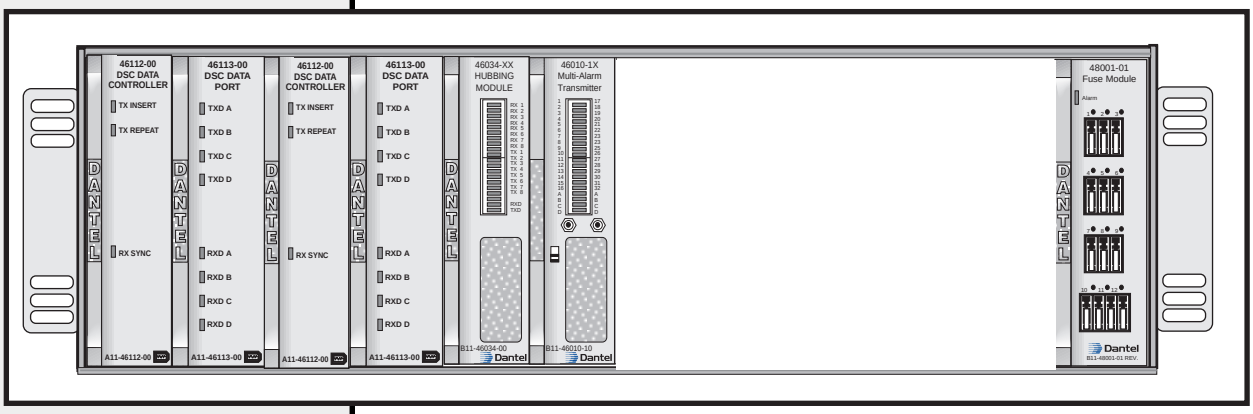
LOCAL SERVICE OFFICE DIGITAL MULTIPLEXOR SHELF B18-05720-XX



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About this Practice:

This practice has been reissued to:

- To update the version of this shelf from A18 to B18 in the ***Ordering Information*** section.
- To update the table in Step 5 of the ***Installation*** section.
- To update the Figs. 2-5 in the ***Installation*** section.

Reissued Practices: Updated and new content can be identified by a banner in the right margin.

UPDATED

Issue date: September 1997

CAUTION

- Install or remove modules from the shelf only when the power is off. If you install a module in the shelf with the power on, the internal circuitry may suffer damage and the product warranty will be void.
- Remove and install circuit boards only in a static-safe environment (use antistatic wrist straps, smocks, footwear, etc.).
- Keep circuit boards in their antistatic bags when they are not in use.
- Do not ship or store circuit boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.
- For more complete information on electrostatic discharge safety precautions, refer to Bellcore™ Technical Reference # TR-NWT-000870.

ORDERING INFORMATION

NOTE: This section lists the different options available for this product. To order any of the available options, contact Dantel Inside Sales through our toll-free number, **1-800-432-6835.**

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OPTION NUMBER	FEATURES
B18-05720-00	LSO Assembly; Backplane; Not Equipped
B18-05720-01	LSO Assembly; Backplane; Equipped

GENERAL DESCRIPTION

DESCRIPTION

NOTE:
Installation & Operation Manuals for the various modules in the DSM are located in the back of this manual.

The Local Service Office (LSO) Digital Service Multiplexor (DSM) is composed of two basic modules. The B11-46112-00 Controller Module and the B11-46113-00 Data Port Module. Each Data Port Module can provide for up to four RS-232 or RS-422 ports. In this application, only the RS-232 ports will be provided. The Controller Module is used to interface the 64Kb channel using an RS-422 interface. Each Controller can accommodate up to 8 Data Port Modules, totaling 32 ports possible. The DSM can be optioned so that the channels terminate at a location or can be repeated to the next locations. If the units are set up for repeat operation, the DSM require two Controllers and at least two Data Port Modules.

The purpose of this system is to provide RS-232 ports from every LSO site to the Service Node. This will allow for transmission of ASCII information such as the Telecom Solutions, DCD-23 BITS clock, TL1 messages on the 64Kb OW channel on FT 2000 fiber systems and to provide for an additional RS-232, 1200 baud port at every LSO. This system will provide for a self healing ring on the 64Kb channel and it will provide for alarm information for maintenance and fault location of the ring.

Specific Application

This application consists of two basic assemblies. The Local Service Office (LSO) and the Service Node Assemblies.

LSO DESCRIPTION

The LSO will be configured so that each RS-232 channel at an LSO location will be terminated, either from the East or West Service Node terminal. Example: If channel 1 data is sent from the West terminal to LSO 1, it will terminate at that site and channel 1 data will not be sent beyond that location. This is also true for the channel 1 data from the East terminal to LSO 1.

The alarm channel (channel 31, address 30) will be terminated at every LSO, on the East and West Data Port Modules and at the Service Node. It will be configured for drop and insert at each LSO location using a data hub module. The drop and insert will be from either the East or West directions of the ring.

GENERAL DESCRIPTION

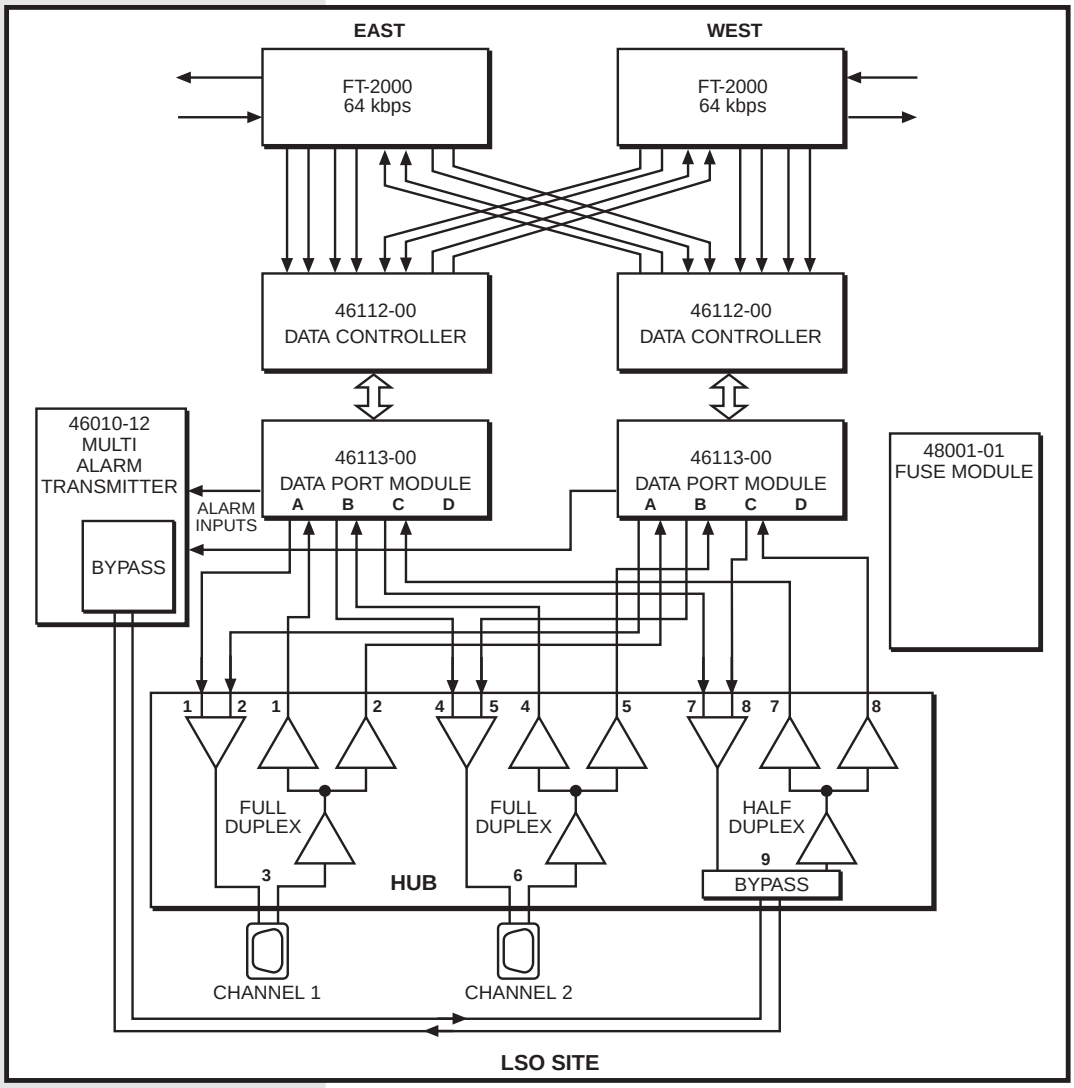
NOTE:

Fig. 1 depicts a simplified representation of a Local Service Office site.

Normal operation for the system at an LSO is: transmission is sent in both directions on the system and it is capable of being received from either direction.

The LSO consists of two Controller cards, two Data Port Modules, a Multiple Alarm Transmitter (MAT) to provide alarm information to the Service Node location, a fuse module and a hubbing module. The LSO will have two RS-232 data ports, one alarm port and one optional port which may be used in the future. The LSO will send and receive data in a East or West direction using 64Kb OW channels of the FT 2000 terminals.

FIG. 1 - LOCAL SERVING OFFICE SITE



NOTE: *Transmit data ports, receive data ports, transmit clocks and receive clocks will be furnished by the East and West FT-2000 terminals of the LSO. The LSOs will be configured so that there are two RS-232 ports at each LSO, one alarm channel and a reserved future channel. Please see Table A for the configurations.*

TABLE A - LOCAL SERVING OFFICE SITE CONFIGURATIONS

LSO ALARM TABLE			
LSO #	RS-232 ASCII Ports A and B Address	Alarm channel (31) Port C Address	Ports D
1	0 and 1	30	Future
2	2 and 3	30	Future
3	4 and 5	30	Future
4	6 and 7	30	Future
5	8 and 9	30	Future
6	10 and 11	30	Future
7	12 and 13	30	Future
8	14 and 15	30	Future
9	16 and 17	30	Future
10	18 and 19	30	Future
11	20 and 21	30	Future
12	22 and 23	30	Future
13	24 and 25	30	Future
14	26 and 27	30	Future
15	28 and 29	30	Future

NOTE: *Channel 32, (Address 31) is used as a pilot channel to detect loop continuity in both the East to West and West to East directions.*

The RS-232 inputs for the customer equipment are on DB9 connectors J3 and J4.

The synchronous RS-422 connections to the FT-2000 are DB15 connectors, C1 for the East terminal and C2 for the West terminal.

LSO ALARMS

Each LSO and Service Node terminal will detect and put out a continuous synch signal using the B11-46112-00 Controller card. If the synch information is detected between sites, no synch alarm will be sent to the MATs. Each section on the system will, in effect, act as discrete transmitter/receiver sections and they will independently synch between each section. If there were four sites on a system A, B, C and D, A to B would be synched to each other, B and C would be synched together and C to D would be synched together. If something happened between A and B, synch would be lost between these two locations on the pair that had a fault on it but the rest of the sites would still be in synch with each other.

This information is used at each LSO location to provide synch alarm inputs to a Multi Alarm Transmitter (MAT). As long as this input is active, there is no alarm. Loss of this input will cause a synch alarm to the MAT. This alarm information is sent to the Multi Alarm Processor (MAP) at the Service Node to tell

it there is a fault on the system and if there is a fault, where the fault is located. The MAP continuously interrogates the MATs at each location. These MATs will monitor synch information on both the East and West DSM Controller Modules at each LSO.

The MATs will also monitor the power supplies of the DSMs, as well as monitor the fuse modules - checking them for blown fuses. If there is a failure at a LSO location, such as a loss of synch, the location and the direction (East or West) will be reported as an alarm point failure to the OS. The user will know that there is a problem between two locations. He will not know if the ring is cut, or if a terminal at one of the two sites is bad. The Service Node location would detect a loop failure and it would enable the appropriate transmit or receive ports at the East DSM. Communications would take place with the MAT and the RS-232 ports in the opposite direction from the way it was before.

If the MAP is unable to communicate with the MAT at the LSO and the ring is intact with no alarms, (no loop detect alarm) the MAP would report the failure and the user would know there was a failure on the MAT. The MAP has the ability to create up to 64 derived alarms from combination of alarms on the system. Example: if there was a communications alarm with a MAT and no ring loop detect alarm, this would be a MAT failure. If the same alarm point came in and there was a loop failure in both directions, the three points would be and-ed together and this would be a complete DSM or complete terminal failure.

The MATs at each LSO also monitor power supplies on each DSM, East and West. If there is a power failure on a single DSM, the loop associated with that card would fail and the data path would be reversed at the Service Node location and the ring would self-heal. The MAP at the Service Node polling the MAT would receive an alarm for the power supply failure. The GPP at the Service Node will poll the MAP and the information will be converted to a TL1 message. This TL1 message will be sent to the OS, advising the OS of the power failure, the location and the direction effected.

An alarm is also sent to the MAT if there is a blown fuse on the fuse module. The alarm information is handled as described above.

The MATs will provide a LED indicator for each alarm input. Additional discrete alarm inputs are provided for customer device inputs to the MAT cards. A relay, and an acknowledge button for that relay, is provided on the MAT for a local external alarm audible/visual device.

The MAT cards are very flexible in the way they can be configured. They can act as annunciator devices. In the annunciator mode, when an alarm is active the LED for that point flashes on and off. The alarm level relay comes on solid. Pressing the ACK button releases the alarm relay and the LED turns on solid. When the alarm goes away the LED again flashes, pressing the ACK causes the alarm LED to go off. This can be used as a

history light for failures on the system. It can also operate in a normal fashion so that an alarm input will turn on the LED and when the alarm restores the LED will turn off. In either case the alarm is sent to the MAP at the Service Node.

The MAT addresses are assigned the same as the LSO numbers and alarm points are assigned as follows:

- Point 1 = East Synch Alarm
- Point 2 = East DSM power supply alarm
- Point 3 = West Synch Alarm
- Point 4 = West DSM power supply alarm
- Point 5 = Blown fuse alarm
- Points 6 to 16 are for customer's use.

TURN-UP PROCEDURE

The following is a step-by-step procedure for turning up the shelf after it has been mounted in an equipment rack and all wiring has been completed.

STEP 1 - MODULE INFORMATION

If the modules are installed in the shelf, remove the Fuse Module first, then remove all the other modules.

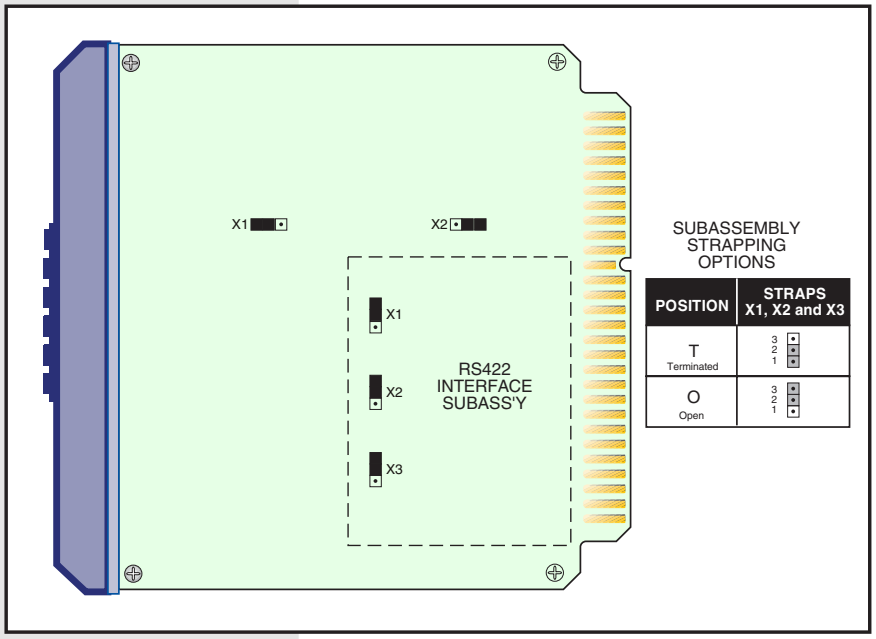
CAUTION: *Modules should only be installed or removed from the shelf after power has been shut off (by removing the Fuse Module). Installing modules in the shelf with power applied may damage internal circuitry and void the product warranty. Observe electrostatic precautions when handling modules. Refer to Bellcore Technical Advisory #TA-TSY-00878, Section 7, for electrostatic discharge information.*

STEP 2 - B11-46112 STRAPPING INFORMATION

Refer to Fig. 2 for 46112 strap locations. Set 46112 switches and straps per following table:

B11-46112 STRAPPING INFORMATION FOR ALL CONTROLLERS				
SHELF A & B, SLOT 1		SUBASSEMBLY		
X1	X2	X1	X2	X3
1 to 2	2 to 3	2 to 3	2 to 3	2 to 3

FIG 2 - 46112 DSM DATA CONTROLLER MODULE STRAP LOCATION



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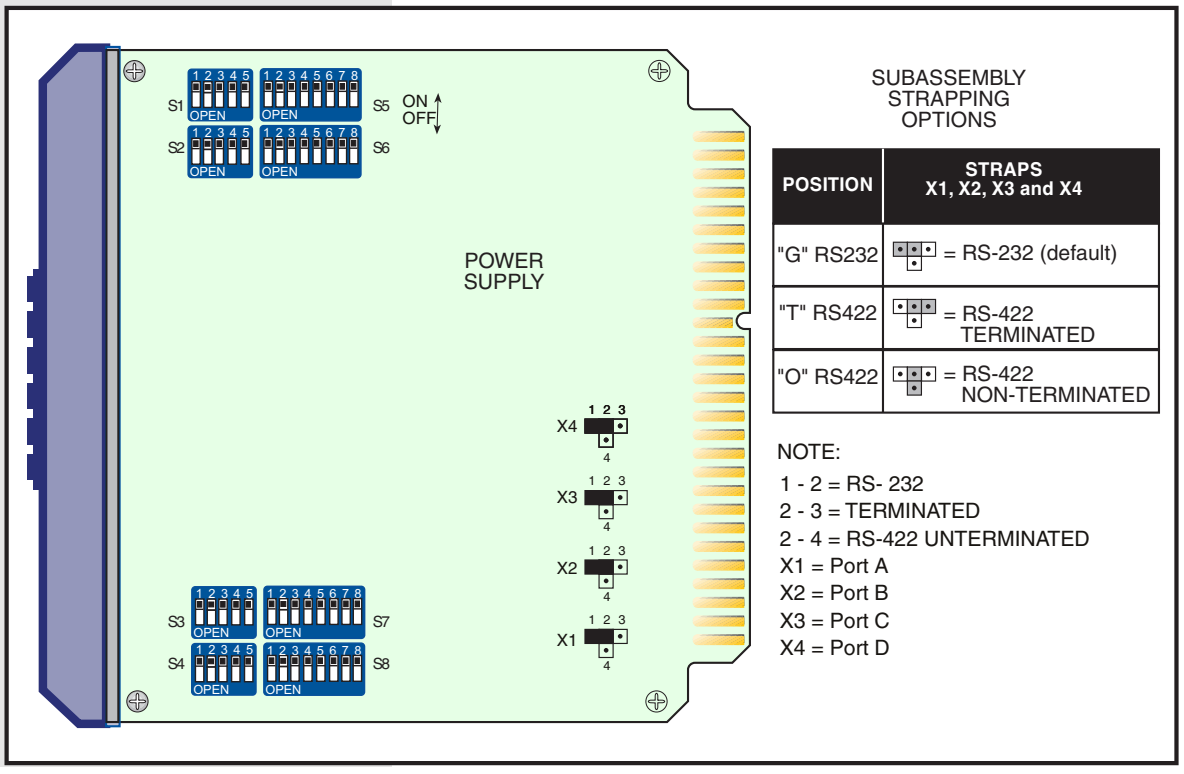
STEP 3 - A11-46113 DATA PORT MODULE SWITCH SETTINGS

Set the 46113 switches and straps per the following table. Switches listed are ON. All other switches are OFF. Refer to Fig. 3 for switch and strap locations.

A11-46113 DATA PORT MODULE SWITCH SETTINGS FOR LSO LOCATIONS								
	PORT A		PORT B		PORT C		PORT D	
SLOT 2&4	S1	S5	S2	S6	S3	S7	S4	S8
LSO 1	All OFF	1,2,5,8	5	1,2,5,8	1,2,3,4	1,2,4,8	4	All ON
LSO 2	4	1,2,5,8	4,5	1,2,5,8	1,2,3,4	1,2,4,8	All OFF	All ON
LSO 3	3	1,2,5,8	3,5	1,2,5,8	1,2,3,4	1,2,4,8	All OFF	All ON
LSO 4	3,4	1,2,5,8	3,4,5	1,2,5,8	1,2,3,4	1,2,4,8	All OFF	All ON
LSO 5	2	1,2,5,8	2,5	1,2,5,8	1,2,3,4	1,2,4,8	All OFF	All ON
LSO 6	2,4	1,2,5,8	2,4,5	1,2,5,8	1,2,3,4	1,2,4,8	All OFF	All ON
LSO 7	2,3	1,2,5,8	2,3,5	1,2,5,8	1,2,3,4	1,2,4,8	All OFF	All ON
LSO 8	2,3,4	1,2,5,8	2,3,4,5	1,2,5,8	1,2,3,4	1,2,4,8	All OFF	All ON
LSO 9	1	1,2,5,8	1,5	1,2,5,8	1,2,3,4	1,2,4,8	All OFF	All ON
LSO 10	1,4	1,2,5,8	1,4,5	1,2,5,8	1,2,3,4	1,2,4,8	All OFF	All ON
LSO 11	1,3	1,2,5,8	1,3,5	1,2,5,8	1,2,3,4	1,2,4,8	All OFF	All ON
LSO 12	1,3,4	1,2,5,8	1,3,4,5	1,2,5,8	1,2,3,4	1,2,4,8	All OFF	All ON
LSO 13	1,2	1,2,5,8	1,2,5	1,2,5,8	1,2,3,4	1,2,4,8	All OFF	All ON
LSO 14	1,2,4	1,2,5,8	1,2,4,5	1,2,5,8	1,2,3,4	1,2,4,8	All OFF	All ON
LSO 15	1,2,3	1,2,5,8	1,2,3,5	1,2,5,8	1,2,3,4	1,2,4,8	All OFF	All ON
FOR LSO 1 THROUGH LSO 15, SET STRAPS X1, X2, X3, AND X4 TO "G" (1 TO 2)								

FIG. 3 - 46113 DSM DATA PORT MODULE STRAP LOCATION



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STEP 4 - B11-46034-01 HUBBING MODULES

Set the 46034 switches and straps per following table. Refer to Fig. 4 for switch and strap locations.

SLOT 5 OPTIONS	
SWITCH	**POSITION**
1	1 ON
2	1 ON
3	2 ON
4	3 ON
5	3 ON
6	4 ON
7	5 ON
8	5 ON
9	2 ON
10	2 ON
11	1 ON
12	4 ON
13	4 ON
14	3 ON
15	5 ON
16	5 ON
17	5 ON
18	All OFF
19	5 ON
20	All OFF
21	All OFF
22	1,2 ON
STRAPS	
1A to 8A	3
1B to 8B	1
C	1
D	2

FIG. 4 - P.C. BOARD SWITCH AND STRAP LOCATIONS, 46034 HUBBING MODULE

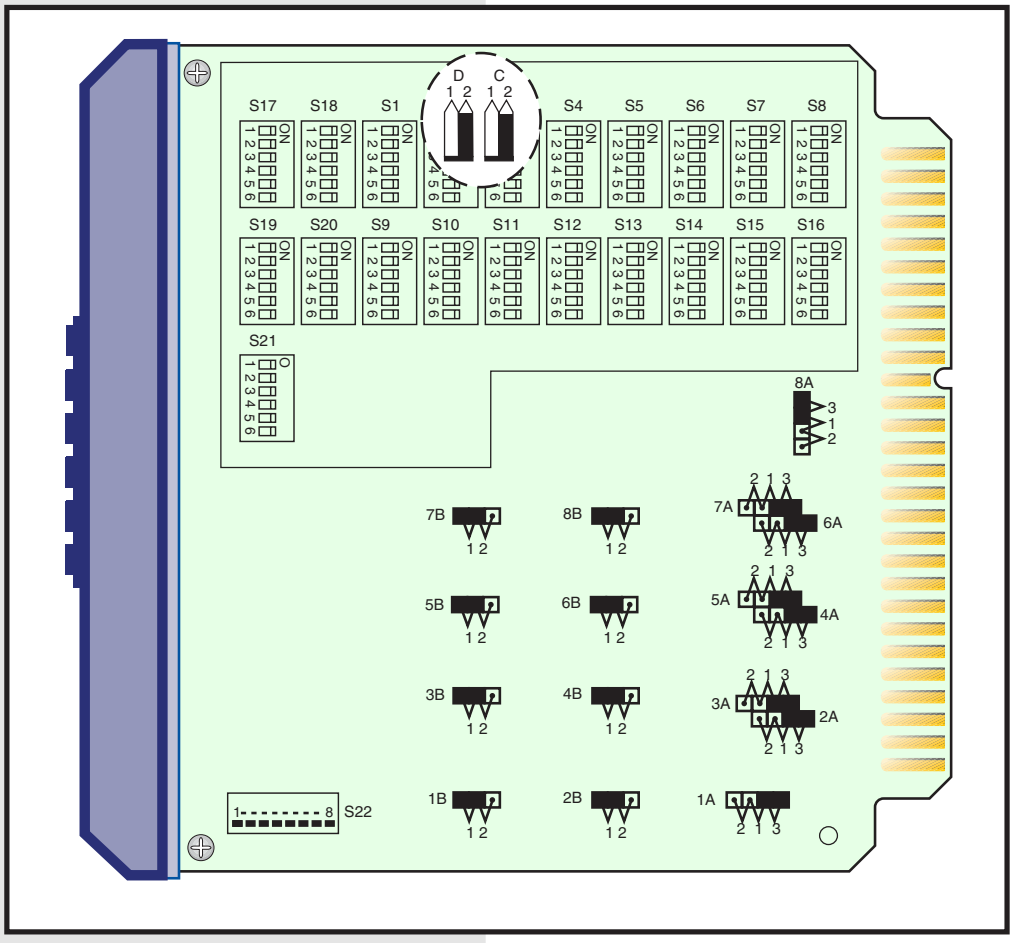

FIGURE UPDATED

STEP 5 - 46010-12 MAT SWITCH SETTINGS

Set 46010 switches and straps per following table. Refer to Fig. 5 for switch and strap locations.

B11-46010-12 MAT SWITCH SETTINGS FOR LSO LOCATIONS 1 TO 15. (SWITCHES LISTED HERE ARE IN THE ON (DOWN) POSITION. ALL OTHERS ARE OFF.)

SLOT 6	S3	S4	S5
LSO 1	1,3	2,3,5	1
LSO 2	1,3	2,3,5	1,8
LSO 3	1,3	2,3,5	1,7
LSO 4	1,3	2,3,5	1,7,8
LSO 5	1,3	2,3,5	1,6
LSO 6	1,3	2,3,5	1,6,8
LSO 7	1,3	2,3,5	1,6,7
LSO 8	1,3	2,3,5	1,6,7,8
LSO 9	1,3	2,3,5	1,5
LSO 10	1,3	2,3,5	1,5,8
LSO 11	1,3	2,3,5	1,5,7
LSO 12	1,3	2,3,5	1,5,7,8
LSO 13	1,3	2,3,5	1,5,6
LSO 14	1,3	2,3,5	1,5,6,8
LSO 15	1,3	2,3,5	1,5,6,7

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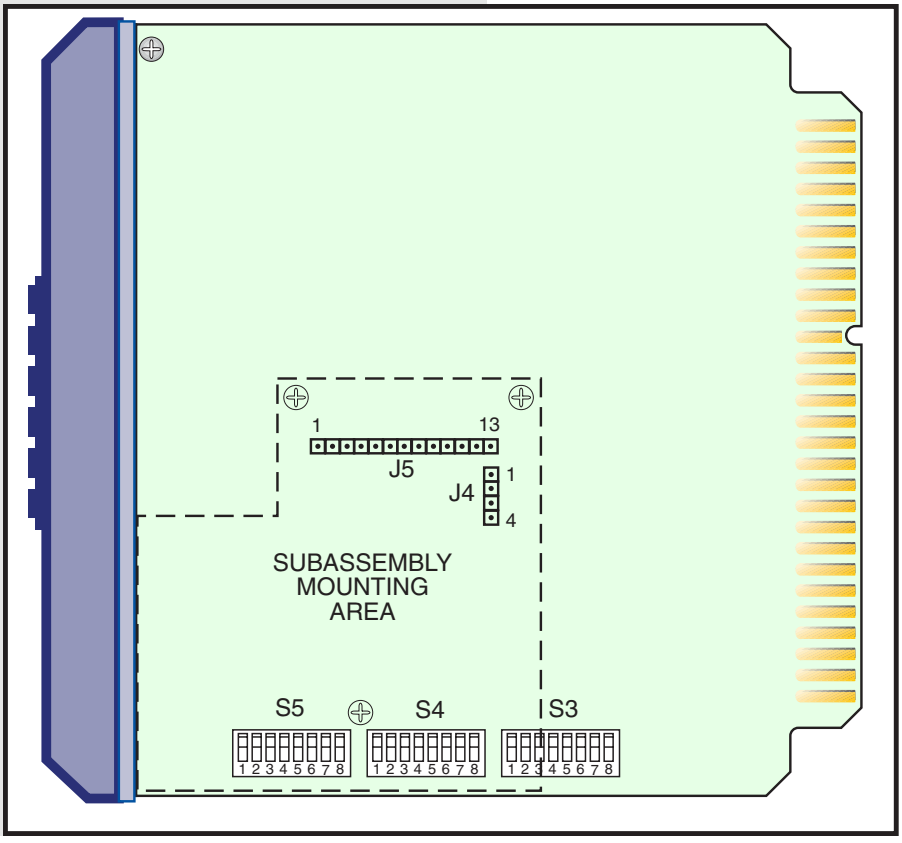
FIG. 5 - 46010 MAT SWITCH LOCATIONS



STEP 6 - DEVICE CONNECTIONS

NOTE:
For a detailed drawing of the 05720 system, refer to the Block and Level Drawing, located at the back of this manual.

Connect the redundant battery supplies to barrier strip terminals 1 and 2. Connect ground to terminal 3.

Insert all of the modules in the shelf, starting at slot 1. When the Fuse Module is installed in slot 14, power will be applied to the shelf.

When the units power up, the TX REPEAT LED will blink on and off at a 1 second rate. If the 46113 continues to flash, it is an indication that there is a wrong switch setting.

When the assembly is connected to the 64Kb channel and it is receiving framed data from the other end of the 64Kb channel, the synch light on the associated 46112 DSM will come on.

If the synch lights do not come on after connection to the known good channel the associated synch alarm on the MAT will be on indicating a synch failure. Point 1 for an East synch failure and point 3 for a West synch failure.

NOTE: *In the event of a failure, as well as during installation, the RX SYNC LED is an important indication of the soundness of the 64KB side of the DSM system. This LED appears as either on or off if there is no synchronization signal detected. When the 46112 DSM receives a good synchronization signal the RX SYNC LED appears to turn on solid. A closer examination however, reveals that the LED is actually alternating on and off at a very high rate. The LED appears to "flicker" slightly*

Remove the fuse from the fuse module for the MAT in slot 2, (Fuse #2). Alarm point #2 should come on. Replace the fuse. This is the East DSM power supply monitor alarm.

Remove the fuse from the fuse module for the MAT in slot 4, (Fuse #4). Alarm point #4 should come on. Replace the fuse. This is the West DSM power supply monitor alarm.

Remove a fuse from the fuse module and replace it with a blown fuse. Point 5 on the MAT should come on. This is the blown fuse alarm. The fuse module alarm should also come on.

If any of the other alarm points are used for local alarms they can be tested and the associated LED with the alarmed point can be observed.

Using a null modem, connect a RS-232 device such as a laptop computer to the DB9 connector J3. When any key is pressed, the LEDs RX3, TX1 and TX2 on the 46034 should turn on and off following the keyed information. The A LEDs on the two 46113 modules should also follow the keyed inputs.

SUPPORT DOCUMENTATION

The B18-05720-XX Local Service Office Digital Service Multiplexor Shelf is made up of individual Dantel modules. Each of these modules has a unique Installation & Operation Manual (practice) detailing the operation of that module. This is a list of those individual practices.

Appendix Documents

1. 46112 DSM Controller Module
2. 46113 DSM Port Module
3. 46034 Hubbing Module
4. 46010 Multiple Alarm Transmitter
5. 48001 Fuse Module
6. B18-05720-XX Block and Level Drawing

NOTES

WARRANTY

LIMITED WARRANTY

The Seller warrants that the standard hardware products sold will be free from defects in material and workmanship and perform to the Seller's applicable published specifications for a period of 18 months for hardware, and 3 months for software, from the date of the original invoice. The liability of the Seller hereunder shall be limited to replacing or repairing, at its option, any defective products which are returned F.O.B. to the Seller's plant, (or, at the Seller's option, refunding the purchase price of such products). In no case are products to be returned without first obtaining permission and a customer return authorization number from the Seller. In no event shall the Seller be liable for any consequential or incidental damages.

Equipment or parts which have been subject to abuse, misuse, accident, alteration, neglect, unauthorized repair or installation are not covered by warranty. The Seller shall make the final determination as to the existence and cause of any alleged defect. No warranty is made with respect to custom equipment or products produced to the Buyer's specifications except as specifically stated in writing by the Seller in the contract for such custom equipment.

This warranty is the only warranty made by the Seller with respect to the goods delivered hereunder, and may be modified or amended only by a written instrument signed by a duly authorized officer of the Seller and accepted by the Buyer.

Warranty and remedies on products not manufactured by the Seller are in accordance with warranty of the respective manufacturer. THE SELLER MAKES NO OTHER WARRANTY OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED; AND ALL IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEEDS THE AFORESAID OBLIGATIONS IS HEREBY DISCLAIMED BY THE SELLER.

IN CASE OF DIFFICULTY

If you experience difficulty with this equipment, check the following, as appropriate:

1. **Switch settings**
2. **Signal levels**
3. **Software configuration**
4. **Connections between Dantel's equipment and your equipment.**

If there is still a problem, substitute equipment that is known to be good. For additional assistance, call Dantel's Technical Field Service Department weekdays, 6 A.M. to 5 P.M. pacific time:

1-800-4DANTEL (1-800-432-6835).

If a thorough checkout shows a piece of equipment has malfunctioned, you may return it to the factory. For repairs and emergency replacements, obtain a Return Material Authorization (RMA) number from the Customer Service Representative at **1-800-4DANTEL** (1-800-432-6835).

To ensure expedient processing of your order, provide a purchase order number and shipping and billing information when requesting an RMA number. Also, when the units are returned to Dantel, include a description of the failure symptoms for each unit returned. Send defective equipment to:

Dantel, Inc. • 2991 North Argyle Avenue • Fresno, California 93727-1388

Dantel

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