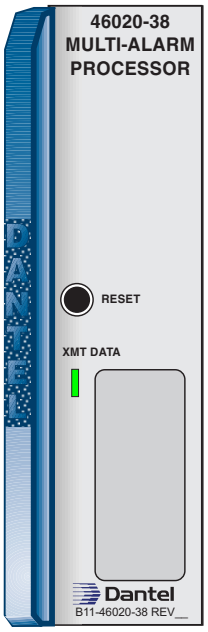
46020-38 MULTIPLE ALARM PROCESSOR WITH 46600-38 FIRMWARE



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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.

Y2K Compliant

About this Practice:

This practice has been reissued to:

- Document Y2K compliance.

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

UPDATED

Issue date: February 1999

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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
B11-46020-38	Multiple Alarm Processor equipped with 46600-38 Firmware.

GENERAL DESCRIPTION

The 46020-38 Multiple Alarm Processor (MAP) is part of a Dantel 460 Alarm and Control System. It is a 46020 MAP with 46600-38 firmware. This chapter describes the features of the MAP and firmware, and also how they work as part of a complete system.

MAP PORTS

The firmware allows a MAP to operate in several different applications of a 460 Alarm and Control System. The MAP provides three different data interface points, and all of them are affected by the firmware. Here is a brief description of each of the ports:

Master Port

- Connects to an alarm center that reports alarm data and issues control point commands.

  The alarm center may be a personal computer or an alarm system master. For example, it could be an E-System master the MAP communicates with through a 46033 E-System Adapter.

- May also connect to another device as an intermediary point in reporting data to an alarm center.

  This device could be a 46062 General Purpose Processor or another MAP (using DCP, TBOS or DCPF protocol).

Printer Port

- Connects to a standard ASCII (VT-100) terminal, with or without a printer,

  or

- Connects to Dantel's 46001 Status Monitor.

  You can use the terminal or status monitor for local alarm reporting. The terminal also can operate controls.

NOTE:
In order to work, the MAP must be configured. Configuration allows you to define how the MAP will function, such as what alarms it will poll and what control points it will operate. Refer to the Switch Settings chapter.

CONTINUED . . .

- ♦ May also operate as a master port (when you're using TBOS, DCP, or DCPF protocol on it).

Data Port

- ♦ Can process up to 32 displays (2,048 points) of alarms and controls. There can be any combination of alarm and control displays; for example, 32 displays of alarms and 32 displays of controls.
- ♦ These may be discrete alarm points connected to 46009 or 46010 Multiple Alarm Transmitters (MATs) and control points wired to 46028 or 46029 Control Point Modules (CPMs).
- ♦ Can communicate with alarm and control points through TBOS serial equipment.
- ♦ Can be wired to either a 46022-12 Multiple Alarm Combiner (MAC), which provides eight RS-422 serial ports or a 46022-20 MAC, which provides one port equipped with a communications subassembly.

TYPICAL SYSTEMS

These diagrams show examples of how you can use the 46020 MAP in typical systems. Fig. 1 shows a basic system and Fig. 2 shows a system with an intermediate MAP.

FIG. 1 - MAP PORTS AND PROTOCOLS

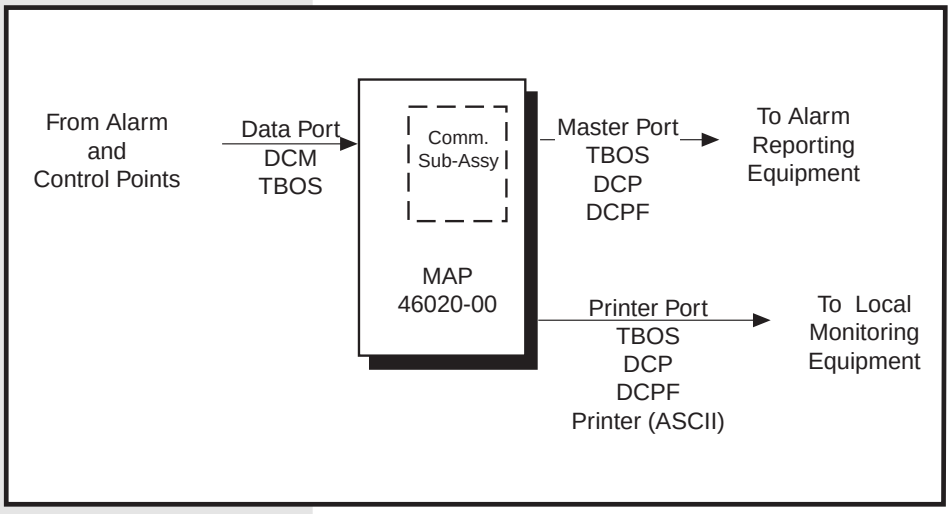
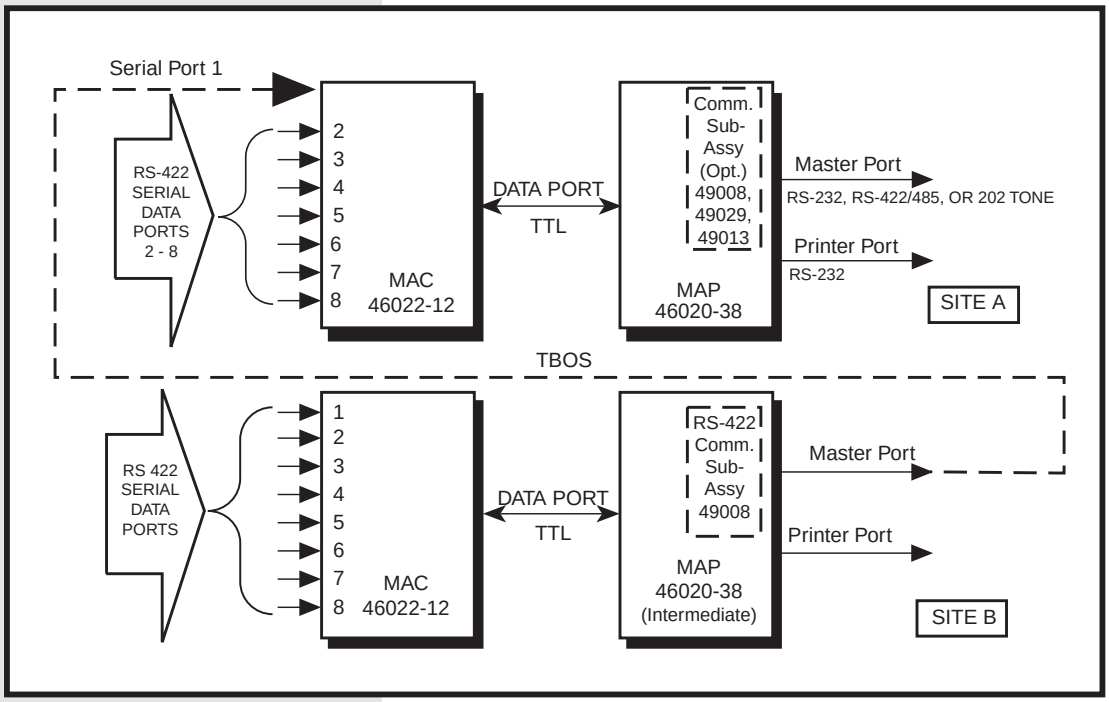


FIG. 2 - EXAMPLE SYSTEM WITH INTERMEDIATE MAP



DATA CAPACITY

Master and Printer Ports

The MAP can handle 2,048 alarm and control points (32 displays) except when you use TBOS protocol.

When TBOS is used on the master and printer ports, the amount of alarm data the MAP can address is limited. TBOS is limited to eight displays of alarms and controls on the master port and an additional eight displays of alarms and controls on the printer port (a total of 16 displays).

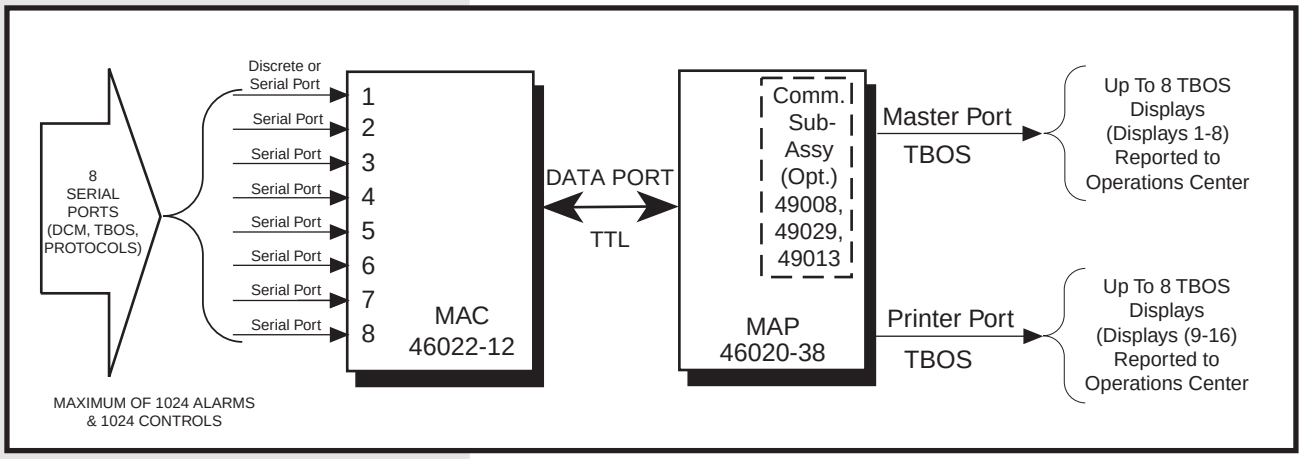
Data Port

With DCM, DCP, or DCPF protocols on the master and/or printer ports, the data port can communicate with up to 2,048 alarm and control points. See Fig. 1 for an illustration of these protocols.

If TBOS is used on the master port, the data port is limited to 512 alarm and 512 control points (eight displays).

If TBOS is used on both master and printer ports, the data port can communicate with up to 1,024 alarm and 1,024 control points. See Fig. 3 for an illustration of TBOS on master and printer ports.

FIG. 3 - TBOS ON THE MASTER AND PRINTER PORTS



PROTOCOLS

There are three communications protocols available for the master port, three for the printer port (plus a printer syntax using ASCII format), and two for the data port. Refer to Fig. 1.

Master and Printer Ports

DCP - This protocol is used when the MAP interfaces another MAP, a personal computer, or an external alarm master (such as an E-System master interfaced through an E-System Adapter).

DCPF - This is a modified DCP protocol with improved error detection. It is used when the MAP interfaces another MAP, a General Purpose Processor, or a Status Monitor.

TBOS - This protocol is used when the MAP interfaces a TBOS serial port, such as on an E2A remote or on the data port of another MAP (refer to Fig. 2).

Printer - This syntax establishes the coding for the printer port to interface a standard ASCII (VT-100) terminal. The Printer Syntax chapter contains the user commands for operating the terminal.

Data Port

TBOS - This allows the MAP to communicate with TBOS serial equipment, such as another MAP as shown in Fig. 2.

DCM - This protocol communicates with discrete points only. The MAP interrogates MATs (Multiple Alarm Transmitters) for alarm data and operates control points on CPMs (Control Point Modules).

NOTE:
Only one protocol may be used on port 1. Choose DCM or TBOS.

INTERFACES

Master Port

The master port requires a subassembly to be mounted on the MAP in order to provide the proper interface to other equipment. When TBOS is used on the master port, the most common is a 49008 subassembly providing an RS-422 interface. Other subassemblies are available for special applications.

When DCP or DCPF is used on the master port, the subassembly is usually a 49009 or 49029 with an RS-232 interface.

Printer Port

The printer port has a built-in RS-232 interface. If you require a different interface on the printer port, you can add a Dantel 46035 Converter Module with the appropriate subassembly between the MAP and the other equipment.

Data Port

The data port of the MAP communicates through transistor-transistor logic (TTL). This means communications cannot extend beyond the shelf where the MAP is installed. To communicate beyond the shelf, you must connect the data port to a 46035 Converter Module, 46022 Multiple Alarm Combiner (MAC) or other device (for example, a 46034 Hubbing Module) for conversion to the appropriate data communications interface.

A 46022-12 MAC has eight communications channels or ports. The MAP's data port supports multiple MACs.

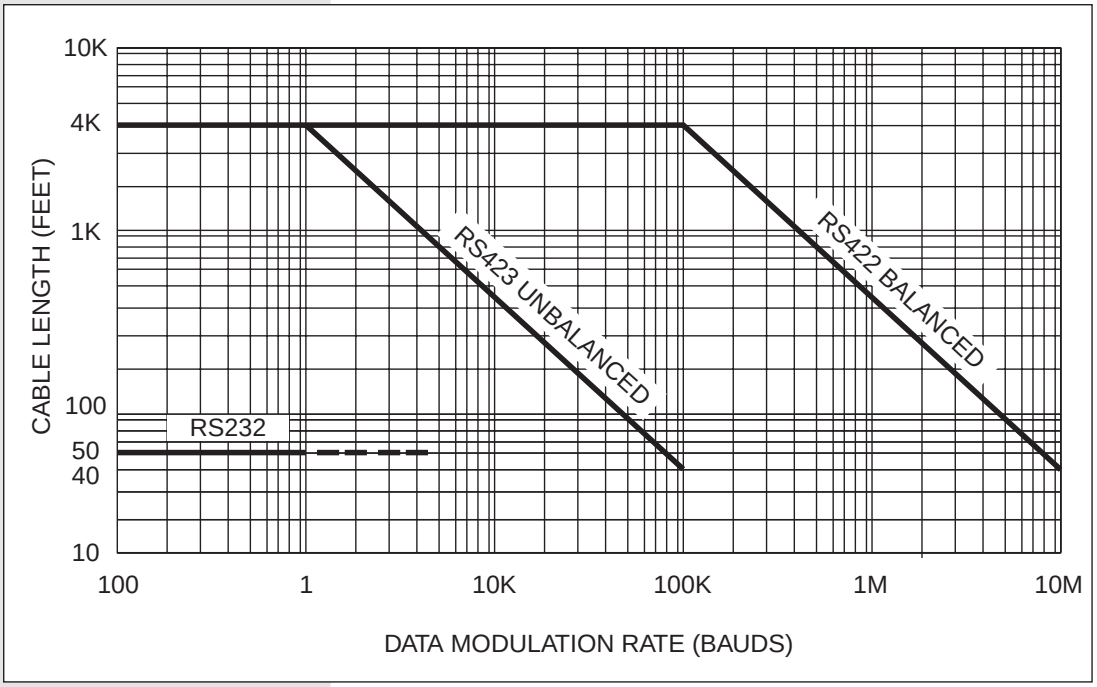
In communicating with alarm and control points, the data port can use DCM protocol (port one only) or TBOS protocol (ports one through eight) on any of the MAC channels.

However, only one protocol can be used on any one channel. The protocol(s) used on the data port do not have to be the same as those used on the printer and master ports. For example, DCP could be used on the master port, PRINTER syntax on the printer port, and DCM and TBOS on the data port.

Transmission Distances

Fig. 4 shows the maximum cable lengths for data transmission interfaces.

FIG. 4 - MAXIMUM CABLE LENGTHS FOR DATA TRANSMISSION INTERFACES



BATTERY BACKUP

The MAP has a battery backup to preserve the system configuration information that has been placed in memory. You can set switches on the MAP to retain the information in memory, even if the power to the MAP is interrupted. If you do not set the switches to retain the memory's contents, configuration information is erased when the power is restored. To learn how to set these switches, refer to the ***Switch Settings*** chapter.

RESET

On the front panel of the MAP, there is a recessed reset button. When you push this button, it executes a complete, or hard, reset. The effect is the same as removing power from the MAP. When power is restored later, the information in the MAP's memory is saved ... ***only*** if you have set the switches to retain it (see Battery Backup paragraph). If you have not set the switches to save the memory, it will be erased.

The MAP also has a protective ("watchdog") circuit. If the software encounters a problem and is unable to refresh the protective circuit, a complete reset automatically occurs after 1.2 seconds.

GENERAL DESCRIPTION

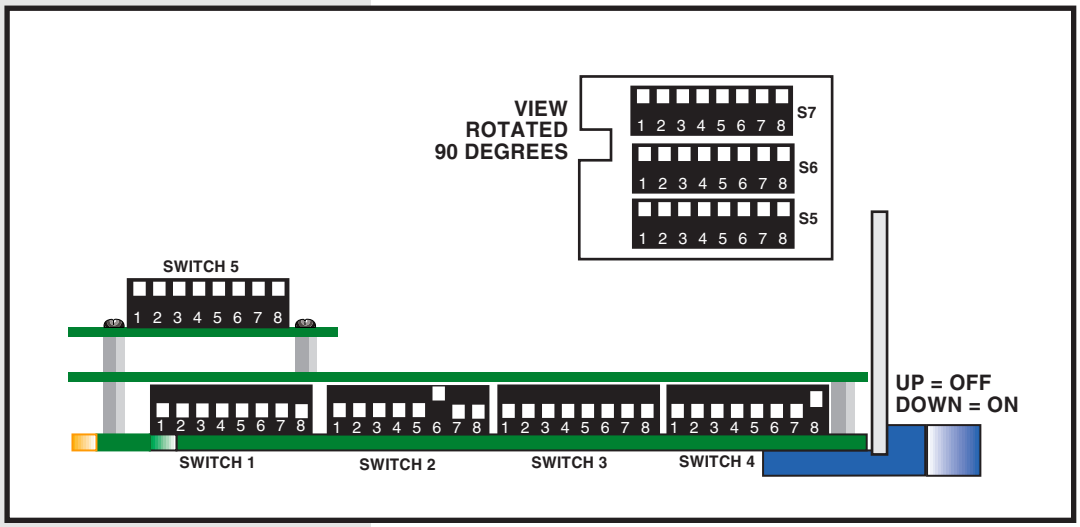
DIP SWITCHES

There are seven banks of DIP switches on the MAP. Each bank has eight levers, and the banks are numbered S1 through S7.

SWITCH NUMBER	LOCATION
S1-S4	At the top of the main printed circuit board.
S5-S7	On the firmware subassembly.

Refer to Fig. 5 for a DIP switch location diagram.

FIG. 5 -46020 MAP VIEWED FROM THE TOP



CIRCUIT DESCRIPTION

Refer to FIG. 6 for a Functional Schematic of the 46020-38 MAP. The circuit consists of the following:

- A microprocessor with EPROM (Erasable Programmable Read-Only Memory).
- Three ports:

  Master port
  Printer port
  Data port

- Parallel input/output interfaces (must be connected to other modules in the same shelf as the MAP):

CONTINUED . . .

Interface for Dantel's 46022-XX Multiple Alarm Combiners (MACs).

Interface for Dantel's 46019 Summary Alarm Module (SAM).

- Regulated power supply.

Binary data goes to and from the microprocessor by way of the system's input/output. It is applied to each port through a series of protectively buffered ACIAs (Asynchronous Communications Interface Adapters).

Master port

Communicates with an external personal computer or other alarm reporting equipment through a plug-in subassembly.

Printer port

Communicates with an external standard ASCII (VT-100) terminal, personal computer, or other alarm reporting equipment through an on-board RS-232 interface.

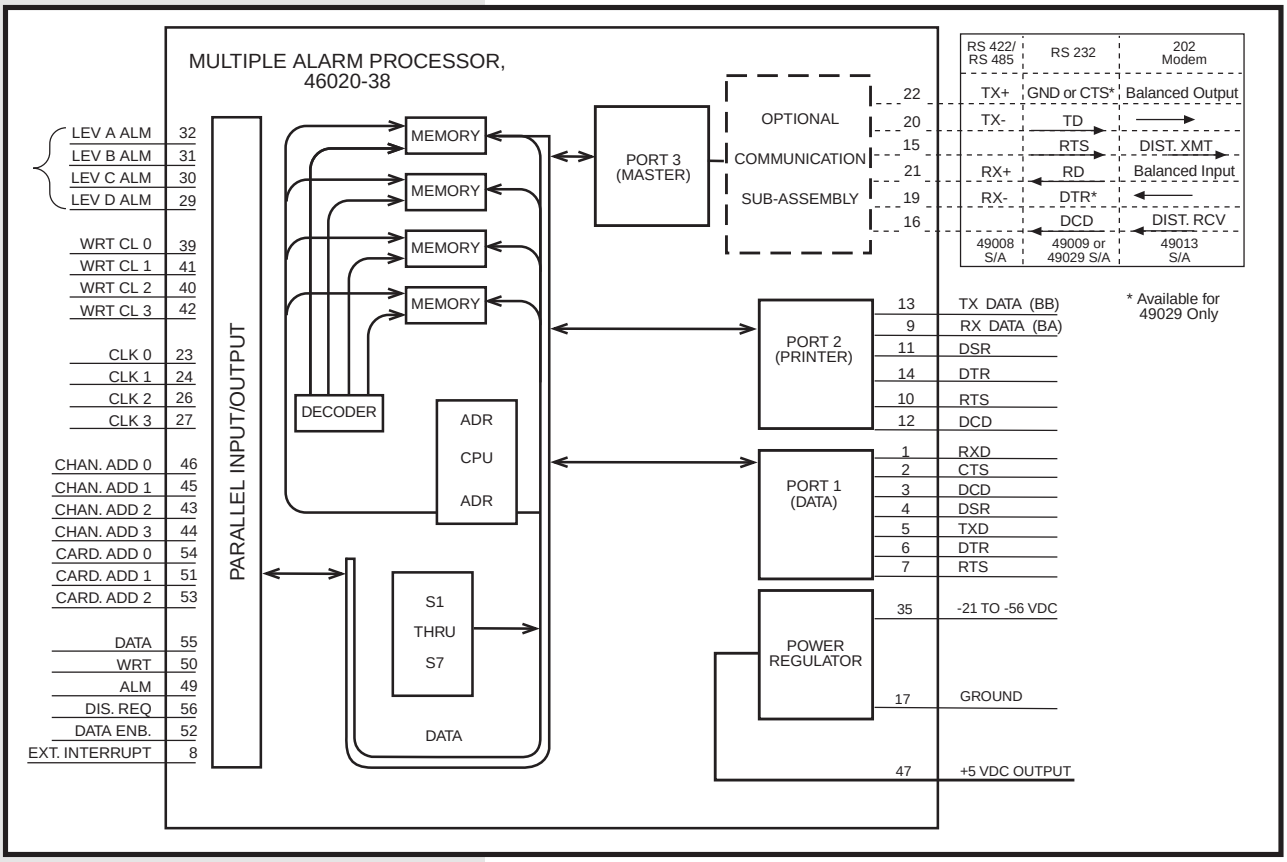
Data port

Communicates either directly or through other Dantel interface modules with remote alarm and control devices using seven TTL buses designated TXD, RXD, RTS, CTS, DCD, DSR, and DTR.

By setting switches, you can determine the default configurations of the ports. These configurations affect the way the MAP functions when you begin operation.

The on-board regulated power supply uses -21 to -56 VDC input power to provide +5 and ± 12 VDC regulated power for the module's circuits. The power supply also provides operating power for the master port communications subassembly.

FIG. 6 - FUNCTIONAL SCHEMATIC



EXAMPLE APPLICATIONS

Fig. 7 shows a TBOS and discrete alarms interfaced to an E-System using several 46020-38 MAPs. Fig. 8 shows a system using a 46020-38 MAP to report discrete points.

TBOS (Serial Ports) and Discrete Points Interfaced to an E-System

Refer to Fig. 7. An E-System Adapter can interface up to four MAP addresses using DCP protocol between the master port of the MAP(s) and the E-System Adapter. The data port of each MAP is interfaced to remote sites through a MAC. The #1 and #3 MAPs are communicating through one port of the MAC-12s using TBOS protocol to the master port of a MAP at the remote sites.

At the remote sites, each MAP is communicating through Port #1 of the MAC-12s using DCM protocol to discrete alarm and control points. You can connect Ports 2-8 to TBOS serial alarm and control equipment. MAP #4 is communicating through a MAC-20 with discrete alarm and control points using DCM protocol.

Discrete Points Interfaced to Alarm and Control System

Refer to Fig. 8. This example application uses one MAP to process data between an alarm system master or personal computer, a printer or standard ASCII (VT-100) terminal, and remote discrete alarm and control points. The 46022-20 MAC is equipped with a data communications subassembly to interface the remote MATs and CPMs.

Other Modules

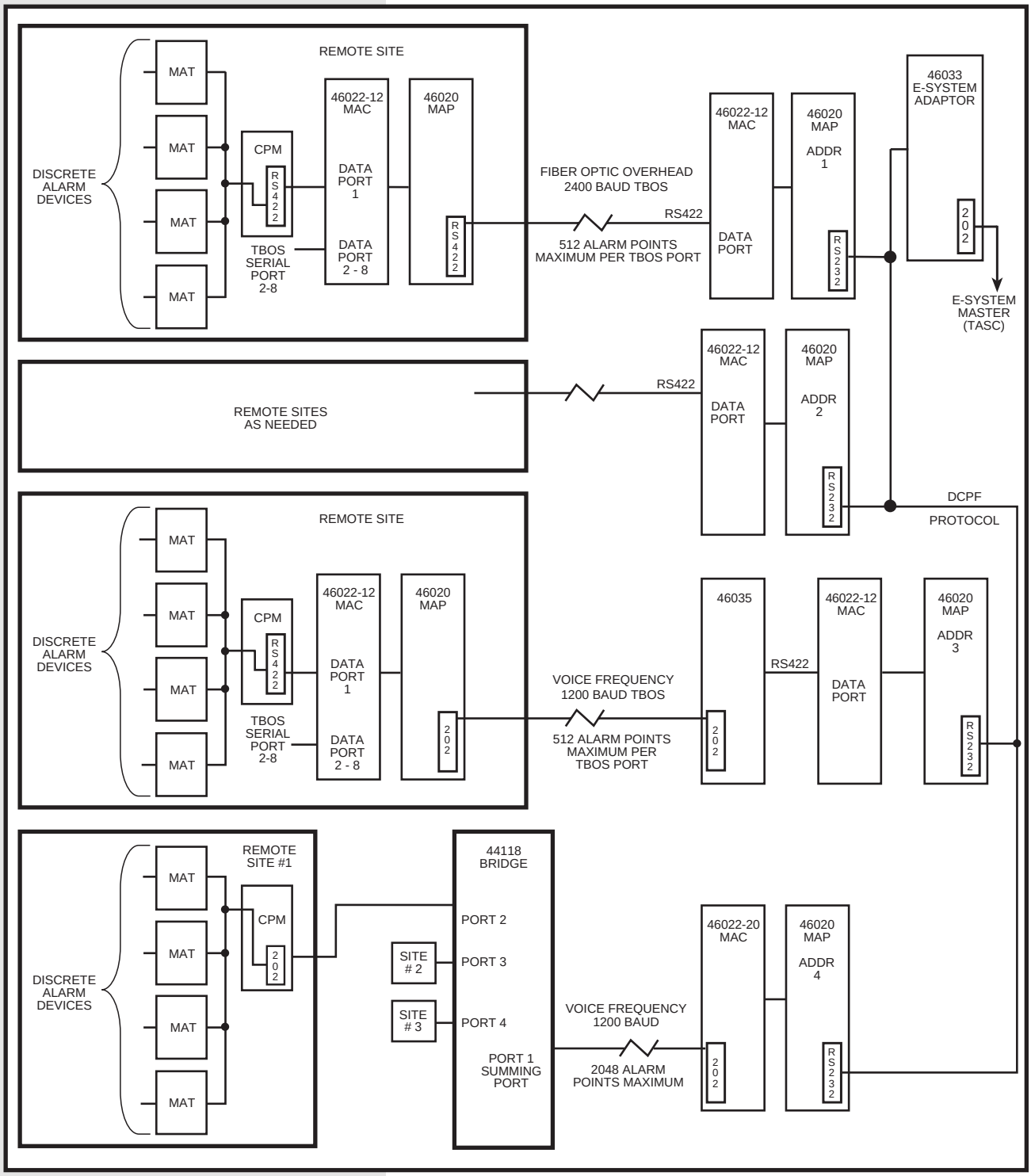
Refer to Fig. 8. The 46019 Summary Alarm Module (SAM) controls audible and/or visual alarm devices. This module provides:

- TTL (Transistor-Transistor Logic) and/or optically coupled inputs,
- Latching or following mode,
- Selectable time-out for quadruple alarm levels.

You can use the 46018 Audible Alarm Module with the 46019 to provide the audible signal. For more information, refer to the manuals for these devices.

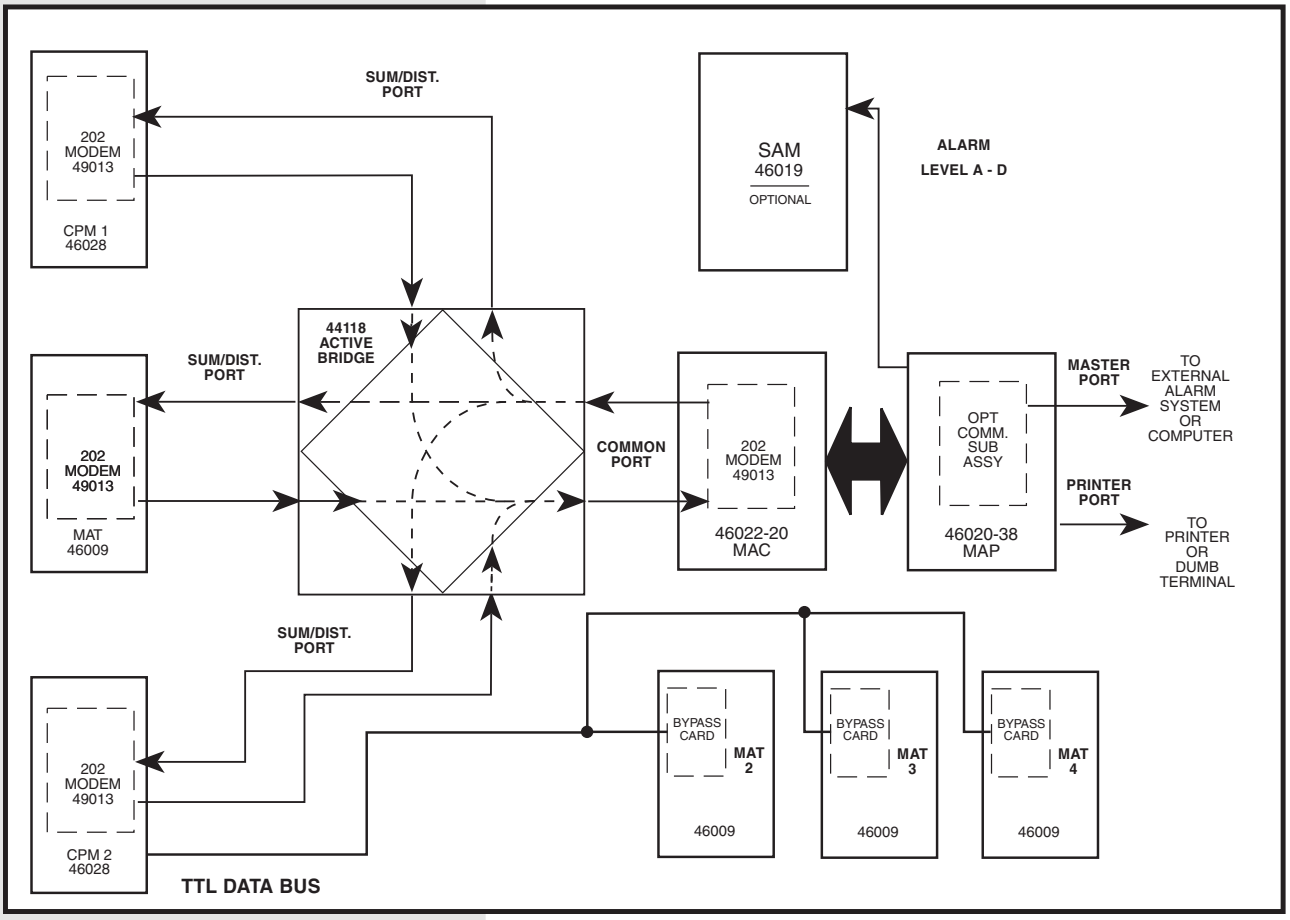
EXAMPLE APPLICATIONS

FIG. 7 - TBOS AND DISCRETE ALARMS INTERFACED TO AN E-SYSTEM



EXAMPLE APPLICATIONS

FIG. 8 - SYSTEM REPORTING DISCRETE POINTS



INSTALLATION

Installation consists of installing the firmware subassembly, installing the communications subassembly, setting switches, installing the module in the shelf, clearing memory, configuring the system, and testing the system.

1. Install the firmware subassembly, if necessary.

To install the subassembly:

- Remove the four screws from the subassembly standoffs on the MAP. Refer to Fig. 9 for the location of the firmware subassembly.
- Separate the subassembly top board from the main board. Be careful not to bend any connector pins.
- Insert the main subassembly board into the connectors on the MAP.

CONTINUED . . .

- Install two screws at the end of the main subassembly board next to the front panel of the MAP.
- At the other end of the main subassembly board, install the two standoffs supplied with the firmware.
- Insert top subassembly board into the connectors on the main subassembly board.
- Install three screws to fasten the top subassembly.

FIG. 9 - MAP SUBASSEMBLY LOCATIONS

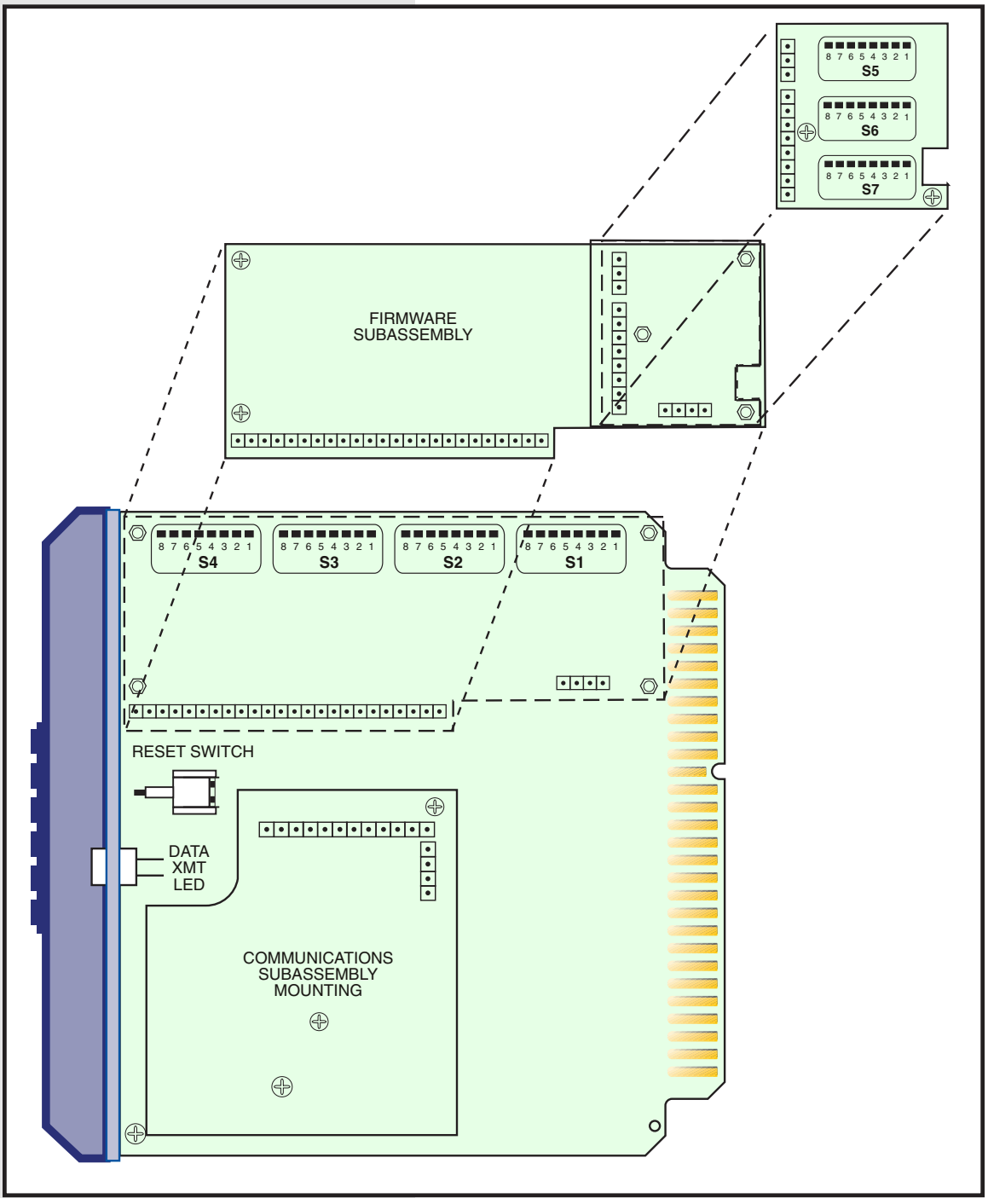
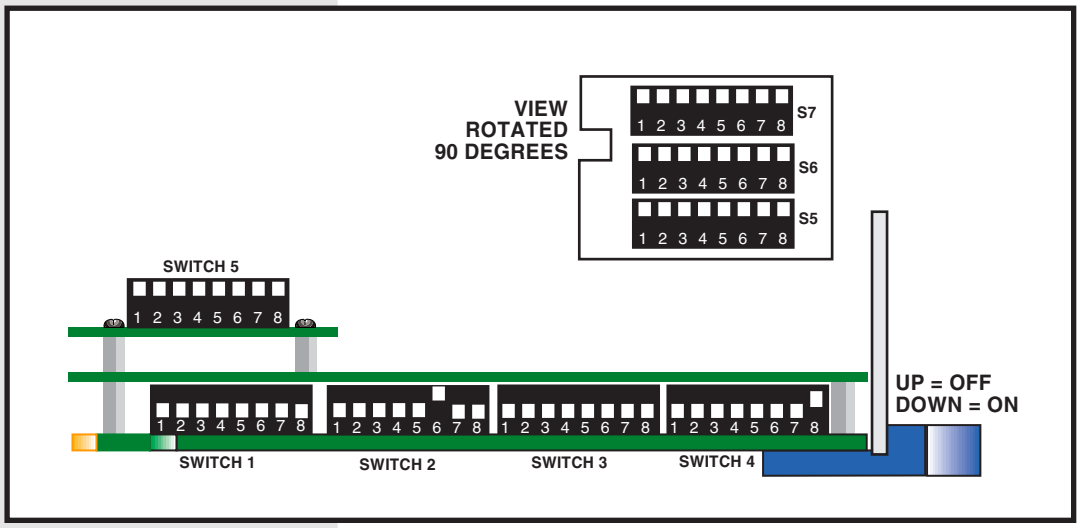


FIG. 10 - 46020 MAP VIEWED FROM THE TOP



2. Install communications subassembly, if necessary.

Refer to Fig. 9 for the location of the master port communications subassembly mounting. Follow these steps:

- If a subassembly is not already installed, remove the three screws from the mounting standoffs.
- Remove the hole plug from the front panel of the module.
- To place the subassembly, insert the subassembly pins into the module sockets.
- Examine the connector pins to be sure each one goes straight into the socket.
- Install the screws in the mounting standoffs.

For information on how to set the strap options and how to operate the subassembly, refer to the manual for that subassembly.

3. Set switches.

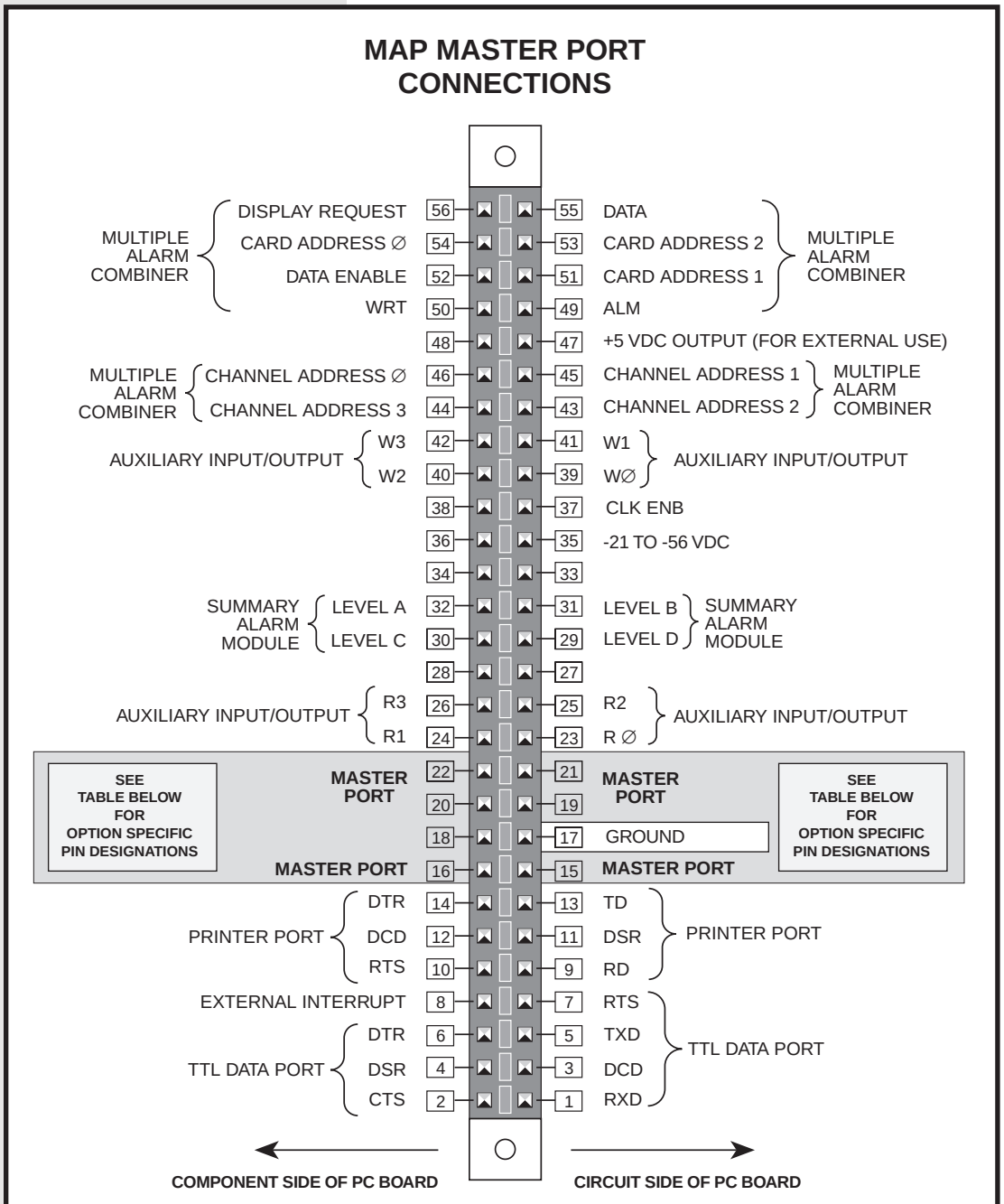
Set switches S1 through S7 on the MAP. Refer to Fig. 10 for switch locations and the chapter on ***Switch Settings.***

4. Install the module in the shelf.

With power off or disconnected, slide the MAP module along the card guides of the correct slot. Firmly seat the module in the 56-pin edge connector.

The shelf is usually wired at the factory, and you do not have to wire the 56-pin edge connector. If it is necessary for you to wire it, refer to Fig. 11.

FIG. 11 - PIN DESIGNATIONS FOR MAP MASTER PORT CONNECTIONS



RS 422/RS 485	RS 232		202	PINS		RS 422/RS 485	RS 232		202
49008	49009	49029	49012 or 49013	COMPONENT SIDE	CIRCUIT SIDE	49008	49009	49029	49012 or 49013
TD+	N/C	GND or CTS	BALANCED OUTPUT	22	21	RD+	RD	RD	BALANCED INPUT
TD-	TD	TD	BALANCED OUTPUT	20	19	RD-	N/C	DTR	BALANCED INPUT
N/C	DCD	DCD	DISTRIBUTION RECEIVE	16	15	N/C	RTS	RTS	DISTRIBUTION TRANSMIT

5. Clear memory, if necessary.

The following paragraph tells you how to clear the memory in the MAP. Follow these instructions ***only*** if you are installing the MAP in a system for the first time or if you need to clear all memory.

The MAP has a battery-backed memory that can retain system configuration in the event of a power interruption to the MAP. To clear the memory, follow these steps:

- Set switch S5-7 in the UP position (refer to Fig. 10).
- Plug the MAP into your system and apply power.
- Wait ten seconds, then turn off power to the MAP.
- Remove the MAP from the system and set switch S5-7 in the DOWN position.

6. Configure the system.

Before you can use the system to poll remote devices, you must specify how you want it to operate. Without this configuration step, the system will not poll. Refer to the ***Switch Settings*** chapter.

Before making connections, refer to the block diagram that comes with the shelf.

7. Test the system.

Once you have configured the system, test it for proper operation:

- Apply power and perform a simple operation check-out. If the MAP is communicating through the data port, the XMT DATA light on the front panel will be blinking.
- Create some alarms. Observe that the correct responses are going through the master or printer port to the alarm center or to a standard ASCII terminal connected to the printer port.
- Operate some control points and verify correct operation.

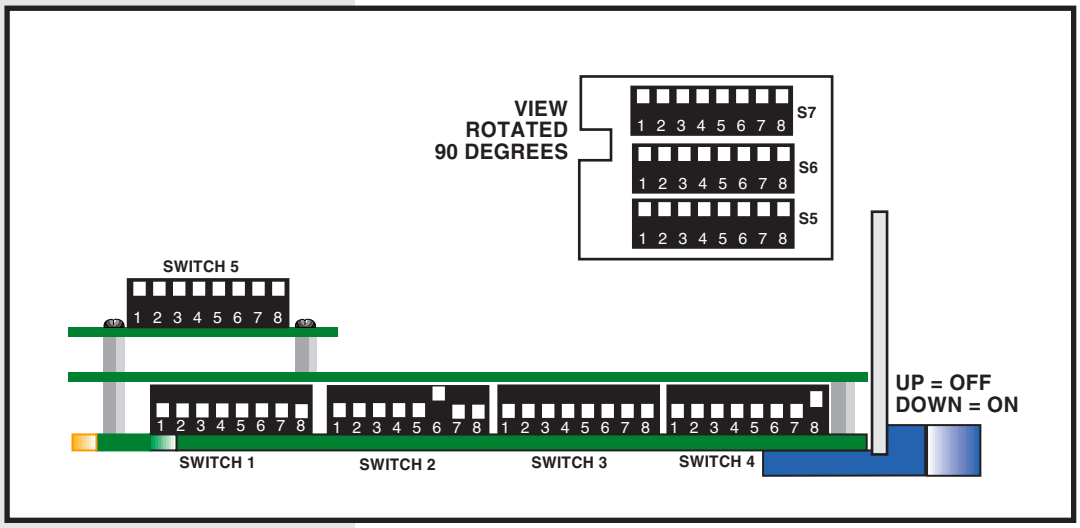
If the MAP does not function properly, check the following:

- Switch settings and/or the communications wiring at the MAP slot.
- Switch settings on modules the MAP is communicating with.

SWITCH SETTINGS

The tables in this section refer to Fig. 12, which represents the way the switches look when the module is viewed from the top, with the front panel of the MAP on the right side.

FIG. 12 - 46020 MAP VIEWED FROM THE TOP



SWITCH S1 - TBOS DISPLAYS AND NUMBER OF MACS

This switch allows you to define:

- The number of 46022-1X Multiple Alarm Combiners (MACs) with switches S1-7 and S1-8. Refer to Table A for switch settings.

  If you use discrete points and/or TBOS serial ports, the MAP data port communicates through MACs. Each MAC has eight communication ports.

  Use one port for each location. A serial port can handle from one to eight TBOS displays, so if more than eight displays come from a location you may need more than one port at that location.

MAC and display limitations for protocols set with switch S2 are:

TBOS/Printer - The maximum number of MACs is one. This protocol is limited to a maximum of eight displays.

TBOS/TBOS - The maximum number of MACs is two. This protocol is limited to a maximum of eight displays.

DCP/Printer or DCP/DCP - The maximum number of MACs is four. These protocols are limited to a maximum of 32 displays.

- TBOS displays per port using switches S1-1 to S1-6. Refer to Table A for switch settings.

NOTE:

If you use a combination of serial ports and discrete points, all discrete points go through the first port of the first MAC. There is no limit on the number of discretes that can go through the first port. The combined total of TBOS displays and discrete points (converted to equivalent TBOS displays of four MATs and four CPMs which equal one display) cannot exceed the protocol limits described above.

Once you determine the number of ports, you can estimate the number of 46022-1X MACs. The number of MACs depends on the number of TBOS displays per port.

There are limitations on the number of displays each MAC port can handle. You must always divide the number of ports into four equal groups. The data port interfaces to the remote ports through a MAC. The number of ports in each group depends on how many MACs you use. Refer to Figs. 13 and 14.

When you divide the ports into four equal groups (there are no switches to set), you must determine and set the number of displays per port in each group, which could affect the number of MACs required. Refer to Fig. 15.

Switches S1-1 through S1-3 set Group A displays per port.

Switches S1-4 through S1-6 set Group B displays per port.

You can set Groups A and B for one to eight displays per port.

See Switch S2 for setting Groups C and D.

If the DCM-Int switch (S3-8) is ON, the MAP automatically ignores the displays-per-port setting for the first port of the first MAC.

After you set the displays per port, set the total number of TBOS displays the MAP interrogates. See Switch S3 for information.

FIG. 13 - GROUP DIVISIONS WITH ONE MAC

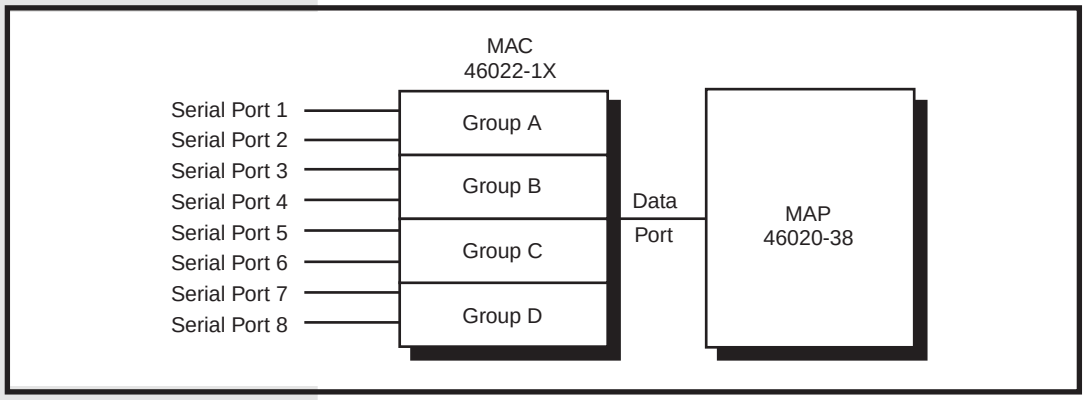


FIG. 14 - GROUP DIVISIONS WITH TWO MACS

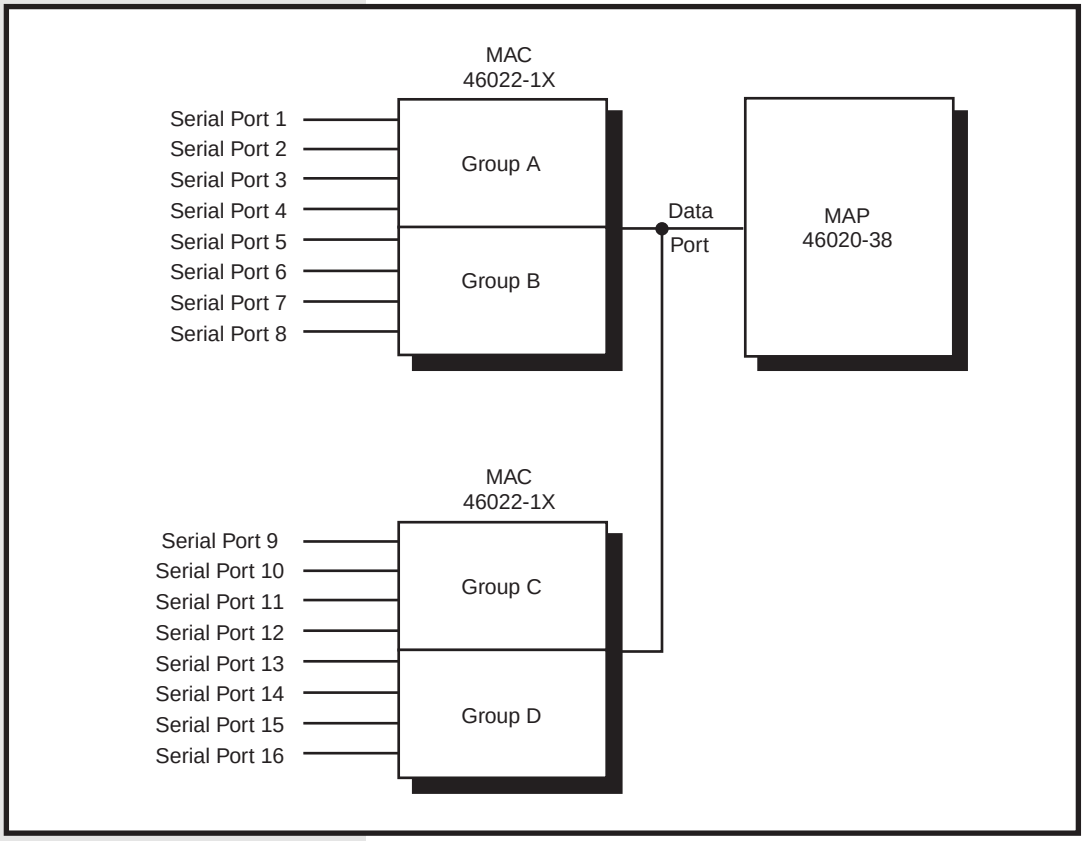


FIG. 15 - TBOS SYSTEM SIZE WITH DISCRETES

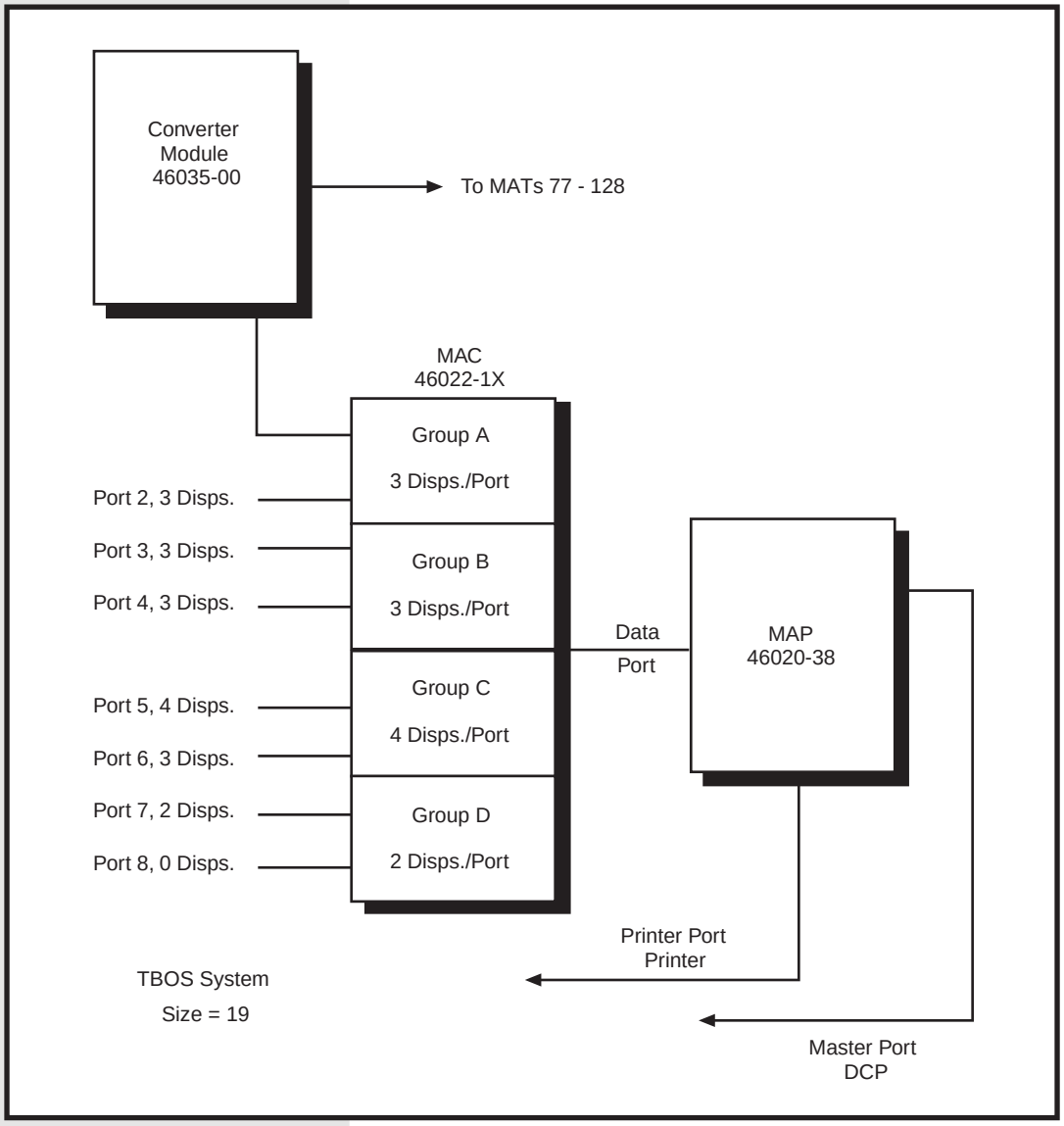


TABLE A - SWITCH S1

TBOS Displays per Port in Group A			
	S1-1	S1-2	S1-3
1 2 3 4	DOWN UP DOWN UP	DOWN DOWN UP UP	DOWN DOWN DOWN DOWN
5 6 7 8	DOWN UP DOWN UP	DOWN DOWN UP UP	UP UP UP UP

TBOS Displays per Port in Group B			
	S1-4	S1-5	S1-6
1 2 3 4	DOWN UP DOWN UP	DOWN DOWN UP UP	DOWN DOWN DOWN DOWN
5 6 7 8	DOWN UP DOWN UP	DOWN DOWN UP UP	UP UP UP UP

Number of MAC-12s		
	S1-7	S1-8
1 2 3 4	DOWN UP DOWN UP	DOWN DOWN UP UP

SWITCH S2 - TBOS DISPLAYS AND PORT CONFIGURATION

This switch allows you to:

- Set the number of TBOS displays per port for Group C using switches S2-1 to S2-3. You can set Group C for one to eight displays per port. Refer to Figs. 13-15.
- Set the number of TBOS displays per port for Group D using switches S2-4 and S2-5. Refer to Figs. 13-15.
- Turn the CPM Echo option on or off using switch S2-6. CPM Echo is used with DCM. Enable CPM Echo by setting switch S2-6 to ON.

CONTINUED . . .

- Set printer port protocol using switch S2-7 and master port protocol for DCP or TBOS using switch S2-8.

  If you set switch S2-8 for DCP protocol, switch S2-7 sets the printer port protocol for DCP or Printer IV.

  If you set switch S2-8 for TBOS protocol, switch S2-7 sets the printer port protocol for TBOS or Printer IV.

Refer to Table B for switch settings.

TABLE B - SWITCH S2

TBOS Displays per Port in Group C			
	S2-1	S2-2	S2-3
1 2 3 4	DOWN UP DOWN UP	DOWN DOWN UP UP	DOWN DOWN DOWN DOWN
5 6 7 8	DOWN UP DOWN UP	DOWN DOWN UP UP	UP UP UP UP

TBOS Displays per Port in Group D			CPM-Echo**	
	S2-4	S2-5		S2-6
1 2 3 8*	DOWN UP DOWN UP	DOWN DOWN UP UP	CPM-Echo ON CPM-Echo OFF	DOWN UP

* In this setting, CPM-Echo has no timeout delay.
** Normal timeout is 12 seconds.

Printer and Master Port Configuration		
Printer/Master	S2-7	S2-8
P/D D/D P/T T/T	DOWN UP DOWN UP	DOWN DOWN UP UP

P = Printer
D = DCP
T = TBOS

SWITCH S3 - TBOS DISPLAYS AND DATA PORT COMMUNICATION

NOTE:

If the MAP reports to an E-System master through an E-System Adapter, you can use up to four MAPs. Because of system requirements, you can only use 28 displays (1,792 points) on the first or third MAP. The first four displays are dedicated to system use. You can use a full 32 displays (2,048 points) on the second or fourth MAP.

This switch allows you to define:

- The total number of TBOS displays the MAP interrogates using switches S3-1 to S3-5.

  You must count all unused displays until you reach the TBOS system total size. After you reach that size, the MAP ignores all displays.

  In Fig. 15, the group settings for displays per port total 21 TBOS displays. The MAP ignores port 8 because there are 19 total displays, but the MAP counts one unused port 6 display in the total.

  If there are no discrete points (switch S3-8 is OFF) the number of displays is 1-32. If there are discrete points (switch S3-8 is ON) the number of displays is 0-31. Use 0 if the MAP communicates only with discrete points.

  If you do not use all TBOS displays, you can use the remaining MAP capacity for discrete points connected through port 1. Refer to Fig. 15.

- The number of TBOS serial ports that operate at 1200 baud instead of the default 2400 baud using switches S3-6 and S3-7. Set the number of ports by group.

- Whether the data port communicates with serial ports only (TBOS-INT) or with serial ports and discrete points (DCM-INT) using switch S3-8.

Refer to Table C for switch settings.

TABLE C - SWITCH S3

Total TBOS Displays Polled						
DCM (S3-8) ON | OFF		S3-1	S3-2	S3-3	S3-4	S3-5
0	1	DOWN	DOWN	DOWN	DOWN	DOWN
1	2	UP	DOWN	DOWN	DOWN	DOWN
2	3	DOWN	UP	DOWN	DOWN	DOWN
3	4	UP	UP	DOWN	DOWN	DOWN
4	5	DOWN	DOWN	UP	DOWN	DOWN
5	6	UP	DOWN	UP	DOWN	DOWN
6	7	DOWN	UP	UP	DOWN	DOWN
7	8	UP	UP	UP	DOWN	DOWN
8	9	DOWN	DOWN	DOWN	UP	DOWN
9	10	UP	DOWN	DOWN	UP	DOWN
10	11	DOWN	UP	DOWN	UP	DOWN
11	12	UP	UP	DOWN	UP	DOWN
12	13	DOWN	DOWN	UP	UP	DOWN
13	14	UP	DOWN	UP	UP	DOWN
14	15	DOWN	UP	UP	UP	DOWN
15	16	UP	UP	UP	UP	DOWN
16	17	DOWN	DOWN	DOWN	DOWN	UP
17	18	UP	DOWN	DOWN	DOWN	UP
18	19	DOWN	UP	DOWN	DOWN	UP
19	20	UP	UP	DOWN	DOWN	UP
20	21	DOWN	DOWN	UP	DOWN	UP
21	22	UP	DOWN	UP	DOWN	UP
22	23	DOWN	UP	UP	DOWN	UP
23	24	UP	UP	UP	DOWN	UP
24	25	DOWN	DOWN	DOWN	UP	UP
25	26	UP	DOWN	DOWN	UP	UP
26	27	DOWN	UP	DOWN	UP	UP
27	28	UP	UP	DOWN	UP	UP
28	29	DOWN	DOWN	UP	UP	UP
29	30	UP	DOWN	UP	UP	UP
30	31	DOWN	UP	UP	UP	UP
31	32	UP	UP	UP	UP	UP

1200 Baud TBOS Ports		
	S3-6	S3-7
None	DOWN	DOWN
Group A	UP	DOWN
A & B	DOWN	UP
All	UP	UP

DCM (MATs & CPMs)	
	S3-8
On	DOWN
Off	UP

NOTE: TBOS default is 2400 baud.

SWITCH S4 - MASTER PORT AND PRINTER PORT PARAMETERS

This switch allows you to set the following master port and printer port parameters for the following protocols (set with switches S2-7 and S2-8).

Depending on which protocol you select, refer to the following table:

Master/Printer	If S2-7 is...	If S2-8 is...	Refer to...
DCP/Printer	DOWN	DOWN	Table D
DCP/DCP	UP	DOWN	Table E
TBOS/Printer	DOWN	UP	Table F
TBOS/TBOS	UP	UP	Table G

DCP/Printer Protocol

NOTE:
If switch S5-6 is DOWN, set the address with switch S6. If switch S5-6 is UP, set the address with switches S4-1 thru S4-5.

- Set the master port ID address using switches S4-1 to S4-5. Refer to Table D.

  You can set the address from 1 to 255 when the MAP interfaces another MAP or a computer. You can set the address from 1 to 4 when the MAP interfaces an E-System Adapter.

- Set the E-System mode using switch S4-6.

  If the MAP interfaces an E-System Adapter, set the E-System mode to ON when you use the MAP as #1 or #3. Set the E-System mode OFF when you use the MAP as #2 or #4 or when the MAP interfaces to another MAP or computer.

NOTE:
When more than one MAP is connected in parallel to an E-System Adapter, set the parallel option of the 49029 subassemblies IN.

- Set the master port data rate using switch S4-7 and the printer port data rate using switch S4-8.

  There are two data rates: 1200 baud and 9600 baud.

DCP/DCP Protocol

NOTE:
If switch S5-6 is DOWN, set the address with switch S6. If switch S5-6 is UP, set the address with switches S4-1 thru S4-5.

- Set the master port ID address using switches S4-1 to S4-5. Refer to Table E.

  You can set the address from 1 to 255 when the MAP interfaces another MAP or a computer. You can set the address from 1 to 4 when the MAP interfaces an E-System Adapter.

- Set the E-System mode using switch S4-6.

CONTINUED . . .

If the MAP interfaces an E-System Adapter, set the E-System mode to ON when you use the MAP as #1 or #3. Set the E-System mode OFF when you use the MAP as #2 or #4 or when the MAP interfaces to another MAP or computer.

- Set the MAP printer port ID address using switches S4-7 and S4-8.

  You can set the address from 1 to 255. You can set the address from 1 to 4 when the MAP interfaces an E-System Adapter.

The master port data rate is 1200 baud. You do not have to set any switches.

TBOS/Printer Protocol

- Set the number of master port displays using switches S4-1 to S4-3. Refer to Table F.
- Switch S4-4 is not used. Leave in the OFF position.
- Set the master port baud rate using switches S4-5 and S4-6.

  Master port baud rates are 1200 and 2400 baud.
- Set the printer port baud rate using switches S4-7 and S4-8.

  Printer port baud rates are 300, 1200, 2400 and 9600 baud.

TBOS/TBOS Protocol

- Set the number of master port displays using switches S4-1 to S4-3. Refer to Table G.
- Switch S4-4 is not used. Leave in the OFF position.
- Set the master port baud rate using switches S4-5 and S4-6.

  Master port baud rates are 1200 and 2400 baud.
- Set the printer port baud rate using switches S4-7 and S4-8.

  Printer port baud rates are 300, 1200, 2400 and 9600 baud.

TABLE D - SWITCH S4 (PRINTER/DCP)

Master Port MAP I.D.*					
	S4-1	S4-2	S4-3	S4-4	S4-5
1	DOWN	DOWN	DOWN	DOWN	DOWN
2	UP	DOWN	DOWN	DOWN	DOWN
3	DOWN	UP	DOWN	DOWN	DOWN
4	UP	UP	DOWN	DOWN	DOWN
5	DOWN	DOWN	UP	DOWN	DOWN
6	UP	DOWN	UP	DOWN	DOWN
7	DOWN	UP	UP	DOWN	DOWN
8	UP	UP	UP	DOWN	DOWN
9	DOWN	DOWN	DOWN	UP	DOWN
10	UP	DOWN	DOWN	UP	DOWN
11	DOWN	UP	DOWN	UP	DOWN
12	UP	UP	DOWN	UP	DOWN
13	DOWN	DOWN	UP	UP	DOWN
14	UP	DOWN	UP	UP	DOWN
15	DOWN	UP	UP	UP	DOWN
16	UP	UP	UP	UP	DOWN
17	DOWN	DOWN	DOWN	DOWN	UP
18	UP	DOWN	DOWN	DOWN	UP
19	DOWN	UP	DOWN	DOWN	UP
20	UP	UP	DOWN	DOWN	UP
21	DOWN	DOWN	UP	DOWN	UP
22	UP	DOWN	UP	DOWN	UP
23	DOWN	UP	UP	DOWN	UP
24	UP	UP	UP	DOWN	UP
25	DOWN	DOWN	DOWN	UP	UP
26	UP	DOWN	DOWN	UP	UP
27	DOWN	UP	DOWN	UP	UP
28	UP	UP	DOWN	UP	UP
29	DOWN	DOWN	UP	UP	UP
30	UP	DOWN	UP	UP	UP
31	DOWN	UP	UP	UP	UP
32	UP	UP	UP	UP	UP

E-System Mode		Data Rates		
	S4-6	Data Rate	Master S4-7	Printer S4-8
On	DOWN	1200 Baud	DOWN	DOWN
Off	UP	9600 Baud	UP	Up

NOTE: E-System Mode is to be OFF if 46033 E-System Adapter is not used. If E-System Adapter is used, set E-System Mode ON for MAPs 1 and 3, OFF for MAPs 2 and 4.

* See switch S5-6

TABLE E - SWITCH S4 (DCP/DCP)

Master Port MAP I.D.*					
	S4-1	S4-2	S4-3	S4-4	S4-5
1	DOWN	DOWN	DOWN	DOWN	DOWN
2	UP	DOWN	DOWN	DOWN	DOWN
3	DOWN	UP	DOWN	DOWN	DOWN
4	UP	UP	DOWN	DOWN	DOWN
5	DOWN	DOWN	UP	DOWN	DOWN
6	UP	DOWN	UP	DOWN	DOWN
7	DOWN	UP	UP	DOWN	DOWN
8	UP	UP	UP	DOWN	DOWN
9	DOWN	DOWN	DOWN	UP	DOWN
10	UP	DOWN	DOWN	UP	DOWN
11	DOWN	UP	DOWN	UP	DOWN
12	UP	UP	DOWN	UP	DOWN
13	DOWN	DOWN	UP	UP	DOWN
14	UP	DOWN	UP	UP	DOWN
15	DOWN	UP	UP	UP	DOWN
16	UP	UP	UP	UP	DOWN
17	DOWN	DOWN	DOWN	DOWN	UP
18	UP	DOWN	DOWN	DOWN	UP
19	DOWN	UP	DOWN	DOWN	UP
20	UP	UP	DOWN	DOWN	UP
21	DOWN	DOWN	UP	DOWN	UP
22	UP	DOWN	UP	DOWN	UP
23	DOWN	UP	UP	DOWN	UP
24	UP	UP	UP	DOWN	UP
25	DOWN	DOWN	DOWN	UP	UP
26	UP	DOWN	DOWN	UP	UP
27	DOWN	UP	DOWN	UP	UP
28	UP	UP	DOWN	UP	UP
29	DOWN	DOWN	UP	UP	UP
30	UP	DOWN	UP	UP	UP
31	DOWN	UP	UP	UP	UP
32	UP	UP	UP	UP	UP

E-System Mode		Printer Port MAP I.D.*		
	S4-6		S4-7	S4-8
On	DOWN	1	DOWN	DOWN
Off	UP	2	UP	DOWN
		3	DOWN	UP
		4	UP	UP

NOTE: E-System Mode is to be OFF if 46033 E-System Adaptor is not used. If E-System Adaptor is used, set E-System Mode ON for MAPs 1 and 3, OFF for MAPs 2 and 4.

* See switch S5-6

TABLE F - SWITCH S4 (PRINTER/TBOS)

	Number of TBOS Displays Reported by Master Port			Configure On Power UP		Master Port Data Rate			Printer Port Data Rate		
	S4-1	S4-2	S4-3		S4-4*		S4-5	S4-6		S4-7	S4-8
1 2 3 4	DOWN UP DOWN UP	DOWN DOWN UP UP	DOWN DOWN DOWN DOWN	ON OFF	DOWN UP	300 Baud** 1200 Baud 2400 Baud 9600 Baud**	DOWN UP DOWN UP	DOWN DOWN UP UP	300 Baud** 1200 Baud 2400 Baud 9600 Baud**	DOWN UP DOWN UP	DOWN DOWN UP UP
5 6 7 8	DOWN UP DOWN UP	DOWN DOWN UP UP	UP UP UP UP								

* S4-4 is always in the OFF Position (Not Used)
** Not used with TBOS protocol

TABLE G - SWITCH S4 (TBOS/TBOS)

	Number of TBOS Displays Reported by Master Port				Number of TBOS Displays Reported by Printer Port			Data Rates		
	S4-1	S4-2	S4-3		S4-4*	S4-5	S4-6		Master S4-7	Printer S4-8
1 2 3 4	DOWN UP DOWN UP	DOWN DOWN UP UP	DOWN DOWN DOWN DOWN	1 2 3 4	DOWN UP DOWN UP	DOWN UP DOWN UP	DOWN DOWN DOWN DOWN	1200 Baud 2400 Baud	DOWN UP	DOWN UP
5 6 7 8	DOWN UP DOWN UP	DOWN DOWN UP UP	UP UP UP UP	5 6 7 8	DOWN UP DOWN UP	DOWN DOWN UP UP	UP UP UP UP			

SWITCH S5 - MAP PARAMETERS

The S5 switches allow you to determine how the MAP operates.

Switch S5-1

If you set switches S2-7 and S2-8 for DCP/DCP protocol:

- Set switch S5-1 UP for a 1200 baud printer port data rate.
- Set switch S5-1 DOWN for a 9600 baud printer port data rate.

If you set switches S2-7 and S2-8 for any other protocol, set switch S5-1 UP.

Switch S5-2

- If you connect a Status Monitor or GPP to the MAP master port, set switches S5-2 and S2-8 DOWN.

CONTINUED . . .

- If you do not connect a Status Monitor or GPP to the MAP master port, set S5-2 UP.

Switch S5-3

- If you connect a Status Monitor or GPP to the MAP printer port, set switches S5-3 DOWN and S2-7 UP.
- If you do not connect a Status Monitor or GPP to the MAP printer port, set S5-3 UP.

Switch S5-4

Always leave switch S5-4 UP.

Switch S5-5

- Report level D alarms to the printer port by setting switch S5-5 UP.
- Treat level D alarms as status points (that is, the MAP ignores the alarms) by setting switch S5-5 DOWN.

Switch S5-6

Enable extended addressing by setting switch S5-6 DOWN. Set extended addressing with switches S6 and S7.

Switch S5-7

The MAP has battery-backed memory which prevents loss of the system configuration in a power outage. When power comes back on, set MAP operation using switch S5-7:

- Have the MAP resume operation where it left off (if the memory is intact) by setting switch S5-7 DOWN.
- Have the MAP erase memory and restart operation by setting switch S5-7 UP.

Switch S5-8

When you use DCM protocol on the data port, set the data port data rate using switch S5-8:

- Set switch S5-8 UP for a 1200 baud data rate.
- Set switch S5-8 DOWN for a 9600 baud data rate.

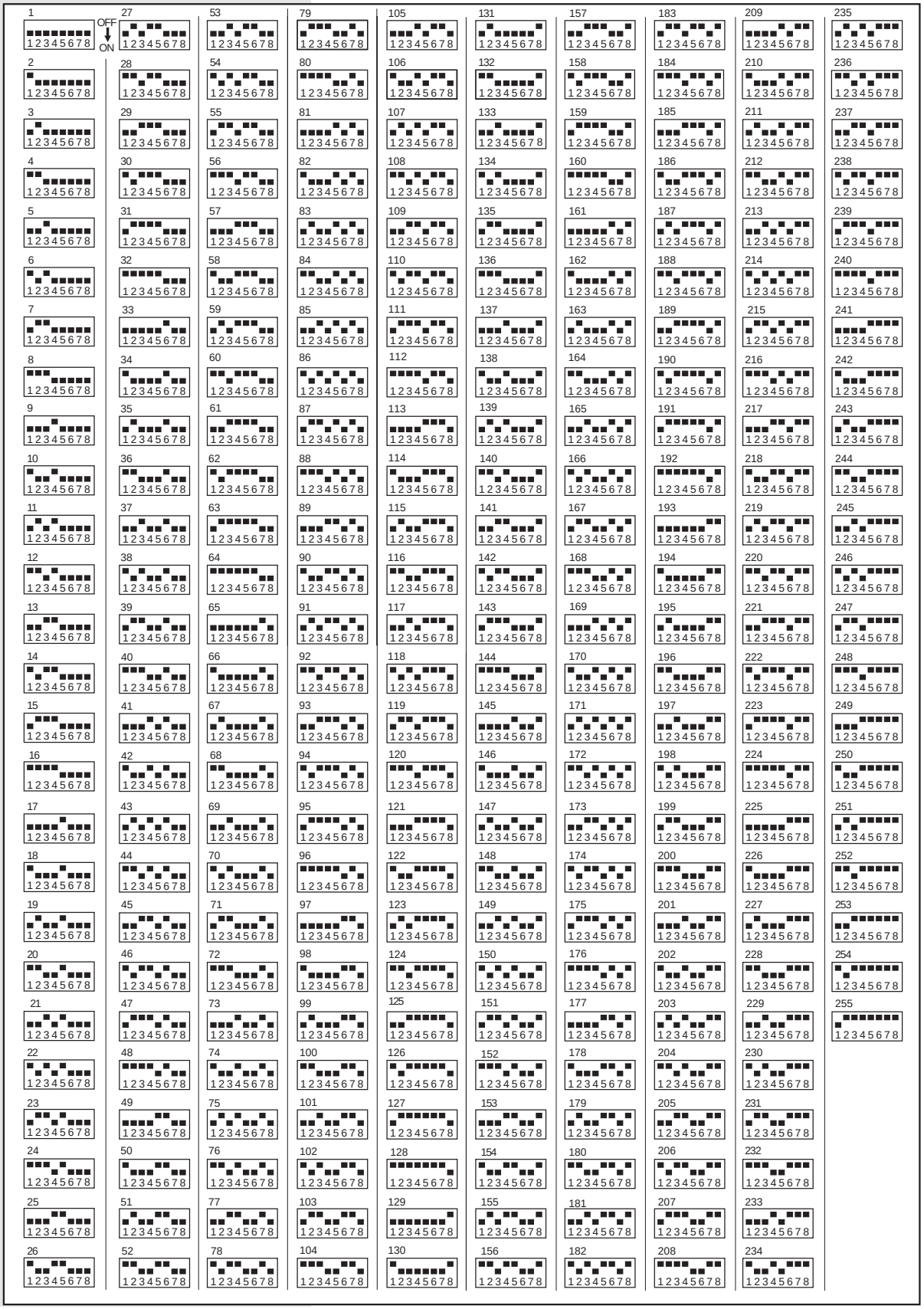
SWITCH S6 & S7 - EXTENDED ADDRESSING

This switch allows you to enable extended addressing. Refer to Table H for switch settings. When S5-6 is in the DOWN position (enabling extended addressing):

- S6 sets the Master Port address
- S7 sets the Printer Port address

SWITCH SETTINGS

TABLE H - SWITCHES S6 AND S7



MAP OPERATION

The front panel of the MAP has a green LED labeled XMT DATA. This LED flashes when data is being transmitted from the data port.

On the front panel of the MAP, there is a recessed reset button. When you push this button, it executes a complete, or hard, reset. The effect is the same as removing power from the MAP. When power is restored later, the information in the MAP's memory is saved ... ***only*** if you have set the switches to retain it (see ***Switch Settings***). If you have not set the switches to save the memory, it will be erased.

For operation of the printer port using Printer Syntax, see the ***Printer Syntax*** chapter.

If you install a subassembly on the master port, refer to the subassembly manual for operation information.

MAC OPERATION

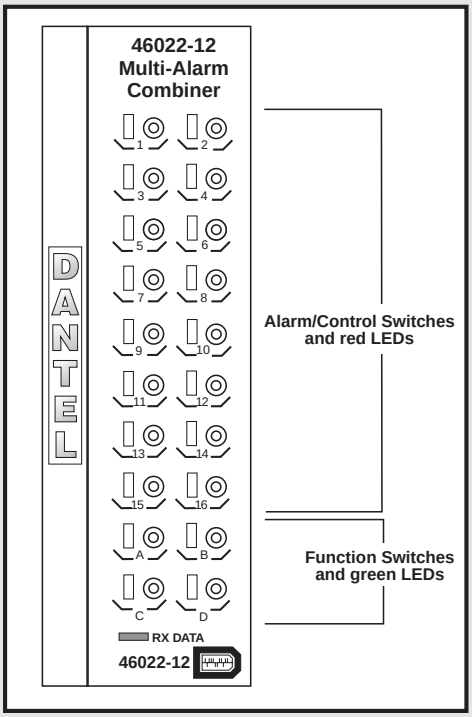
The MAC may be used to display alarm and communication status. The firmware affects the operation of the LEDs and switches on the 46022-12 MACs. The following operating instructions apply only when this firmware is used in a MAP that is operating with a 46022-12 MAC.

Applications

One MAC front panel has a capacity of 32 displays (See Fig. 16). This represents 2,048 alarm and control points. Through the use of function switches, the MAC front panel reports individual alarm point status.

If the MAP communicates with more than one MAC (whenever more than eight serial ports are needed), only the number one MAC provides all front panel functions. Other MACs provide only communications status reports for their own ports.

FIG. 16 - MAC-XX FRONT PANEL



Functions:

These functions are performed at the MAC front panel:

A. Change of Status Alarm Reporting

B. Change of Status Alarm Acknowledgement

C. Acknowledged Alarm Status

D. Acknowledge All (ACK ALL)

E. Control Point Operations

F. Control Point Status

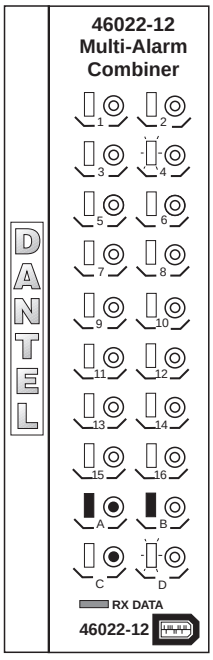
G. Communications Status Report for all MAC Ports

H. Lamp Test

Operation Steps

The MAC function begins from the default mode. To return to default mode at any time, press buttons A and C at the same time.

CHANGE OF STATUS



STEP 1
Default Mode

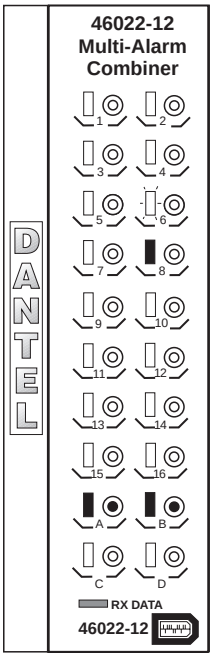
1. Press A & C to return to Default Mode.

2. D LED flashes to show Default Mode.

3. A & B LEDs come on alternately to show which displays are being shown on Alarm LEDs. (A=1-16, B = 17-32).

4. Alarm LEDs show displays that have alarms. (Indicated by flashing LED, see LED #4.)

CONTINUED . . .



STEP 2
Group Selection

1. Press A to show to displays 1-16.

   Press B to show displays 17-32.

2. A LED on if displays 1-16.

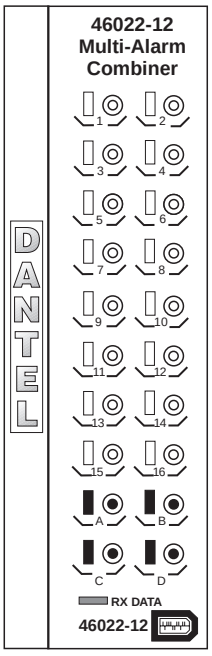
   B LED on if displays 17-32.

3. Alarm LEDs show display status.

   OFF = No alarms

   FLASHING = Unacknowledged alarms.

   ON = Acknowledged alarms.



STEP 3
Display Section

1. Press button for desired display.
   Alarm LEDs will show status of points 1 - 16.

2. LED A on shows points 1-16 selected.
   (First MAT in the display).

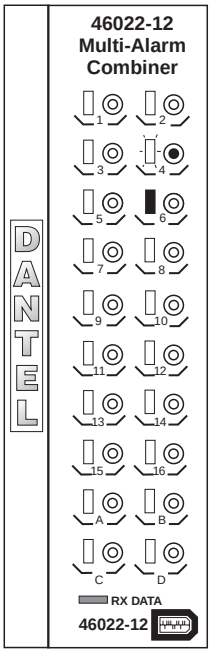
3. Press button B to show points 17-32.
   (Second MAT in display) LED B comes on.

4. Press button C to show points 33-48.
   (Third MAT in display) LED C comes on.

5. Press button D to show points 49-64.
   (Fourth MAT in display) LED D comes on.

6. Press button A to return to points 1-16.
   LED A comes on.

CONTINUED . . .



STEP 4
Point Selection

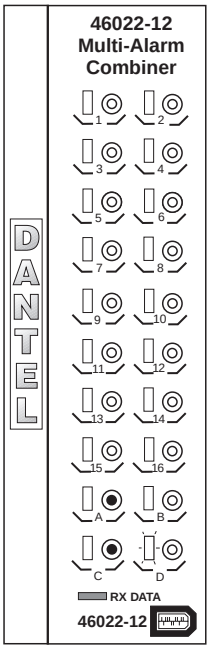
1. LED flashing indicates a change of status at that point, see example at LED #4.

2. Acknowledge by pressing button next to flashing LED.

   LED ON shows acknowledged alarm state, see example at LED #6.

   LED OFF shows acknowledged normal state.

CONTROL POINT OPERATION

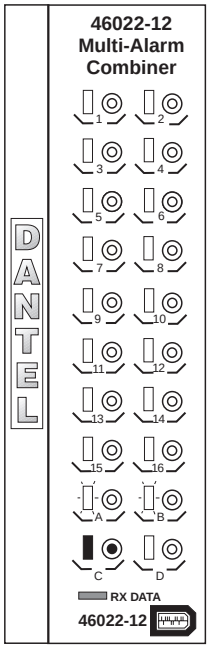


STEP 1
Return to Default Mode

1. Press A & C to return to Default Mode.

2. D LED flashes to show Default Mode.

CONTINUED . . .

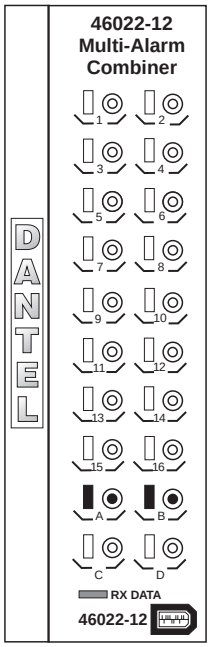


STEP 2
Control Mode Selection

1. Press button C to select Control Mode.

2. LED C on to indicate Control Mode selected.

3. LEDs A & B flash.



STEP 3
Select Group

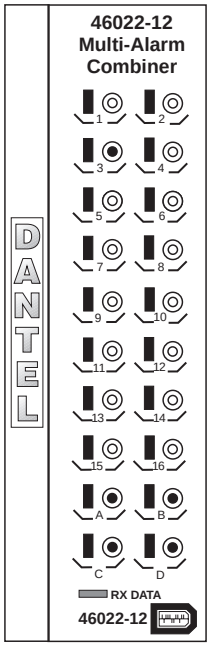
1. Press A to select displays 1-16.

Press B to select displays 17-32.

2. A LED on if displays 1-16 selected.

B LED on if displays 17-32 selected.

CONTINUED . . .



STEP 4
Display Selection

1. Press button for desired display. See example button #3.

   Alarm LEDs will all come on.

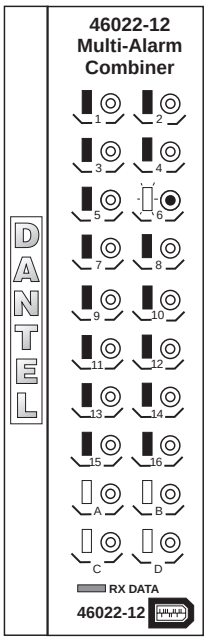
2. LED A on show points 1-16 selected. (First CPM in display.)

3. Press button B to show points 17-32. (Second CPM in display.) LED B comes on.

4. Press button C to show points 33-48. (Third CPM in display.) LED C comes on.

5. Press button D to show points 49-64. (Fourth CMP in display.) LED D comes on.

6. Press button A to return to points 1-16. LED A comes on.



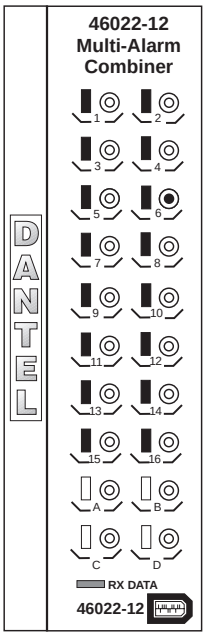
STEP 5
Control Point Selection

1. All alarm LEDs on to show Control Mode.

2. Select control point by pressing button for desired point, see example button #6.

3. LED flashes to show selected status, see example LED #6.

CONTINUED . . .

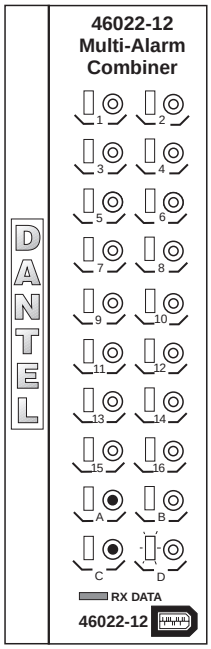


STEP 6
Control Point Selection

1. Press button for selected point a second.
2. LED comes on to show point operated.

   (With TBOS, point will return to normal after a short delay. CPM points should be optioned for momentary operation. Latched points can be set from the MAC but cannot be reset.)

ACKNOWLEDGE ALL (ACK ALL)

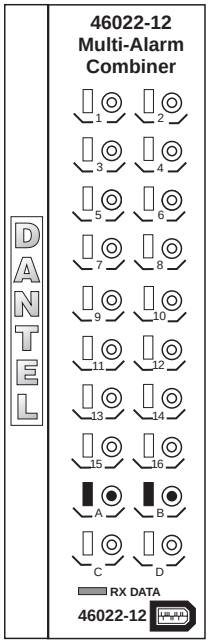


STEP 1
Return to Default Mode

1. Press A & C to return to Default Mode.

2. D LED flashes to show Default Mode.

CONTINUED . . .



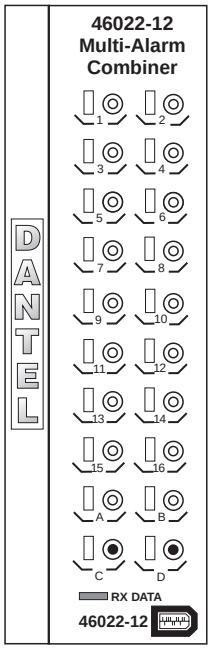
STEP 2
Select Display Group

1. Press A to select displays 1-16.

Press B to select displays 17-32.

2. A LED on if displays 1-16 selected.

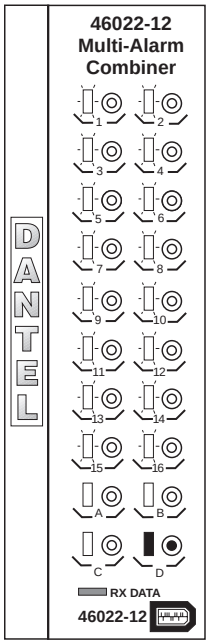
3. B LED on if displays 17-32 selected.



STEP 3
Acknowledge All

1. Press C & D buttons together to acknowledge all alarms within the selected group of displays.

COMMUNICATIONS TEST



STEP 1
Start from Default mode.

STEP 2
Use button D to set Comm Test Mode.

1. Press button D to test communications.
2. D LED comes on to show Comm Test Mode.
3. Odd numbered Alarm LEDs blink to show data transmitted at each port.

   (LED 1 corresponds to port 1, LED 3 corresponds to port 2, etc.)
4. Even numbered Alarm LEDs blink to show data received at each port.

   (LED 4 is port 2, etc.)

LAMP TEST

Step 1

Start from Default Mode.

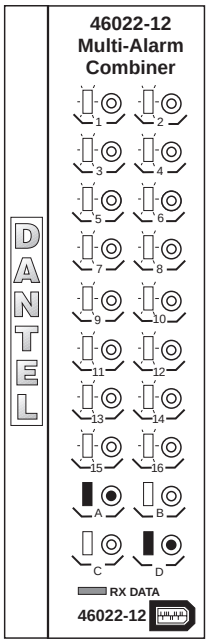
Step 2

Use buttons B & D to set Lamp Test Mode.

Step 3

All LEDs should light.

CONFIGURATION CONTROL



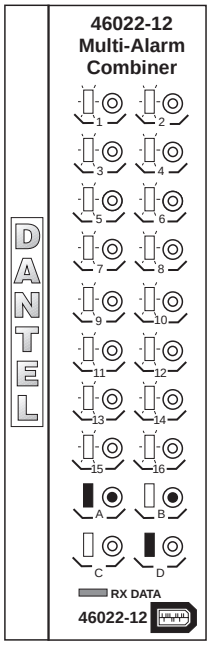
STEP 1
Start from Default mode.

STEP 2
Configuration mode selection.

1. Press buttons A & D to select configure mode.

2. LED's A & D come on.

Note: Entire system will now be reconfigured unless Steps 3 - 5 are performed.



STEP 3
Group selection.

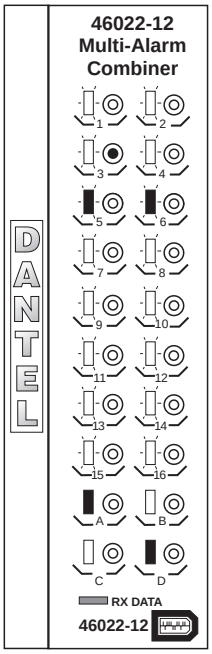
1. Press A to select 1 - 16 or if using MAC -22.

Press B to select 17 - 32.

2. A & D LED's on if ports 1 - 16 selected.

B & D LED's on if ports 17 - 32 selected.

CONTINUED . . .



STEP 4

1. Press button for port to be configured.
(Press 1 on MAC -22)

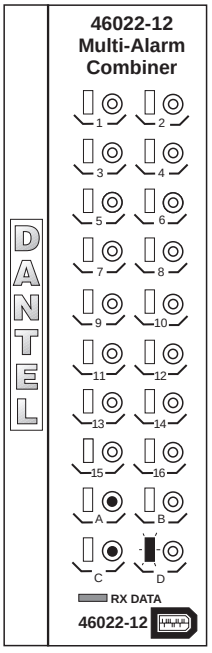
2. Odd numbered Alarm LED's blink to show data transmitted at the selected port.
(LED 1 corresponds to port 1, LED 3 corresponds to port 2, LED 5 to port 3, etc.)

3. Even numbered Alarm LED's blink to show data received at the selected port.
(LED 2 corresponds to port 1, LED 4 corresponds to port 2, LED 6 to port 3, etc.)

NOTE: If default mode not selected (step 5). the system will be locked on the selected port for configuration only. No status reports will be received for any other ports.

LED's A & D on show ports 1 - 16 selected.

LED's B & D show ports 17 - 32 selected.



STEP 5

1. LED's stop blinking.
Means configuration is complete. Additional ports may now be selected for configuration.

2. Press A & C to return to Default Mode.

NOTE:
On MAC -22 the LED's will not stop blinking unless a full complement of 128 MAT's and 128 CPM's is present and working.

3. D LED flashes to show Default Mode.

PRINTER SYNTAX

Here are the commands for MAP printer port operation. This syntax establishes the coding for the printer port to interface to a standard ASCII (VT-100) terminal or a personal computer with terminal emulation software. The printer syntax allows you to communicate with the alarm and control system to find out the status of alarms and to operate control points.

GETTING STARTED

The terminal must be set for the same data rate (baud), parity, stop bits, and word length as those set on Switch S4 (See ***Switch Settings***).

- Make these settings before connecting the terminal to the MAP.
- If the system is operating properly, a prompt > appears on the screen. The MAP is ready to accept command inputs.
- If the terminal and MAP do not communicate, remove power from the MAP. Then check the settings at the terminal and also at the MAP.

Type UNLOCK and press Enter.

This command unlocks the MAP so you can enter most of the other commands. If there is a password in the MAP, you will have to type the password in order to unlock the MAP. See the Password command in the ***Syntax Commands*** section for instructions on setting up a password.

ENTERING COMMANDS

After each command you type at the terminal, press Enter to execute the command.

Some standard ASCII terminals (or computers operating as terminals) have function keys you can program to do frequently used keystroke sequences in a single keystroke. Refer to your terminal's user manual for instructions on how to program the function keys.

ERROR MESSAGES

Two error messages may appear on the terminal screen:

MESSAGE	MEANING	ACTION
COMMAND ERROR	Command not understood	Enter the command correctly
SYNTAX ERROR	Entry does not follow the rules of syntax	Enter the command correctly

EDITING

The following table shows how to do some common editing tasks. The term **Ctrl** refers to the Control key on the terminal keyboard.

TASK	KEYSTROKES
Stop Output (Stop data flow from the MAP.)	Hold down the CTRL key and press D. (CTRL-D)
Backspace	Backspace or CTRL-H
Recall Previous Line (Use to edit command line after receiving an error message.)	CTRL-K
Recall Current Line (Use when interrupted by a system status message.)	CTRL-R
Pause Output (Interrupt data flow from MAP.)	CTRL-S (CTRL-Q to restart)
Re-execute Last Command	CTRL-X

ABBREVIATIONS AND SUBSTITUTIONS

Several of the syntax commands in the following section can be abbreviated or replaced by other commands. Here is a list of alternate commands that will work in place of the regular commands:

REGULAR COMMAND	ABBREVIATION OR SUBSTITUTION
BELL	BEEP or DING
DISPLAY	DISP or D
POINT	PNT or P
QUERY	Q or ?
STATUS	STAT
SWITCHES	DIPS
LINEFEED	LF
SYSTEM	SYS

SYNTAX COMMANDS

ACKNOWLEDGE

Purpose:

Acknowledges all alarms at the MAT(s), MAP and MAC, and control points at the MAP.

Format:

ACK ALL

ACK [MAT number]

ACK [CPM number]

ACK [TBOS number]

[MAT number] ACK

BELL

Purpose:

Reports if the terminal bell is on or off. Turns bell on or off. When bell is on, it sounds when a change of alarm status occurs.

Format:

BELL

BELL ON

BELL OFF

Remarks:

The command BELL shows if the bell is on or off. The other commands turn the bell on or off.

CLEAR ALARMS

Purpose:

Clears the entire alarm data base, but does not change the polling list or configuration.

Format:

CLEAR ALARMS

CPM POINT ACTIVATE

Purpose:

Operates one listed point at the specified CPM.

Format:

CPM [number] ACT (or ACTIVATE) [points]

Remarks:

The point operates during the time period set by option switches or programming. (See OPTION and CPM POINT TIME PERIOD commands.)

CPM POINT CLEAR

Purpose:

Resets one listed point at the specified CPM.

Format:

CPM [number] CLR (or CLEAR) [point number]

CPM POINT DIRECT OPERATE

Purpose:

Momentarily turns CPM points on or off. Also latches CPM points on and resets latched points.

Format:

CPM [number] DLON [point numbers]

CPM [number] DLOF [point numbers]

CPM [number] DMON [point numbers]

CPM [number] DMOF [point numbers]

Remarks:

This group of commands overrides the CPM(s) option switch settings (momentary/latching).

List point numbers individually with a comma between them, as a group with a hyphen between them, or use the word ALL.

The DLON command latches CPM points on.

The DLOF command resets the latched points.

The DMON command operates CPM points for three seconds.

CONTINUED . . .

The DMOF command turns latched CPM points off for three seconds, then back on.

Example:

```
>CPM 1 DLON 1,3,5

>CPM DEVICE   1  POINT   1  OPERATE   OCT 22, 1996  10:20:03
 CPM DEVICE   1  POINT   3  OPERATE   OCT 22, 1996  10:20:04
 CPM DEVICE   1  POINT   5  OPERATE   OCT 22, 1996  10:20:04
```

CPM Point Release

Purpose:

Resets CPM specified points.

Format:

CPM [point number] [RLS point number(s)]

Remarks:

List point numbers individually with a comma between them, as a group with a hyphen between them, or use the word ALL.

CPM Point Select Operate

Purpose:

Momentarily turns CPM points on or off. Also latches CPM points on and resets latched points.

Format:

CPM [number] SLON [point number(s)]

CPM [number] SLOF [point number(s)]

CPM [number] SMON [point number(s)]

CPM [number] SMOF [point number(s)]

Remarks:

This group of commands overrides the CPM(s) option switch settings (momentary/latching).

List point numbers individually with a comma between them, as a group with a hyphen between them, or use the word ALL.

The SLON command latches CPM points on.

The SLOF command resets the latched points.

CONTINUED . . .

The SMON command operates CPM points for three seconds.

The SMOF command turns latched CPM points off for three seconds, then back on.

Example:

```
>CPM 1 DLON 1,3,5

>CPM 1 EXE

>CPM DEVICE   1  POINT   1  OPERATE   OCT 22, 1996  10:20:03
 CPM DEVICE   1  POINT   3  OPERATE   OCT 22, 1996  10:20:04
 CPM DEVICE   1  POINT   5  OPERATE   OCT 22, 1996  10:20:04
```

CPM Point Set

Purpose:

Operates CPM points.

Format:

CPM [number] SET [point number(s)]

Remarks:

List point numbers individually with a comma between them, as a group with a hyphen between them, or use the word ALL.

Points operate during the time periods set by the options switches or programming. (See OPTION and CPM POINT TIME PERIOD commands).

CPM Point Time Period

Purpose:

Sets the time period for moemntary operation of CPM points.

Format:

CPM [number] LONG [time]

CPM [number] SHORT [time]

CPM [number] PER (or PERIOD) [point number] [time]

Remarks:

Time is in tenths of a second, from 0.1 to 25.5 seconds. Specify the time from 1-255 tenths of a second.

The CPM LONG command sets the time period for extended (E) operation CPM control points.

CONTINUED . . .

The CPM SHORT command sets the time period for short (S) operation CPM control points.

The command CPM PER sets a unique time period for momentary operation of a specific control point.

Operate the control points using the CPM [number] SET [point number(s)] command.

See the OPTION command for more information.

Note:

When setting long or short time periods, the CPM options return to the default settings. You must reset CPM options (see OPTION command) before you operate the control points if you want settings other than the default.

Example:

```
>CPM 1 LONG 200
```

If CPM points default to something other than extended (E) operation, you must reset the options:

```
>CPM 1 OPT E E E E E E E E E E E S S S S
```

DATE

Purpose:

Displays or sets the system date.

Format:

DATE

DATE mm/dd/yy (or mm-dd-yy)

Remarks:

The command DATE displays the system date.

The command DATE followed by the month-day-year entry sets the system date.

If the TIME command is set for TIME OFF, the date will not change.

DCM

Purpose:

Shows if the MAP's DCM switch (S3-8) is on or off.

DEFAULT

Purpose:

Restores CPM and MAT options to their default (switch) settings. This command does not apply to TBOS.

Format:

CPM [number] DEF

MAT [number] DEF

Remarks:

The command CPM [Number] DEF changes the S, E and L time options on the CPM relays.

The command MAT [number] DEF changes the MAT A, B, C and D alarm level option settings. The command does not change the MAP alarm level option settings.

DELETE

Purpose:

Removes specified device(s) from the system configuration and clears all device alarms.

Format:

DELETE CPM [number]

DELETE MAT [number]

DELETE TBOS [number]

ECHO

Purpose:

Reports the MAP CPM Echo switch (S2-6) as on or off.

Format:

ECHO

INTERPOLL DELAY

Purpose:

To modify the timeout between responses when the MAP is polling DCM devices.

Format:

IPD

IPD [delay time]

Remarks:

The command IPD shows the current delay time setting.

The default setting for the time delay is zero. This means that the interpoll delay is not used.

To enter a delay time, type a number between 128 and 255. A delay of 128 equals 500 milliseconds. A delay of 255 equals one second.

Once a delay time is set, you cannot reset the delay to zero. To return the delay time to zero, follow the steps below.

CAUTION:
This procedure will erase the configuration in the memory of the MAP.

- Turn off power to the MAP.
- On the MAP, place switch S5-7 UP.
- Install the MAP in the shelf.
- Apply power for ten seconds. This erases the configuration and resets the interpoll time delay to zero.
- Remove the MAP and place switch S5-7 DOWN.
- Install the MAP in the shelf.
- Turn on the power.

LINEFEED

Purpose:

Reports if the linefeed is off. Turns the linefeed on or off.

Format:

LINEFEED

LINEFEED ON

LINEFEED OFF

Remarks:

The command LINEFEED shows if the linefeed is on or off. The other commands turn the linefeed on or off.

LOCK

Purpose:

Locks the MAP's printer port so it will not accept commands that change system configuration, acknowledge alarms, or set control points.

Format:

LOCK

LOG

Purpose:

Reports the logging feature as on or off. Turns the logging feature on or off.

Format:

LOG

LOG ON

LOG OFF

Remarks:

The LOG command reports the logging feature as on or off.

The LOG ON command turns logging on. Whenever there is a MAT alarm point status change, or a CPM control point status change, the system issues a report. The system also issues a report when there is a device failure.

CONTINUED . . .

The LOG OFF command turns logging off. Changes in status and device failures are not reported. The most recent changes are stored in memory and displayed when the logging feature is turned on.

Example of a change of status report:

```
ALM  DISP  1  POINT  1  FAIL  ALM  LVL  A  OCT  22,  1995  10:22:00
CTL  DISP  1  POINT  1  NORM  ALM  LVL  D  OCT  22,  1995  15:36:09
```

MODE

Purpose:

Shows if the system is locked or unlocked.

Format:

MODE

OFF, OFFLINE, ON

Purpose:

Puts a device or devices in or out of service.

Format:

MAT [number] ON [data rate]

CPM [number] ON [data rate]

TBOS [number] ON [data rate]

MAT [number] OFF

CPM [number] OFF

TBOS [number] OFF

Remarks:

The ON command followed by the data rate puts a device in service that interrogates at the defined baud rate. Up to 32 remote device channels (ports) can communicate with the data port through 46022 Multiple Alarm Combiners. All devices on any one channel must be set to the same data rate.

The OFF command puts a device out of service. When the device is out of service, the MAP does not interrogate the device, but lists the device as OFF in system status reports.

CONTINUED . . .

The OFFLINE command changes a MAT or CPM status to "not in service." The MAP does not interrogate the device and does not list the device in system status reports. The device returns to service with the ON command or at the next system reconfiguration, which occurs 10 minutes after completion of the last configuration.

OPTION, PUT, SHOW

Purpose:

Displays or sets CPM, MAT and MAP options.

Format:

CPM [number] OPT [option letters]

MAT [number] OPT [option letters]

MAT [number] SHW (or SHOW)

MAT [number] PUT

Remarks:

The OPT command displays the MAT alarm level option settings and CPM control point options. The MAP memory maintains the listed settings and the settings are not necessarily the same as the device option settings.

MAT alarm priority level options are A, B, C, and D. CPM control point options are L (latched points), S (short momentary time period (300 milliseconds)), E (extented momentary time period (3 seconds), and M (unique time period; see the CPM POINT TIME PERIOD command). Enter options for all 16 points and put spaces between the letters.

The MAT SHOW command displays the MAT alarm level options.

The MAT PUT command downloads the MAP options to the MAT(s).

Example:

```
>CPM 1 OPT
CPM1 OPTIONS  S E L L S E L L S E L L S E L L
```

PASSWORD

Purpose:

Sets password for system security.

Format:

PASSWORD

Remarks:

When you type PASSWORD, the screen prompts for a new password. If an old password exists, you must enter the old password before setting a new one.

As you type the password, the actual entry does not appear on the screen - a row of asterisks displays instead of the word. This feature prevents an unauthorized person from seeing the password on the screen and adds to the security of the password. Maximum length is seven characters.

Some commands are password protected. They include control point operation commands and the following:

ACK ALL
CLEAR ALARMS
DCP/DCPF MODE
LOG ON
LOG OFF
PASSWORD
RESET
TIME ON

Example:

```
>PASSWORD
New Password:  ****
```

QUERY

Purpose:

Provides information on the configuration of the master and printer (terminal) ports.

Format:

QUERY

CONTINUED . . .

Example:

```
>QUERY
Remote Port - Data Acquisition
TBOS System Size        = 7 Displays
No. of Chan/Group       = 2
No. of Disp Group       = 1
No. of Disp Group 2     = 1
No. of Disp Group 3     = 1
No. of Disp Group 4     = 1
No. of Grps @ 1200 baud = 0
DCM is ON
Cpm Echo is OFF

Terminal Port: Printer III
Terminal Port baud      = 9600

Master Port: DCP/S Responder
Master Port Baud        = 1200
Esys Mode is ON
DCP/S Map Id            = 1
```

RESET

Purpose:

Resets the system.

Format:

RESET

Remarks:

The command RESET tells the MAP to restart operation. It locks the printer port. However, it does not erase the system configuration downloaded into the MAP. This command performs the same function as pushing the reset button on the front panel of the MAP.

REVISION

Purpose:

Gives the revision level of MAT(s), CPM(s) or the MAP.

CONTINUED . . .

Format:

MAT [number] REV

CPM [number] REV

REVLIST

STATUS

Purpose:

Produces a report on the status of all devices in the system.

Format:

STATUS

CPM [number] STATUS

MAT [number] STATUS

TBOS [number] STATUS

Remarks:

If Smart MACs are connected to the MAP, the STATUS command gives the status of the Smart MACs themselves, not the status of the devices connected to the Smart MACs.

SWITCHES

Purpose:

Gives listing of MAP switch settings.

Format:

SWITCHES

Example:

In this example, D = DOWN and U = UP.

```
>SWITCHES
DIP   1)DDDDDDDD   2)DDDDDUDD   3)DDDDDDDD   4)DDDDDDDD
```

SYSTEM

Purpose:

Produces a report on the status of displays.

CONTINUED . . .

Format:

SYSTEM

CPM [number] SYSTEM

MAT [number] SYSTEM

TBOS [number] SYSTEM

Remarks:

The SYSTEM command produces a report on all displays in the system. You can also produce a report on individual CPM, MAT and TBOS displays.

Example:

```
>SYSTEM
LIST SYSTEM        10:32:46    DEC 15, 1996
TB     5.1 . . . DF. . . . NORM
TB     5.2 . . . . . F . . NORM
TB     5.3 . . . . DN. . . NORM
TB     5.4 . . . . . . . . NORM
TB     5.5 . . . . . . . . NORM
TB     5.6 . . . . . . . . NORM
TB     5.7 . . . . . . . . NORM
TB     5.8 . . . . . . . . NORM
MAT     21 . . . AF. . F . . . BF. . . . .
MAT     22 . . . . . . . . . . . . . . . . FAIL
MAT     23 . . CN. . . . . . . . . . . . .
CPM      1 C;C;C;O;O;O;O;O;O;O;O;O;O;O;O;O;
```

In the display example above, TB 5.1 has an unacknowledged D-level alarm failure, TB 5.2 has an acknowledged alarm failure that still exists, and TB 5.3 has an unacknowledged D-level that has returned to normal operation.

MAT displays 21 and 23 show A, B and C-level alarms the same as displays TB 5.1 to 5.3. MAT 22 is not responding to polls. The CPM display shows whether points are closed (C) or open (O); semicolons indicate point operation has not been acknowledged.

See the ACKNOWLEDGE command to acknowledge alarm and control points.

TBOS POINT SET

Purpose:

Operates TBOS control points.

Format:

TBOS [display number] SET [point number(s)]

Remarks:

TBOS control points automatically reset.

CONTINUED . . .

Enter the full 64-point display number. You cannot enter a character (an 8-point portion of a display, for example, 5.1).

List point numbers (1-64) individually with a comma between them, as a group with a hyphen between them, or use the word ALL.

TIME

Purpose:

Displays or sets system time.

Format:

TIME

TIME hh:mm:ss

TIME ON

TIME OFF

Remarks:

The command TIME displays the current time.

To set the time, type TIME and then the hour-minute-second time in 24-hour format.

TIME ON turns on the time and date functions. TIME OFF turns off the time and date functions and the time and date do not change.

UNLOCK

Purpose:

Unlocks the MAP so it will accept password-protected commands (see PASSWORD command).

Format:

UNLOCK

Remarks:

If a password has been set, you must enter it in order to unlock the system.

Example:

```
>UNLOCK
Password :   ****
System Unlocked
```

DESCRIPTION	VALUE
Input Voltage Range	-21 to -56 VD
Input Current (less firmware and subassemblies; ±15%)	
@ -21 VDC	113 mA
@ -24 VDC	104 mA
@ -48 VDC	73 mA
@ -56 VDC	71 mA
Heat Dissipation (less firmware and subassemblies; ±15%)	
@ -21 VDC	8.1 BTU/Hr
@ -24 VDC	8.5 BTU/Hr
@ -48 VDC	12.0 BTU/Hr
@ -56 VDC	13.6 BTU/Hr
Weight (less subassemblies)	11.25 ounces
Physical Dimensions	1.4" x 6.0" x 5.6"
Operating Temperature Range	0° to 55° C.

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