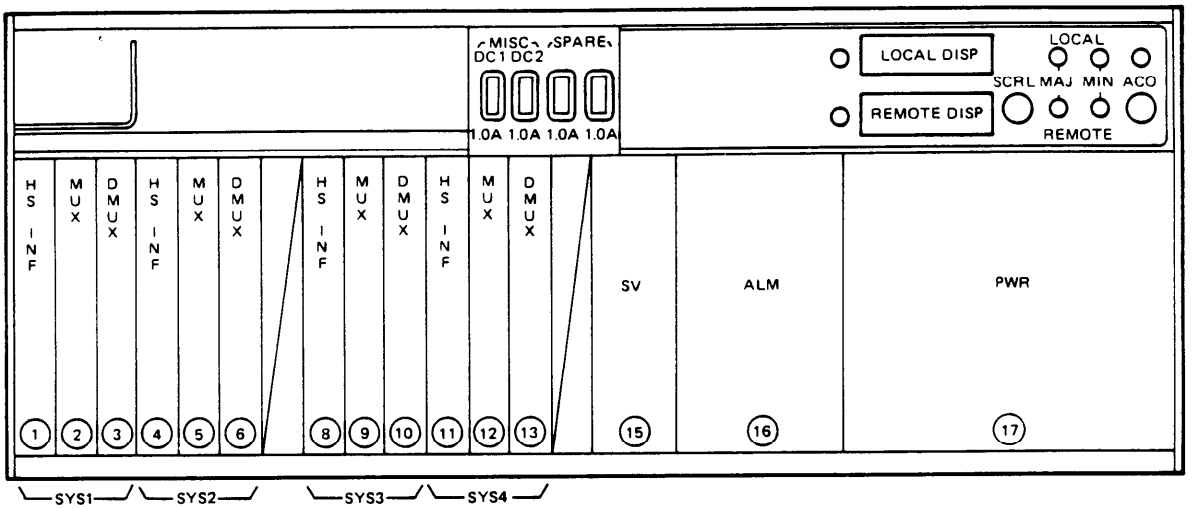
COMPONENT UNIT

DESIGNATION	APPELLATION	CODE	REMARKS	QUANTITY	
				REDUNDANT	
				1 SYS	2 SYS
MUX	Multiplexer unit (DS1)	E32-482-X0300-0A00 E32-482-X0300-0A02	-48V	2	4
DMUX	Demultipelxer unit (DS1)	E32-482-X0301-0A00	-48V	2	4
		E32-482-X0301-0A01 E32-482-X0301-0A02	-48V		
HS INF	6M optical interface unit	E32-852-X0306-0E00	LED-PIN, MM	2	4
		E32-852-X0306-0F00	LED-PIN, SM		
		E32-852-X0306-0F01	LED-PIN, SM		
		E32-852-X0307-0B00	LD-APD, MM	2	4
		E32-852-X0307-0C00	LD-APD, SM		
		E32-852-X0307-0C01	LD-APD, SM		
CTRL	Control unit	E32-852-X0316-0A00	-48V, OPT	1	2
		E32-001-X0316-0A01 E32-001-X7387-0A00	-48V, OPT		
ALM	Alarm unit	E32-107-X0314-0A00	-48V, PARALLEL	1	1
		E32-107-X0314-0A01	-48V, PARALLEL		
		E32-107-X0314-AA00	-48V, SERIAL		
SV	Supervisory unit	E32-080-X0315-0A00		1	1
PWR	Power unit	E32-014-X1914-0A00	-48V and AC	1	1

Note: The following shows the combination of CTRL, MUX, and DMUX units to be mounted:

CTRL (X0316A/A1),	MUX (X0300A),	DMUX (X0301A/A1)
CTRL (X7387A),	MUX (X0300A2),	DMUX (X0301A2)
CTRL (X7387A),	MUX (X0300A2),	DMUX (X0301A/A1)

Figure 3-1 FD-2240A Unit Location and Component Units (Sheet 5 of 8)

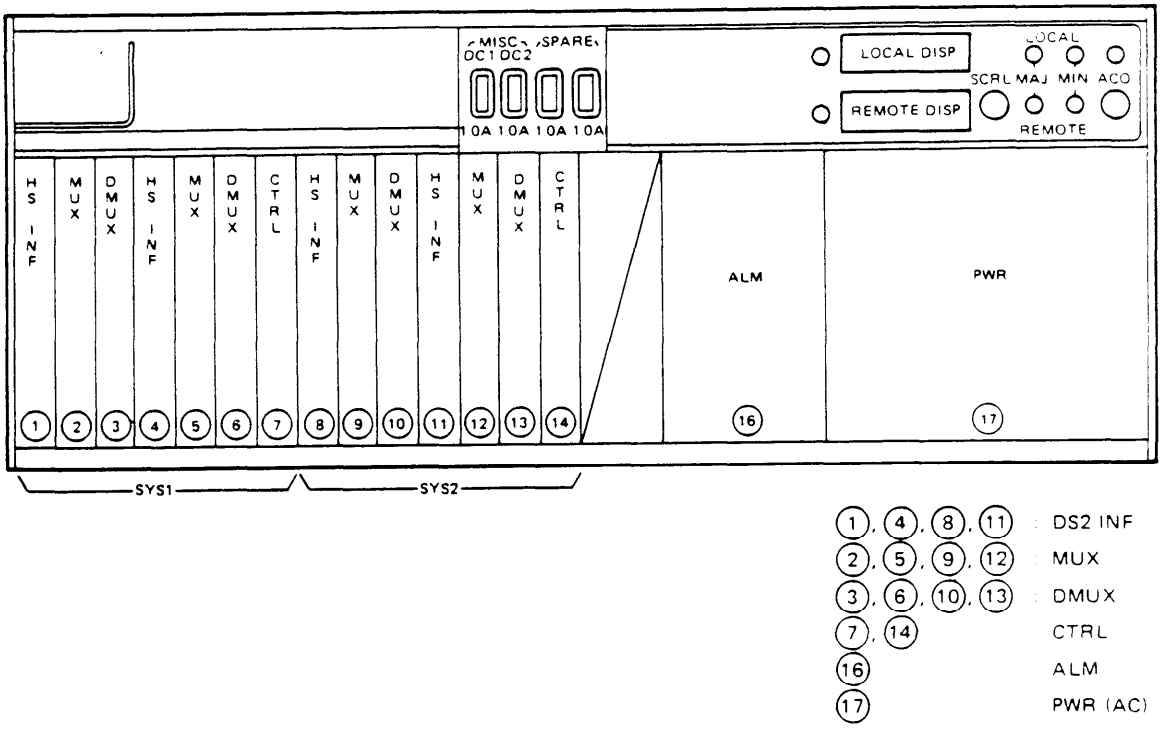


(F) Optical Interface of Non-redundant Configuration for AC Application

COMPONENT UNIT

DESIGNATION	APPELLATION	CODE	REMARKS	QUANTITY			
					NON-REDUNDANT		
				1 SYS	2 SYS	3 SYS	4 SYS
MUX	Multiplexer unit (DS1)	E32-482-X0300-0A00 ◗E32-482-X0300-0A02◖	-48V	1	2	3	4
DMUX	Demultipelxer unit (DS1)	E32-482-X0301-0A00	-48V	1	2	3	4
		E32-482-X0301-0A01 ◗E32-482-X0301-0A02◖	-48V				
HS INF	6M optical interface unit	E32-852-X0306-0E00	LED-PIN, MM	1	2	3	4
		E32-852-X0306-0F00	LED-PIN, SM				
		E32-852-X0306-0F01	LED-PIN, SM				
		E32-852-X0307-0B00	LD-APD, MM	1	2	3	4
		E32-852-X0307-0C00	LD-APD, SM				
		E32-852-X0307-0C01	LD-APD, SM				
ALM	Alarm unit	E32-107-X0314-0A00	-48V, PARALLEL	1	1	1	1
		E32-107-X0314-0A01	-48V, PARALLEL				
		E32-107-X0314-AA00	-48V, SERIAL				
SV	Supervisory unit	E32-080-X0315-0A00		1	1	1	1
PWR	Power unit	E32-014-X1914-0A00	-48V and AC	1	1	1	1

◗Figure 3-1 FD-2240A Unit Location and Component Units (Sheet 6 of 8)◖



(G) Bipolar Interface of Redundant Configuration for AC Application

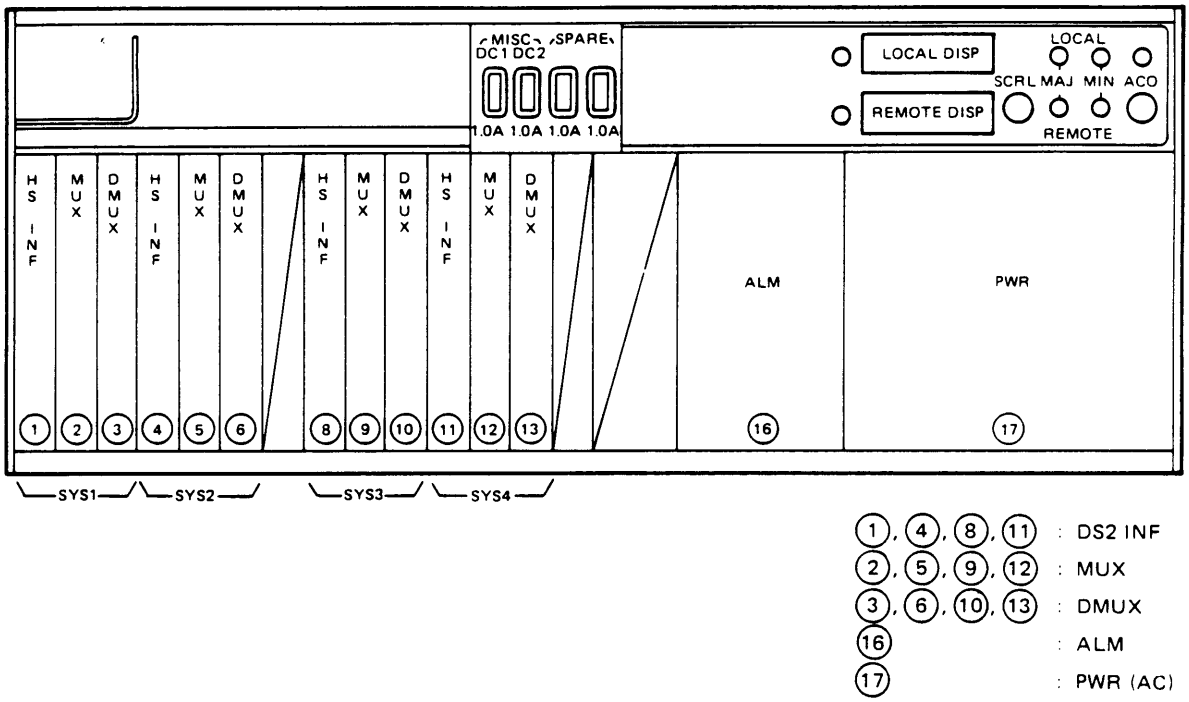
COMPONENT UNIT

DESIGNATION	APPELLATION	CODE	REMARKS	QUANTITY REDUNDANT 1 SYS	QUANTITY REDUNDANT 2 SYS
MUX	Multiplexer unit (DS1)	E32-482-X0300-0A00 E32-482-X0300-0A02	-48V	2	4
DMUX	Demultipelxer unit (DS1)	E32-482-X0301-0A00	-48V	2	4
		E32-482-X0301-0A01 E32-482-X0301-0A02	-48V		
HS INF	DS2 interface unit	E32-409-X0308-0A00	-48V	2	4
		E32-409-X0308-0A01	-48V		
CTRL	Control unit	E32-001-X0316-0B00 ◆ E32-001-X7387-0B00 ◆	-48V, BP	1	2
ALM	Alarm unit	E32-107-X0314-0A00	-48V, PARALLEL	1	1
		E32-107-X0314-0A01	-48V, PARALLEL		
		E32-107-X0314-AA00	-48V, SERIAL		
PWR	Power unit	E32-014-X1914-0A00	-48V and AC	1	1

◆ Note: The following shows the combination of CTRL, MUX, and DMUX units to be mounted: ◆

CTRL (X0316B),	MUX (X0300A),	DMUX (X0301A/A1)
CTRL (X7387B),	MUX (X0300A2),	DMUX (X0301A2)
CTRL (X7387B);	MUX (X0300A2),	DMUX (X0301A/A1)

◆ Figure 3-1 FD-2240A Units Location and Component Units (Sheet 7 of 8) ◆



(H) Bipolar Interface of Non-redundant Configuration for AC Application

COMPONENT UNIT

DESIGNATION	APPELLATION	CODE	REMARKS	QUANTITY			
				NON-REDUNDANT			
				1 SYS	2 SYS	3 SYS	4 SYS
MUX	Multiplexer unit (DS1)	E32-482-X0300-0A00 ◗E32-482-X0300-0A02◖	-48V	1	2	3	4
DMUX	Demultipelxer unit (DS1)	E32-482-X0301-0A00	-48V	1	2	3	4
DMUX		E32-482-X0301-0A01 ◗E32-482-X0301-0A02◖	-48V				
HS INF	DS2 interface unit	E32-409-X0308-0A00	-48V	1	2	3	4
		E32-409-X0308-0A01	-48V				
ALM	Alarm unit	E32-107-X0314-0A00	-48V, PARALLEL	1	1	1	1
		E32-107-X0314-0A01	-48V, PARALLEL				
		E32-107-X0314-AA00	-48V, SERIAL				
PWR	Power unit	E32-014-X1914-0A00	-48V and AC	1	1	1	1

◗ Figure 3-1 FD-2240A Unit Location and Component Units (Sheet 8 of 8) ◖

A. Unit Mounting

3.03 After checking unit strapping and polarity and voltage of station power use the following procedures to mount the plug-in unit in the shelf.

(1) Slide two lock levers on the front cover inwards and open down the cover gently. See Figure 3-2. Hold the cover with hands until it is fully opened.

(2) Slowly push unit inward until the front of unit reaches the lock bar at front of shelf. See Figure 3-3.

(3) Lift the ejector so that the unit can be locked in the shelf.

(4) When installing 6M OPT INF unit, insert unit halfway and connect optical patch (or pigtail) fiber cords to optical adapters. Refer to NECA 365-407-202 for optical connections.

(5) Close the front cover by pushing up the cover and slide the lock levers outward.

B. Unit Removal

3.04 Removal of the plug-in unit is done by the following procedures.

(1) Slide two lock levers on the front cover inwards and open down the cover gently. See Figure 3-2. Hold the cover with hands until it is fully opened.

(2) Depress ejector. The unit is unlocked and rear connector is disconnected. See Figure 3-4.

(3) Pull unit out along guide rail. Do not touch adjacent units. Handle with both hands, if necessary.

(4) When removing 6M OPT INF unit, remove unit halfway and disconnect optical patch (or pigtail) fiber cords. Refer to NECA 365-407-202 for optical connections.

(5) Remove the unit carefully.

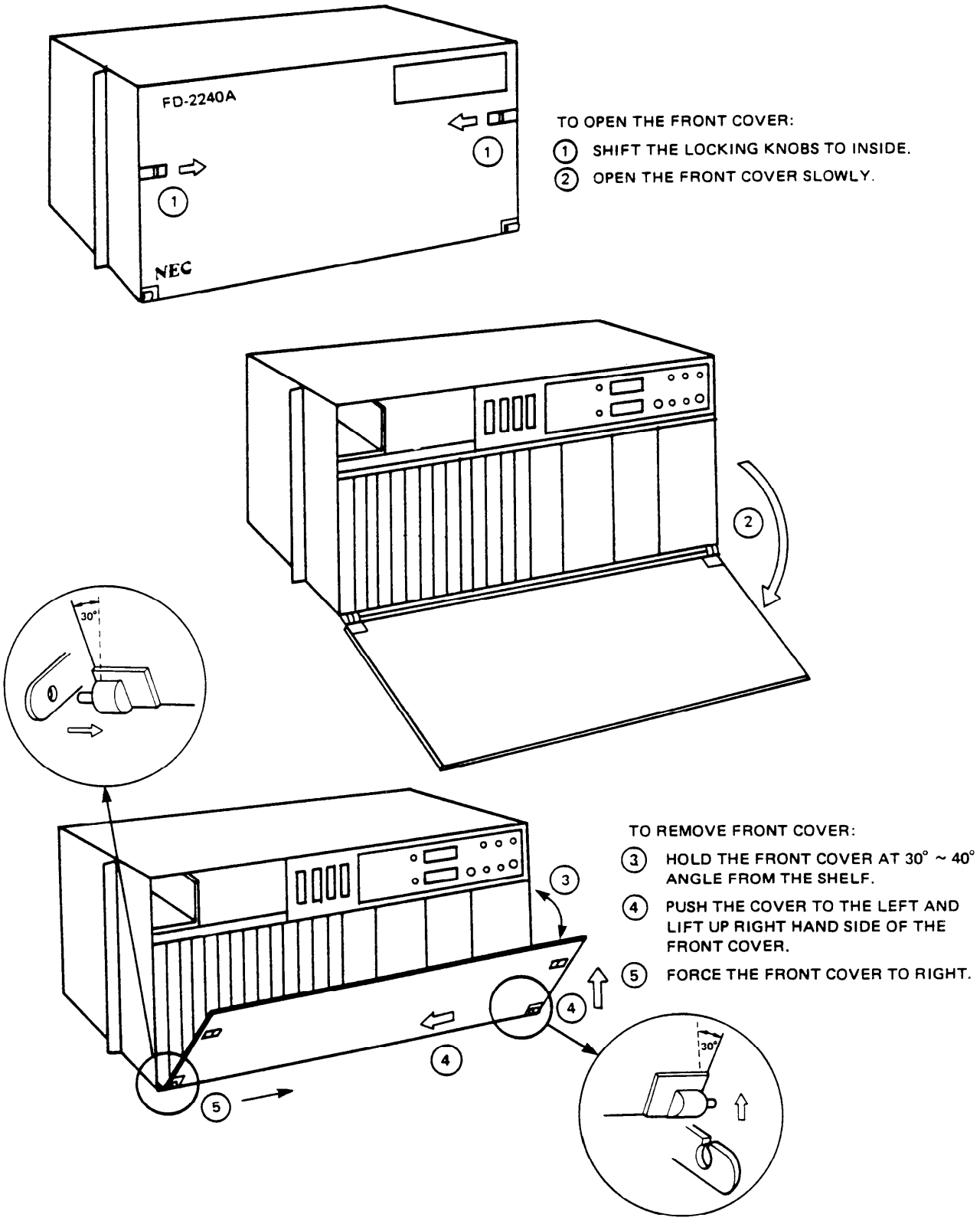
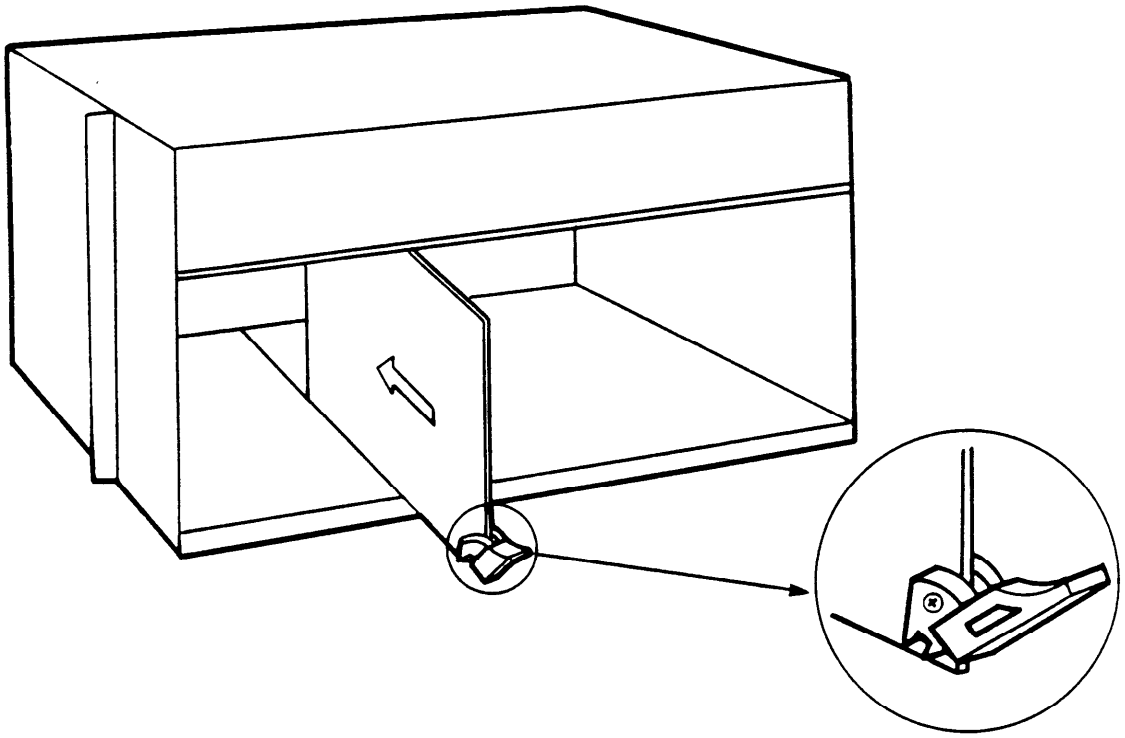
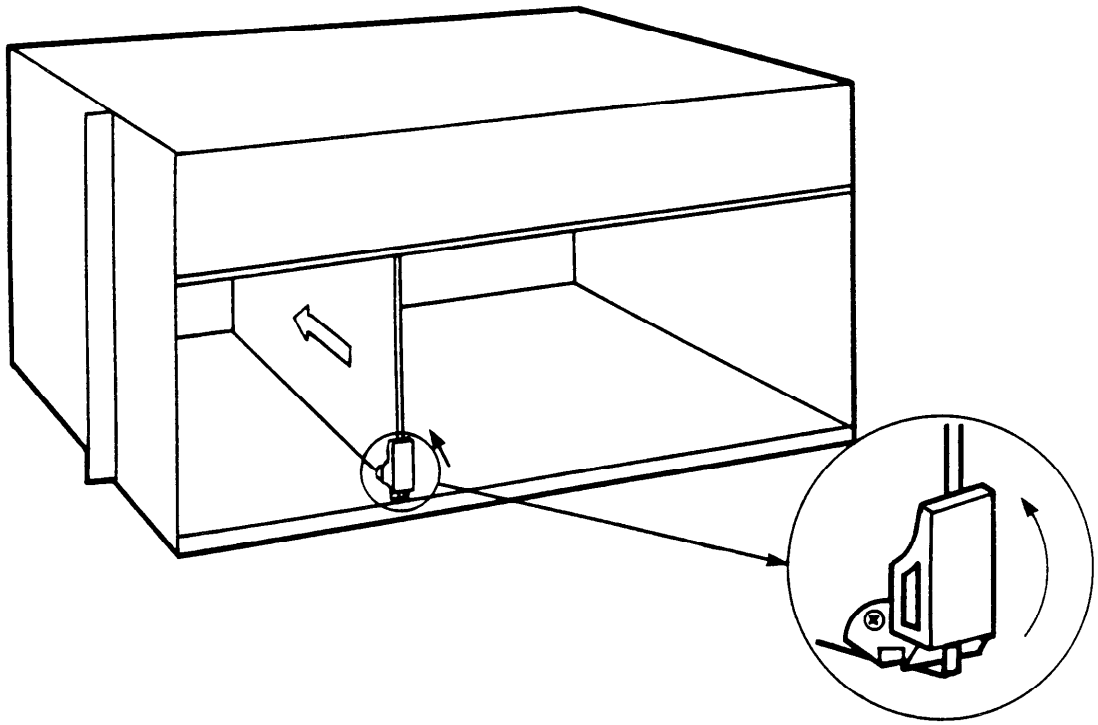


Figure 3-2 Front Cover Removing Method

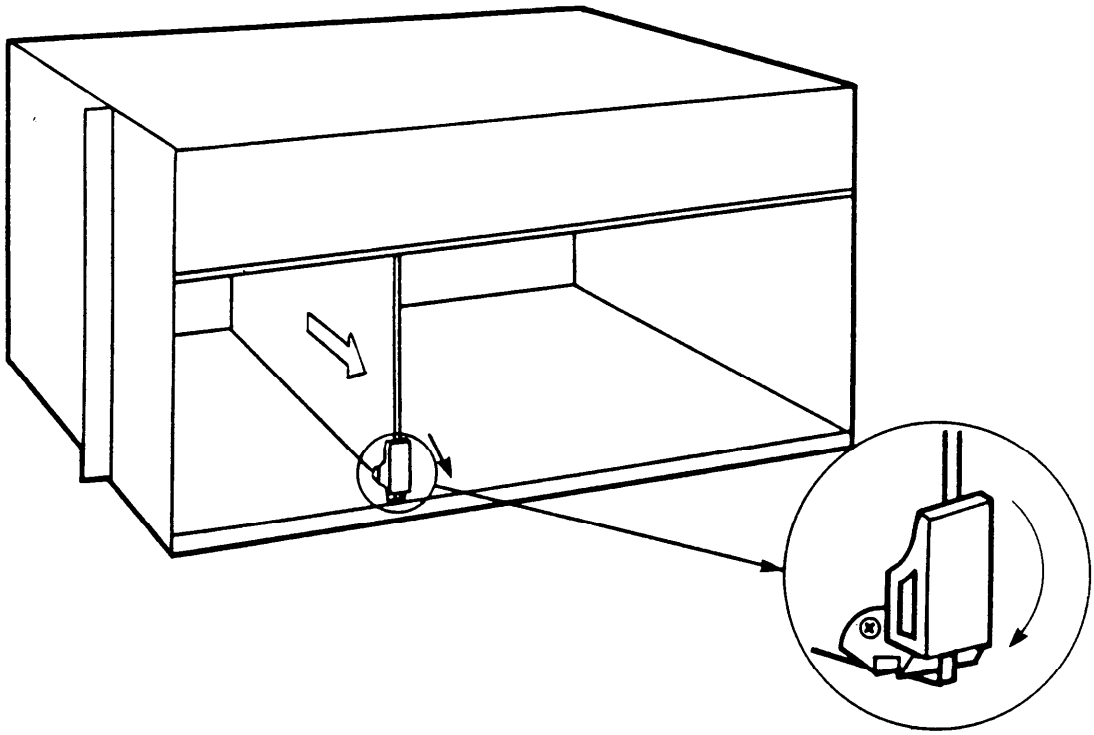


1. Insert unit along guide rail and slowly push inward.

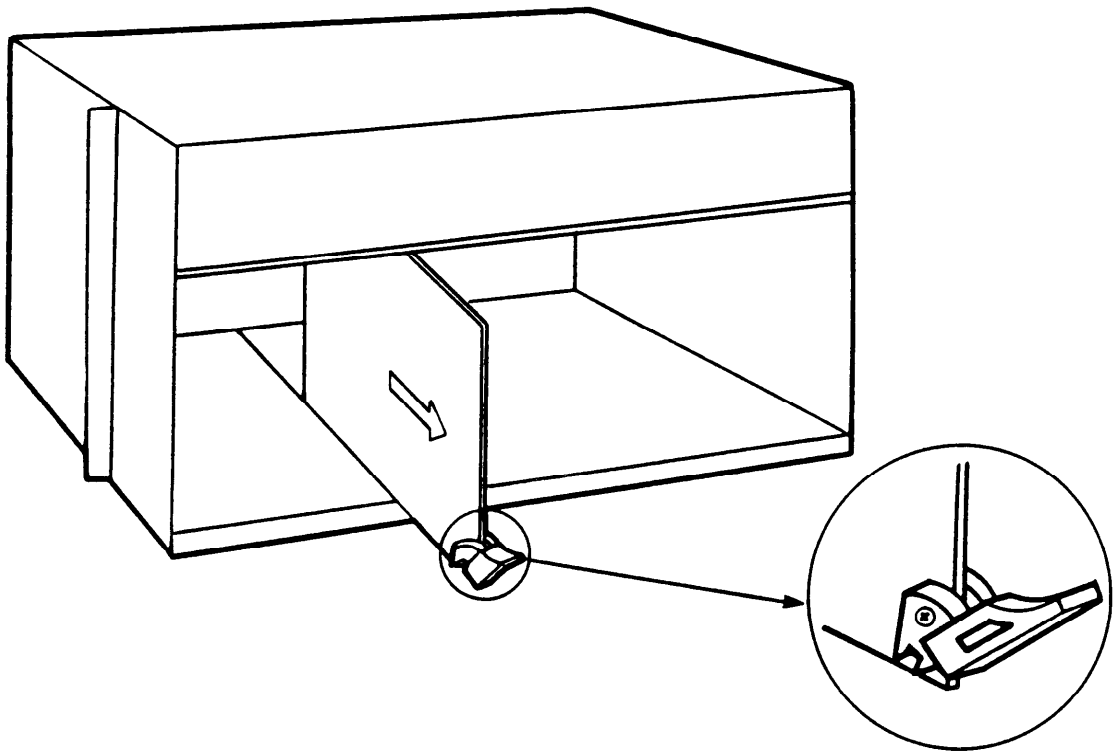


2. The unit is connected to the connector at back of shelf when ejector is lifted.

Figure 3-3 Unit Mounting



1. When the ejector is pulled down, the unit is disconnected from the connector at back of shelf.



2. Slowly pull out along guide rail.

Figure 3-4 Unit Removal

4. STRAPPING ADJUSTMENT

4.01 The following sections contain information and instructions concerning adjustment of strapping on the plug-in unit of the FD-2240A. It contains unit drawings and tabular data to be used during adjustment of the units prior to unit installation. It also includes a section describing the function performed by each unit.

4.02 The information presented in the following sections are of a general nature, and are intended only to provide a guide for use during installation. In some cases additional information may be required in order to determine how to adjust the various strapping. Such information is, of course, beyond the scope of this practice. For detailed information concerning system configuration, ancillary equipment, etc. refer to the appropriate equipment documentation and the engineering package for your facility.

4.03 Strapping adjustment is presented in two parts. The first part, Section 5, contains unit drawings showning the location of strapping terminals and switches, as well as adjustment instructions in tabular form. The second part, Section 6, describes each unit strapping in more details.

4.04 Refer to Section 5 and check to ensure that the strapping on each unit are properly adjusted. If incorrect, the strapping should be changed. In most cases, the information presented in Section 5 will be sufficient to determine the correct setting for each unit. In cases where more information is necessary, refer to the appropriate part of Section 6 and, if necessary, the engineering package for your facility.

5. STRAPPING ADJUSTMENT FIGURES

5.01 When checking and/or adjusting strappings on the unit, refer to the figures presented in this section.

5.02 The 6.3MB O-LTM consists of seven types of units. The following units have straps which need to be checked before installation or reset in accordance with system configuration.

(1) ALM unit See Figures 5-1 through 5-3.

(2) CTRL unit See Figures 5-4, 5-5 and ◗5-5A.◖

(3) DMUX (DS1) unit See Figures 5-6, 5-7 and ◗5-7A.◖

(4) DS2 INF unit See Figures 5-8 and 5-9.

(5) MUX (DS1) unit See Figure 5-10.

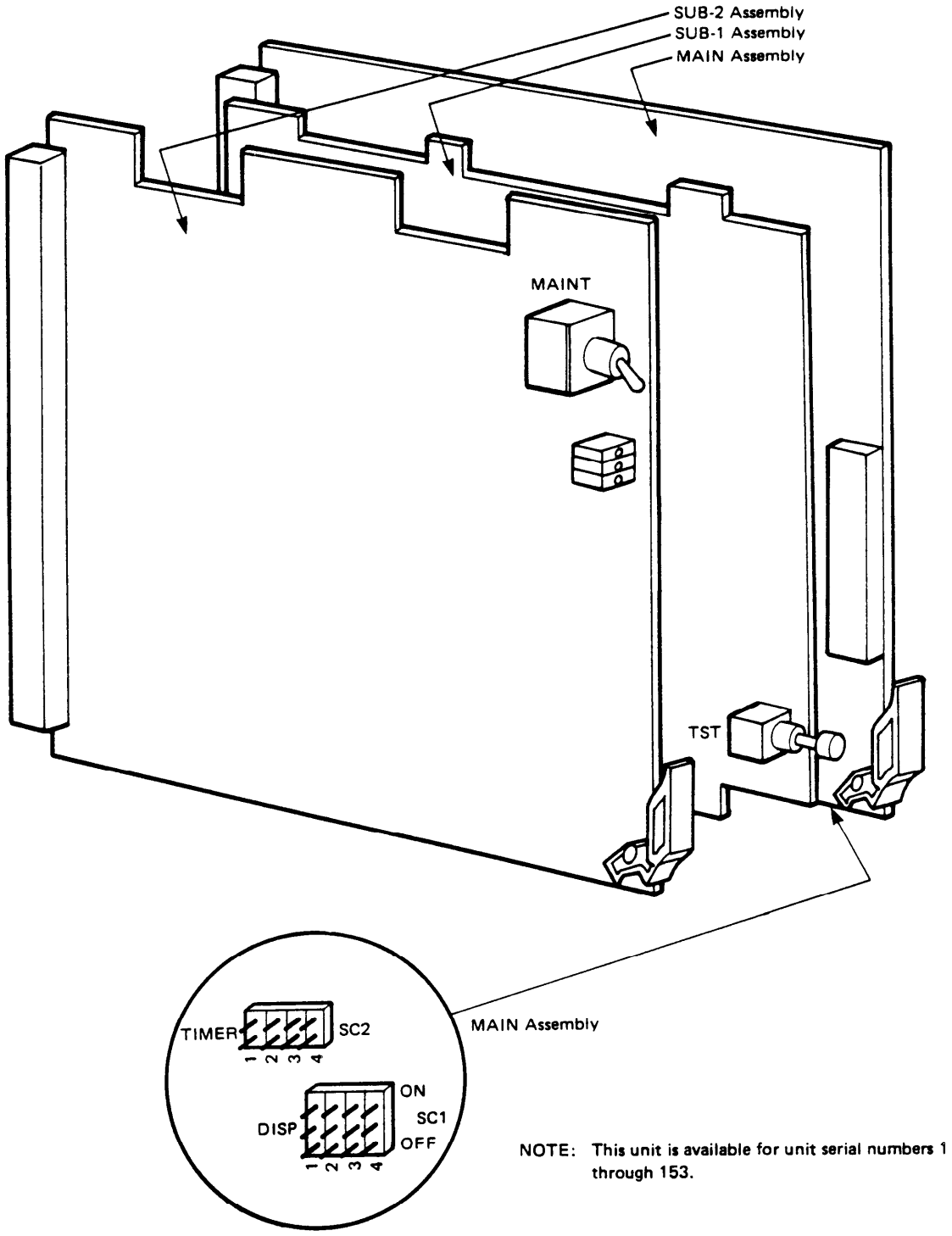
(6) 6M OPT INF (X0306) unit See Figure 5-11.

(7) 6M OPT INF (X0307) unit See Figures 5-12 and 5-13.

To check or reset the strapping positions, remove the unit from shelf, if it is installed in the shelf. Refer to Section 3 in this practice for insertion/removal of the unit.

CAUTION

Do not touch the connectors when handling the plug-in units. If oil and salt will be deposited on the connectors, it will result in a poor electrical connection.



NOTE: This unit is available for unit serial numbers 1 through 153.

Figure 5-1 ALM Unit (Grp: 0A00) Straps Location (Sheet 1 of 2)

Strapping Adjustment Table

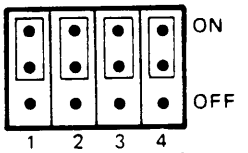
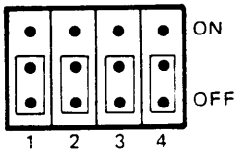
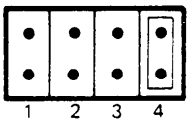
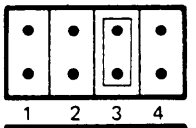
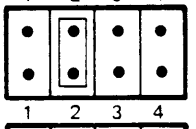
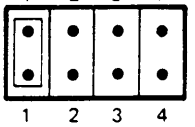
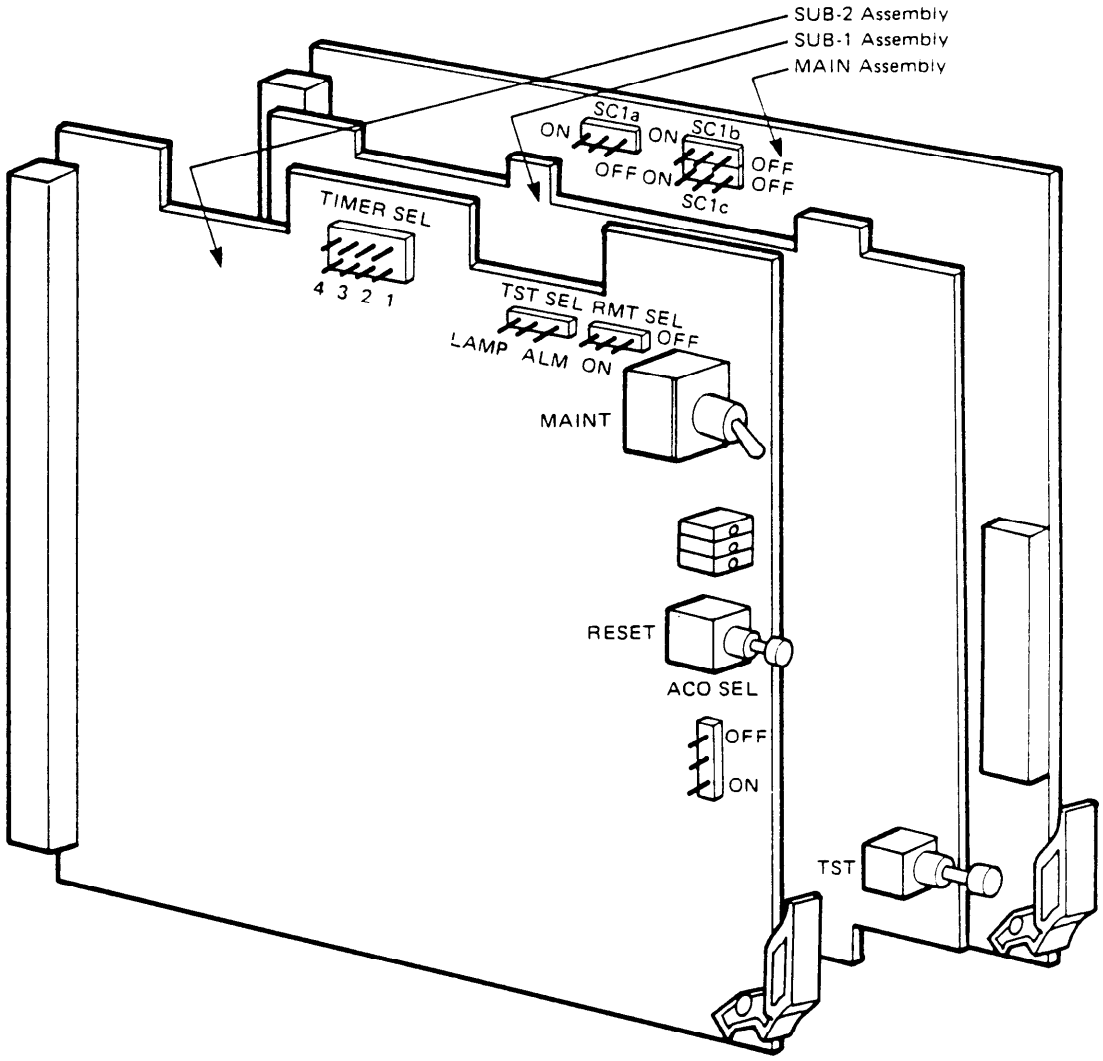
STRAP	DESCRIPTION	
SC 1 (DISP)	Enables to indicate by character display (Local, Remote DISP) and associated LED indicators.	
	Disables to indicate by character display and associated LED indicators.	
SC 2 (TIMER)	Indicates CO ALM and SV ALM at 2.5 seconds after alarm occurrence and stretches SV ALM for 2.5 seconds.	
	Indicates CO ALM and SV ALM at 5.0 seconds after alarm occurrence and stretches SV ALM for 5.0 seconds.	
	Indicates CO ALM and SV ALM at 10.0 seconds after alarm occurrence and stretches SV ALM for 10.0 seconds.	
	Indicates CO ALM and SV ALM at 20.0 seconds after alarm occurrence and stretches SV ALM for 20.0 seconds.	

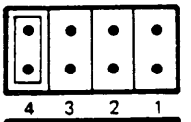
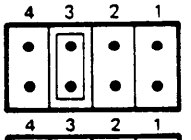
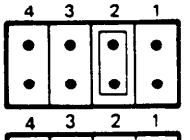
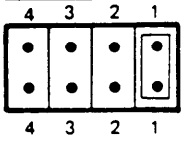
Figure 5-1 ALM Unit (Grp: 0A00) Straps Location (Sheet 2 of 2)



NOTE: This unit is available for unit serial numbers from 154 on.

Figure 5-2 ALM Unit (Grp: 0A01/0B00) Straps Location (Sheet 1 of 2)

Strapping Adjustment Table

	STRAP	DESCRIPTION	
Main Assembly	SC 1a (DISP)	Lights DISP REMOTE LED when remote alarm is detected.	ON [• • •] OFF
		Inhibits to light DISP REMOTE LED when remote alarm is detected.	ON [• • •] OFF
	SC 1b (DISP)	Lights DISP LOCAL LED when an alarm occurs in the equipment.	ON [• • •] OFF
		Inhibits to light DISP LOCAL LED when an alarm occurs in the equipment.	ON [• • •] OFF
	SC 1c (DISP)	Indicates alarm on LOCAL or REMOTE display when an alarm occurs in the equipment or remote alarm is detected.	ON [• • •] OFF
		Inhibits to indicate alarm on LOCAL or REMOTE display when an alarm occurs in the equipment or remote alarm is detected.	ON [• • •] OFF
Sub 2 Assembly	SC 1 (ACO SEL)	Releases MAJ AUD, MIN AUD, MAJ VIS, MIN VIS by ACO switch operation.	ON [• • •] OFF
		Releases only MAJ AUD and MIN AUD by ACO switch operation.	ON [• • •] OFF
	SC 2 (TST SEL)	Performs LED lamp test on display panel and each unit (except PWR unit) by TST switch operation.	LAMP [• • •] ALM
		Performs LED lamp test (except PWR unit) and CO alarm test by TST switch operation.	LAMP [• • •] ALM
	SC 3 (RMT SEL)	Indicates office alarm when remote alarm is detected.	ON [• • •] OFF
		Does not indicate office alarm when remote alarm is detected.	ON [• • •] OFF
	SC 4 (TIMER SEL)	Indicates CO ALM (AUD) and SV ALM at 2.5 seconds after alarm occurrence and stretches SV ALM for 2.5 seconds.	
		Indicates CO ALM (AUD) and SV ALM at 5.0 seconds after alarm occurrence and stretches SV ALM for 5.0 seconds.	
		Indicates CO ALM (AUD) and SV ALM at 10.0 seconds after alarm occurrence and stretches SV ALM for 10.0 seconds.	
		Indicates CO ALM (AUD) and SV ALM at 20.0 seconds after alarm occurrence and stretches SV ALM for 20.0 seconds.	

◗ Figure 5-2 ALM Unit (Grp: 0A01/0B00) Straps Location (Sheet 2 of 2)◖

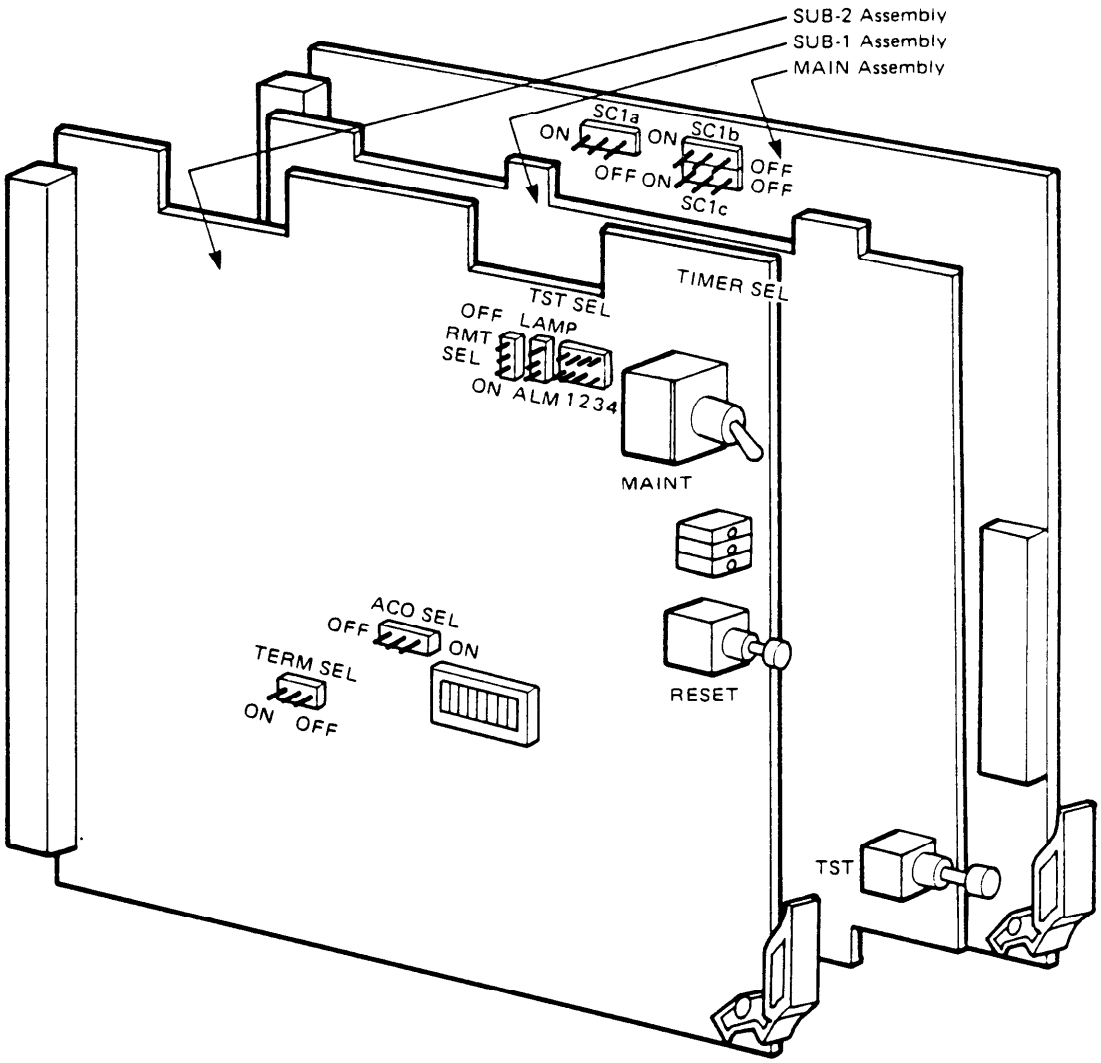


Figure 5-3 ALM Unit (Grp: AA00/AB00) Straps Location (Sheet 1 of 2)

Strapping Adjustment Table

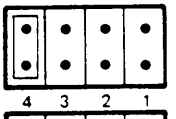
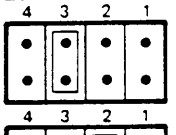
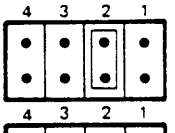
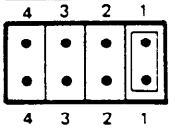
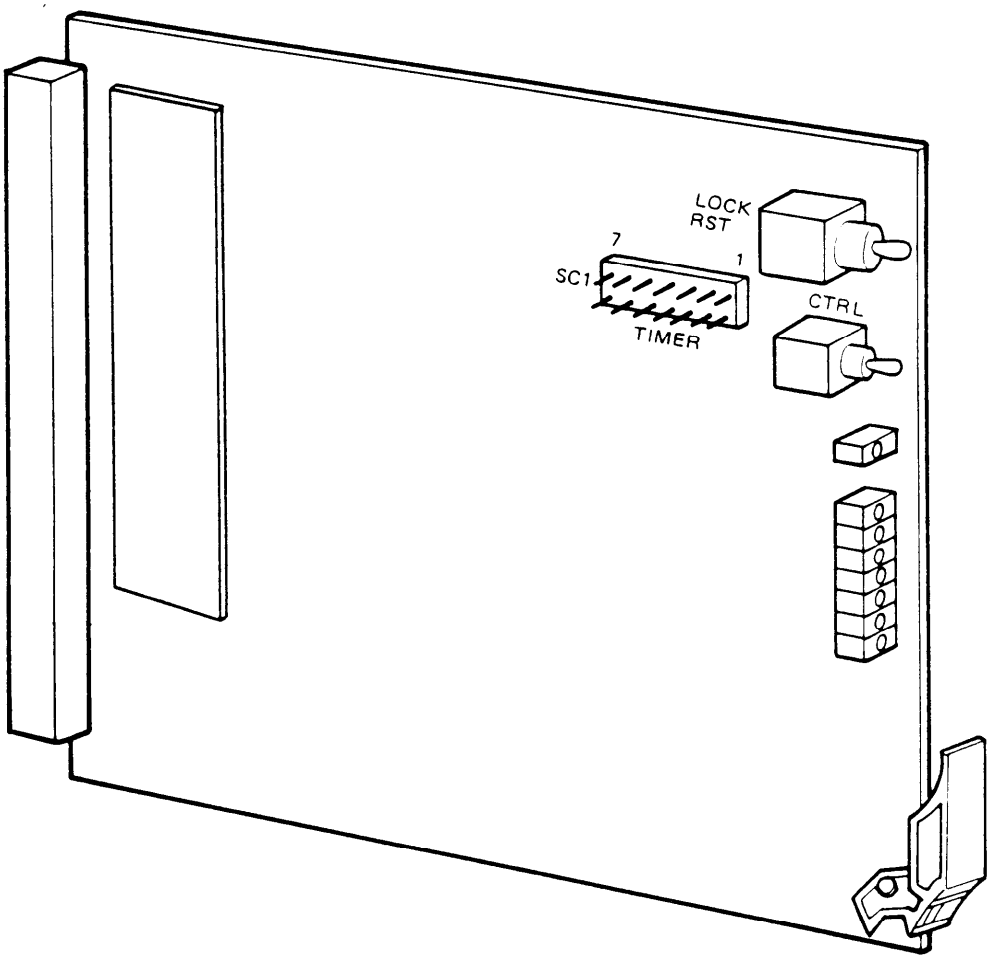
	STRAP	DESCRIPTION	
Main Assembly	SC 1a (DISP)	Lights DISP LED when remote alarm is detected.	ON ● ● ● OFF
		Inhibits to light DISP LED when remote alarm is detected.	ON ● ● ● OFF
	SC 1b (DISP)	Lights DISP LOCAL LED when an alarm occurs in the equipment.	ON ● ● ● OFF
		Inhibits to light DISP LOCAL LED when an alarm occurs in the equipment.	ON ● ● ● OFF
	SC 1c (DISP)	Indicates alarm on LOCAL or REMOTE display when an alarm occurs in the equipment or remote alarm is detected.	ON ● ● ● OFF
		Inhibits to indicate alarm on LOCAL or REMOTE display when an alarm occurs in the equipment or remote alarm is detected.	ON ● ● ● OFF
Sub 2 Assembly	SC 1 (ACO SEL)	Releases MAJ AUD, MIN AUD, MAJ VIS, MIN VIS by ACO switch operation.	ON ● ● ● OFF
		Releases only MAJ AUD and MIN AUD by ACO switch operation.	ON ● ● ● OFF
	SC 2 (TST SEL)	Performs LED lamp test on display panel and each unit (except PWR unit) by TST switch operation.	LAMP ● ● ● ALM
		Performs LED lamp test (except PWR unit) and CO alarm test by TST switch operation.	LAMP ● ● ● ALM
	SC 3 (RMT SEL)	Indicates office alarm when remote alarm is detected.	ON ● ● ● OFF
		Does not indicate office alarm when remote alarm is detected.	ON ● ● ● OFF
	SC 4 (TIMER SEL)	Indicates CO ALM (AUD) and SV ALM at 2.5 seconds after alarm occurrence and stretches SV ALM for 2.5 seconds	
		Indicates CO ALM (AUD) and SV ALM at 5 seconds after alarm occurrence and stretches SV ALM for 5 seconds	
		Indicates CO ALM (AUD) and SV ALM at 10 seconds after alarm occurrence and stretches SV ALM for 10 seconds	
		Tndicates CO ALM (AUD) and SV ALM at 20 seconds after alarm occurrence and stretches SV ALM for 20 seconds	
	SC 5 (TERM SEL)	Terminates receive side line of RS-422 interface with 100Ω resistor	ON ● ● ● OFF
		Does not terminate receive side of RS-422 interface with 100Ω resistor	ON ● ● ● OFF

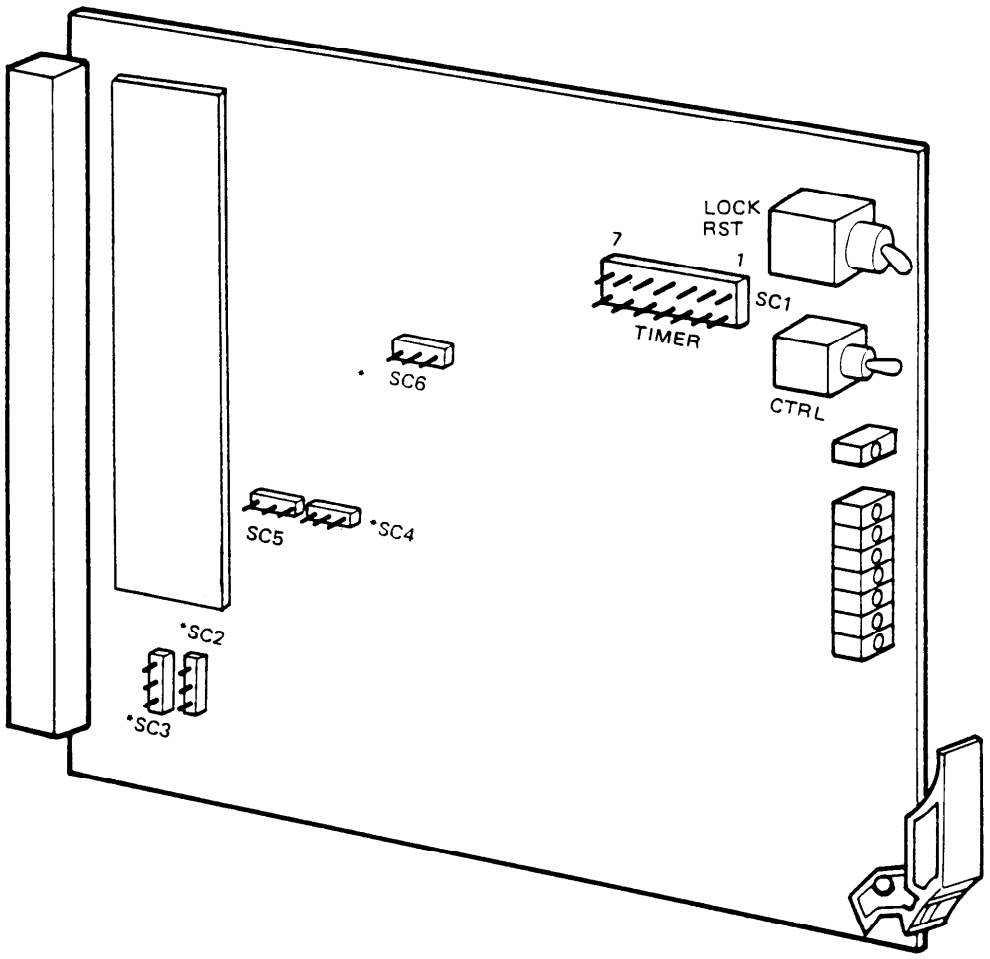
Figure 5-3 ALM Unit (Grp: AA00/AB00) Straps Location (Sheet 2 of 2)



NOTE: This unit is available for unit serial numbers 1 through 164 and is used when high speed side is 6M OPT INF unit. SC 1 is available when high speed side is DS2 INF unit.

Strap	Description		
SC 1	Sets automatic release time of automatically locked system		7 6 5 4 3 2 1
	Strap position	Release time	
	1	22 min	
	2	44 min	
	3	1.5 hrs	
	4	3 hrs.	
	5	6 hrs.	
	6	12 hrs.	NOTE: This strap is effective only when high speed side is DS2 INF unit.
	7	24 hrs	

♦ Figure 5-4 CTRL Unit (X0316, Grp: 0A00) Strap Location ♦



* Factory adjustment

NOTE: Group 0A01 is used with 6M OPT INF unit and group 0B00 is used with DS2 INF unit.

Figure 5-5 CTRL Unit (X0316, Grp: 0A01/0B00) Straps Location (Sheet 1 of 2)

Strapping Adjustment Table

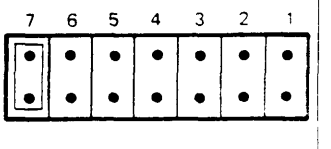
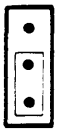
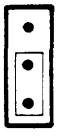
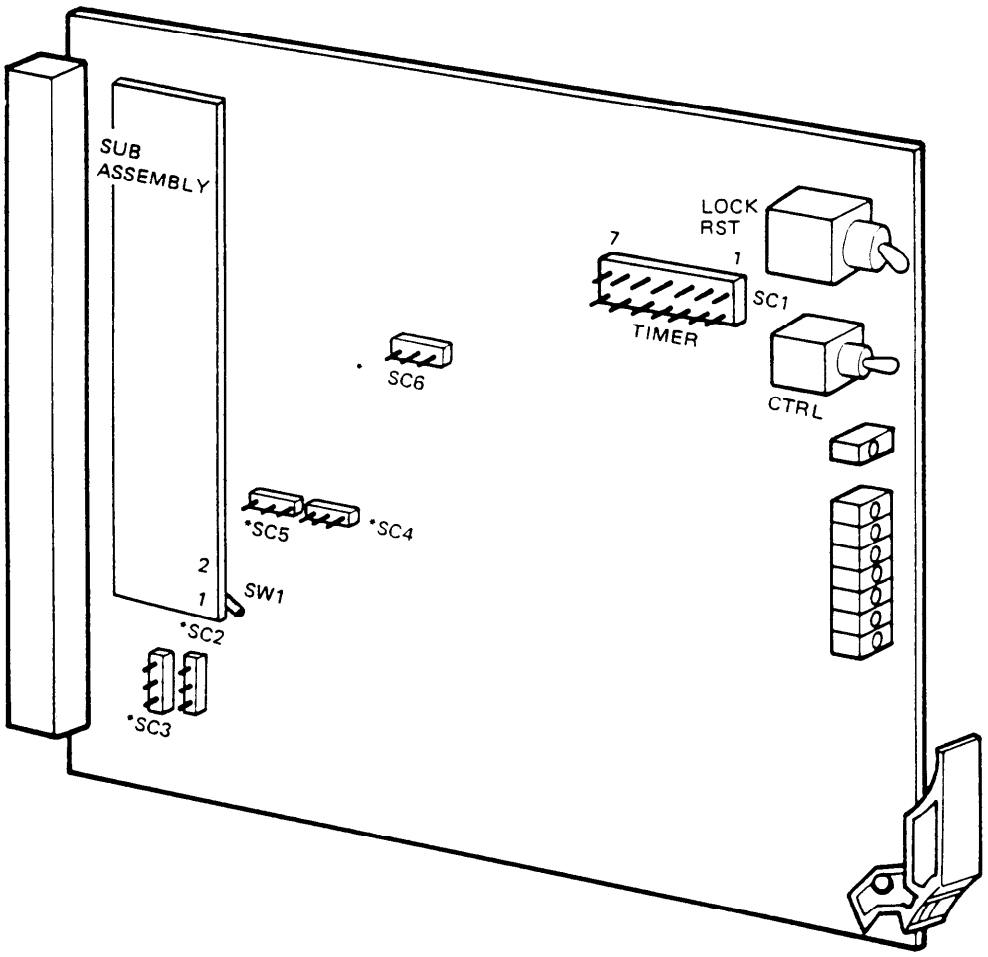
STRAP	DESCRIPTION	
SC 1	Sets automatic release time of the system which is locked automatically. Strapping positions and their release times are as listed below. Position — Release time 1 — 22 min 2 — 44 min 3 — 1.5 hrs 4 — 3.0 hrs 5 — 6.0 hrs 6 — 12.0 hrs 7 — 24.0 hrs	
SC 2	Factory adjustment	
SC 3	Factory adjustment	
SC 4	Factory adjustment	
SC 5	Factory adjustment	
SC 6	Factory adjustment	

Figure 5-5 CTRL Unit (X0316, Grp: 0A01/0B00) Straps Location (Sheet 2 of 2)



* Factory adjustment

NOTE: Group 0A00 is used with 6M OPT INF unit and group 0B00 is used with DS2 INF unit.

◗ Figure 5-5A CTRL Unit (X7387, Grp: 0A00/0B00) Straps Location (Sheet 1 of 2) ◖

Strapping Adjustment Table

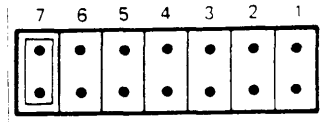
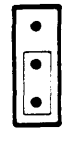
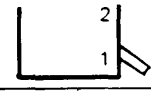
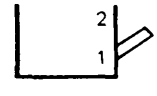
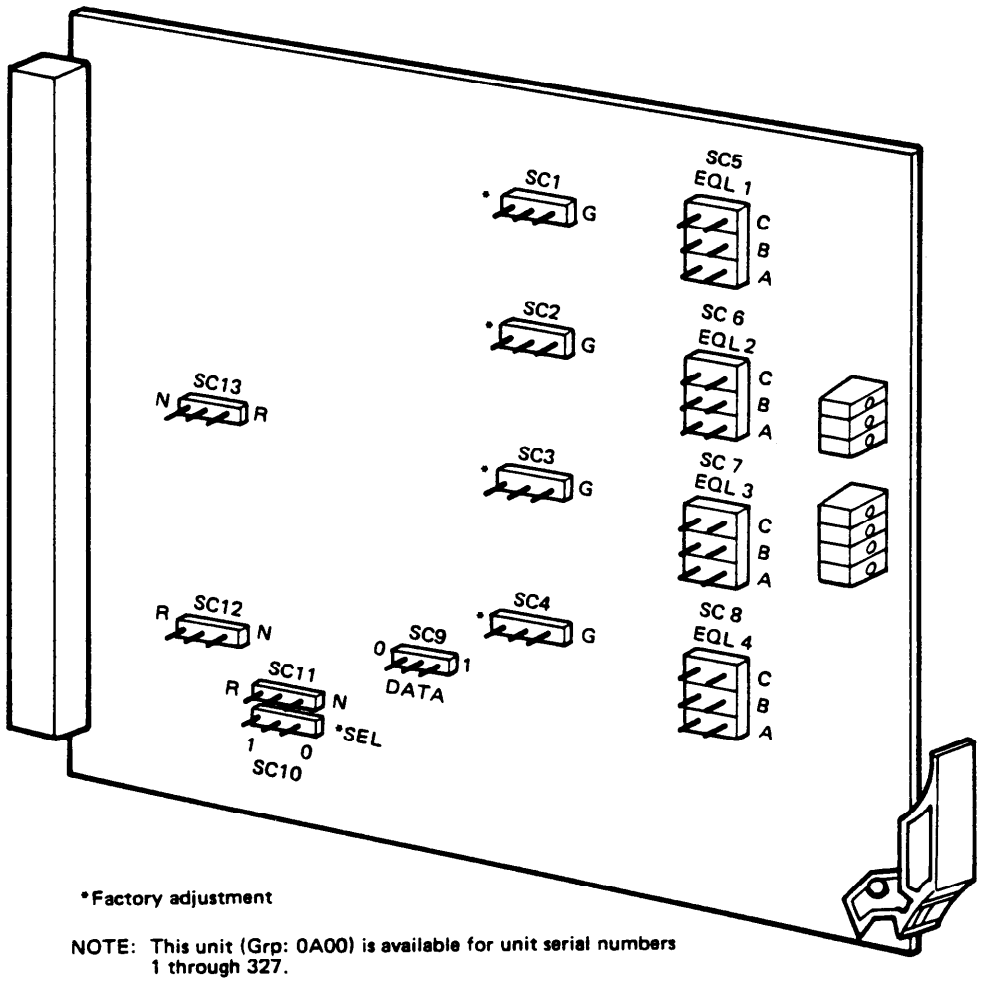
STRAP	DESCRIPTION
SC 1	Sets automatic release time of the system which is locked automatically. Strapping positions and their release times are as listed below. Position — Release time 1 — 22 min 2 — 44 min 3 — 1.5 hrs 4 — 3.0 hrs 5 — 6.0 hrs 6 — 12.0 hrs 7 — 24.0 hrs 
SC 2	Factory adjustment
SC 3	Factory adjustment 
SC 4	Factory adjustment
SC 5	Factory adjustment
SC 6	Factory adjustment
SW1	When set to "1" position the unit is compatible with the New MUX (X0301A2/B2) and the New DMUX (X0300A2/B2) 
	When set to "2" position the unit is compatible with the New MUX (X0301A2/B2) and the Primary DMUX (X0301A or A1/B) 

Figure 5-5A CTRL Unit (X/387, Grp: 0A00/0B00) Straps Location (Sheet 2 of 2)



*Factory adjustment

NOTE: This unit (Grp: 0A00) is available for unit serial numbers 1 through 327.

Figure 5-6 DMUX Unit (Grp.: 0A00) Straps Location (Sheet 1 of 2)

Strapping Adjustment Table

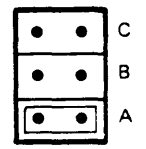
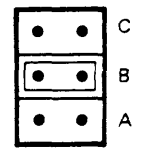
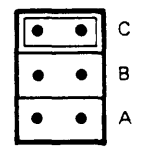
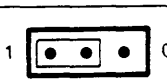
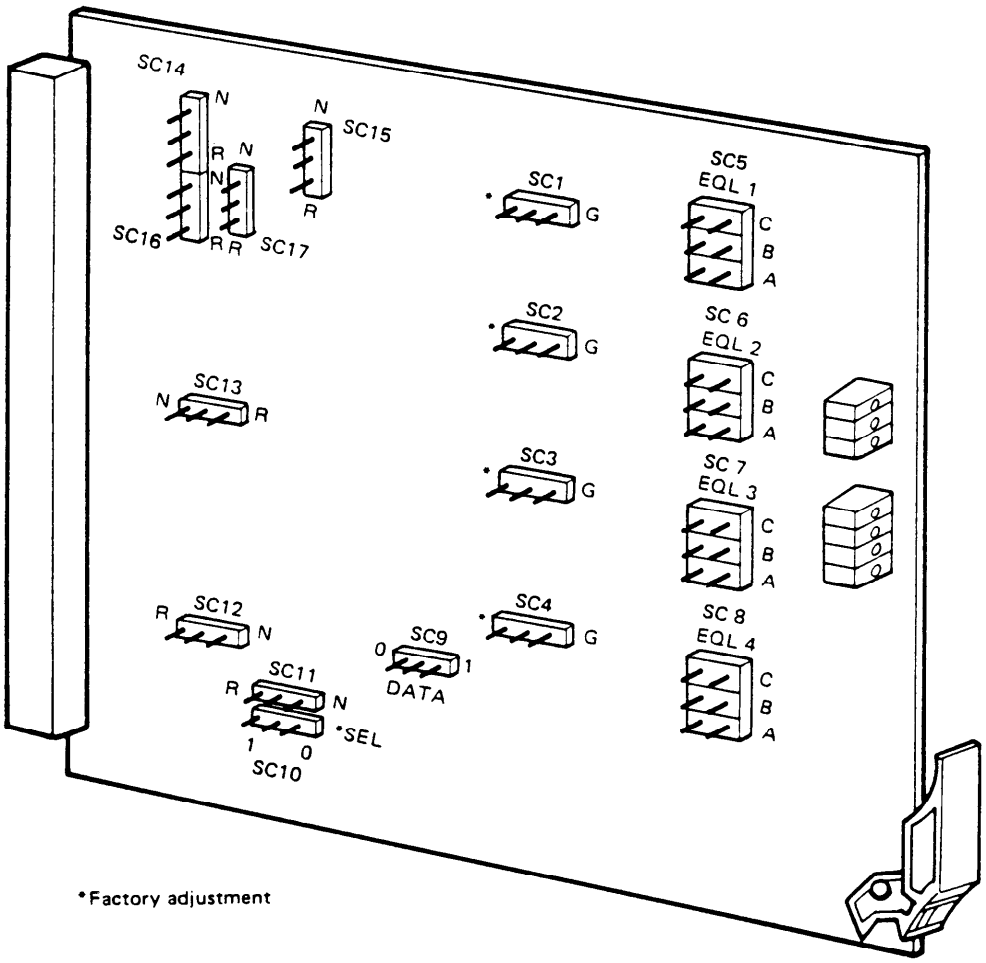
STRAP	DESCRIPTION	
SC 1 through SC 4	Factory adjustment to operate VCOX properly under normal condition.	
	Factory adjustment to be used for VCOX adjustment.	
SC 5 through SC 8 (EQL 1 - EQL 4)	EQL setting to compensate cable loss between DS1 equipments and DSX-1 cross connect for cable length 0 to 200 feet.	
	EQL setting to compensate cable loss between DS1 equipment and DSX-1 cross connect for cable length 200 to 450 feet.	
	EQL setting to compensate cable loss between DS1 equipment and DSX-1 cross connect for cable length 450 to 655 feet.	
SC 9 (DATA)	Sends out "1" alarm signal to DS1 CH side, when no input to high speed line.	
	Send out "0" alarm signal to DS1 CH side, when no input to high speed line.	
SC 10 (X SEL)	Detects when x bit transmitting remote alarm in incoming signal is "0".	
	Detects when x bit transmitting remote alarm in incoming signal is "1".	
SC 11 through SC 13 (R/N)	Sets "R" for redundant system configuration.	
	Sets "N" for non-redundant system configuration.	

Figure 5-6 DMUX Unit (Grp: 0A00) Straps Location (Sheet 2 of 2)



♦ Figure 5-7 DMUX Unit (Grp: 0A01/0B00) Straps Location (Sheet 1 of 2) ♦

Strapping Adjustment Table

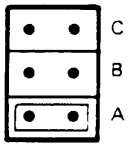
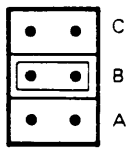
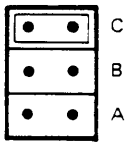
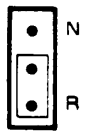
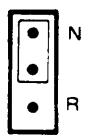
STRAP	DESCRIPTION	
SC 1 through SC 4	Factory adjustment to operate VCOX properly under normal condition.	
	Factory adjustment to be used for VCOX adjustment.	
SC 5 through SC 8 (EQL 1 - EQL 4)	EQL setting to compensate cable loss between DS1 equipments for cable length 0 to 200 feet.	
	EQL setting to compensate cable loss between DS1 equipment for cable length 200 to 450 feet.	
	EQL setting to compensate cable loss between DS1 equipment for cable length 450 to 655 feet.	
SC 9 (DATA)	Sends down a continuous stream of 1's to D4 channel banks in case of a unit or channel failure.	
	Sends down a continuous stream of 0's to D4 channel banks in case of unit or channel failure.	
SC 10 (X SEL)	Detects when x bit transmitting remote alarm in incoming signal is "1".	
	Detects when x bit transmitting remote alarm in incoming signal is "0".	
SC 11 through SC 13 (R/N)	Sets "R" for redundant system configuration.	
	Sets "N" for non-redundant system configuration.	
SC 14 through SC 17 (R/N)	Sets "R" for redundant system configuration.	
	Sets "N" for non-redundant system configuration.	

Figure 5-7 DMUX Unit (Grp: 0A01/0B00) Straps Location (Sheet 2 of 2)

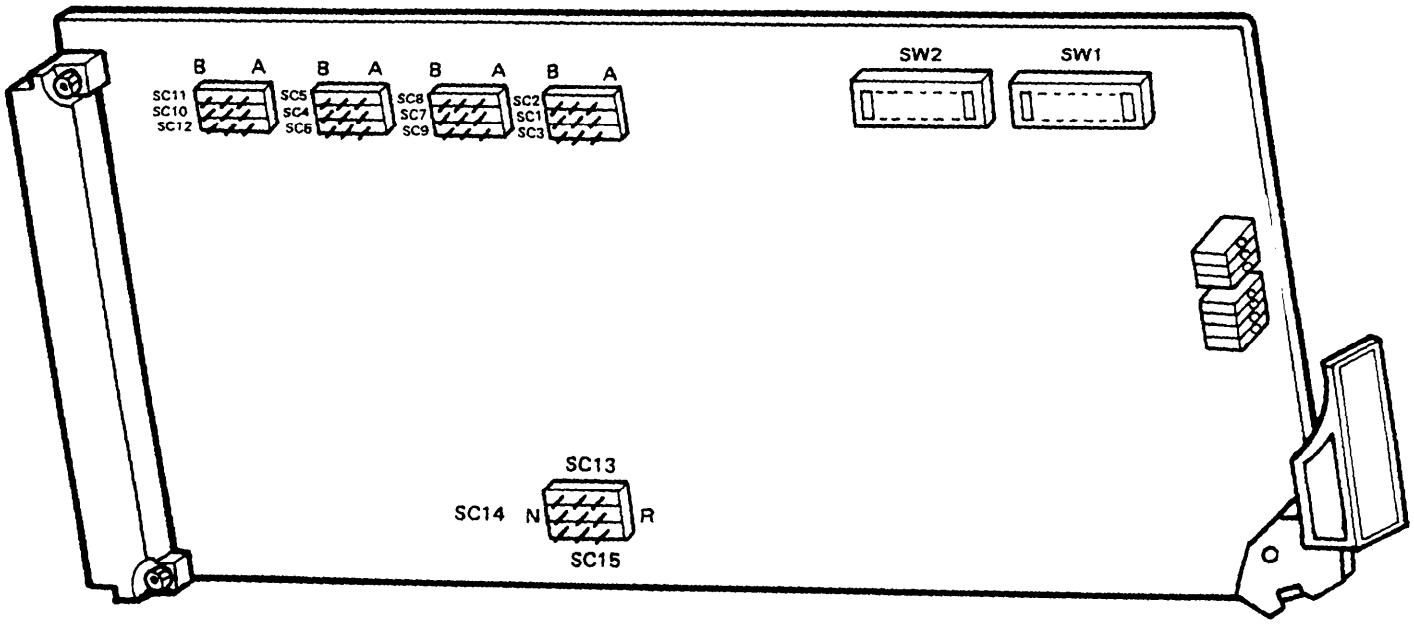
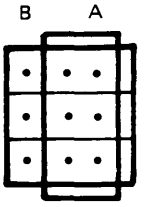
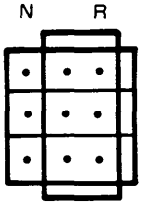
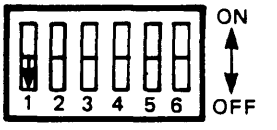
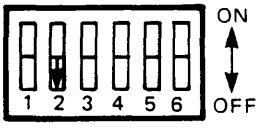
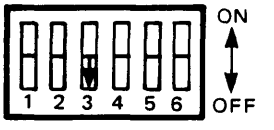
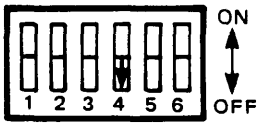
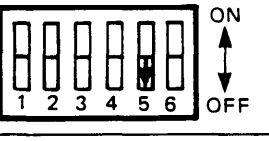
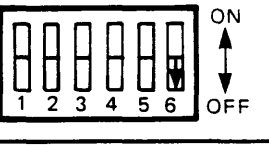
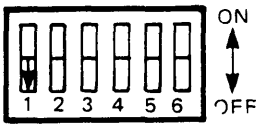
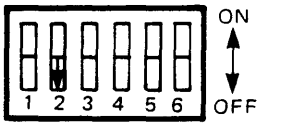
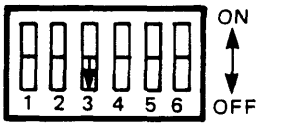
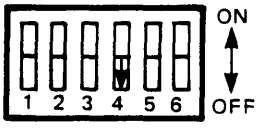
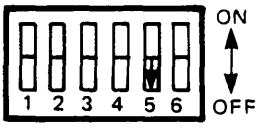
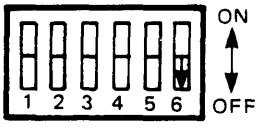
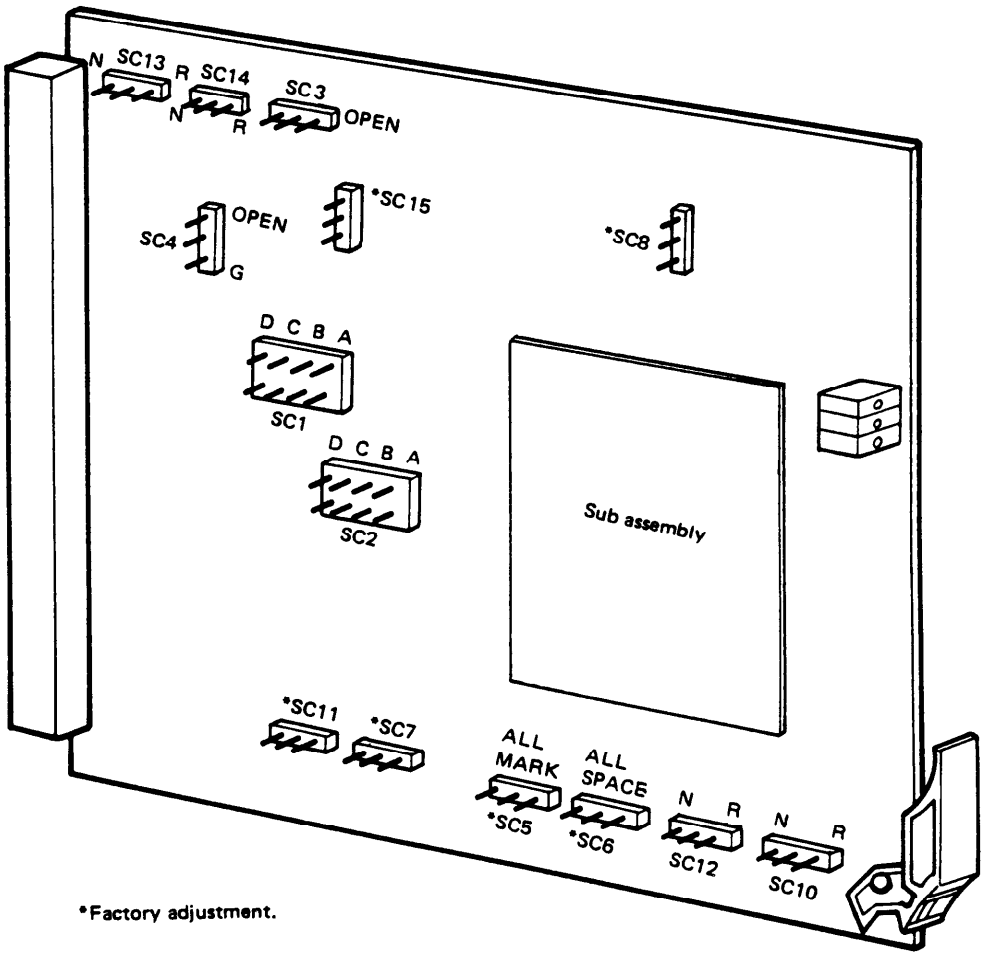


Fig. 5-7A DMUX Unit (GRP: 0A02/0B02) Options Location

Options Adjustment Table			
OPTIONS	**OPTION'S POSITION**	**DESCRIPTION**	**SHIPPED CONDITION**
SC1 through SC12	A	Sets when cable length to cross-connect is 0 to 450 feet.	
	B	Sets when cable length to cross-connect is 450 to 655 feet.	
SC13 through SC15	R	Sets when the system is used as redundant configuration.	
	N	Sets when the system is used as non-redundant configuration.	
SW 1-1	ON	Fixes to "0" the polarity of 1.5MB output data, when the HS data is lost.	
	OFF	Fixes to "1" the polarity of 1.5MB output data, when the HS data is lost.	
SW 1-2	ON	Disables ALM when equipment other than NEC is used at opposite side.	
	OFF	Enables ALM when equipment other than NEC is used at opposite side.	
SW 1-3	ON	Enables to receive remote loopback request by NEC method.	
	OFF	Disables to receive remote loopback request by NEC method.	
SW 1-4	ON	Enables to receive remote loopback request by stuff control bits method.	
	OFF	Disables to receive remote loopback request by stuff control bits method.	
SW 1-5	OFF	Not used. Fixed to the OFF position.	
SW 1-6	OFF	Not used. Fixed to the OFF position.	

Options Adjustment Table			
OPTIONS	**OPTION'S POSITION**	**DESCRIPTION**	**SHIPPED CONDITION**
SW 2-1	ON	Sets DS1 line code to B8ZS.	
	OFF	Sets DS1 line code to AMI.	
SW 2-2	ON	Fixes to "0" the polarity of X bit of DS2 frame structure.	
	OFF	Fixes to "1" the polarity of X bit of DS2 frame structure.	
SW 2-3	ON	Disables ALM output when Channel 1 is not used.	
	OFF	Enables ALM output when Channel 1 is not used.	
SW 2-4	ON	Disables ALM output when Channel 2 is not used.	
	OFF	Enables ALM output when Channel 2 is not used.	
SW 2-5	ON	Disables ALM output when Channel 3 is not used.	
	OFF	Enables ALM output when Channel 3 is not used.	
SW 2-6	ON	Disables ALM output when Channel 4 is not used.	
	OFF	Enables ALM output when Channel 4 is not used.	



NOTE: This unit (Grp: 0A00) is available for unit serial numbers 1 through 20.

Figure 5-8 DS2 INF Unit (Grp: 0A00) Straps Location (Sheet 1 of 2)

Strapping Adjustment Table

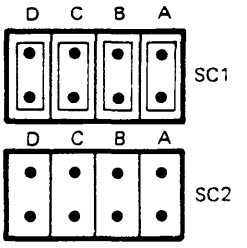
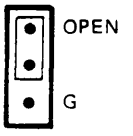
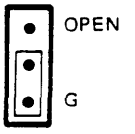
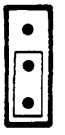
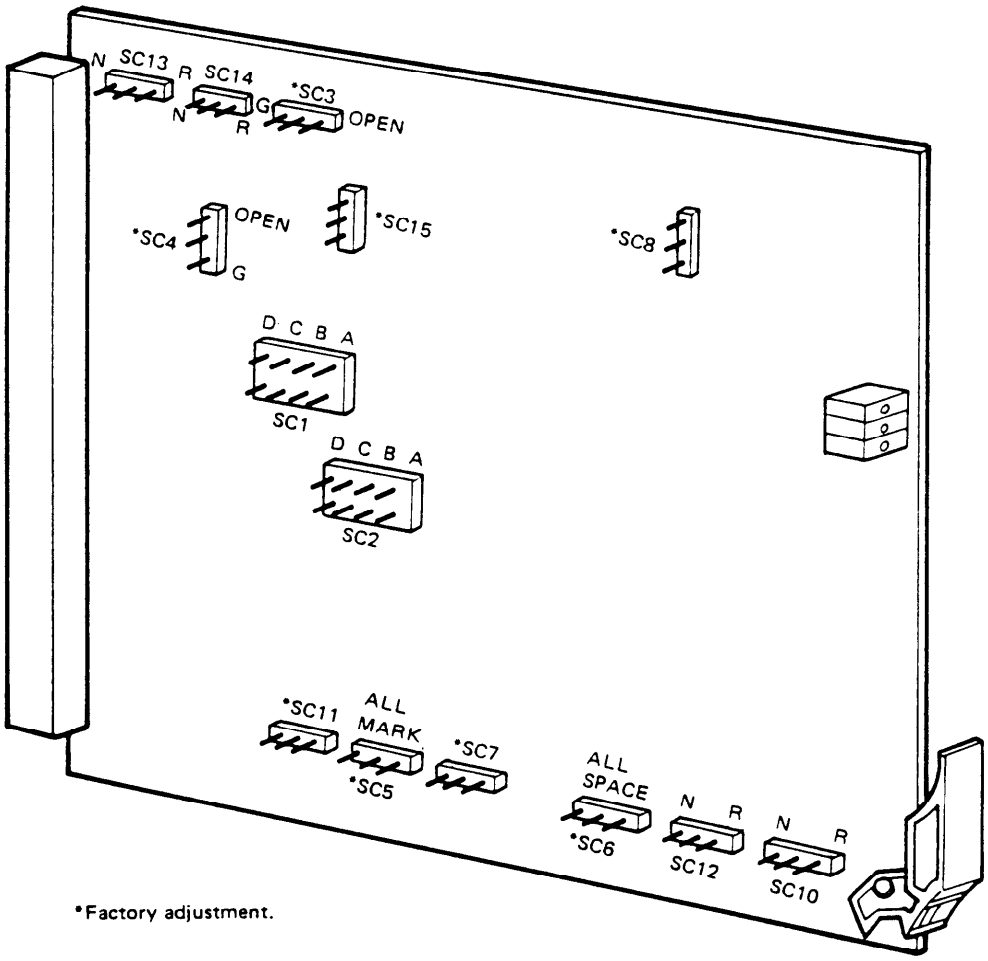
STRAP	DESCRIPTION	
SC 1 and SC 2 (EQL)	Sets for line cable length between this equipment and DSX-2 cross connect. Refer to paragraph 6.36 and Table 6-1.	
SC 3 (CT)	To use primary center tap of PS2 input transformer to be opened (normally).	
	To use primary center tap of DS2 input transformer to be grounded.	
SC 4 (CT)	To use secondary center tap of DS2 output transformer to be opened (normally).	
	To use secondary center tap of DS2 output transformer to be grounded.	
SC 5	Factory adjustment	
SC 6	Factory adjustment	
SC 7	Factory adjustment	
SC 8	Factory adjustment	
SC 10 and SC 12 to SC 14 (R/N)	Sets for redundant system configuration.	
	Sets for non-redundant system configuration.	
SC 11	Factory adjustment	
SC 15	Factory adjustment	

Figure 5-8 DS2 INF Unit (Grp: 0A00) Straps Location (Sheet 2 of 2)



*Factory adjustment.

♦ Figure 5-9 DS2 INF Unit (Grp: 0A01/0B00) Straps Location (Sheet 1 of 2) ♦

Strapping Adjustment Table

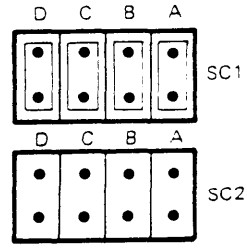
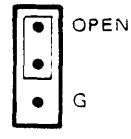
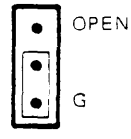
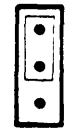
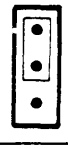
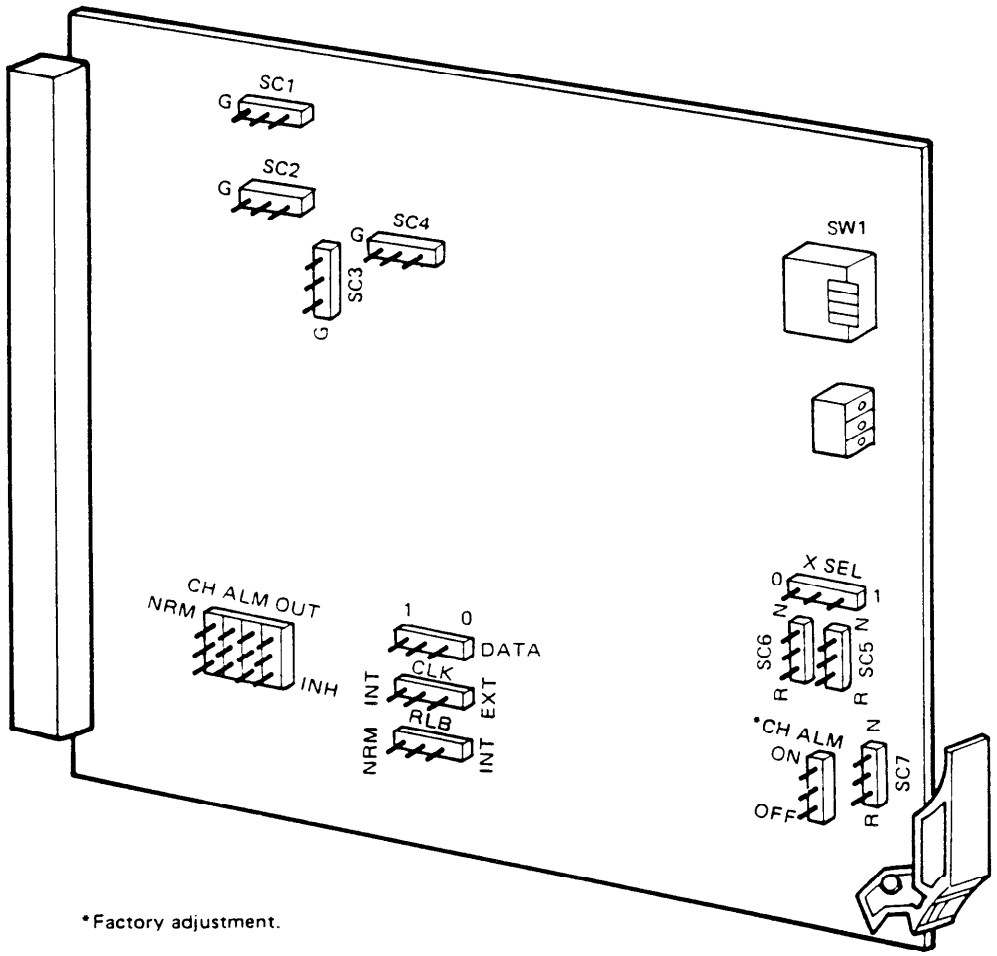
STRAP	DESCRIPTION	
SC 1 and SC 2 (EQL)	Sets for line cable length between this equipment and DSX-2 cross connect. Refer to paragraph 6.36 and Table 6-1.	
SC 3 (CT)	To Use primary center tap of DS2 input transformer to be opened (normally).	
	To use primary center tap of DS2 input transformer to be grounded.	
SC 4 (CT)	To use secondary center tap of DS2 output transformer to be opened (normally).	
	To use secondary center tap of DS2 output transformer to be grounded.	
SC 5	Factory adjustment	
SC 6	Factory adjustment	
SC 7	Factory adjustment	
SC 8	Factory adjustment	
SC 10 and SC 12 to SC 14 (R/N)	Sets for redundant system configuration.	
	Sets for non-redundant system configuration.	
SC 11	Factory adjustment	
SC 15	Factory adjustment	

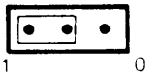
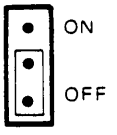
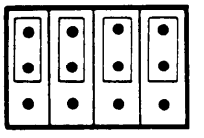
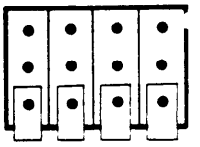
Figure 5-9 DS2 INF Unit (Grp: 0A01/0B00) Straps Location (Sheet 2 of 2)



*Factory adjustment.

Figure 5-10 MUX Unit (Grp: 0A00/0B00) Straps Location (Sheet 1 of 2)

Strapping Adjistment Table

STRAP	DESCRIPTION	
SC 1 through SC 4	Sets center tap of input transformer to be open.	
	Sets center tap of input transformer to be ground.	
SC 5 through SC 7	Sets for redundant system configuration.	
	Sets for non-redundant system configuration.	
X SEL	To insert "0" into X bit of alarm information to be sent to remote station.	
	To insert "1" into X bit of alarm information to be sent to remote station.	
DATA	When no DS1 CH data of low speed side is input, sends "1" as alarm information to high speed side.	
	When no DS1 CH data of low speed side is input, sends "0" as alarm information to high speed side.	
CLK	To use external 6.312 MHz CLK . (TTL level)	
	To use internal 6.312 MHz CLK.	
RLB	Enables remote loopback operation.	
	Inhibits remote loopback operation.	
CH ALM	Factory adjustment	
CH ALM OUT	When no DS1 CH data is input to low speed side, sends this information to ALM unit.	
	When no DS1 CH data is input to low speed side, inhibits to send this information to ALM unit.	

♦ Figure 5-10 MUX Unit (Grp: 0A00/0B00) Straps Location (Sheet 2 of 2) ♦

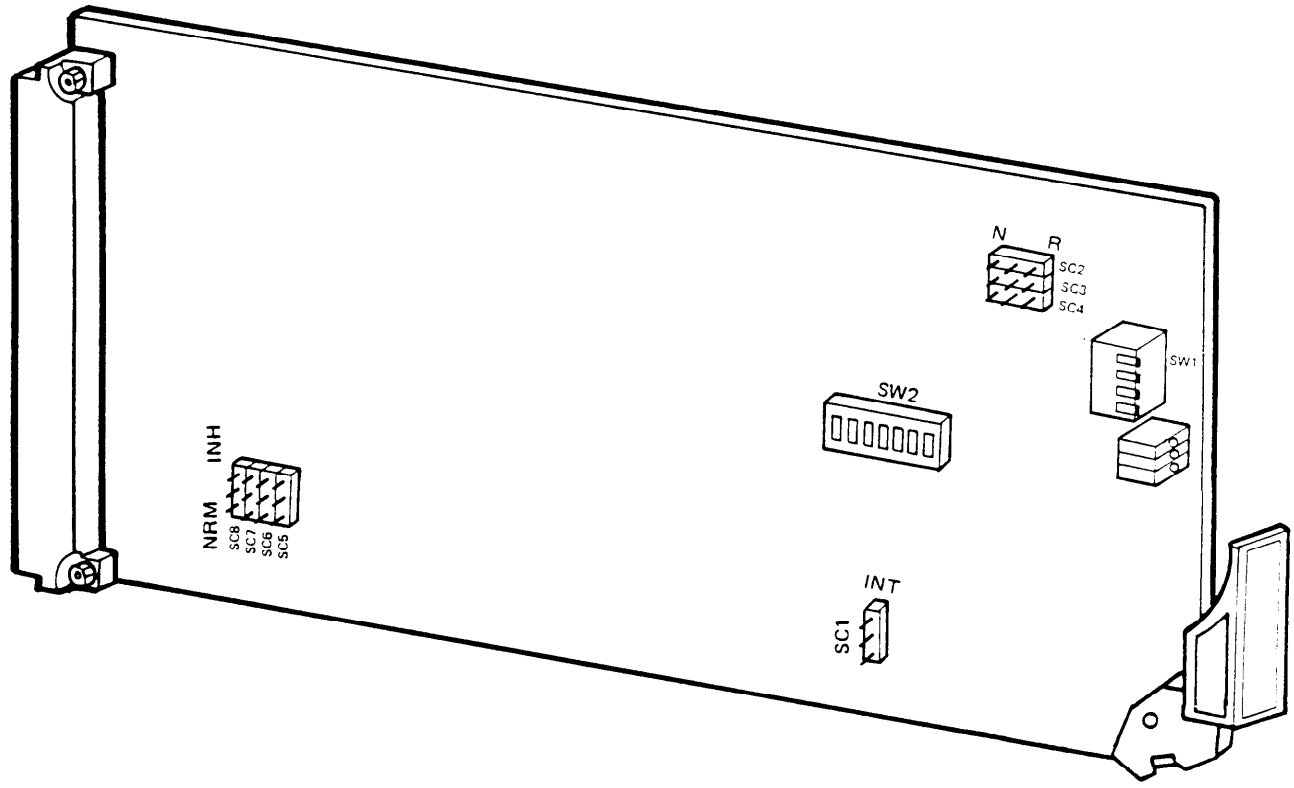
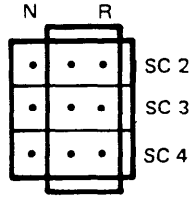
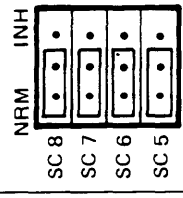
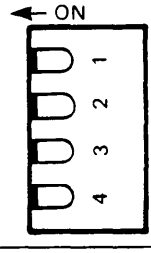
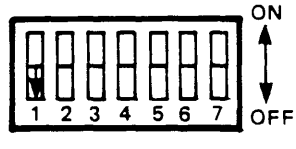
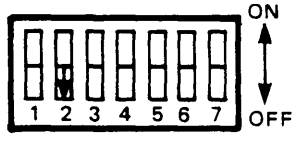
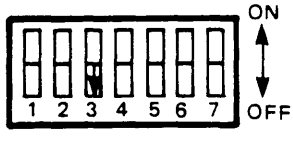
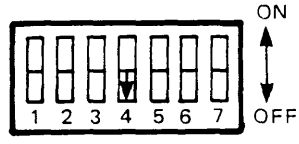
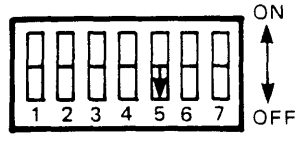
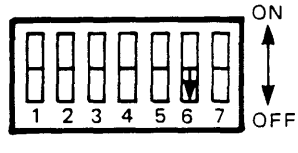
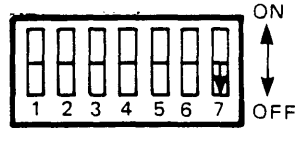


Fig. 5-10A MUX Unit (GRP: 0A02/0B02) Options Location

Options Adjustment Table			
OPTIONS	OPTION'S POSITION	DESCRIPTION	SHIPPED CONDITION
SC 1	INT	Sets when internal clock (6.312 MHz) is used.	
	EXT	Sets when external clock (6.312 MHz, TTL level) is used.	
SC 2 through SC 4	R	Sets when the system is used as redundant configuration.	
	N	Sets when the system is used as non-redundant configuration.	
SC 5 through SC 8	NRM	Sets transfer the information that DS1 channel data is not input to low speed side to ALM unit.	
	INH	Inhibits to transfer the information that DS1 channel data is not input to low speed side, to ALM unit.	
SW 1	ON	Setting CH switch to ON enables remote loopback of corresponding CH when the MAINT switch on ALM unit is set to ON position.	
	OFF	Normal state where remote loopback is not carried out when the MAINT switch on ALM unit is set to ON position.	
SW 2-1	ON	Sets to output as FAIL when DS1 channel data is not input to low speed side.	
	OFF	Sets not to output as FAIL when DS1 channel data is not input to low speed side.	
SW 2-2	ON	Sets when the mounted DMUX unit (X0301) group is 0A02/0B02.	
	OFF	Sets when the mounted DMUX unit (X0301) group is 0A00/0A01/0B00.	
SW 2-3	ON	Sets when remote loopback uses NEC method.	
	OFF	Sets when remote loopback uses stuff control bits method.	

Options Adjustment Table			
OPTIONS	OPTION'S POSITION	DESCRIPTION	SHIPPED CONDITION
SW 2-4	ON	Sets Bipolar Violation (BPV) timer so that BVP error is detected at 10^{-3} and released at 10^{-4}.	
	OFF	Sets Bipolar Violation (BPV) timer so that BVP error is detected at 10^{-6} and released at 10^{-7}.	
SW 2-5	ON	Enables the detection circuit for Bipolar Violation.	
	OFF	Disables the detection circuit for Bipolar Violation.	
SW 2-6	ON	Fixes to "0" the polarity of X bit of DS2 frame structure.	
	OFF	Fixes to "1" the polarity of X bit of DS2 frame structure.	
SW 2-7	ON	Sets DS1 code to B8ZS.	
	OFF	Sets DS1 code to AMI.	

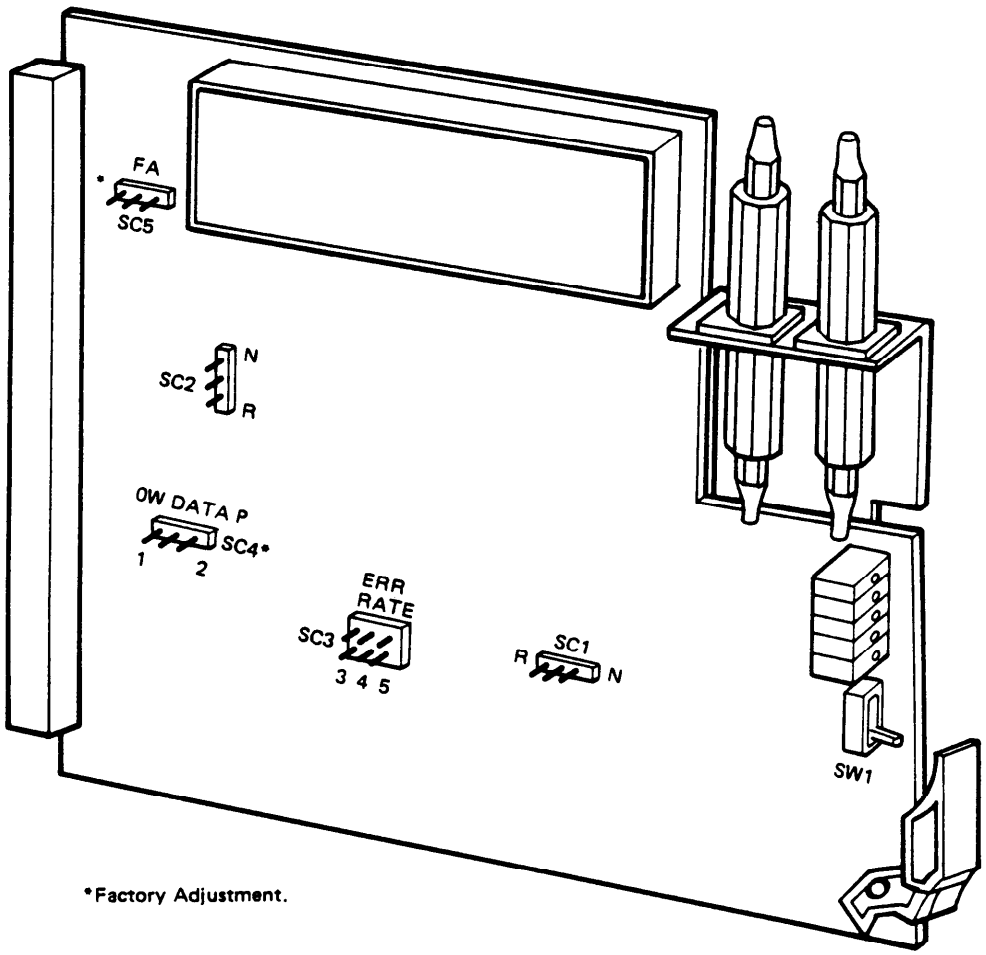


Figure 5-11 6M OPT INF (X0306) Unit (Grp: 0E00, 0F00, 0F01) Straps Location (Sheet 1 of 2)

Strapping Adjustment Table

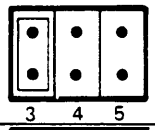
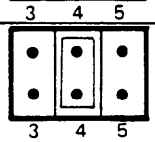
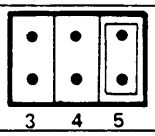
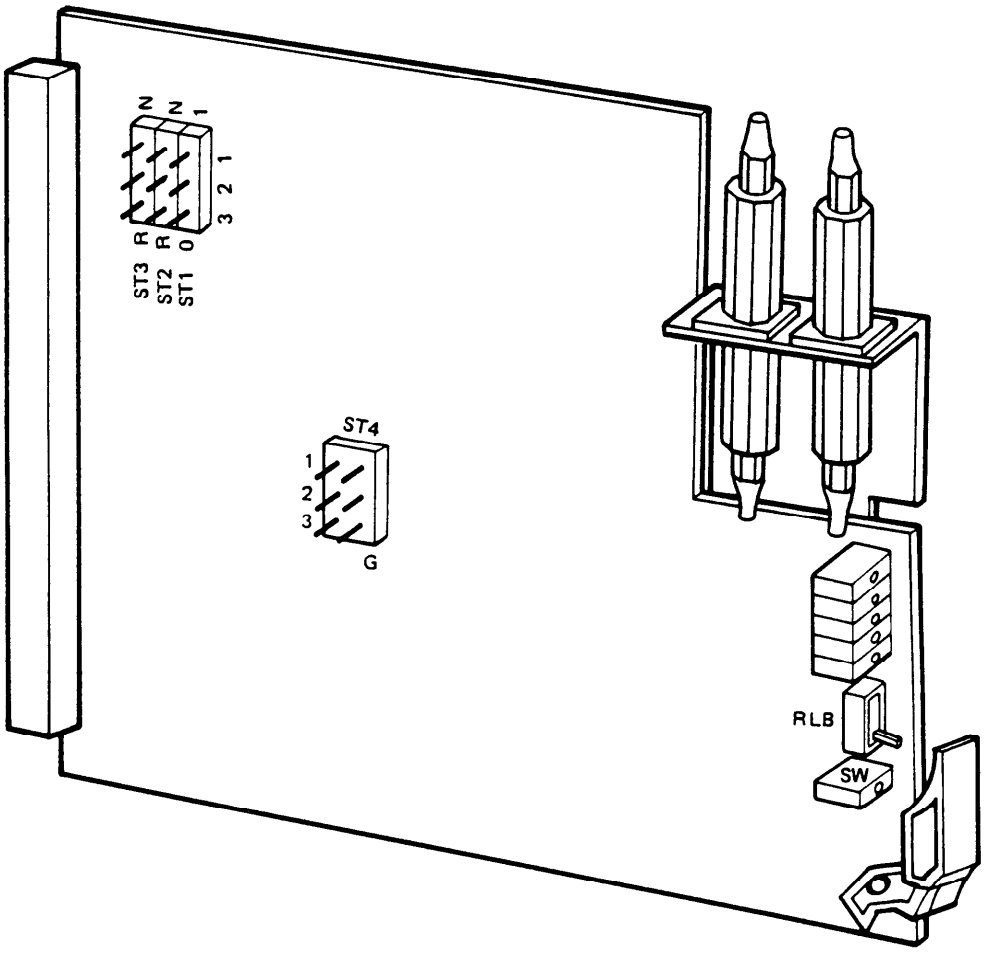
STRAP	DESCRIPTION	
SC1 and SC2 (R/N)	To set "R" for redundant (R) system configuration.	
	To set "N" for non-redundant (N) system configuration.	
SC 3 (ERR RATE)	To set to generate an alarm when bit error rate of received data exceeds 1×10^{-3}.	
	To set to generate an alarm when bit error rate of received data exceeds 1×10^{-4}.	
	To set to generate an alarm when bit error rate or received data exceeds 1×10^{-5}.	
SC 4 (OW DATA P)	Factory adjustment.	
SC 5 (FA)	Factory adjustment	

Figure 5-11 6M OPT INF (X0306) Unit (Grp: 0E00, 0F00, 0F01) Straps Location (Sheet 2 of 2)



NOTE: This unit available for unit serial numbers 1 through 20.

Figure 5-12 6M OPT INF (X0307) Unit (Grp: 0C00) Straps Location (Sheet 1 of 2)

Strapping Adjustment Table

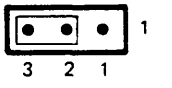
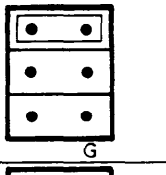
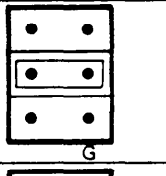
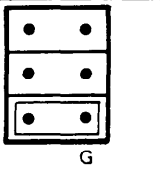
STRAP	DESCRIPTION	
ST 1 (OW DATA P)	Factory adjustment.	
ST 2 and ST 3 (R/N)	To set "R" for redundant (R) system confiration.	
	To set "N" for non-redundant (N) system configuration.	
ST 4 (ERR RATE)	To set to generate an alarm when bit error rate of received data exceeds 1×10^{-5}.	
	To set to generate an alarm when bit error rate of received data exceeds 1×10^{-4}.	
	To set to generate an alarm when bit error rate of received data exceeds 1×10^{-3}.	

Figure 5-12 6M OPT INF (X0307) Unit (Grp: 0C00) Straps Location (Sheet 2 of 2)

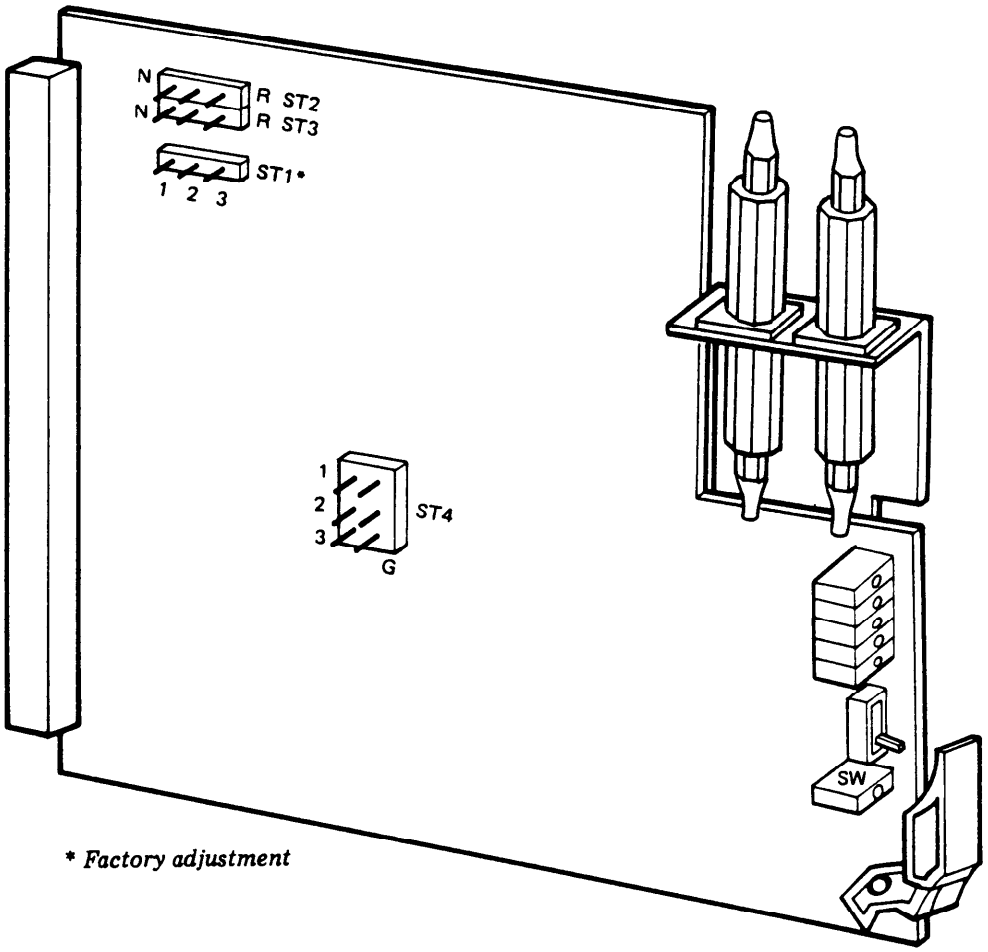


Figure 5-13 6M OPT INF (X0307) Unit (Grp: 0C01, 0B00) Straps Location (Sheet 1 of 2)

Strapping Adjustment Table

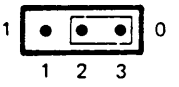
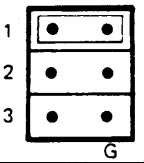
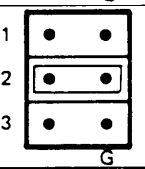
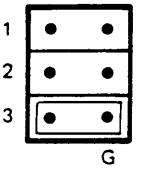
STRAP	DESCRIPTION	
ST 1 (OW DATA P)	Factory adjustment.	
ST 2 and ST 3 (R/N)	To set "R" for redundant (R) system confiration.	
	To set "N" for non-redundant (N) system configuration.	
ST 4 (ERR RATE)	To set to generate an alarm when bit error rate of received data exceeds 1×10^{-5}.	
	To set to generate an alarm when bit error rate of received data exceeds 1×10^{-4}.	
	To set to generate an alarm when bit error rate of received data exceeds 1×10^{-3}.	

Figure 5-13 6M OPT INF (X0307) Unit (Grp: 0C01, 0B00) Straps Location (Sheet 2 of 2)

6. STRAPPING ADJUSTMENT DESCRIPTION

A. ALM Unit Strappings

6.01 The ALM unit consists of group 0A00, 0A01◆0B00,◆AA00◆and AB00◆and there are strapping locations on main assembly board or sub 2 assembly board of each unit. Group 0A00 unit is the primary version of ALM unit for parallel alarm interface and has two strap locations on its main assembly board. See Figure 5-1. Group 0A01◆and 0B00◆unit is a modified version of group 0A00 unit for parallel alarm interface and there are 3 strap locations on its main board and 4 locations on sub 2 board. See Figure 5-2. Group AA00◆and AB00◆unit is a version for serial alarm interface and has 3 strap locations on its main board and 5 locations on sub 2 board. See Figure 5-3.

Straps on Group 0A00 Unit Main Board

6.02 SC1 (DISP): Selects whether to enable character display (LOCAL DISP, REMOTE DISP) and associated LED indications. Selection is done by setting ON or OFF position. Two straps have to be placed in the same position of ON or OFF. When set in ON position, alarm information is displayed. When shipped, they are set in ON position.

6.03 SC2 (TIMER): When an alarm occurs in this equipment, sets the timing to delay and stretch a CO ALM or SV ALM. When shipped, they are set in position 4. Timing selection is as follows: (See Figure 5-1)

Position	Timing (sec)
1	20
2	10
3	5
4	2.5

◗Straps on Group 0A01 and 0B00 Main Board◖

6.04 SC1a (DISP): When an alarm information signal from remote station is detected, selects whether to light DISP RMT LED (red) on the display panel or not. When set in ON position, the LED is lit and the LED is not lit when set in OFF position. When shipped, it is set in ON position.

6.05 SC1b (DISP): When an alarm occurs in this equipment, selects whether to light DISP LOCAL LED (red) on the display panel or not. When set in ON position, the LED is lit and the LED is not lit when set in OFF position. When shipped, it is set in ON position.

6.06 SC1c (DISP): When an alarm occurs in this equipment or detects an alarm information signal from remote station, selects whether to indicate contents of this alarm on the character display of the display panel (LOCAL or REMOTE) or not. When set in ON position, alarm contents is displayed and in OFF position, it is not displayed. When shipped, set in ON position.

◗Straps on Group 0A01 and 0B00 Sub 2 Board◖

6.07 SC1 (ACO SEL): Selects whether to cut off audible alarm (AUD ALM) and visible alarm (VIS ALM) by the alarm cutoff switch (ACO SW) operation. Selection is done by setting ON or OFF position. When set in ON position, MAJ AUD, MIN AUD, MAJ VIS and MIN VIS ALM are cut off and when set in OFF position, only MAJ AUD and MIN AUD are cut off. When shipped, set in OFF position.

6.08 SC1 (TST SEL): Selects whether to enable LED lamp test of each unit (except PWR unit) and display panel or both lamp test and CO ALM test (to send CO ALM). When set in LAMP position, all LEDs of all units (except PWR unit) and on display panel light. When set in ALM position, all LEDs are lit and CO ALM is displayed. When shipped, set in LAMP position.

6.09 SC3 (RMT SEL): Selects whether to indicate central office alarm (CO ALM) when alarm information signal from remote station is detected. When set in ON position, CO ALM is indicated and when in OFF position, CO ALM is not indicated. When shipped, set in OFF position.

6.10 SC4 (TIMER SEL): When an alarm occurs in this equipment, sets the timing to delay and stretch CO ALM or SV ALM. When shipped, set in position 4. Timing selection follows:

Position	Timing (sec)
1	20
2	10
3	5
4	2.5

Straps on Group AA00 Main Board

6.11 SC1a (DISP): Selects whether to light DISP RMT LED (red) on the display panel, when detects an alarm signal information from remote station. When set in ON position, LED is lit and in OFF position, LED is not lit. When shipped, set in ON position.

6.12 SC1b (DISP): Selects whether to light DISP LOCAL LED (red) on the display panel, when an alarm occurs in this equipment. When set in ON position, LED is lit and when in OFF position, LED will not light. When shipped, set in ON position.

6.13 SC1c (DISP): Selects whether to indicate the contents of alarm on the character display (LOCAL or REMOTE) on the display panel, when an alarm occurs in this equipment or detects an alarm information signal from remote station. When set in ON position, the alarm contents is displayed, and when in OFF position, it is not displayed. When shipped, set in ON position.

◗Straps on Group AA00 and AB00 Sub 2 Board◖

6.14 SC1 (ACO SEL): Selects whether to cut off audible alarm (AUD ALM) and visible alarm (VIS ALM) by the alarm cutoff switch operation. When set in ON position, enables to cut off MAJ AUD, MIN AUD, MAJ VIS and MIN VIS alarms. When set in OFF position, enables to cut off only MAJ AUD and MIN AUD alarms. When shipped, set in OFF position.

6.15 SC2 (TST SEL): Selects whether to enable LED lamp test of each unit (except PWR unit) and display panel, or to enable both lamp test and CO ALM test by the TST switch operation. When set at LAMP side, enables to light LEDS on each unit (except PWR unit) and display panel. And when set in ALM side, enables both functions. When shipped, set in LAMP position.

6.16 SC3 (RMT SEL): Selects whether to indicate central office alarm (CO ALM) or not when alarm information signal from remote station is detected. When set in ON position, enables to indicates CO ALM and when in OFF position, disables such indication. When shipped, set in OFF position.

6.17 SC4 (TIMER SEL): When an alarm occurs in this equipment, sets the timing to delay and stretch CO ALM or SV ALM. When shipped, set in position 4. Timing selection follows:

Position	Timing (sec)
1	20
2	10
3	5
4	2.5

6.18 SC5 (TERM SEL): When SV alarm is provided with RS-422 serial interface, selects whether to terminate data line of receive side with 100Ω resistor or not. When set in ON position, RX data line is terminated and when in OFF position, is not terminated. When shipped, set in OFF position.

B. CTRL Unit Strappings

6.19 ◗The CTRL unit has two types by optical type or electrial type. X0316 unit Group 0A00, 0A01 and X7387 unit group 0A00 is used when high speed side is optical, X0316 unit group 0B00 and X7387 unit group 0B00 is used when electrical.◖ The straps are located on the main assembly board of the unit. See Figures 5-4 and 5-5.

◗Straps on X0316 Unit Group 0A00◖

6.20 SC1: This strap is effective only when high speed side is DS2 INF unit. Group 0A00 is used when high speed side is 6M OPT INF unit.

◗Straps on X0316 Unit Group 0A01, 0B00◖

6.21 SC1: This strap is effective only when the unit Grp. 0B00 and high speed side is DS2 INF unit. This is used for automatic setting of release time (interval) of the locked working system. In redundant configuration, if working system is switched more than three times within 10 minutes, the system is locked in working status and will not switch again in spite of failure occurrence in working system. To release locked status, either automatic or manual operation is available. For automatic release, seven intervals, as listed below, can be selected by strapping position. When shipped, set in position 7.

Position	Release time
1	22 min
2	44 "
3	1.5 hr
4	3.0 "
5	6.0 "
6	12.0 "
7	24.0 "

NOTE: When high speed side is OPT, automatic locking is not provided (Grp:0A01).

6.22 SC2 through SC6: These straps are set at factory for unit adjustment. Be sure not to change their strapping positions.

Strap on X7387 Unit Group 0A00, 0B00

6.22A SC1: This strap is effective only when the unit Grp. 0B00 and high speed side is DS2 INF unit. This is used for automatic setting of release time (interval) of the locked working system. In redundant configuration, if working system is switched more than three times within 10 minutes, the system is locked in working status and will not switch again in spite offailure occurrence in working system. To release locked status, either automatic or manual operation is available. For automatic release, seven intervals, asl listed below, can be selected by strapping position. When shipped, set in position 7.

Position	Release time
1	22 min
2	44 "
3	1.5 hr
4	3.0 "
5	6.0 "
6	12.0 "
7	24.0 "

NOTE: When high speed side is OPT, automatic locking is not provided (Grp:0A00).

6.22B SC2 through SC6: These straps are set at factory for unit adjustment. Be sure not to change their strapping positions.

6.22C SW1: This switch determines the combination of MUX and DMUX. When a new MUX (X0300: Group 0A02/0B02) and new DMUX (X0301: Group 0A02/0B02), both of which is controlled by the control (CTRL) unit X7387A/B*, are to be mounted, this switch must be set to position "1". When a new MUX (X0300: Group 0A02/0B02) and primary DMUX (X0301: Group 0A00 or 0A01/0B00) are to be mounted, the switch must be set to position "2".

* : X7387 group 0A00 is used for O-LTM configuration (OPT interface).
X7387 group 0B00 is used for MUX configuration (DS2 interface).

C. DMUX (DS1) Unit Strappings

6.23 The DMUX unit has three types: group 0A00, group 0A01/0B00 and group 0A02/0B02. There are 13 strapping locations on the main assembly board of group 0A00, 17 strapping locations on the main assembly board of group 0A01/0B00, and 15 strapping location and two DIP switches on the main assembly board of group 0A02/0B02. See Figures 5-6, 5-7 and 5-7A.

Straps on Unit Group 0A00

6.24 SC1 through SC4: These straps correspond to DS1 channels. Normally, the strapping positions are not grounded. If set in position G, PLL circuit in the unit does not operate properly and the line becomes faulty. When shipped, set in not grounded position.

6.25 SC5 through SC8 (EQL1 through EQL4): These straps corresponding to DS1 channels are used to compensate for transmission characteristics according to distance between channel and DSX-1 cross connect. When shipped, set in position A. The positions are selected by the following distances.

Position	Distance (ft)
A	0 to 200
B	200 to 450
C	450 to 655

6.26 SC9 (DATA): Selects, by 1 or 0, alarm signal to be sent to D4 channel banks when a unit or channel failure occurs. When set in position 1, a consecutive 1 signal stream is sent to DS1 CH. When shipped, set in position 1.

6.27 SC10 (X SEL): Selects, by 0 or 1, the detecting X bit transmitting remote alarm in incoming signal. The strap should be set to correspond to the sending X bit from remote station. Normally, the strap is set in position 0. When 0 is detected in X-bit position of 6.312 Mb/s frame structure, it indicates that an alarm is generated at the FD-2240A of remote station. When shipped, set in position 0.

6.28 SC11 through SC13 (R/N): These are located at three parts on the board, select redundant (R) or non-redundant (N) mode. When shipped, set in position R.

◖Straps on Unit Group 0A01 and 0B00◗

6.29 SC1 through SC4: These straps correspond to DS1 channels. Normally, the strapping positions are not grounded. If set in position G, PLL circuit in the unit does not operate properly and the line becomes faulty. When shipped, set in not grounded position.

6.30 SC5 through SC8 (EQL1 through EQL4): These straps corresponding to DS1 channels are used to compensate for transmission characteristics according to distance between channel and DSX-1 cross connect. When shipped, set in position A. The positions are selected by the following distances.

Position	Distance (ft)
A	0 to 200
B	200 to 450
C	450 to 655

6.31 SC9 (DATA): Selects, by 1 or 0, alarm signal to be sent to D4 channel banks when a unit or channel failure occurs. When set in position 1, a consecutive 1 signal stream is sent to DS1 CH. When shipped, set in position 1.

6.32 SC10 (XSEL): Selects, by 0 or 1, the detecting X bit transmitting remote alarm in incoming signal. The strap should be set to correspond to the sending X bit from remote station. Normally, the strap is set in position 0. When 0 is detected in X-bit position of 6.312 Mb/s frame structure, it indicates that an alarm is generated at the FD-2240A of remote station. When shipped, set in position 0.

6.33 SC11 through SC17 (R/N): These are located at seven parts on the board, selects redundant (R) or non-redundant (N) mode. When shipped, set in position R.

Options on Unit Group 0A02/0B02

6.33A SC1 through SC12: These straps are used to set equalizer (EQL) of each CH depending upon the cable length of DS1 output. Eigher A or B position is set. The relation between EQL setting position and DS1 line cable length is as follows:

EQL POSITION	CABLE LENGTH
A	0 to 450 feet
B	450 to 655 feet

Also, the relation between each strap and CH is shown below:

STRAPS	DS1 CH
SC1 through SC3	CH1
SC4 through SC6	CH2
SC7 through SC9	CH3
SC10 through SC12	CH4

6.33B SC13 through SC15: These Straps determine whether this equipment uses redundant system or non-redundant system or non-redundant system. When they are set to the R position, redundant system is selected. When set to the N position, non-redundant system is selected.

6.33C DSW 1 element 1 (FIX DATA): This switch element determines the polarity of 1.5MB data output to DS1 line when a failure occurs in this unit or in HS receive side. When it is set to the ON position, it fixes the data polarity to "0", and when set to the OFF position, it fixes to "1".

6.33D DSW 1 element 2 (UN DET): This switch element selects, when an equipment other than NEC is used as an opposite equipment, whether to detect abnormal stuffing rate information from the equipment or not. When it is set to th ON position, alarm is not detected, and when set to the OFF position, alarm is detected.

6.33E DSW 1 element 3 (RLB SEL 1): This switch element selects whether to detect the remote loopback command by NEC method sent from the opposite station or not. Setting it to the ON position selects detection, and setting it to the OFF position selects non-detection.

6.33F DSW 1 element 4 (RLB SEL2): This switch element selects whether to detect the remote loopback command by stuff control bits method sent from the opposite station or not. Setting it to the ON position selects detection, and setting it to off position selects non-detection.

6.33G DSW 1 element 5 (RLB SEL 3): This switch element is not used and should always be set to the OFF position.

6.33H DSW 1 element 6 (RLB SEL 4): This switch element is not used and should always be set to the OFF position.

6.33J DSW 2 element 1 (AMI/B8ZS): This switch element selects the DS1 code. Setting it to the ON position selects B8ZS, and setting it to the OFF position selects AMI code.

6.33K DSW 2 element 2 (X BIT): This switch element determines the polarity of X bit of DS2 frame. Setting it to the ON position fixes X bit polarity to "0", and setting it to the OFF position fixes to "1".

6.33L DSW 2 element 3 (NOT USE 1): This switch element determines, when CH 1 in this unit is not used, whether to output it as alarm information or not. Setting it to the ON position does not output alarm information, and setting it to the OFF position outputs alarm information.

6.33M DSW 2 element 4 (NOT USE 2): This switch element determines, when CH 2 in this unit is not used, whether to output it as alarm information or not. Setting it to the ON position does not output alarm information, and setting it to the OFF position outputs alarm information.

6.33N DSW 2 element 5 (NOT USE 3): This switch element determines, when CH 3 in this unit is not used, whether to output it as alarm information or not. Setting it to the ON position does not output alarm information, and setting it to the OFF position outputs alarm information.

6.33P DSW 2 element 6 (NOT USE 4): This switch element determines, when CH 4 in this unit is not used, whether to output it as alarm information or not. Setting it to the ON position does not output alarm information, and setting it to the OFF position outputs alarm information.

D. DS2 INF Unit Strappings

6.34 There are two unit groups for the DS2 INF unit, one is 0A00 and another is 0A01/0B00. And there are 14 strapping locations on the main board of each group. See Figures 5-8 and 5-9.

6.35 Although some strapping locations are not identical for these two groups, their functions are quite the same.

Straps on Unit Group 0A00, 0A01 and 0B00

6.36 SC1 and SC2 (EQL): These straps are used to adjust the unit's cable length equalization network. These straps allow 0 to 15 dB loss for insertion into an outgoing path with less than 1000 feet to the DSX-2 cross connects. Setting any of the straps on SC1 and SC2 inserts an equivalent amount of cable loss. When cable length is less than 880 ft, refer to Table 6-1 and set an appropriate strap on SC1 and SC2. For example: If the cable length is 600 ft, set 120 FT EQL (position A) and 240 FT EQL (position B) ON and set positions C and D OFF on SC2. At this time, set positions A and B OFF and positions C and D ON on SC1. In case of 360 ft loss, set positions A and C ON and positions B and D OFF on SC2. And on SC1, set positions A and C OFF and positions B and D ON. When shipped, straps are all set ON on SC1 and OFF on SC2.

Table 6-1

Cable Length Equalization

Cable Length (feet)	Loss (dB)	120 FT EQL (Position A)		240 FT EQL (Position B)		480 FT EQUL (Position C)		960 FT EQL (Position D)	
		SC1	SC2	SC1	SC2	SC1	SC2	SC1	SC2
0 to 40	8	ON	OFF	ON	OFF	ON	OFF	OFF	ON
40 to 160	7	OFF	ON	OFF	ON	OFF	ON	ON	OFF
160 to 280	6	ON	OFF	OFF	ON	OFF	ON	ON	OFF
280 to 400	5	OFF	ON	ON	OFF	OFF	ON	ON	OFF
400 to 520	4	ON	OFF	ON	OFF	OFF	ON	ON	OFF
520 to 640	3	OFF	ON	OFF	ON	ON	OFF	ON	OFF
640 to 760	2	ON	OFF	OFF	ON	ON	OFF	ON	OFF
760 to 880	1	OFF	ON	ON	OFF	ON	OFF	ON	OFF
880 to 1000	0	ON	OFF	ON	OFF	ON	OFF	ON	OFF

NOTE: 1. ON : Strap is in setting position.

OFF : Strap is not setting position.

2. Equalization should be set so that total cable length becomes 800 ft to 1,000 ft.

3. EQL will be through (not effective) if all positions on SC1 (position A, B, C and D) are strapped.

4. When SC1 in same position is set ON, SC2 should be set OFF and vice versa.

6.37 SC3 (CT): This strap is utilized to select condition of DS2 input transformer primary center tap of the unit to be open or grounded. During normal operation, this strap should be set in OPEN condition (OPEN position). When shipped, set in OPEN position.

6.38 SC4 (CT): This strap is utilized to select condition of DS2 output transformer secondary center tap to be open or grounded. During normal operation, it should be set in OPEN position. When shipped, set in OPEN position.

6.39 SC5: This is set at factory for unit adjustment. Do not change its strapping position.

6.40 SC6: This is set at factory for unit adjustment. Do not change its strapping position.

6.41 SC7 and SC8: These straps are set at factory for unit adjustment. Do not change their positions.

6.42 SC10 and SC12 through SC14 (R/N): These are located at four places on the board. They are used to select redundant (R) or non-redundant (N) mode. When shipped, set in position R.

6.43 SC11: This is set at factory for unit adjustment. Do not change its strapping position.

6.44 SC15: This is set at factory for unit adjustment. Do not change its strapping position.

E. MUX (DS1) Unit Strappings

6.45 The MUX unit has two types: group 0A00/0B00 and 0A02/0B02. There are 16 strapping locations on the main board of group 0A00/0B00, and 8 strapping locations, one DIP switch and one switch on the main board of group 0A02/0B02.

•Strap on Unit Group 0A00/0B00•

6.46 SC1 through SC4: SC1 through SC4 correspond to DS1 channels. Selects whether the input transformers (T1 - T4) primary center taps are grounded or not. Normally, this unit is used with center taps open. When shipped, set in open (not grounded) position.

6.47 SC5 through SC7: Selects redundant (R) or nonredundant (N) mode. When shipped, set in position R.

6.48 X SEL: Selects, by 0 or 1, alarm signal bit used to send alarm information generated in equipment to the remote station. This signal is sent in the X-bit position of 6.312 Mb/s frame structure. When shipped, set in position 0.

6.49 DATA: Selects, by 1 or 0, alarm signal sent to high speed side when no signal is input to low speed side. When set in position 1, a consecutive 1 stream is sent. When shipped, set in position 1.

6.50 CLK: Selects, by INT or EXT, whether 6.312 MHz signal is supplied internally or externally. When set in EXT position, the external clock should be supplied to MUX unit at TTL level. When shipped, set in INT position.

6.51 RLB: Selects remote loopback (RLB) function. NRM position enables RLB function and INH position inhibits RLB function. When shipped, set in NRM position.

6.52 CH ALM OUT: Four straps correspond to DS1 channels and select, by NRM or INH positions, whether or not to send input alarm signals to the ALM unit. When set in NRM position, alarm information is sent to the ALM unit via alarm bus line. When shipped, set in NRM position.

6.53 CH ALM: Factory adjustment. This is set in OFF position.

Options on Unit Group 0A02/0B02

6.53A SC 1: This strap is for selecting the supply of 6.312 MHz clock. When it is set to INT side, it enables internal supply, and when it is set to EXT side, it enables external supply (TTL level).

6.53B SC 2 through SC4: These straps determine whether the system of this equipment is used in redundant configuration or non-redundant one. When they are set to R side, they select redundant system, and when they are set to N side, they select non-redundant system.

6.53C SC 5 through SC8: These strap determine, when DS1 data is not input to each channel of this unit, whether to transfer this to the ALM unit as alarm information or not. When they are set to NRM side, the information is transferred, and when they are set to INH side, the information is not transferred. The relation between SC5 through SC8 and each channel is as follows:

Strap	DS1 Channel
SC5	CH 1
SC6	CH 2
SC7	CH 3
SC8	CH 4

6.53D SW 1 element 1 to 4 (RLB): When the MAINT switch of the ALM unit is ON, setting this switch to ON enables loopback in the appropriate channel at remote station. The switch positions correspond to CH 1 to CH 4, top to bottom. In normal status, each element should be set to OFF.

6.53E DSW2 element 1: This switch element determines, when data is not input to DS1 channel, whether to transfer this to the ALM unit as FAIL information and to light the FAIL lamp or not. When it is set to ON side, the information is transferred and FAIL lamp is lit, and when it is set to OFF side, the information is not transferred and FAIL lamp is not lit.

6.53F DSW2 element 2: This switch element is set for the group of DMUX unit mounted in this equipment. It is set to OFF for Grp:0A00/0A01/0B00 and ON for Grp:0A02/0B02.

6.53G DSW2 element 3: This switch element selects remote loopback method of this unit. When it is set to the ON position, it selects NEC method, and when it is set to the OFF position, it selects stuff control bits method.

6.53H DSW2 element 4: This switch element sets the timer of Bipolar Violation (BPV). When it is set to the ON position, the alarm detection of BPV ERR is carried out at 10^{-3} or more and released at 10^{-4} or less. When it is set to the OFF position, the alarm detection of BPV ERR is carried out at 10^{-6} or more and released at 10^{-7} or less. This switch operates when the DSW2 element 5 is set to ON position.

6.53J DSW2 element 5: This switch element determines whether to enable the detection circuit of BPV or not. When it is set to the ON position, it enables the detection circuit, when it is set to the OFF position, it disables the circuit.

6.53K DSW2 element 6: This switch element determines the polarity of X bit inserted in DS2 frame. When it is set to the ON position, it fixes the polarity to "0", and when it is set to the OFF position, it fixes the polarity to "1".

6.53L DSW2 element 7: This switch element sets the DS1 code. When it is set to the ON position, it selects B8ZS, and when it is set to the OFF position, it selects AMI.

F. 6M OPT INF (X0306) Unit Strappings

6.54 The X0306 type 6M OPT INF unit uses LED as optical source and PIN as optical detector. There are three groups, 0E00, 0F00 and 0F01, for this unit. Group 0E00 is for long wavelength multimode and group 0F00 and 0F01 are for long wavelength singlemode. Each group unit has similar strapping locations.

6.55 There are five strap locations on the main assembly board of this unit See Figures 5-11.

Straps on Unit Group 0E00, 0F00 and 0F01

6.56 SC1 and SC2 (R/N): Straps are located at two place on the board. Selects redundant (R) or non-redundant (N) mode. When shipped, set in position R.

6.57 SC3 (ERR RATE): This strap sets the bit error rate alarm level detected at the receive side by selecting one of following three positions:

Position	Detection level
3	1×10^{-3}
4	1×10^{-4}
5	1×10^{-5}

When position 3 is selected, an alarm is output when the bit error rate exceeds 1×10^{-3}. When shipped, set in position 4.

6.58 SC SC4 (OW DATA P): This strap is set at factory for unit adjustment. Do not change its position. When shipped, set to left position.

6.59 SC5 (FA): This strap is set at factory for unit adjustment. Do not change its position.

G. 6M OPT INF (X0307) Unit Strappings

6.60 The X0307 type 6M OPT INF unit uses LD as optical source and APD as optical detector and has unit group 0B00, 0C00 and 0C01. Group 0B00 is for long wavelength multimode, and group 0C00 and 0C01 are for long wavelength single mode.

6.61 There are four strapping locations on the main assembly of the 6M OPT INF unit. See Figures 5-12 and 5-13.

Straps on Unit Group 0B00, 0C00 and 0C01

6.62 ST1 (OW DATA P): This strap is set at factory for unit adjustment. Do not change its position. When shipped, set in position 1. When shipped, set to lower or left position.

6.63 ST2 and ST3 (R/N): Straps are located at two places on the board. Select redundant (R) or non-redundant (N) mode. When shipped, set in position R.

6.64 ST4 (ERR RATE): This strap sets the bit error rate alarm level detected at the receive side by selecting one of following three positions:

Position	Detection level
3	1×10^{-3}
2	1×10^{-4}
1	1×10^{-5}

When position 3 is selected, an alarm is output when the bit error rate exceeds 1×10^{-3}. When shipped, set to position 2.