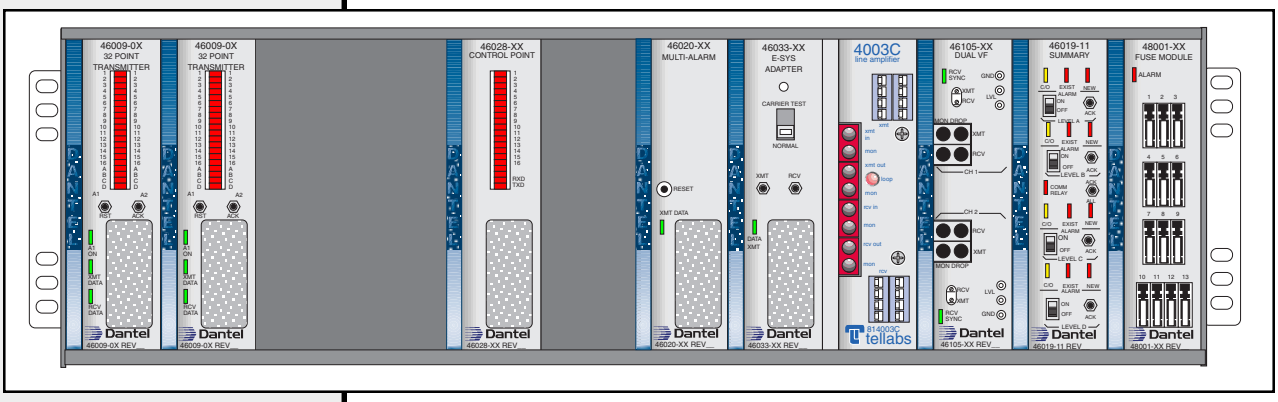
# B18-05725-02

## REMOTE E2A ALARM SHELF, WITH 64-KILOBIT OUTPUT, USING 46600-38 FIRMWARE 64 DISCRETE INPUTS, 16 CONTROLS, NO SERIAL




## Table of Contents



**About this Practice:**

This is a new document.

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

UPDATED

**Issue date: April 1999**

**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.**

| OPTION NUMBER | FEATURES |
|---|---|
| B18-05725-02 | 64 discrete alarms, 16 control points, terminal port for access, E2A output, 64 KB digital output, cross-connect block and four 25-foot cables |

# GENERAL DESCRIPTION

The 05725 Remote E2A shelf is a 12-position 460 Alarm and Control System (ACS) shelf. This shelf collects discrete alarm data from central office communications equipment. The alarm data is processed, concentrated, and converted to E2A protocol for transmission to the host computer at the Alarm Center. For a functional schematic of this shelf, refer to sheet 2 of 3 of the B18-05725-XX drawing that accompanies this Application Manual.

The -02 option is equipped with a 46105 Dual VF 64-kilobit Channel Module. The output of this shelf is a digital signal that can be transmitted over a 56K or 64K digital service channel.

## MODULES

This shelf, like many Dantel shelves is made up of separate plug-in modules that are factory-wired together to accomplish a task. The modules used in the 05725-02 shelf are described below and shown in Fig. 1.

### Multiple Alarm Transmitters (MATs) - slots 1-2

Each MAT:

- Reports the alarm status for up to 32 independent discrete alarm inputs
- Provides LEDs to indicate active alarms.

***NOTE:*** *Slots 3 and 4 are wired for MATs only and not equipped.*

### Control Point Module (CPM) - slot 5

The CPM provides 16 discrete (independent) relays controllable by the MAP. Commands can be entered from the Printer Port of the MAP using a dumb terminal (refer to 46020-38 manual), or by the Alarm Center. Any of the 16 control points can be turned on or off to control a particular piece of equipment.

### Multiple Alarm Combiner (MAC) - slot 6

Slot 6 is wired only and not equipped.

### Multiple Alarm Processor (MAP) - slot 7

The MAP is the center of the Dantel system. The MAP:

- Polls (interrogates) remote alarm reporting equipment
- Operates control points
- Reports alarm status to the Alarm Monitoring Center (FMAC)

The MAP uses three ports to receive and transmit information:

- The Data Port connects the MAP to the Control Point Module (CPM) and Multi Alarm Transmitters (MATs) .
- The Printer Port, (also called the Craft, Configuration, or Interface Port), is used for local monitoring and configuring of the MAP. A serial printer can be connected here to obtain a hardcopy printout of the alarm information.
- The Master Port is used to report the alarm information to the alarm center through the E-System Adapter.

  The Master Port provides mounting for the RS-232 subassembly.

### E-System Adapter (ESA) - slot 8

The ESA provides an interface between the MAP(s) and the TNC. It:

- Takes the DCP protocol from the MAP and converts it to E2A
- Provides mounting for a 202 Tone Modem.

It then sends that information to the Alarm Center.

### Tellabs 4003C Line Amplifier - slot 9

The 4003C Line Amplifier with Loopback provides:

- Switch-selectable level control.
- Equalization.
- Impedance matching in transmit and receive channels.
- Tone-activated or dc-activated equal-level loopback of the facility.

### Dual VF 64-Kilobit Channel (64KB) - slot 10

The 64KB interfaces analog voice or data equipment to a 64-kilobit digital service channel equipment. The module has two channels which operate independently or interconnected in bridge configuration.

## Summary Alarm Module (SAM) - slot 11

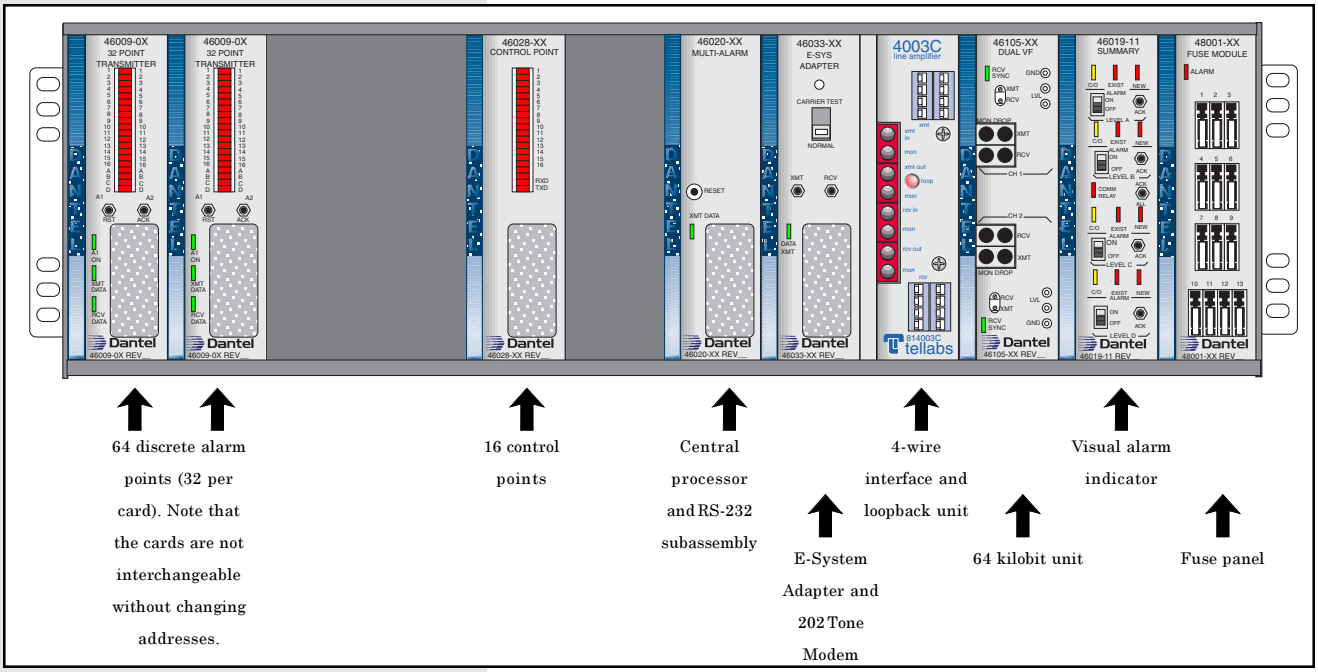
This module provides a means to control an audible and/or visual alarm device for four alarm levels (A,B, C, and D). Wired to, and controlled by, the MAP in slot 7, the SAM provides four independent "form C" relays.

## Fuse Module - slot 12

The B11-48001-01 Fuse Module provides 13 GMT indicating-type fuse circuits and a failure alarm circuit for fusing 400-type modules in an equipment shelf. The module fits into any 400-type or similar equipment housing and operates on -21 to -56 VDC input power. The front panel includes 13 indicating-type GMT fuses and an alarm LED.

This application uses the Fuse Module's redundant inputs. Connecting one power supply as Source A, and a second power supply as Source B parallels both supplies. Refer to Fig. 2.

**FIG. 1 - 05725-02 SHELF FRONT VIEW**



# INSTALLATION

This section consists of three parts:

1. Equipment Mounting
2. Wiring
3. Switch and Strap Settings
   - 46009 Multiple Alarm Transmitter
   - 46028 Control Point Module
   - 46020-38 Multiple Alarm Processor with Firmware
     - 46029 RS-232 Current Loop Interface Subassembly
   - 46033 E-System Adapter
     - 49013 202 Tone Modem Subassembly
   - Tellabs 4003C
   - 46105 Dual VF 64-kilobit Channel
   - 46019 Summary Alarm Module
   - 48001 Fuse Module
4. Summary of Switch Settings

## EQUIPMENT MOUNTING

Tools Required:

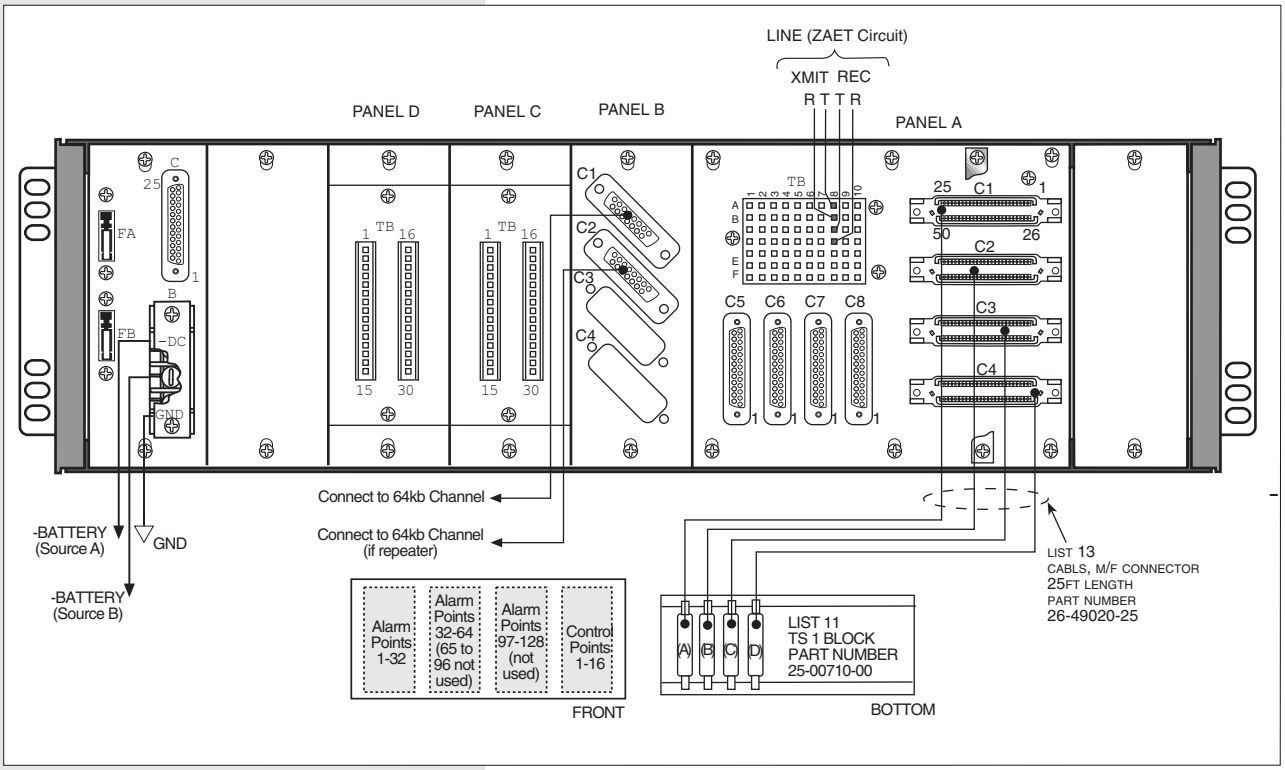
- ♦ Ohmmeter
- ♦ Phillips screwdriver
- ♦ 7/16" Nutdriver or socket wrench
- ♦ (TMS) Transmission measuring Set

Visually inspect shelf for obvious damage.

Use ohmmeter to check for a short across the power input at A and B (-DC) and (GND) at the left end of the rear of the shelf (refer to Fig. 2).

TMS is used to verify the levels at the output of the 46033 E-System Adapter and the 4003C Line Amplifier.

**FIG. 2 - REAR VIEW OF 05725 SHELF**

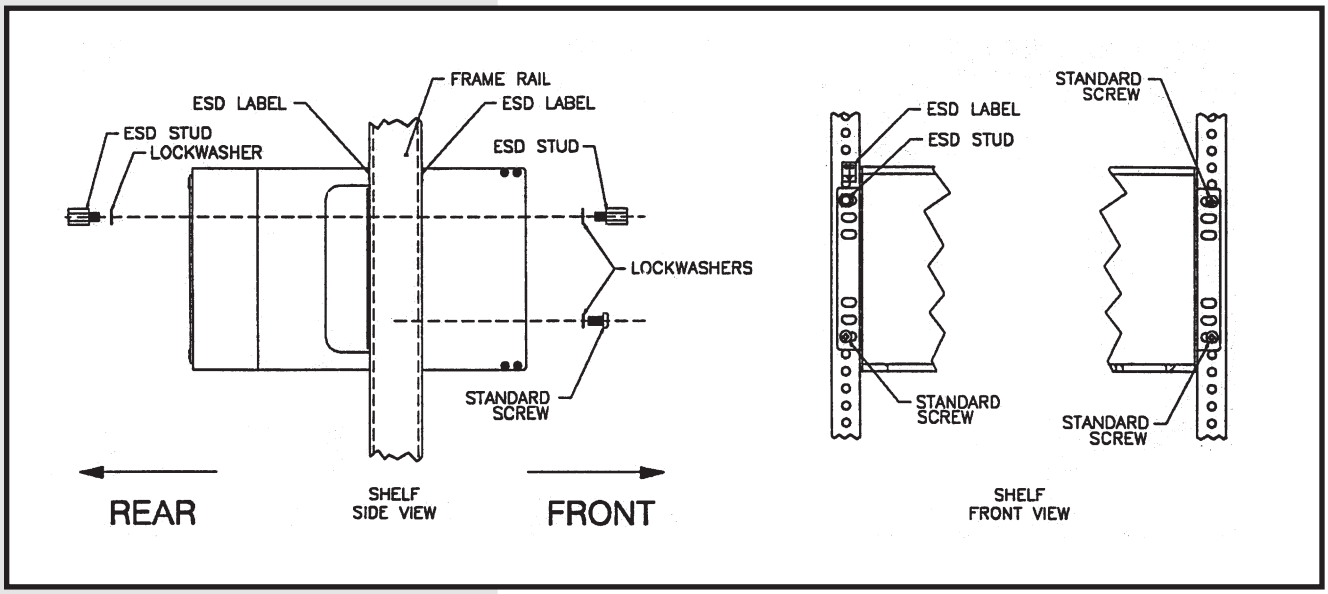



With a Phillips screwdriver, mount the shelf in an equipment rack using the screws and lockwashers supplied in a bag attached to the side of the shelf.

Mounting hardware is supplied in a bag attached to the side of the shelf.

Refer to Figure 3.

FIG. 3 - MOUNTING CONFIGURATION, 41075 400-TYPE MOUNTING




1. Facing the frame rail, place the equipment shelf in the rack in the desired location. Secure with three Phillips-head screws and lockwashers - two on the right side, top and bottom, and one on the lower left side.
2. Install one ESD stud, with lockwasher, in the upper left location.
3. Secure all fasteners tightly, ensuring proper grounding between ESD stud and frame rail.
4. Place ESD label next to the ESD stud.
5. From the rear of the bay, install the other ESD stud and lockwasher into the frame rail next to the equipment shelf. Secure tightly, ensuring proper grounding of the ESD stud. Place ESD label next to the ESD stud.

## WIRING

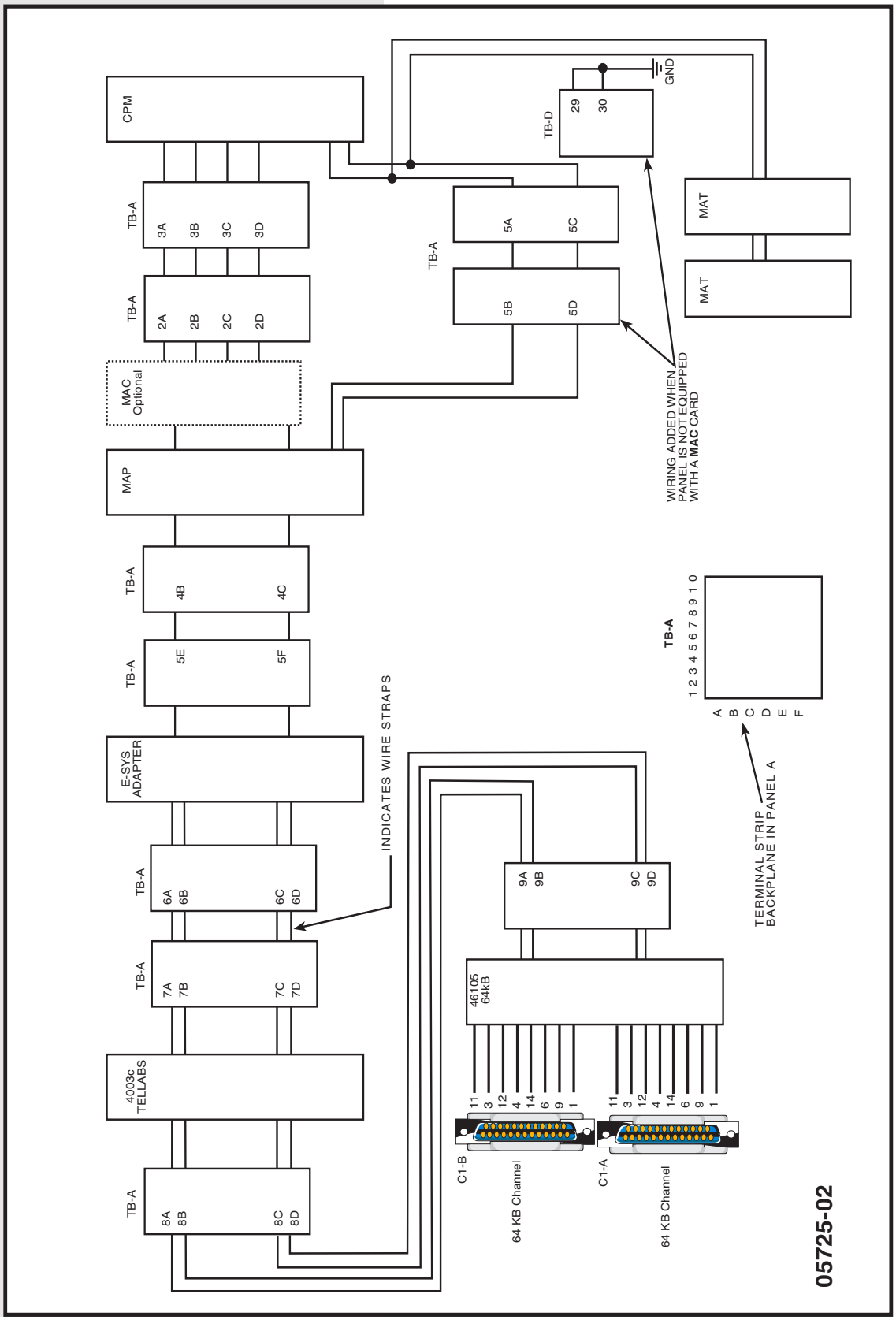
Wire the 05725 Remote E2A Alarm Shelf to external equipment as required. Use the B18-05725-XX Block and Level Drawing as a reference for making connections to Dantel equipment.

Refer to interconnect wiring diagram Fig 4. This will help understand and read the circuit diagrams.

### 64kb Channel

- Connect to C1-B for terminal application.
- Connect to C1-B and C2-B for repeater application.

**FIG. 4 - 05725 INTERCONNECT DIAGRAM**



## STRAP AND SWITCH SETTINGS

### 46009 Multiple Alarm Transmitter (MAT)

Refer to Fig. 5 and Table A.

FIG. 5 - 46009 MAT SWITCH AND STRAP LOCATIONS

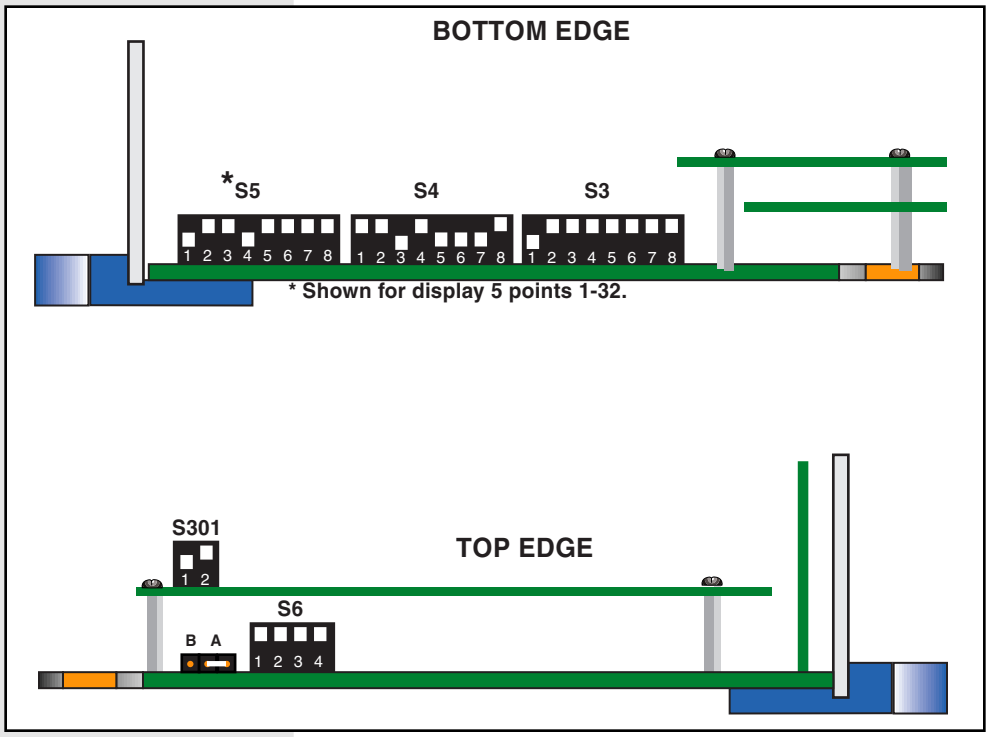


**TABLE A - 46009 MAT SWITCH AND STRAP OPTIONS**

| SWITCH | POSITION | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| SW5 | | | | | | | | |
| Slot 1 ** | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| Slot 2 *** | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| SW4 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| SW3 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| SW6 | 1 | 1 | 1 | 1 | - | - | - | - |
| SW301 | 0 | 1 | - | - | - | - | - | - |

***NOTE**: A "1" indicates that the switch is up (up = OFF). A "0" indicates that the switch is down (down = ON).*

** *DCM addresses 17/18 (display 5, bits 1-32)*
*** *DCM addresses 19/20 (display 5, bits 33-63)*

***NOTE:** The MATs in slots 1 and 2 are not interchangeable without changing the address on switch 5 first.*

## 46028 Control Point Module (CPM)

Refer to Fig. 6 and Table B.

**FIG. 6 - 46028 CPM SWITCH AND STRAP LOCATIONS**

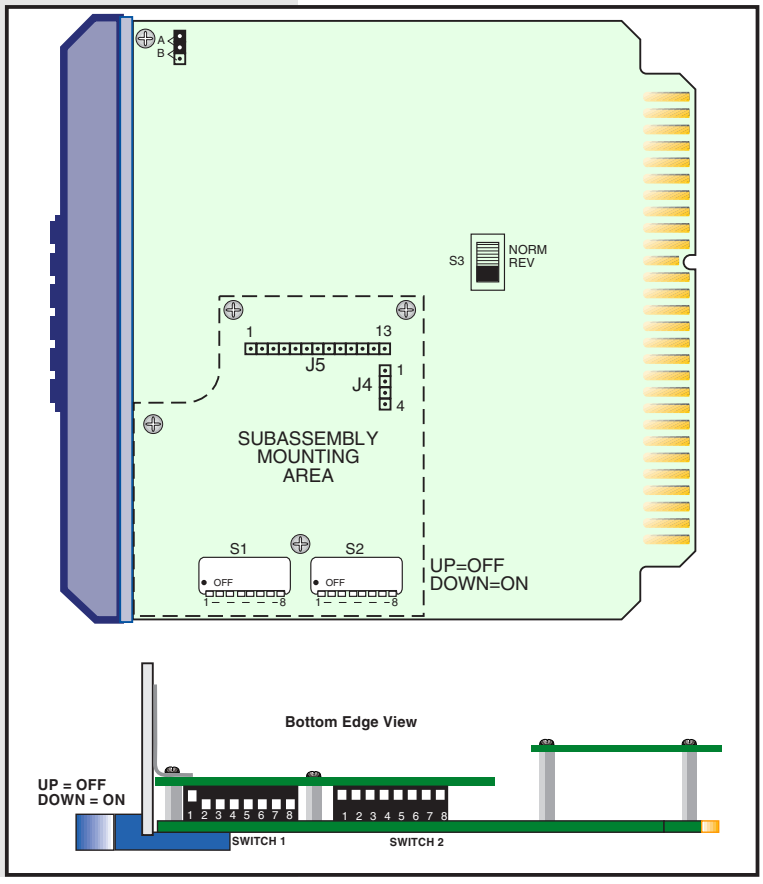


**TABLE B - 46028 CPM SWITCH AND STRAP OPTIONS**

| SWITCH | POSITION | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| SW1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| S3 | Leave in "NORM" | | | | | | | |
| AB Strap | Leave in "A" position. | | | | | | | |
| ***NOTE**: A "1" indicates that the switch is up (up = OFF). A "0" indicates that the switch is down (down = ON).* | | | | | | | | |

### 46020-38 Multiple Alarm Processor (MAP)

Refer to Figs. 7 and 8, and Tables C and D.

**FIG. 7 - 46020 MAP SUBASSEMBLY AND SWITCH LOCATIONS**

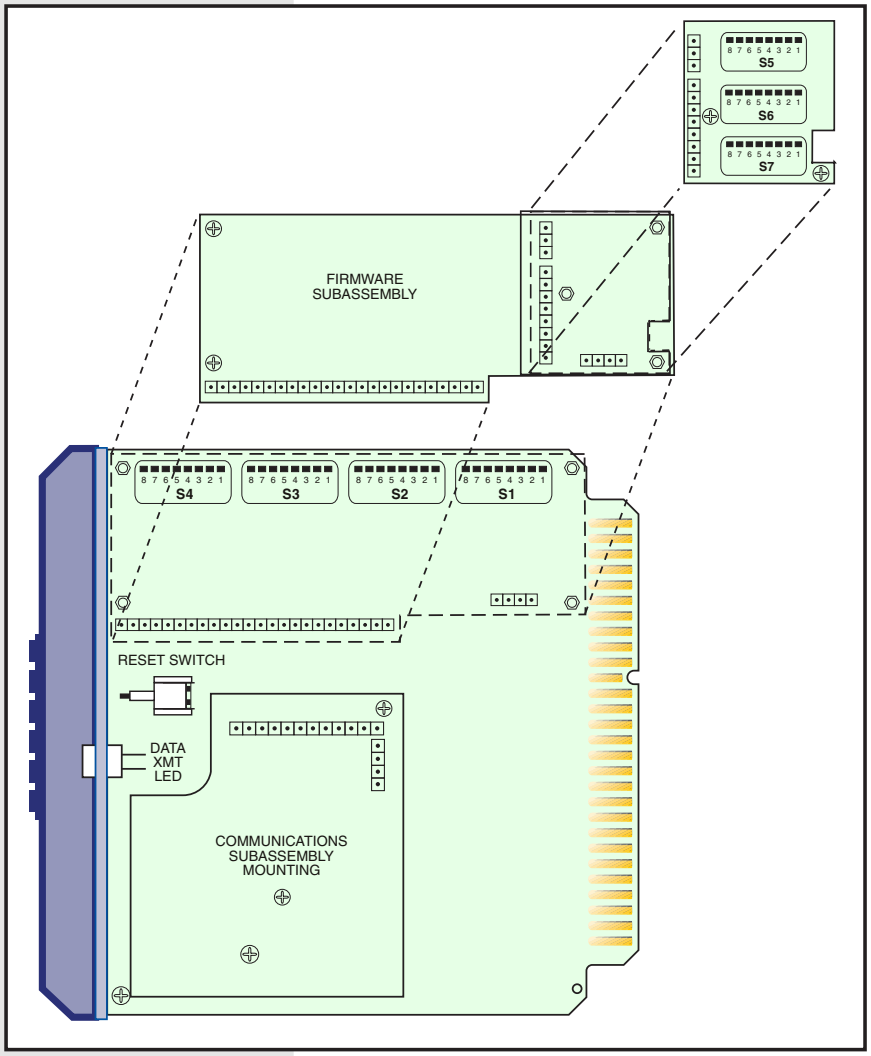
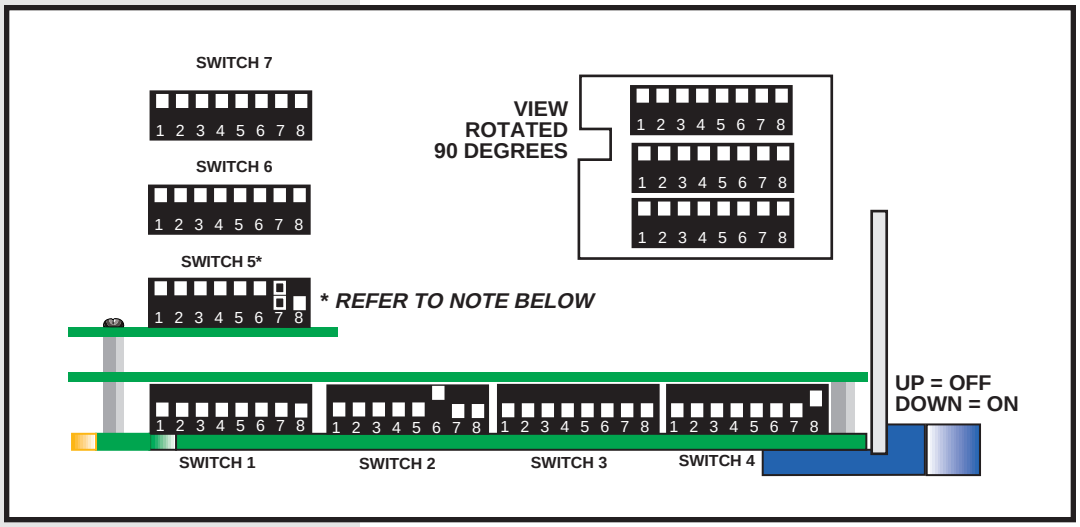


**FIG. 8 - 46020 MAP VIEWED FROM THE TOP**




***NOTE:*** *Apply power initially with switch 5 position 7 UP and allow the MAP to self-configure. Then remove power and place switch 5 position 7 DOWN. This will retain the configuration in memory.*

**TABLE C - SWITCHES 1 THRU 4, 46020-38**

| SWITCH | POSITION | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| SW1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| SW3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

***NOTE:*** *A "1" indicates that the switch is up (up = OFF). A "0" indicates that the switch is down (down = ON).*

**TABLE D - SWITCH 5-7, 46020-38**

| SWITCH | POSITION | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| SW5 | 1 | 1 | 1 | 1 | 1 | 1 | * | 0 |
| SW6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| SW7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

**** NOTE:*** *Switch 5 position 7 must be up to configure on initial power-up. Place down to retain configuration in memory. A "1" indicates that the switch is up (up = OFF). A "0" indicates that the switch is down (down = ON).*

## 49029 RS-232 Current Loop Interface Subassembly

Refer to Fig. 9 and Table E.

**FIG. 9 - 49029 SWITCH AND STRAP POSITIONS**

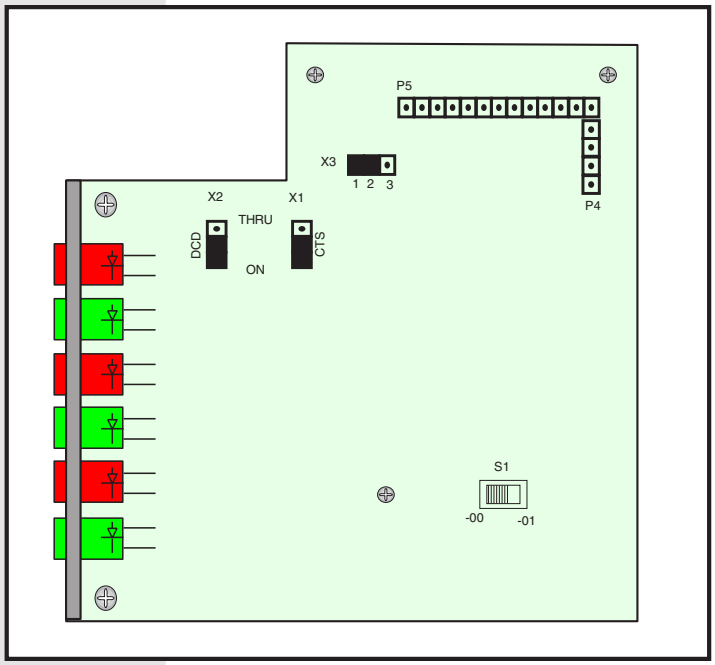



**TABLE E - 49029 SWITCH AND STRAP SETTINGS**

| OPTION | SWITCH OR STRAP SETTINGS |
|---|---|
| Normal Position * | S1 - -00 Mode |
| TXD, RXD, RTS, and DCD reversed | S1 - -01 Mode |
| CTS used for handshaking | X1 - THRU |
| CTS not used for handshaking * | X1 - ON |
| DCD used for handshaking | X2 - THRU |
| DCD not used for handshaking * | X2 - ON |
| Parallel Option | |
| YES | X3 - Jumper pins 2 & 3 |
| NO * | X3 - Jumper pins 1 & 2 |

**NOTE:**

Default switch and strap positions are indicated by a "*". For more detail and further explanations about the individual modules, refer to the practices specific to that module.

## 46033 E-System Adapter

Refer to Fig. 10 and Tables F and G

**FIG. 10 - 46033 E-SYSTEM ADAPTER SWITCH LOCATIONS**

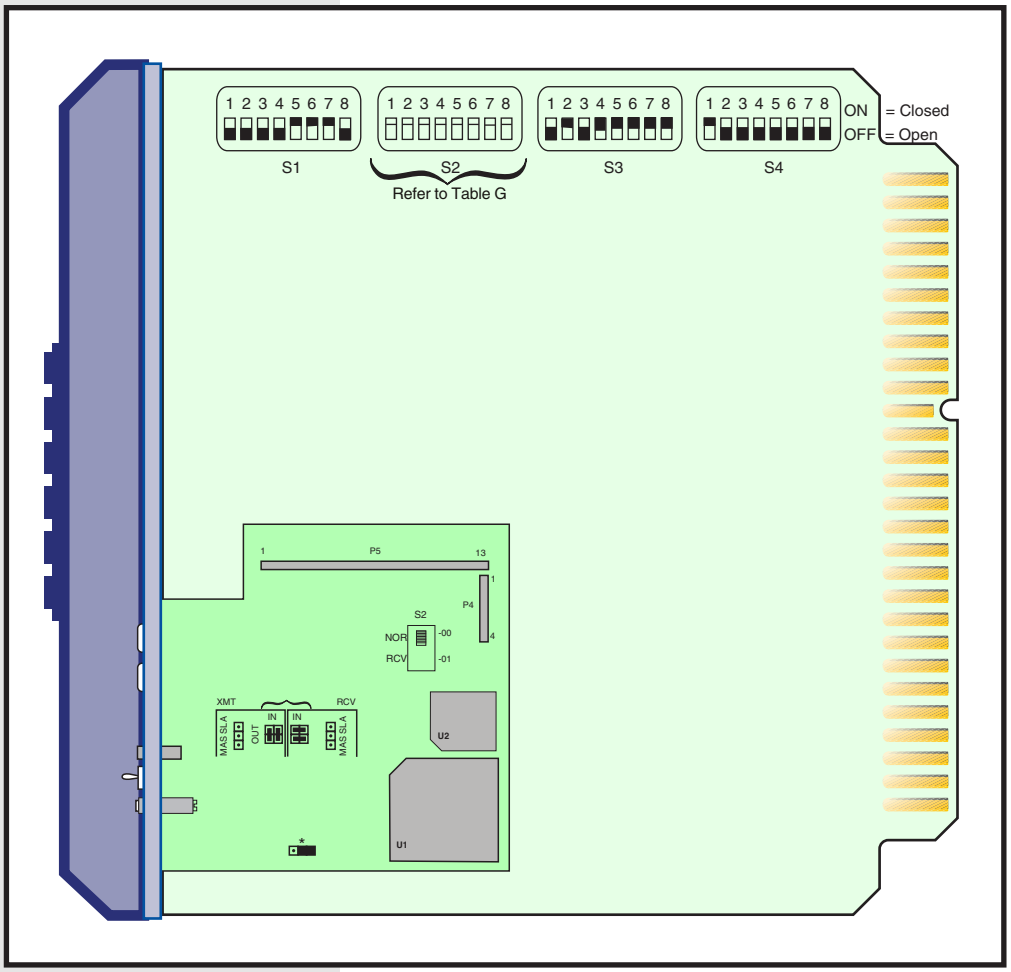



**TABLE F - 46033 E-SYSTEM ADAPTER SWITCH SETTINGS**

| SWITCH | POSITION | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| SW1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 |
| SW2 | Station Address. Refer to Table F. | | | | | | | |
| SW3 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| SW4 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

***NOTE**: A "1" indicates that the rocker switch is up adjacent to the position number (open = OFF). A "0" indicates that the rocker switch is down adjacent to the position number (closed = ON).*

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**TABLE G - 46033 E-SYSTEM ADAPTER S2 SWITCH SETTINGS**

**NOTE:**

A "0" indicates that the rocker switch is down adjacent to the position number (closed = ON). A "1" indicates that the rocker switch is up adjacent to the position number (open = OFF).

* = Factory Default

| ADDRESS | POSITION | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01 * | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 02 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 03 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 04 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 05 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 06 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 07 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 08 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 09 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 10 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 11 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 12 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 13 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| 14 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 15 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 16 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 17 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 18 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 19 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 20 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 21 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 22 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 23 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 |
| 24 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 25 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| 26 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 27 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| 28 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 29 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 |
| 30 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| 31 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |

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**TABLE G (CONTINUED) - 46033 E-SYSTEM ADAPTER S2 SWITCH SETTINGS**

**NOTE:**

A "0" indicates that the rocker switch is down adjacent to the position number (closed = ON). A "1" indicates that the rocker switch is up adjacent to the position number (open = OFF).

| ADDRESS | POSITION | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 32 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 33 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 34 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 35 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 36 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 37 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| 38 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 39 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| 40 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 41 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| 42 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 43 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| 44 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| 45 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| 46 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 |
| 47 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 |
| 48 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 49 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 50 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 51 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| 52 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| 53 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 54 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 55 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 |
| 56 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 57 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 |
| 58 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| 59 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 |
| 60 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 |
| 61 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| 62 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 |
| 63 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 64 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 66 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 67 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 68 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 69 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| 70 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 71 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 72 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 73 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 74 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 75 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |

**CONTINUED . . .**

**TABLE G (CONTINUED) - 46033 E-SYSTEM ADAPTER S2 SWITCH SETTINGS**

**NOTE:**

A "0" indicates that the rocker switch is down adjacent to the position number (closed = ON). A "1" indicates that the rocker switch is up adjacent to the position number (open = OFF).

| ADDRESS | POSITION | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 76 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| 77 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 |
| 78 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 |
| 79 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 80 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 81 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 82 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 83 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| 84 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 85 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 86 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| 87 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 |
| 88 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 89 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 |
| 90 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| 91 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 92 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 |
| 93 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 |
| 94 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| 95 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 96 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 97 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 98 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 99 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 |
| 100 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 101 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| 102 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| 103 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| 104 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 105 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| 106 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| 107 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 |
| 108 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 |
| 109 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| 110 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 |
| 111 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| 112 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 113 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 |
| 114 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| 115 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| 116 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |
| 117 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| 118 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 |
| 119 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |

CONTINUED . . .

**TABLE G (CONTINUED) - 46033 E-SYSTEM ADAPTER S2 SWITCH SETTINGS**

**NOTE:**

A "0" indicates that the rocker switch is down adjacent to the position number (closed = ON). A "1" indicates that the rocker switch is up adjacent to the position number (open = OFF).

| ADDRESS | POSITION | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 120 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 121 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 122 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 |
| 123 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| 124 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 |
| 125 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| 126 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 127 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 128 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 130 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 131 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 132 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 133 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 134 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 135 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 136 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 137 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 138 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 139 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 140 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 141 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| 142 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 143 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 144 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 145 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 146 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 147 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 148 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 149 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 150 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 151 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 |
| 152 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 153 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| 154 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 155 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| 156 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 157 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 |
| 158 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| 159 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| 160 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 161 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 162 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 163 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |

CONTINUED . . .

TABLE G (CONTINUED) - 46033 E-SYSTEM ADAPTER S2 SWITCH SETTINGS

**NOTE:**

A "0" indicates that the rocker switch is down adjacent to the position number (closed = ON). A "1" indicates that the rocker switch is up adjacent to the position number (open = OFF).

| ADDRESS | POSITION | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 164 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 165 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| 166 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 167 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| 168 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 169 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| 170 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 171 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| 172 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| 173 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| 174 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 |
| 175 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 |
| 176 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 177 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 178 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 179 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| 180 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| 181 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 182 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 183 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 |
| 184 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 185 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 |
| 186 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| 187 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 |
| 188 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 |
| 189 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| 190 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 |
| 191 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 192 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 193 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 194 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 195 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 196 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 197 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| 198 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 199 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 200 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 201 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 202 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 203 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| 204 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| 205 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 |
| 206 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 |
| 207 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |

CONTINUED . . .

**TABLE G (CONTINUED) - 46033 E-SYSTEM ADAPTER S2 SWITCH SETTINGS**

**NOTE:**

A "0" indicates that the rocker switch is down adjacent to the position number (closed = ON). A "1" indicates that the rocker switch is up adjacent to the position number (open = OFF).

| ADDRESS | POSITION | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 208 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 209 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 210 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 211 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| 212 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 213 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 214 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| 215 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 |
| 216 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 217 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 |
| 218 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| 219 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 220 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 |
| 221 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 |
| 222 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| 223 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 224 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 225 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 226 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 227 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 |
| 228 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 229 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| 230 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| 231 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| 232 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 233 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| 234 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| 235 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 |
| 236 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 |
| 237 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| 238 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 |
| 239 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| 240 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 241 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 |
| 242 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| 243 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| 244 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |
| 245 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| 246 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 |
| 247 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 248 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 249 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 250 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 |
| 251 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |

**TABLE G (CONTINUED) - 46033 E-SYSTEM ADAPTER S2 SWITCH SETTINGS**

**NOTE:**
A "0" indicates that the rocker switch is down adjacent to the position number (closed = ON). A "1" indicates that the rocker switch is up adjacent to the position number (open = OFF).

| ADDRESS | POSITION | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 252 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 |
| 253 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| 254 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 255 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

### 49013 202 Tone Modem Subassembly

Refer to Fig. 11 and Table H for switch and strap settings.

**FIG. 11 - 49013 202 TONE MODEM SWITCH AND STRAP LOCATIONS**

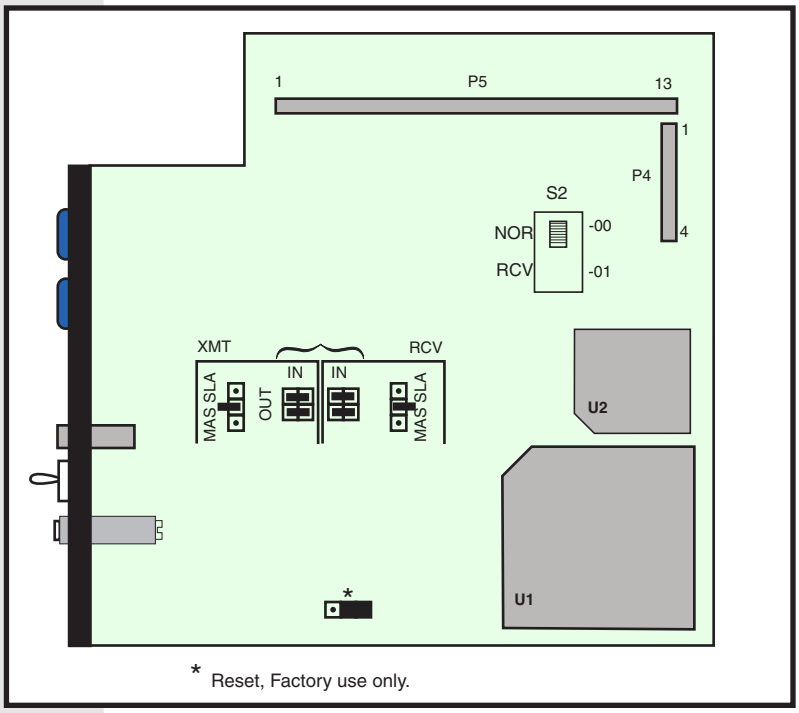


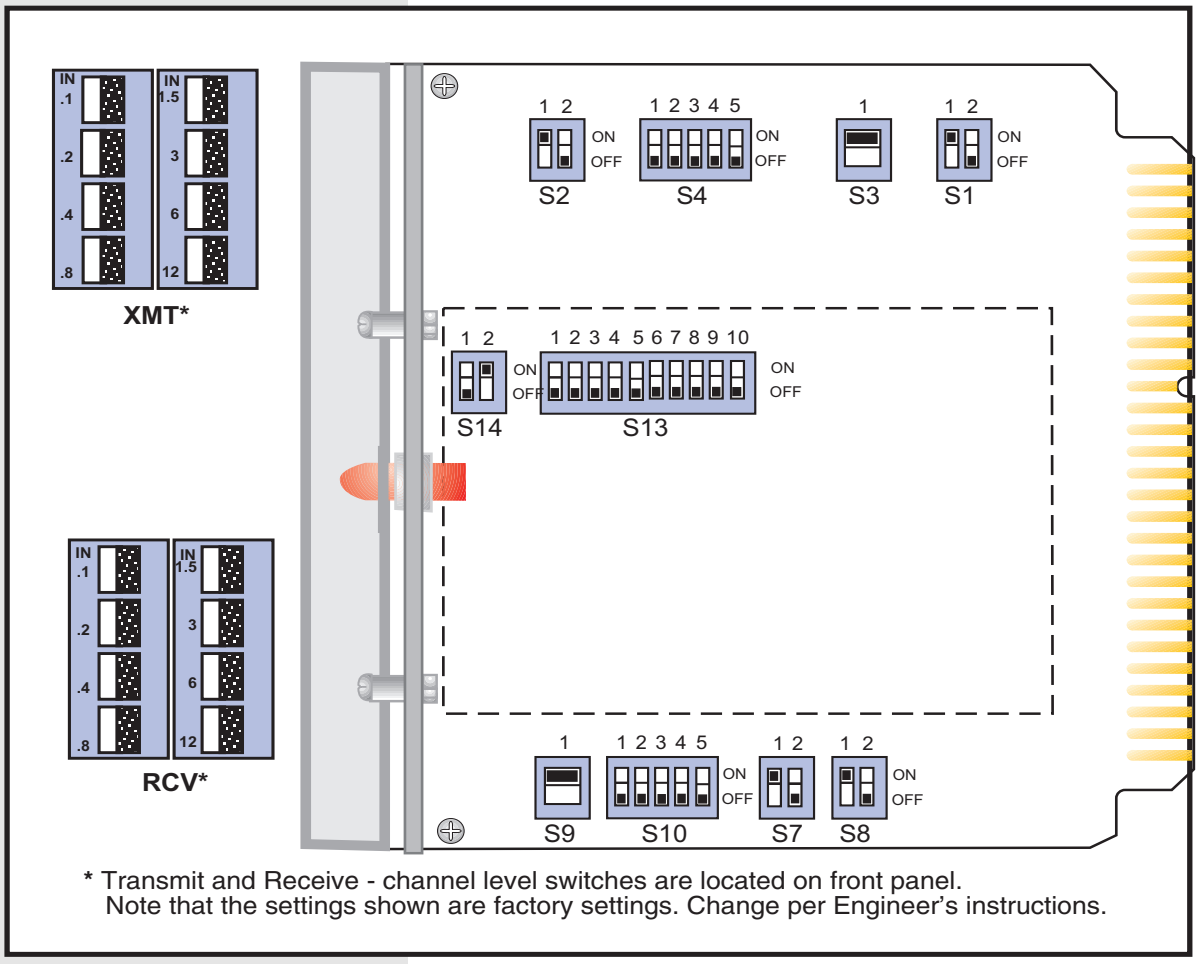

**TABLE H - 49013 202 TONE MODEM SWITCH AND STRAP OPTIONS**

| OPTION | INSTALL STRAP |
|---|---|
| Transmitter Master/Slave | Remove or store in inoperative position (see Fig. 11) |
| Receiver Master/Slave | Remove or store in inoperative position (see Fig. 11) |
| RCV Pad In (input level 0 to -20 dB) | Jumpers placed parallel to connector P5 |
| XMT Pad In (output level adjustable between -20 and -40 dBm) | Jumpers placed parallel to connector P5 |
| S2 | NOR (Toward connector P5) |

## Tellabs 4003C

Refer to Fig. 12 and Tables I, J, and K for switch and strap options.

FIG. 12 - 4003C SWITCH AND STRAP LOCATIONS




* Transmit and Receive - channel level switches are located on front panel.
Note that the settings shown are factory settings. Change per Engineer's instructions.

**TABLE I - 4003C SWITCH OPTIONS**

| SWITCH | POSITION |
|---|---|
| S1-1 | ON |
| S1-2 | OFF |
| S2-1 | ON |
| S2-2 | OFF |
| S3 | LOSS |
| S4 | all OFF |
| S7-1 | ON |
| S7-2 | OFF |
| S8-1 | ON |
| S8-2 | OFF |
| S9 | LOSS |
| S10 | all OFF |
| S13-1 | 1 ON* (refer to Table J) |
| S14-1 | OFF |
| S14-2 | ON |

| FRONT PANEL LEVEL SWITCHES |
|---|
| XMT |
| 0 dB (refer to Fig. 12) |
| RCV |
| 0 dB (refer to Fig. 12) |

**TABLE J - 4003C LOOPBACK FREQUENCY SELECTION (S13)**

**NOTE:**
* 2713 Hz is the factory default setting. Change per Engineer's instructions.

| FREQUENCY | S13 SWITCH POSITION SET ON* |
|---|---|
| 2813 Hz | all OFF |
| * 2713 Hz | 1 |
| 2513 Hz | 2 |
| 2413 Hz | 3 |
| 1913 Hz | 4 |
| 1813 Hz | 5 |
| 1713 Hz | 6 |
| 1613 Hz | 7 |
| 1513 Hz | 8 |
| 1413 Hz | 9 |
| 1313 Hz | 10 |

**** NOTE:** All other S13 switch positions must be set to the OFF position.*

**TABLE K - 4003C LOOPBACK LEVEL SELECTION (S14)**

**NOTE:**
* Factory Default for -23 dB.

| LOOPBACK LEVEL | S14 POSITION 1 | S14 POSITION 2 |
|---|---|---|
| +16 dB | OFF | OFF |
| +9 dB ** | OFF | ON |
| -16 dB | ON | OFF |
| -23 dB* | ON | ON |

***** NOTE:** This setting equals **0** dB on those units with an "M3" label on the handle.*

## 46105 Dual VF 64-Kilobit Channel

Refer to Fig. 13 and Table L for switch and strap options.

***NOTE:*** *Switch and strap settings for this application are indicated by a "*" in the following tables.*

**FIG. 13 - 46105 SWITCH AND STRAP LOCATIONS**

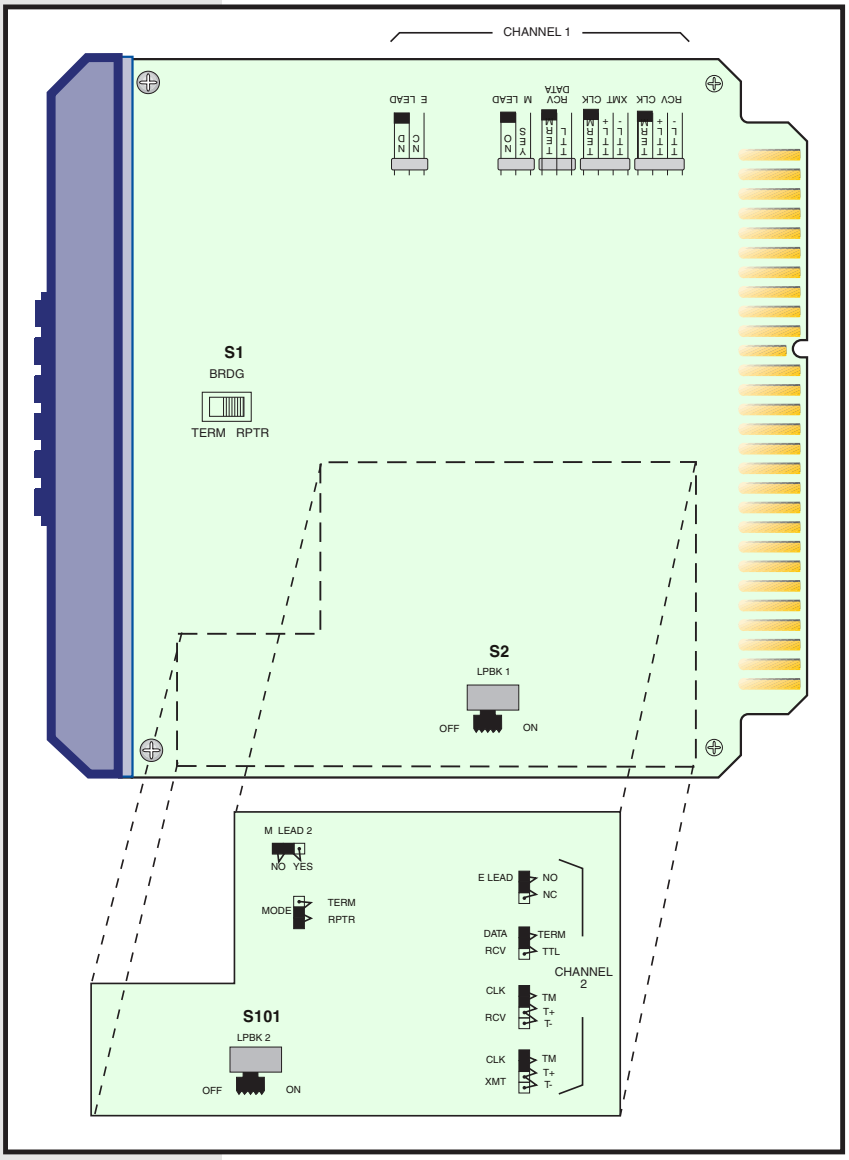


**TABLE L - 46105 SWITCH AND STRAP OPTIONS**

| STRAP | POSITION | DESCRIPTION |
|---|---|---|
| XMT CLK 1 (see note below) | TERM * | 180-ohm termination across RS-422 inputs at pins 51 and 52 |
| | TTL+ | XMT CLK 1 pin 51 is TTL (+ edge) compatible; pin 52 is not used |
| | TTL– | XMT CLK 1 pin 52 is TTL (– edge) compatible; pin 51 is not used |
| RCV CLK 1 | TERM * | 180-ohm termination across RS-422 inputs at pins 45 and 46 |
| | TTL+ | RCV CLK 1 pin 45 is TTL (+ edge) compatible; pin 46 is not used |
| | TTL– | RCV CLK 1 pin 46 is TTL (– edge) compatible; pin 45 is not used |
| RCV DATA 1 | TERM * | 180-ohm termination across RS-422 inputs at pins 43 and 44 |
| | TTL+ | RCV DATA 1 pin 43 is TTL compatible; pin 44 is not used |
| XMT CLK 2 (see note below) | TERM * | 180-ohm termination across RS-422 inputs at pins 5 and 6 |
| | TTL+ | XMT CLK 2 pin 5 is TTL (+ edge) compatible; pin 6 is not used |
| | TTL– | XMT CLK 2 pin 6 is TTL (– edge) compatible; pin 5 is not used |
| RCV CLK 2 | TERM * | 180-ohm termination across RS-422 inputs at pins 11 and 12 |
| | TTL+ | RCV CLK 2 pin 11 is TTL (+ edge) compatible; pin 12 is not used |
| | TTL– | RCV CLK 2 pin 12 is TTL (– edge) compatible; pin 11 is not used |
| RCV DATA 2 | TERM * | 180-ohm termination across RS-422 inputs at pins 13 and 14 |
| | TTL+ | RCV DATA 2 pin 13 is TTL compatible; pin 14 is not used |
| E LEAD 1 | NO * | Relay at pins 39 and 40 is normally open when E Lead 1 is active |
| | NC | Relay at pins 39 and 40 is normally closed when E Lead 1 is inactive |
| E LEAD 2 | NO * | Relay at pins 19 and 20 is normally open when E Lead 2 is active |
| | NC | Relay at pins 19 and 20 is normally closed when E Lead 2 is inactive |
| M LEAD 1 | YES | M Lead 1 input at pins 41 and 42 is used |
| | NO * | M Lead 1 input at pins 41 and 42 is not used |
| M LEAD 2 | YES | M Lead 2 input at pins 15 and 16 is used |
| | NO * | M Lead 2 input at pins 15 and 16 is not used |
| MODE (S1) | TERM | Digital sections of channel 1 and 2 are not interconnected. Select this position when the channels will operate independently. BRDG switch also must be in the TERM position. |
| | RPTR * | Digital sections of channel 1 and 2 are interconnected, bypassing the analog sections when they are not in use. Select this position when the channels are bridged together in the repeater mode. BRDG switch also must be in the RPTR position. |

**NOTE:**

If an external clock is not used, strap XMT CLK 1 and XMT CLK 2 to TTL+.

| SWITCH | SWITCH | SWITCH |
|---|---|---|
| BRDG | TERM | Channels 1 and 2 operate independently. |
| | RPTR * | Channels 1 and 2 are bridged together. |
| LPBK 1 (S2) | OFF * | Analog signals for Channel 1 are not looped back. |
| | ON | Analog signals from the transmit input of Channel 1 are looped back to the receive output of Channel 1. Use to check or set audio levels. |
| LPBK 2 (S101) | OFF * | Analog signals for Channel 2 are not looped back. |
| | ON | Analog signals from the transmit input of Channel 2 are looped back to the receive output of Channel 2. Use to check or set audio levels. |

## 46019 Summary Alarm Module

Refer to Fig. 14 and Table M.

**FIG. 14 - 46019 SWITCH AND STRAP LOCATIONS**

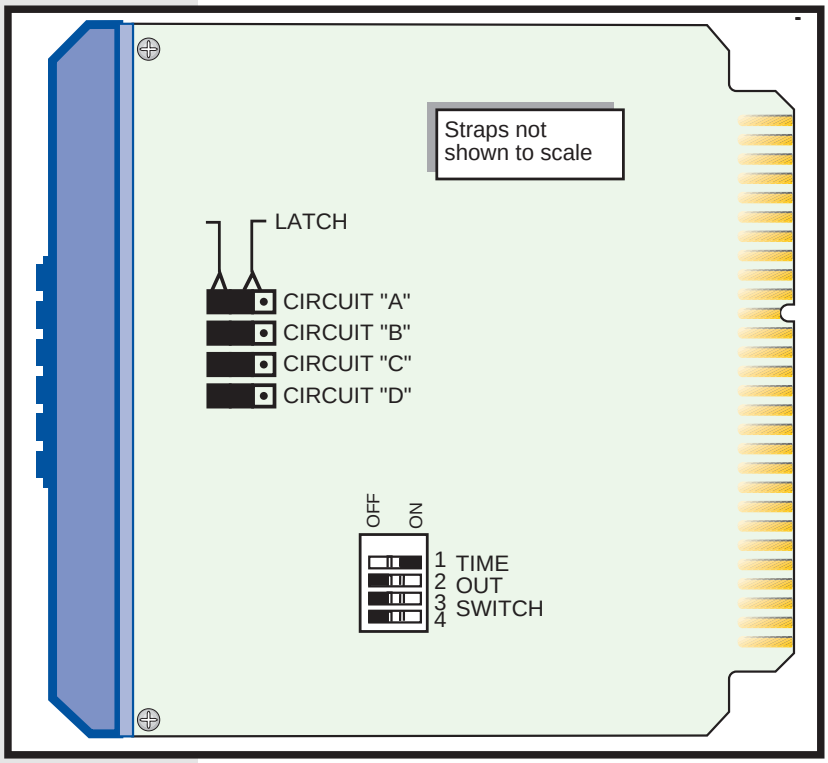



**TABLE M - 46019 SWITCH AND STRAP OPTIONS**

| SWITCH | POSITION |
|---|---|
| 1* | ON (Timeout = 0.5 min.) |
| 2 | ON (Timeout = 1.0 min.) |
| 3 | ON (Timeout = 4.0 min.) |
| 4 | ON (Timeout = 8.0 min.) |
| * Setting for this application. All switches OFF = no timeout. Only one switch may be on at a time. | |

## 48001 Fuse Module

Refer to Fig. 15 and Table N.

**FIG. 15 - STRAP LOCATION, B11-48001**

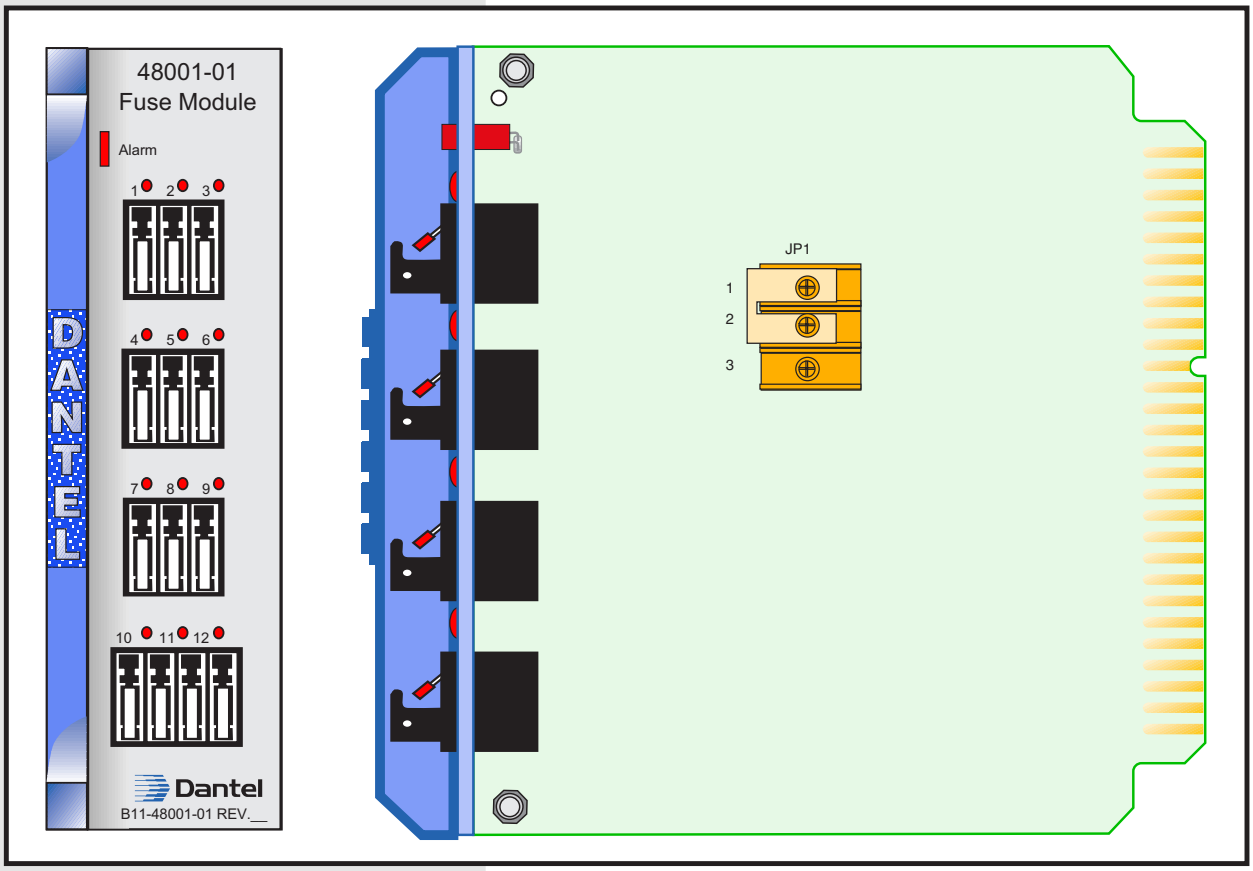



**TABLE N - JP1 STRAP OPTIONS**

| POSITION | DESCRIPTION |
|---|---|
| Pins 1 & 2 * | Redundant or Single Input |
| Pins 2 & 3 | Two Independant Inputs |
| * Setting for this application. | |

## SUMMARY OF SWITCH SETTINGS

Table O documents what the application switch settings for the 05725-02 shelf do.

### TABLE O - SUMMARY OF SWITCH SETTINGS

| MODULE | SLOT | SUMMARY OF DEFAULT SWITCH SETTINGS |
|---|---|---|
| 46009 Multiple Alarm Transmitter | 1 | Addresses 17 and 18 (E-System display 5, bits 1-32); DCM protocol; 9600 baud; display function set for alarms with levels; transmit of data in response to poll; no input alarm reversals; alarm inputs set for latching; alarm points latch release automatic on poll. |
| 46009 Multiple Alarm Transmitter | 2 | Addresses 19 and 20 (E-System display 5, bits 32-64); DCM protocol; 9600 baud; display function set for alarms with levels; transmit of data in response to poll; no input alarm reversals; alarm inputs set for latching; alarm points latch release automatic on poll. |
| 46028 Control Point Module | 5 | No subassembly; 9600 baud; relays set for long momentary (3 seconds); address 1; latch release set for normal; CA/CF reversal (S3) set for normal; watchdog circuit strap set for A. |
| 46020-38 Multiple Alarm Processor | 7 | CPM-Echo off; memory battery backup off initially, then on when system configured; extended addressing off; printer port set for printer syntax, 9600 baud; master port set for DCP protocol, address 1, E-system mode on, 1200 baud; data port set for 9600 baud, DCM protocol, no TBOS. |
| 49029 RS-232 Subassembly | 7 | S1 set for -00 (normal mode); CTS not used (X1 on); DCD not used (X2 on); parallel option off (X3 to 1 & 2). |
| 46033 E-System Adapter | 8 | E-System address 1; set to poll one MAP; E2A protocol; delay setting on; 1200 baud data rate; second address disabled; DCP polling rate set to 1200 baud; configuration for address 1 set to 32 (all displays set for L142). |
| 49013 Tone Modem | 8 | XMT and RCV set for no master/slave operation; RCV pad set in (0 to -20 dBm input); XMT pad set to in (-20 to -40 dBm output; S2 set for -00 option (normal); reset/default jumper set for default. |
| 4003C DST | 9 | XMT pad totals 0 dB; RCV pad totals 0; loopback frequency set for 2713 Hz; loopback level set for 23 dB. 2713 factory default. Set per Engineer's instructions. |
| 46105 64 kB Dual VF Channel | 10 | Repeater mode; M Lead active; E Lead inactive; RCV data, XMT data, RCV CLK, and XMT CLK all set for RS-422 terminated; VF bridge switch (S1) set for RPTR; LPBK 1 (S2) off; LPBK 2 (S101) off; test tonelevel set for +7 RCV and -16 XMT; data levels set for -29 dBm XMT and -6 dBm RCV. |
| 46019 Summary Alarm Module | 11 | All levels set to latch with alarms; visual alarm indicator must be acknowledged; audible relay output cutoff set for .5 seconds. |
| 48001 Fuse Module | 12 | Set for redundant power feeds. |

# TURN-UP PROCEDURE

The following is a step-by-step procedure for turning up the shelf after it has been mounted in the equipment bay, all wiring has been made, and all switches and straps have been set.

*NOTE: All switches have been set at the factory for the default setting. The only changes to the switch settings are the setting of the E-System Adapter address, the configuration of alarm point level indicators, if they are required, and the setting of the MAP memory (switch 5 position 7 to ON) after configuration is complete.*

## STEP 1-INSERT MODULES AND CONNECT THE INTERFACE CABLES

**NOTE:**
All switches, straps, and level adjustments are factory-set. Refer to the B18-05725 Block and Level Drawing and circuit order card, if applicable for standard levels.

(See DJ05725 for simple block drawing and how to connect cables)

1. Install all modules in the shelf starting with Slot 1 through slot 11. Refer to the B18-05725-XX Block and Level Drawing page 3 for Module slot assignments.
2. Make power and ground connections to the B18-05725 shelf using barrier strip B1 for the A battery feed and barrier strip B2 for the B battery feed, if redundant battery is provided. Ground is connected to barrier strip terminal B3.
3. Use the DJ05725 drawing sheets 2 and 3 as references, and connect the 929-00062-00 DB 15 M/M cables between C1 and C2 and the fiber optic terminals.
4. Mount the A25-00710-00 frame block on a frame or use the A25-00508-01 23" Block mounting bar to mount the cross connect block on, and mount the mounting bar in the relay rack where the cross connects will take place.
5. Connect the four 50 pin connector cables, A26-49029-25, between the A25-00710-00 cross connect block and the B18-05725 assembly. C1, C2, C3 and C4 of the B18-05725 assembly and A, B, C, and D of the cross connect block.
6. When the fuse module is inserted into slot 12 power will be applied to the shelf.

## STEP 2 - SET LEVELS

The levels that are used by the modem are -29 dBm XMT and -6 dBm RCV. This should always apply since all shelves will be equipped with the Tellabs 4003C card.

The data levels at the 46105 will be -29 dBm XMT (into the 46105) and -6 dBm RCV (out of the 46105). Refer to Fig 16.

The over-all system levels can be verified by injecting a terminated -16 dBm, 1 kHz test tone at the far end 46105 XMT drop jack and measuring the local 46105 RCV drop jack at +7dBM, terminated. If the signal is not within $\pm$ 1 dB of the required RCV test tone

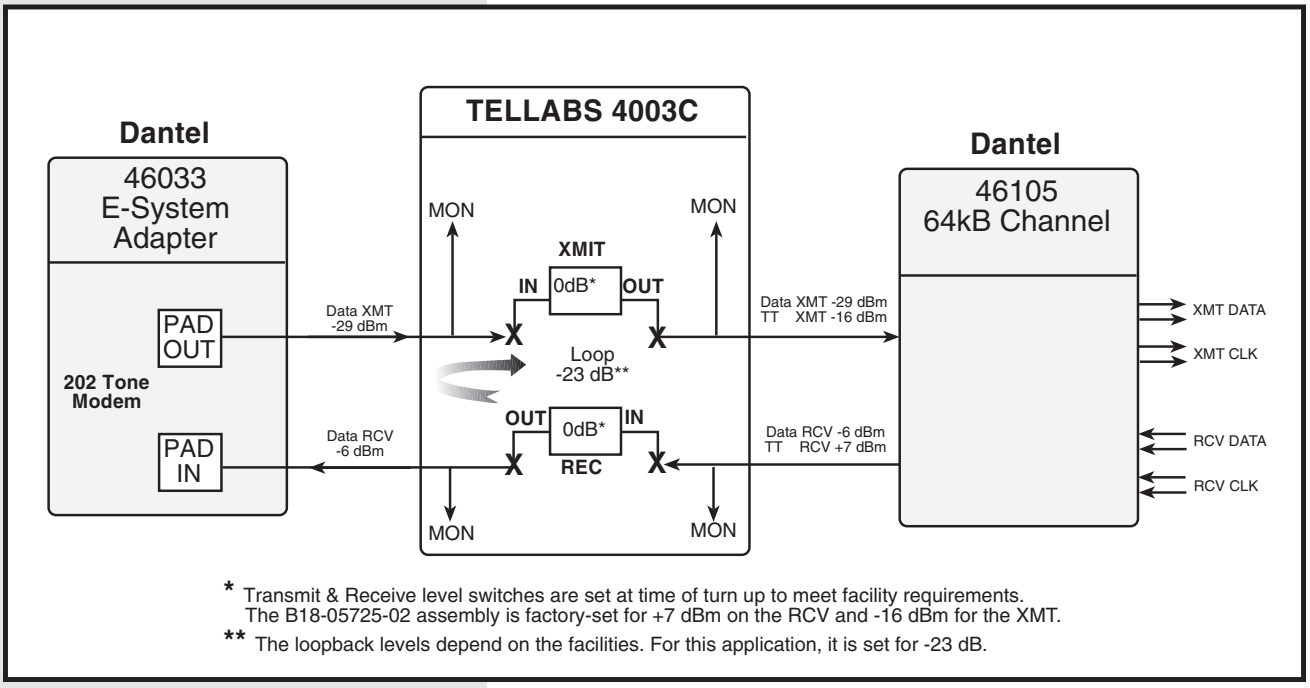
CONTINUED . . .

level, verify that the transmit level, at the blue XMT level pin jack on the front panel of the far end 46105, is 0 dB. If it is not, adjust the far end transmit potentiometer for 0 dB.

If the transmit level is correct and the RCV level is still not within ± 1 dB, adjust the local RCV potentiometer until the RCV level is +7 dBm.

Check the local XMT level to the remote RCV in the same way. Insert a -16 dBm, 1 kHz tone into the XMT drop jack and check for a +7 dBm at the far end RCV drop jack. These levels need not be changed, unless they are not within the ± 1 dB tolerance, but they should be verified on the routine level maintenance schedule.

**FIG. 16 - TONE LEVELS**




* Transmit & Receive level switches are set at time of turn up to meet facility requirements. The B18-05725-02 assembly is factory-set for +7 dBm on the RCV and -16 dBm for the XMT.

** The loopback levels depend on the facilities. For this application, it is set for -23 dB.

CONTINUED . . .

## STEP 3 - OBSERVE THE LEDS

Careful examination of the LEDs on each module will reveal much about the status of the system. Detailed information on each module is contained in the practice specific to that module. The following sections describe the LED functions and how they can be used for troubleshooting.

Refer also to Fig. 17.

***NOTE:*** *Some of the following sections describe level adjustment procedures. These procedures should only be required to verify suspected bad modules or to set levels on modules that have been swapped out.*

### SLOTS 1 AND 2: MULTIPLE ALARM TRANSMITTER (MAT)

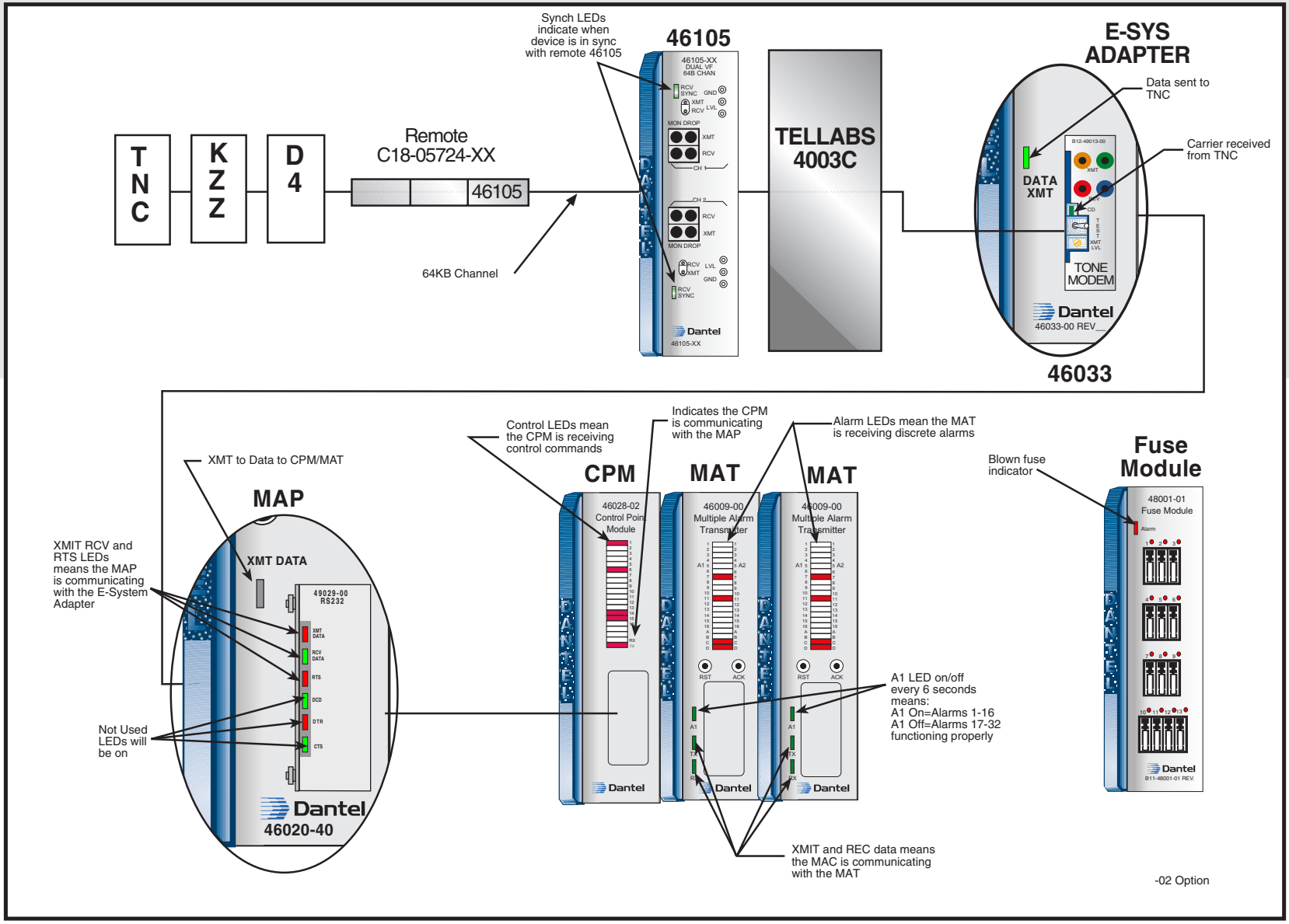
***NOTE:*** *Slots 3 and 4 are wired only and not equipped*

The MAT is equipped with 20 red LEDs and 3 green LEDs. Observe the LEDs for proper operation of the MATs.

- The red LEDs are numbered 1 through 16 and 17 through 32 and indicate current alarms. Any active alarm detected by the MAT will result in a LED lighting.
- The red LEDs labeled A, B, C, and D are alarm level LEDs. Every alarm can be assigned a level A, B, C, or D representing Critical, Major, Minor, or Status alarms.

***NOTE:*** *The **05725-02** option only supports the D level option on the MATs.*

FIG. 17 - 05725 LEDs






CONTINUED . . .

- The green A1 ON LED indicates whether points 1 through 16 or 17 through 32 are being displayed. When the A1 LED is on, points 1 through 16 are being displayed. When the A1 LED is off points 17 through 32 are being displayed.
- The green XMT DATA LED will flash every time the MAT responds to a valid poll for its address.
- The green RCV DATA LED will flash every time the MAP sends out a poll for a DCM (discrete) device.

If the RCV DATA LEDs on the MATs do not flash, check the Multi Alarm Processor (MAP) in slot 7 and verify that the XMT DATA LED is flashing. If it is not flashing, reset the MAP. If it still does not flash, replace the MAP with a known good MAP. The MAP DATA LEVEL LED and the RCV DATA LEDs on the MATs should now be flashing.

### Testing the Inputs to the MATs

Refer to DJ05725, sheet 4 of 6

On the A25-00710-00 cross connect block, place a ground on each of the alarm inputs, one at a time, from alarm input points 1 to 64 and observe the MAT alarm LEDs.

The corresponding LED on the MAT should light up whenever the alarm input of the A25-00710-00 block is grounded. MAT 1 is for alarm inputs 1 to 32 and MAT 2 is for alarm inputs 33 to 64.

## SLOT 5: CONTROL POINT MODULE

- Sixteen red LEDs numbered 1 through 16 display the status of the 16 control points available on the CPM. Activating any control point lights the corresponding LED. For more details on setting control points refer to the 46020-38 MAP practice.
- A red RXD LED indicates a receipt of a DCM poll from the MAP.
- The red TXD LED flashes every time the CPM responds to a valid poll from the MAP.
- If the RCV DATA LEDs on the CPM does not flash, check the Multi Alarm Processor (MAP) in slot 7 and verify that the XMT DATA LED of the MAP is flashing. If it is not flashing, reset the MAP. If it still does not flash, replace the MAP with a known good MAP. The MAP DATA LEVEL LED and the RCV DATA LED on the CPM should now be flashing. Every poll from the MAP to a remote device will cause the RCV DATA LED of the CPM to flash. When the CPM is polled with its address, it will respond and the XMT DATA LED on the CPM will flash.

CONTINUED . . .

### Checking for correct relay operation

1. Plug into the craft/printer port as described below under Slot 7 MAP, and issue the following command:

   **CPM 1 DLON ALL**

   When the command is entered, the terminal will show that the MAP sent the command to the CPM and that all of the points are now operated. This will set all of the CPM relays into a latch mode

2. Observe the CPM module, all of the LEDs from 1 through 16 should be on.

3. Place a meter between each of the control point wire wrap terminals on the A25-00710-00 block, CP1 and CP1', CP2 and CP2' etc. Each set of contacts should show a short.

4. On the craft/printer port issue the following command:

   **CPM 1 DLOF ALL**

   When the command is entered, the terminal will show that the MAP sent the command to the CPM and that all of the points are now released. This will turn off all control points.

5. Observe the CPM LEDs from 1 through 16, they should now be off

6. Use the ohmmeter again and check all control point contacts CP1 and CP1' etc. They should now all be open.

## SLOT 6: MULTI ALARM COMBINER (MAC)

In the 05725-02 option, this is a wired slot only. The slot is not equipped.

## SLOT 7: MULTI ALARM PROCESSOR (MAP)

Observe the XMT DATA LED on the MAP front panel. It should be flashing when the shelf is powered up. This is an indication that the MAP is polling the remote devices.

The 49029 communications subassembly, mounted on the MAP Master port, is used to communicate with the E-System adapter in Slot 8. The 49029 contains 6 LEDS.

- ♦ XMT DATA - indicates data is being transmitted from the MAP to the E-System Adapter.
- ♦ RCV DATA - indicates that a poll is being received from the E-System Adapter.
- ♦ RTS, DTR, DCD, CTS - indicates that the handshaking lines are active.

CONTINUED . . .

Verify that the RCV DATA LED is flashing on the 49029. If it is not, check the 46033 E-System adapter in slot 8 by removing the fuse for slot 8 (Fuse 8) and removing the E-System adapter. Check the switch setting per Tables E and F in this manual. If the switch settings are correct, reinstall the module and the fuse.

If the RCV DATA LED on the 49029 subassembly on the MAP still does not flash, remove the fuse again and replace the E-System adapter with a known good module after setting its switch settings per Tables E and F. Replace the fuse for slot 8.

If the 49029 subassembly XMT DATA LED on the MAP does not flash, remove the fuse for slot 7 (Fuse 7) and verify that the switch settings are correct by comparing them with Tables H through L. Verify that the strap settings on the 49029 module are correct; per the settings in Table M.

Replace the module and the fuse. If the RCV LED on the 49029 module flashes, and the switch settings are correct, and the XMT LED still does not flash, replace the MAP, with a 49029 subassembly on it, with a known good one that has the switches set correctly per the Tables.

### Changing Default Alarm Levels

All alarms default to a D level. If it is necessary to change any point to another alarm level, use the craft port of the MAP (C6-A) and attach a laptop, in a terminal mode (VT100), or a dumb terminal and set that terminal for a baud rate of 9600 baud, 8 bit word, one stop bit and 0 parity bits.

Changing the levels of any alarm from the default level is done by using the craft printer port.

1. When a laptop or dumb terminal is connected to the craft port of the MAP, and the MAP is reset, a ">" character will be seen on the screen, indicating that the MAP is communicating with the terminal device.

2. Type in the command **UNLOCK** and hit the **ENTER** key. If there has been no password entered into the system, the message "System Unlocked" will come back to the user.

***NOTE:*** *If a password has been entered, you will have to enter the password, and then the message."System Unlocked" will come back*

3. To set the levels of alarms for each MAT address, type in:

   **MAT** [MAT address] **OPT** [option letters]

   Assign all 16 points and put a space between each letter (point assignment)

CONTINUED . . .

Example:

**MAT 5 OPT A B C D A B C D A B C D A B C D**

This would set the option in the MAP for MAT address 5 as follows:

- Points 1, 5, 9, and 13 would be set for level A
- Points 2, 6, 10 and 14 would be set for B
- Points 3, 7, 11, and 15 would be set for level C
- Points 4, 8, 12 and 16 would be set for level D

If you typed in

**MAT 5 OPT A A A A A A A A A A A A A A A A**

You would have defined all 16 points on MAT 5 as level A.

4. Download the options to the MAT using the command:

   **MAT** [MAT address] **PUT**

   In the case above the command would be:

   **MAT 5 PUT**

***NOTE:*** *Until the PUT command is sent,the devices are not downloaded. This is a two step process.*

To see if the devices are correctly loaded, type:

**MAT** [MAT address] **SHOW**

Or, in this case,

**MAT 5 SHOW**

The MAT level assignment will come back as follows:

**MAT 5 OPTIONS A A A A A A A A A A A A A A A A**

***NOTE:*** *After the MAP has been configured, remove power from the MAP (Fuse 7), remove the MAP from the shelf, and place switch 5 position 7 down. Replace the MAP and fuse 7. This will cause the MAP to retain the configuration in memory if power is ever removed from the MAP for any reason. This should be the last step in the turning up of the system.*

## SLOT 8: E-SYSTEM ADAPTER (ESA)

1. Remove power from the shelf, remove the ESA and verify the switch settings on the ESA and the 49013 202 modem.
2. Using Table F, set the switches for the desired E-System address. This should be the only switch that requires changing on the ESA or the 49013 module.

CONTINUED . . .

3. Verify the 49013, 202 modem transmit level is correct by inserting an unterminated level meter in the pin jacks marked XMT and turning the test switch on the front of the 49029 on. The level meter should read -29 dBm. Adjust the XMT level pot (R9) on the 49029 to obtain the correct reading. Turn the test switch back to normal (not in the test mode)

   Whenever the ESA is polled from TMAS and it recognizes its address, it will respond to TMAS. When the ESA responds, the XMT DATA LED on the ESA will flash. Whenever TMAS turns on its modem and it polls a remote address, the CD LED on the 49013 202-modem sub assembly will turn on. When the ESA XMT DATA LED flashes, TMAS should see the responses from the ESA. If the CD LED on the 49029 comes on, but the XMT DATA LED never comes on, verify that the switch settings for the ESA are set per Tables E and F. If the switch settings are correct, verify that TMAS has the correct address for the ESA and it is polling that address.

## SLOT 9: 4003C LINE AMPLIFIER

The settings for the 4003C are preset from the factory using the programmable switch setting on the front of the module. No changes should be required. Use Tables B, C, and D to verify that no switches have been changed during shipment.

**NOTE:**
If any level adjustments are required, make them on the 4003C module in slot 9 first. Then, if more adjustments are needed, adjust the modem in the ESA in slot 8. This will avoid the repetition of steps.

***NOTE:*** *The following steps should be only be used to verify the level settings. They should only be required if modules are swapped or to test suspected bad modules.*

1. Using a Transmission Measuring Set (TMS), insert a terminated 1200 Hz tone at a level of -6 dBm into the RCV IN jacks of the 4003C.
2. Insert a bridged dB meter at the RCV pin jacks of the 49013 202 modem on the E-System Adapter. The reading should be -6 dBm. If it is not within ± 1dB, adjust the programmable switches on the 4003C until the reading is -6 dBm.
3. At the RCV IN jacks of the 4003C, insert loopback tone for 2 seconds (2713 Hz at level at a level of +7 dBm.) This is the Transmission Level Point (TLP).

***NOTE:*** *2713 Hz is the factory setting. Final setting for loopback tone is set per Engineering's instructions.*

4. Observe that the red LED on the 4003C comes on when the loopback and control circuit are active.
5. After the red LED comes on, change the test tone in the RCV IN jacks to 1 kHz at +7 dBm and move the dB meter to the XMT OUT jacks and terminate it. The level should be -16 dBm, ± 1 dB.
6. Reset the test tone frequency to 2713 HZ for .7 seconds and the loopback will restore the module and the LED will turn off.

CONTINUED . . .

7. Remove the 2713 HZ tone, and lower the level to -3 dBm, (10 dB below TLP of +7 dBm) and reinsert the tone for 2 seconds. The loopback should still function correctly. Remove tone, and reapply it for .7 seconds. The loopback should restore back to normal, and the LED will turn off.

8. This completes the 4003C testing, and alignment

## SLOT 10: DUAL VF 64KB CHANNEL

All switch and option settings are factory set. Verify that the switch settings are per Table A and that the strap settings match those shown in Fig. 4.

With power on the module, the cables attached to the Sonet equipment, and a 46105 modules in service on the rest of the system, the SYNCH LED on the 46105 module will come on steady. In the repeater mode, both SYNCH LED LEDs will come on. This is an indication that the framing bits are being detected by the digital sections of the channels of the module, indicating synchronization of data transmitted to the 46105. The 46105 is now able to send data on the system.

***NOTE:*** *The following steps should be used to only verify the level settings. They should only be required if modules are swapped out or to test suspected bad modules.*

1. Refer to Fig. 4 and set the bridge terminal switch to terminal. Set the S2 and S101 to loopback or to on. Reinstall the module and power it up.

***NOTE:*** *Other parts of the system do not have to be functioning.*

2. Insert a -16 dBm, 600 ohm terminated 1 kHz signal into the DROP XMT jack of channel 1 on the front panel of the 46105 module.

3. Insert a 600-ohm bridging dB meter into the blue front panel XMT LVL test points for channel 1. The reading should be 0 dB. If the level is not correct, adjust the front panel transmit potentiometer for channel 1.

4. Install a terminated 600-ohm dB meter into the DROP RCV jacks for channel 1. (It can be the same meter as used in step 3 above.) Verify a level of +7 dBm. If the level is not correct, adjust the front panel receive potentiometer for RCV 1.

5. Move the signal generator from channel 1 to the DROP XMT jack for channel 2.

6. Insert a 600-ohm bridging dB meter into the blue front panel XMT LVL test points for channel 2. The reading should be 0 dB. If the level is not correct, adjust the front panel transmit potentiometer for channel 2.

CONTINUED . . .

7. Install a terminated 600-ohm dB meter into the DROP RCV jacks for channel 2. (It can be the same meter as used in step 3 above.) Verify a level of +7 dBm. If the level is not correct, adjust the front panel receive potentiometer for RCV 2.
8. Remove the power
9. Reset the bridge switch to RPTR, and reset loopback switches S2 and S101 to OFF.
10. Reinstall the power
11. To verify the levels of the bridge, insert a -16 dBm, 600 ohm terminated 1 kHz signal into the DROP XMT jack for channel 1 on the front panel of the 46105 module.
12. Verify with the dB meter (not terminated) a level of 0 dB at both XMT LVL test point jacks for channel 1 and 2.
13. Install a terminated 600-ohm dB meter into the DROP RCV jacks for channel 2. Verify a level of +7 dBm.
14. With the meter still terminated, move the meter to the DROP RCV jack for channel 1 and verify a reading of -40dB or more negative.
15. Insert a -16 dBm, 600 ohm terminated 1 kHz signal into the DROP XMT jack for channel 2 on the front panel of the 46105 module.
16. Verify with the dB meter (not terminated) a level of 0 dB at both XMT LVL test point jacks for channel 1 and 2.
17. Install a terminated 600-ohm dB meter into the DROP RCV jacks for channel 1. Verify a level of +7 dBm.
18. With the meter still terminated, move the meter to the DROP RCV jack for channel 2 and verify a reading of -40dB or more negative.
19. This completes the testing and alignment for the 46105.

## SLOT 11: SUMMARY ALARM MODULE (SAM)

The SAM allows for annunciation of four levels of alarms: A, B, C, and D. Each of these sections contain three LEDS:

- ♦ C/O - lights when the Alarm Cut-Off (ACO) switch for that section is on.
- ♦ EXIST - indicates an existing alarm
- ♦ NEW - indicates an unacknowledged alarm. Pressing the ACK button clears this LED

The default setting for all alarms is the D level alarm. Any level can be assigned to any point by using the craft port of the MAP and configuring the level of alarm per each point. If a level is not defined, it is defaulted to a D level. See the MAP section above to set the levels of alarms.

### SLOT 12: FUSE MODULE

The Fuse Module has been strapped for redundant power feeds. The module contains an alarm LED on its front panel. If any of the fuses blow, this LED will light and the alarm relay will release.

1. With power on the shelf and all of the fuses in place, place a meter ohmmeter between TB-D pins 10 and 11 and see if there continuity, there should be none.
2. Remove power from the shelf, and there should be a short between pins 10 and 11 and the LED on the fuse module should be off.
3. Move the meter to 13 and 14 and observe the meter. There should be no short with power and a short with no power.
4. With the meter still connected to pins 13 and 14 remove one of the fuses in the fuse module and replace it with a blown fuse. With the blown fuse in the slot, there should be a short between 13 and 14 and the LED should be on.
5. Replace the blown fuse with a good one, the short should be removed and the LED should be off.

## GENERAL TROUBLESHOOTING

If difficulties are experienced with this unit, check the following as appropriate:

- ♦ Switch and strap settings
- ♦ Signal Levels
- ♦ Connections to external equipment

This could be for bad cables, or poor connections. In some cases null modems might be required, such as if both devices are DCE devices.

If there is a problem with a module, substitute a unit that is known to be good.

***NOTE:*** *Additional assistance is available from Dantel's Customer Support Services Department between the hours of 6am and 5pm Pacific time, Monday through Friday. Call 1-800-4-DANTEL (800/432-6835)*

When it is determined that a unit has malfunctioned, the faulty unit may be returned to the factory for repair. For repairs and emergency replacements, obtain a "Returned Material Authorization" (RMA) number by calling Dantel and asking for the Customer Returns Representative. Please to provide a purchase order number, and shipping and billing information when requesting

# TURN-UP PROCEDURE

an RMA number. Include a description of the malfunction with the returned equipment. Send defective equipment, with the RMA number clearly written on the outside of the package, to:

Dantel, Inc.

2991 N. Argyle Ave.

Fresno, CA 93727-1388

If a unit is returned and no problem is found, there will be a diagnostic charge for checking the unit, whether it is covered by warranty or not.

# SUPPORT DOCUMENTATION

The B18-05725-XX Remote E2A Alarm Shelf is made up of individual Dantel modules. Each of these modules has a unique Installation & Operation Manual available detailing the operation of that module. Those practices can be obtained by contacting Dantel Customer Support (1-800-4-DANTEL).

Included in this section:

- 46020-38 Installation and Operation Manual
- B18-05725-XX Block and Level Drawing
- DJ-05725 Ordering Guide

# 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**