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**MODEL 240MS  
EVENT RECORDING  
SYSTEM**

**USER MANUAL**

**MICRO-AIDE**  
***Rail Signal Products***

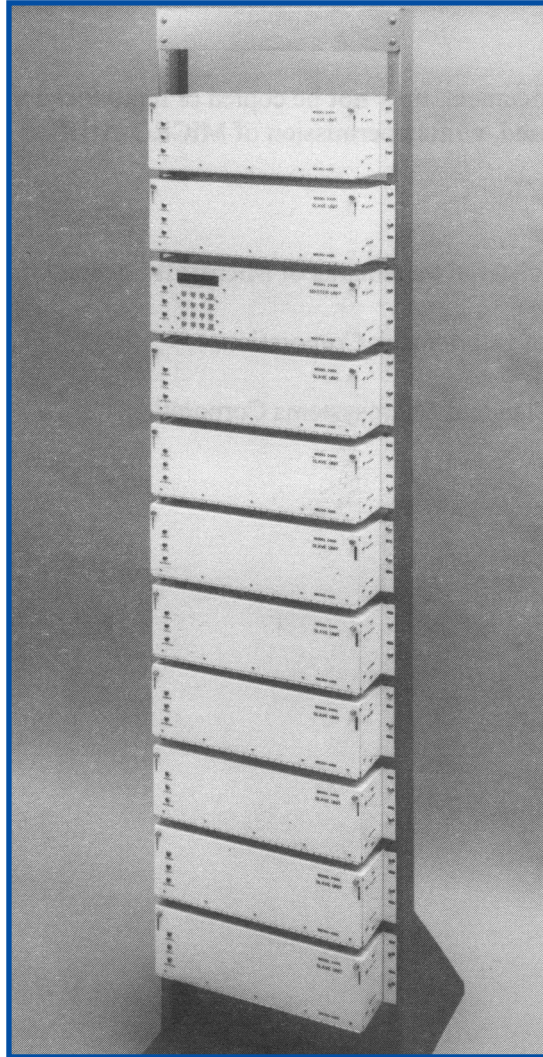
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CLOCK SYNCHRONIZERS    CURRENT SENSORS    VOLTAGE MONITORS  
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# MICRO-AIDE



[www.micro-aide.com](http://www.micro-aide.com)



## MODEL 240MS EVENT RECORDING SYSTEM USER MANUAL

Revised: April 10, 2014

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RAIL SIGNAL PRODUCTS

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# General Description

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## Introduction

The MICRO-AIDE Model 240M/S is a high capacity Event Recorder system engineered to meet the demanding needs of today's rail industry. Its design shares a great deal with the Model 240D Event Recorder which has proven to be versatile, rugged and easy to use. Its unique, flexible design makes it an ideal solution in a broad range of large scale event recording applications. It is designed to ensure that the operation of the monitored circuits is not affected in any way. The Model 240M/S is comprised of a master unit (Model 240M) and multiple slave units (Model 240S). Its maximum capacity is 3,840 inputs.

The Model 240M serves as the user's focal point for the system. It comes equipped with a built-in keypad and display screen located on the front panel. This allows the user to operate the entire system without the need for additional peripheral devices. The Model 240M does, however, support peripheral based applications. An RS-232 port is provided that can be used to interface a personal computer or video display terminal. Accordingly, Event Records can be displayed in expanded form, saved to a text file or printed depending upon the user's specific requirements. The peripheral device can also be used to facilitate setup of the system. An optional 14,400 Baud internal modem allows the user to remotely access and operate the system.

The Model 240S slave unit is designed to serve as an Event Recorder without the user interface common to the Model 240M. A 2.5 Mbps Arcnet® based Local Area Network (LAN) permits multiple slave units to be controlled and accessed by a single Model 240M. The Model 240M chassis actually contains a master processor section and a slave section that functions like any other Model 240S. In effect, the first 240 system inputs are a part of the Model 240M chassis. The maximum capacity of 3,840 inputs is reached by using one master and fifteen slaves.

The Model 240M/S is simple to use and maintain. Its design is based upon the premise that value and reliability begin with attention to detail and a concern for usability rather than needless complexity.

## Features and Benefits

Listed below are just a few of the features and benefits included with every Model 240M/S system.

- Standard storage capacity is 419,428 Event Records (expandable to 1,677,712).
- Event Records from as many as 90 days can be stored.
- Memory is non-volatile. Event Records are retained even if power is removed.
- Any signal within a broad range extending from 5 to 30 VDC can be sensed. AC voltages in the range from 7 to 20 VAC can also be sensed.
- Positive and negative voltage polarities can be sensed.
- Event Detection Times can be set by the user on an input-by-input basis. Default values are provided as an aid to the user.
- Flashing signal events are detected.

- Events satisfying the Detection Time criteria are time stamped to the nearest tenth of a second.
- Attaching the system to an event generating circuit is completely non-intrusive to the circuit. This is ensured by the high input resistance nature of the design. Each input utilizes opto-isolation technology to provide ground isolation of at least 3,800 VDC.
- Installation is quite simple. Input wires are terminated in detachable, screw-down terminals. Wire sizes as large as 12 AWG can be used.
- Power consumption is typically 7 Watts and 3 Watts per Model 240M and Model 240S chassis, respectively. A standard 12 or 24 VDC power source can be used to power the system.
- Setup data and Event Record data can be easily and quickly transferred to a PC file.
- Three distinct levels of password security provide protection against unauthorized access.
- Diagnostic commands allow users to perform complete online testing of the system.
- Year 2000 compliant.

## About this Manual

This document is intended to provide the user with comprehensive, easy-to-read instructions on how to install, set up, operate and maintain the MICRO-AIDE Model 240M/S Event Recorder. Wherever possible, step-by-step instructions are listed. In the event the user has questions about any of the described procedures the user should contact MICRO-AIDE for assistance. Additional copies of this manual are available upon request.

### MICRO-AIDE CORPORATION

Customer Service

TEL: 626-915-5502      FAX: 626-331-9484



**Note:** the MICRO-AIDE Material Return and Limited Warranty policies can be found on the inside back cover of this manual.

## Revision Level

This document refers to Version 3.03 of the Model 240M/S firmware. The sample data and command details were prepared using a Version 3.03 system. The differences between Version 2.X and Version 3.03 firmware include the following:

- Extensive diagnostic commands have been added.
- Improved Arcnet LAN performance has been achieved.
- The standard Event Memory capacity has been increased.
- RS-232 and modem data through put rates have been dramatically improved.
- Several bugs pertaining to the retrieval of record data have been corrected.
- Year 2000 compliance has been added.



**Note:** users presently operating systems with Version 1.X or 2.X are urged to contact MICRO-AIDE so that their systems may be upgraded to Version 3.03 (or later). **Upgrades are offered at no charge.**

# Setup

---

## Introduction

This chapter describes how to properly unpack, install and set up the Model 240M/S prior to operation. It is advisable to review the Unpacking, Initial Check-out and Installation sections before actually performing the procedures described in this chapter.

## Unpacking

Each Model 240M/S chassis assembly is packed in an individual container that is properly sized for the unit. Abundant packing materials are provided to minimize mechanical shock to the contents. Before opening the shipping carton inspect the carton for damage. Damage to the container should be noted. Carefully remove the unit. It is advisable to save all packing materials in the event the unit ever needs to be returned to MICRO-AIDE.

Inspect the unit for any visual damage. The unit should not be scratched, dented or deformed in any way. If it appears that the unit was damaged in shipment the responsible carrier should be notified immediately. MICRO-AIDE will assist the user in filing a claim in the event damage was sustained during shipment.

## Initial Check-out

Before the system is installed at a signal facility it is recommended that an operational check of the system be performed. The following materials are required as a part of this procedure.

- 12 VDC power source.
- Common hook-up wire, preferably red and black, for power and testing inputs (approx. 12 ft., 16 AWG).
- Wire strippers and small, flat-head screwdriver.
- PC equipped with a communications program (e.g., Procomm® or HyperTerminal®) or a Video Display Terminal (VDT). Either one must be set for 19,200 Baud.
- Digital Voltmeter (DVM), optional.

Perform the following steps in the sequence listed. A Trouble-shooting Guide is available on page 76. It may be of assistance in the event the user experiences a problem.

- Open the hinged, front cover of the Model 240M chassis by turning the two screw fasteners counter-clockwise. Refer to Figure 1.
- Ensure that the power switch is in the off or down position. It is located towards the left side of the unit on the printed circuit board (PCB) labeled "POWER". Refer to Figure 2 for a view of the PCB layout and power switch location.

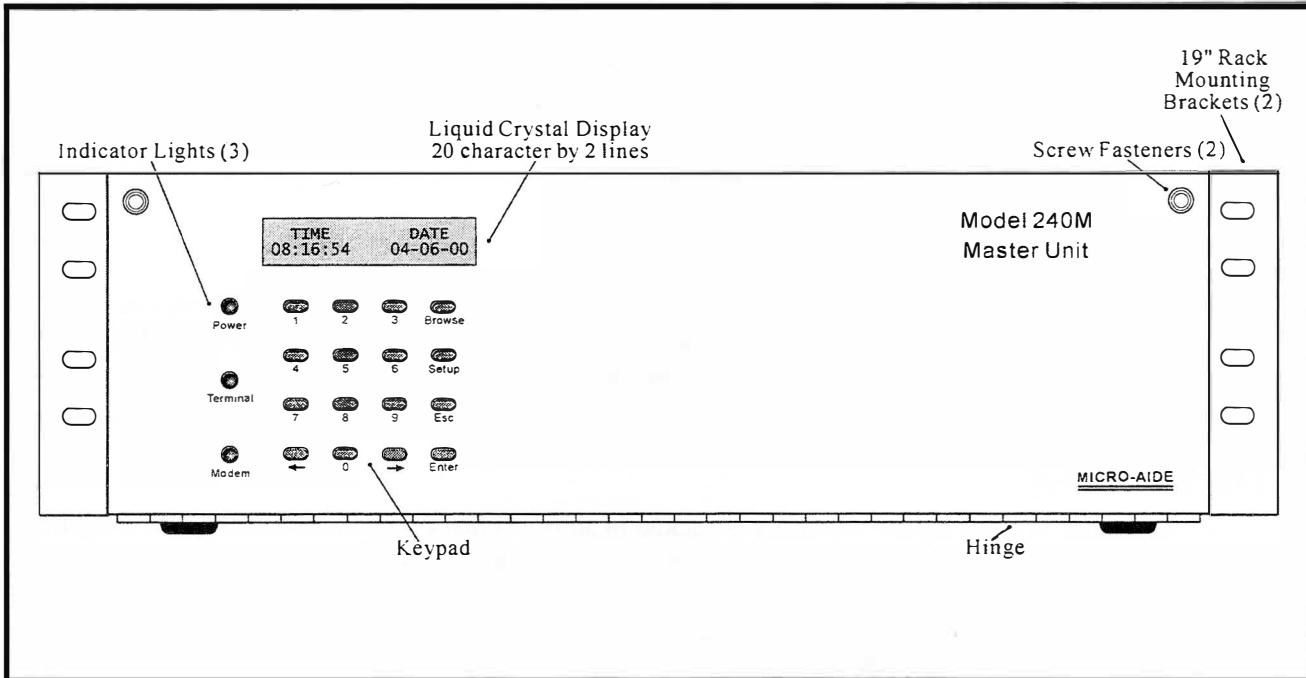


Figure 1  
Model 240M front panel

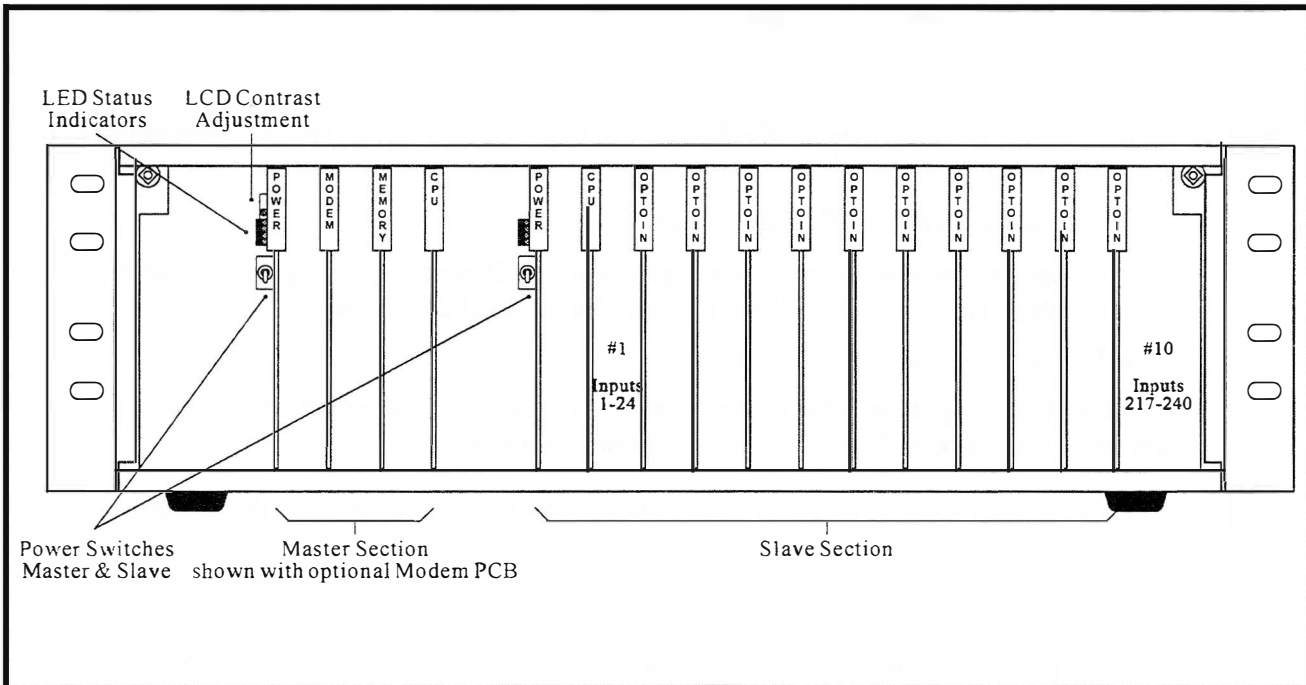


Figure 2  
Model 240M printed circuit board positions

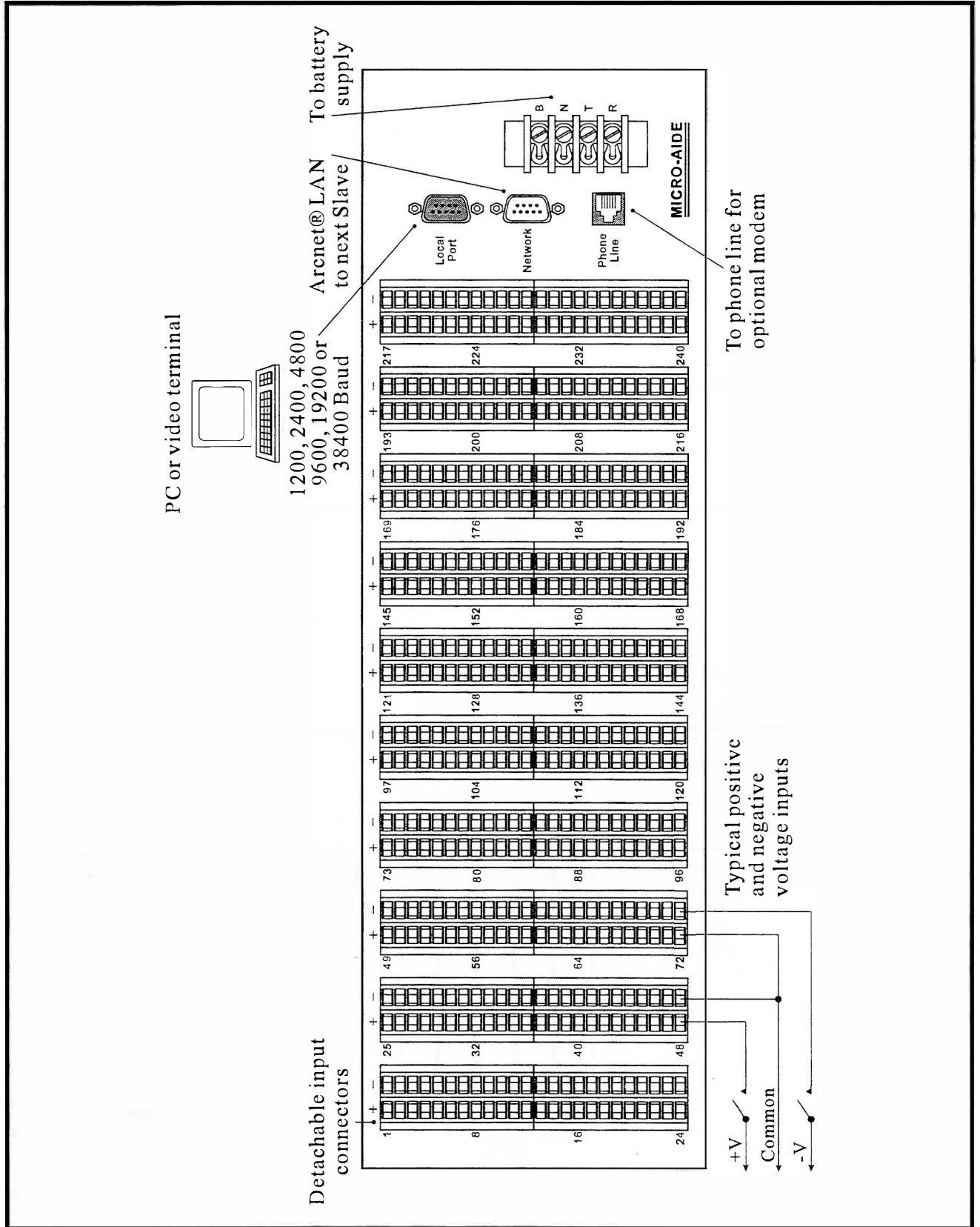


Figure 3  
Model 240M rear panel connections

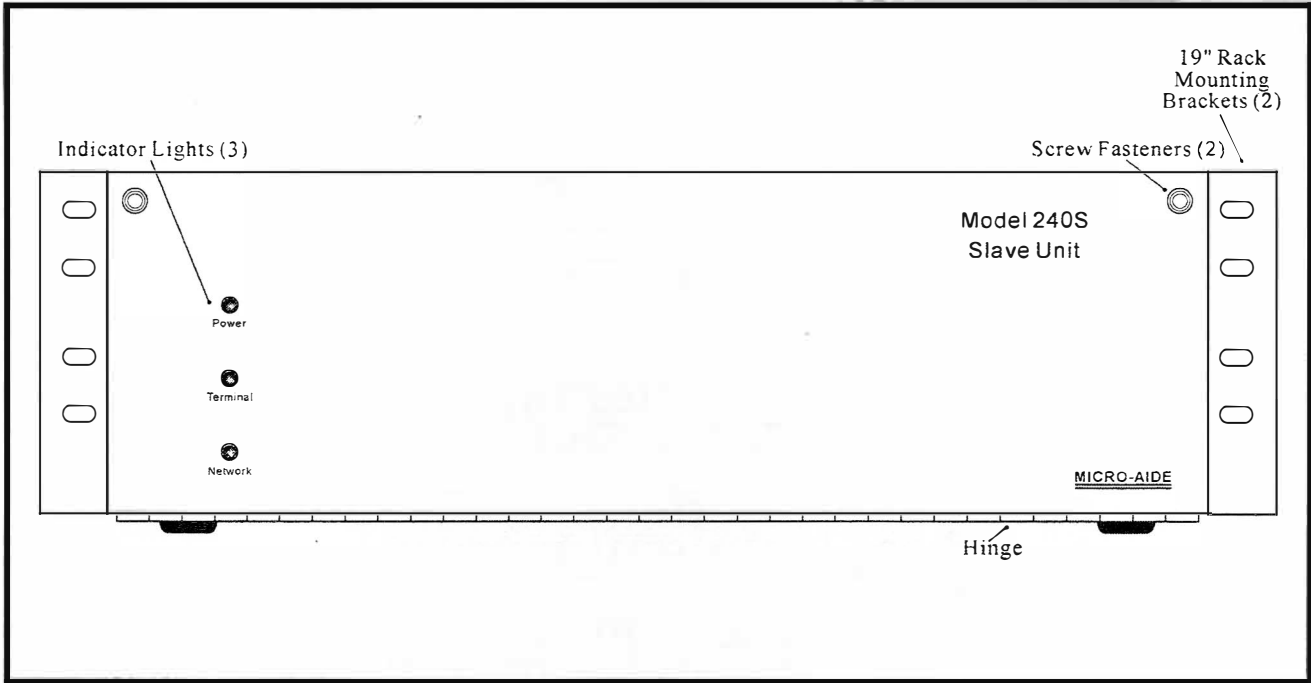


Figure 4  
Model 240S front panel

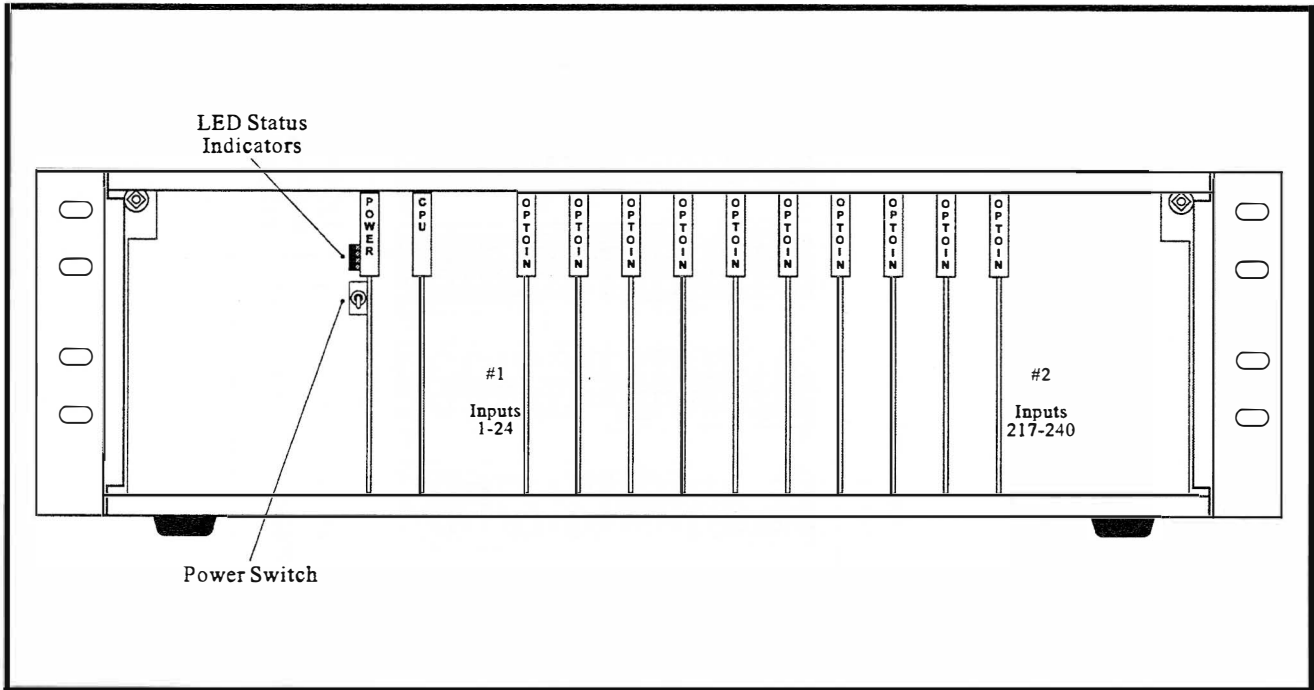


Figure 5  
Model 240S printed circuit board positions

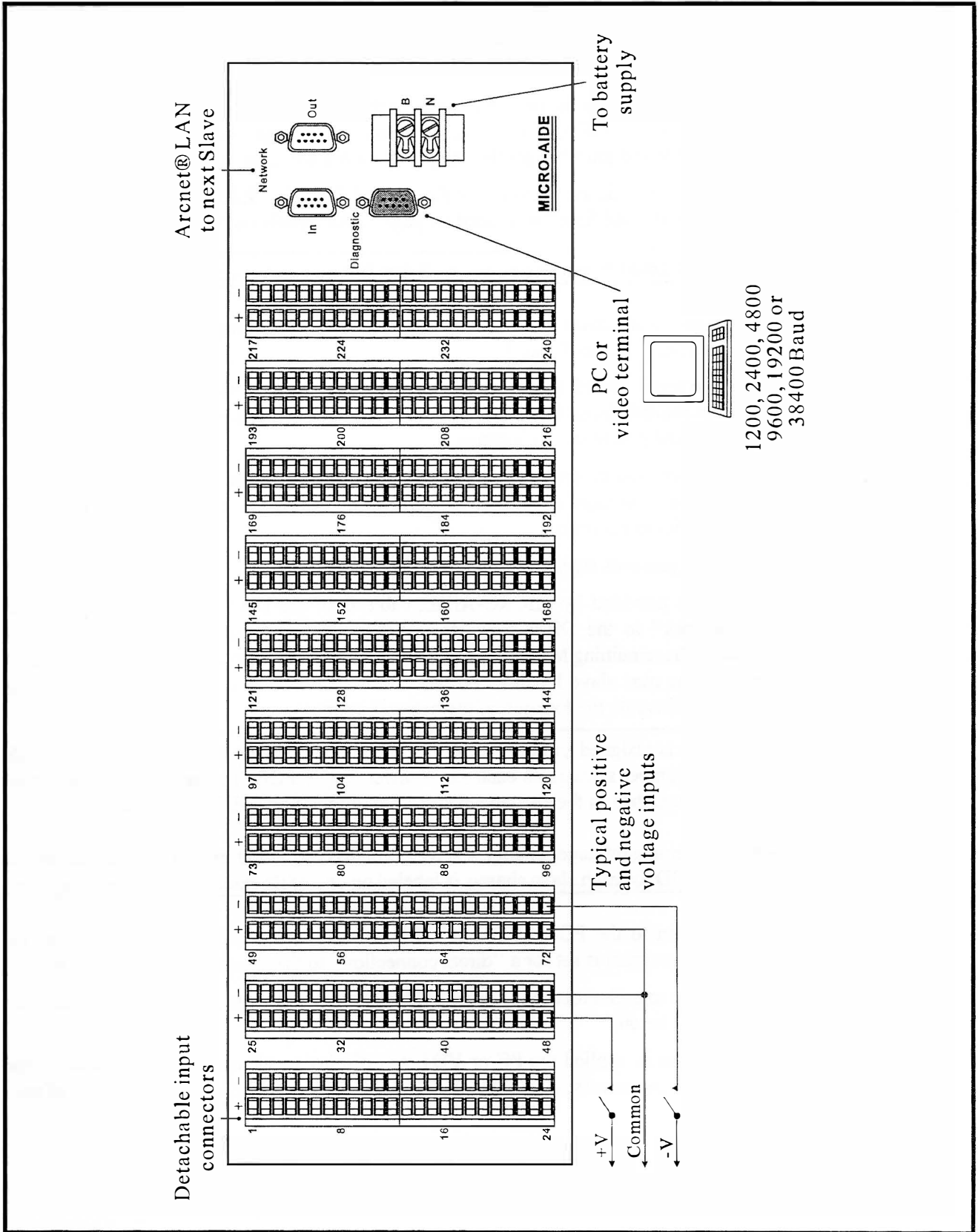


Figure 6  
Model 240S rear panel connections

- Connect the power source ground to the screw terminal at the rear of the unit labeled “N”. Connect the positive voltage of the power source to the screw terminal at the rear of the unit labeled “B”. Refer to Figure 3.
- Connect the PC or VDT to the port at the rear of the unit labeled “Local Port”. Use the cable provided by MICRO-AIDE or a DB-9 to DB-9 “straight-through” (i.e., one-to-one) cable. The Model 240M cable end must be female. Peripheral cables are assembled as shown in Figure 14. The factory default Baud rate setting for the “Local Port” is 19,200. Refer to the procedure entitled “Set Local Baud Rate” described on page 16 for details on changing the Baud rate.



**Note:** the Model 240M/S requires no parity, 8 data bits and 1 stop bit (i.e., N-8-1).

- Open the hinged, front cover of the Model 240S chassis by turning the two screw fasteners counter-clockwise. Refer to Figure 4.
- Ensure that the power switch is in the off or down position. It is located towards the left side of the unit on the printed circuit board (PCB) labeled “POWER”. Refer to Figure 5 for a view of the PCB layout and power switch location.
- Connect the power source ground to the screw terminal at the rear of the unit labeled “N”. Connect the positive voltage of the power source to the screw terminal at the rear of the unit labeled “B”. Refer to Figure 6.
- Repeat the three previous steps for each Model 240S unit.
- Using the cables provided by MICRO-AIDE, cable from the DB-9 connector on the master labeled “Network” to the DB-9 connector labeled “Network In” on the first slave unit. “Daisy-chain” the remaining Model 240S units by cabling from the port labeled “Network Out” to the port on the next slave labeled “Network In”. The last slave will have a single cable. Figures 3 and 6 illustrate the location of the network connectors.



**Note:** each slave is assigned a unique identification number ranging from 1 to 16. The ID code is controlled by jumper settings on each slave power supply PCB. The procedure for selecting the slave ID is described in the section entitled “Setting the Slave ID” on page 69.

**Caution:** the user should never change a slave ID unless requested by MICRO-AIDE service technicians. The ID for each slave chassis is labeled on one of its external sheet metal surfaces.

- Turn the power on to the PC or VDT. If a PC is being used check to make sure that the communications program is set for a “direct connection” to the appropriate COMM PORT.
- Turn the power on to each unit of the Model 240M/S. The LED power indicator located on each front panel should be on.
- Shortly after power is applied the PC or VDT will display a password request similar to the following. The firmware version number (e.g., 3.03) is always specified in the first line of text.



```
Model 240MS Event Recorder. Ver 3.03 (C) 1998 Micro-Aide Inc.
```

```
***** NOT SET *****
```

```
Event storage capacity: 419428
```

```
Enter password:
```

- If the master unit fails to display the password request, recheck the power and peripheral connections and Baud rate and communications settings. If the problem can be isolated to any portion of the Model 240M/S contact MICRO-AIDE customer service for instructions on how to proceed.
- The event storage capacity should not be less than 419,428 events. If additional memory has been installed the storage capacity must be greater than 419,428 events. Contact MICRO-AIDE immediately if the event capacity is not correctly listed.



**Note:** repair and return policies are described on the inside back cover of this manual.

- From the PC or terminal keyboard type "PASSWORD" in **upper-case** letters. This is the default password. Complete the entry by pressing the "ENTER" key.
- The Main Menu, shown below, will be displayed.

```
This is a System Administrative session.
```

```
A Toggle Display Mode
B Browse events by date
C System configuration
D Selective dump of events
E Erase oldest events
F Set Flashing inputs
H Toggle Full/Half duplex
K Set input detect times
L Set location name
M Set modem ring delay
N Set input names
O Set event names
P Print password
Q Query inputs
R Retrieve database by XMODEM
S Print live status of inputs
T Print the current date and time
U Upload/Download setup parameters
V Print incoming events
X Log off system
```

```
Select a command:
```

- Using a short pair of stripped jumper wires place ground and +12 VDC to Input Number 1. As viewed from the rear of the Model 240M chassis, Input Number 1 is located in the upper left-hand corner. Ground should be placed on the terminal to the right and +12 VDC on the left. The voltage **must be held for at least three seconds** before proceeding.

- Using the same procedure as described in the previous paragraph, test Input Number 24. Continue the process of checking the first and last inputs of each connector until the tenth connector is completed.
- Perform a Dump of the Event Records by pressing “D” followed by pressing “ENTER” twice at the PC or VDT keyboard. Refer to the section entitled “Selective Dump of Events” command described on page 39 for details.
- Verify that the Dump includes an Event Record for each input tested. Note any inputs not listed and retest the inputs again, being careful to hold the voltage for at least three seconds. A second Dump should verify the retested inputs.
- Repeat the last four steps for each of the Model 240S units assigned to the system. The first input of a slave unit will be reported as input “241”, “481”, etc.
- Before completing the Initial Check-out procedure verify that the Liquid Crystal Display (LCD) is providing acceptable contrast. If it needs to be improved adjust the potentiometer on the Power Supply PCB located in the master section of the Model 240M chassis. Figure 2 illustrates the location of the contrast adjustment control.

The input circuit check-out procedure can be used at any time to verify proper circuit operation.

This concludes the Initial Check-out procedure. Power can now be removed from the system and the covers closed. Connections to the peripheral device should also be removed.



**Tip:** in the event that a failure occurs during any part of this procedure a series of diagnostic tests should be performed. Refer to the section entitled “Diagnostic Tests” on page 72.

Alternatively, the user may wish to contact MICRO-AIDE customer service. Instructions on how to proceed will be offered. **Material Return** and **Limited Warranty** policies are described on the inside back cover of this manual.

## Installation

Installation of the Model 240M/S is very straightforward. The following sections describe the recommended installation procedure. Figures 3 and 6 illustrate the rear panels of the Model 240M and Model 240S. The figures show the location of all connectors and screw terminals.

### Location

The physical location where the recording system is to be installed should comply with a few simple requirements. Most importantly, the ambient temperature near the system should be in the range of -30°C to +72°C.

### Mounting

Each chassis that comprises the Model 240M/S system should be mounted in a standard 19" equipment rack. Each chassis is equipped with a pair of rack mounting brackets suitable for use with 19" racks.



**Tip:** contact MICRO-AIDE in the event 23" rack mounting brackets are required.

The rack mounting brackets can be secured in either of three positions. The brackets can also be reversed. This allows the front panel of each chassis to be positioned in either of six places.

Once the brackets are positioned properly the various chassis can be mounted into the equipment rack. The Model 240M chassis should be mounted at a height where its LCD can be easily viewed. Each chassis requires 6-1/8" of vertical rack space, assuming the space between units is held to 7/8". The various chassis can be placed together closely since the power consumption of each unit is very low. The amount of heat build-up will be minimal.

Each chassis should be secured in the rack with four, 1/4" long, 10-32 machine screws. Systems using numerous slave units may require a second equipment rack. The second rack should be placed adjacent to the first rack to minimize the total length of network cabling.

## Site Preparation

The equipment location must have access to a stable 10 to 36 VDC power source. A pair of wires should be run from the power source to the location where the recording system will be mounted. One wire should be used for the positive voltage and the other wire should be attached to the return of the power source. The Model 240M/S end of each pair should be crimped to standard No. 6 spade lugs. The power cables should be properly secured to prevent damage. They should not be located adjacent to electrical equipment such as motors that may generate large electrical disturbances.



**Note:** the power source should be rated for a minimum of .5 Amps of current per Model 240M/S unit (i.e., assuming a 12 VDC source).

Wire sizes ranging from 12 to 22 AWG can be used for the input cables. The Model 240M/S end should be stripped approximately 1/4" from the end. The stripped end will be secured by a screw-down connection located at the rear panel of the unit. Each wire should be tagged with its circuit identity. Each input cable or wire bundle should be anchored to prevent damage to the connections at either end.

## Peripheral Equipment

If a PC or VDT is to be co-located with the Model 240M/S an appropriate AC power source must be available. The RS-232 cable from the peripheral device to the Model 240M should be kept to a minimum distance, preferably less than 20 feet.

MICRO-AIDE provides, as a standard feature, an RS-232 DB-9 to DB-9 cable. This cable is suitable for use with most PCs. In the event a DB-9 to DB-25 cable is needed either contact MICRO-AIDE or purchase a DB-9 to DB-25 converter at any computer supply store.

If the Model 240M is equipped with the optional internal modem a standard telephone line must be attached to the unit. The telephone line can be terminated with an RJ-11 connector like those commonly used in residential telephone service. Test the telephone line first to ensure that a dial tone is available.

## Cabling

Several cables must be attached to the recording system. Follow the steps listed below to complete the cabling procedure.

### Power

The power source to the Model 240M/S system should be connected as follows.

- Open the front cover of each chassis by turning the front cover screw fasteners counter-clockwise. Ensure that the power switch is in the off or down position.
- The two conductors connected to the power source should be secured to the screw-down terminals labeled “B” and “N”, respectively.
- Connect AC power to the PC or VDT.

### Local Area Network

The Model 240M master unit must be able to constantly communicate with each Model 240S slave unit. An Arcnet® based local area network (LAN) is used by the Model 240M/S system to provide the required communications path. Each unit is interconnected using a “daisy-chain” approach. All of the LAN cables are included with each shipment. The cabling procedure is described in the following section.

- Attach the first cable to the female, DB-9 connector labeled “Network” at the rear of the Model 240M chassis. Connect the other end of the cable to the female, DB-9 connector labeled “Network In” at the rear of the first slave chassis.
- Attach the second cable to the female, DB-9 connector labeled “Network Out” at the rear of the first slave chassis. Connect the other end of the cable to the female, DB-9 connector labeled “Network In” at the rear of the second slave chassis.
- Repeat the previous step until the LAN extends to the last slave chassis. The last slave will have a single cable.
- Each LAN cable should be properly secured to prevent accidental damage or disconnection.

### Peripherals

Peripheral devices include PCs, VDTs and the optional telephone line. Follow the steps listed below to connect peripheral devices to the Model 240M/S system.

- Attach the RS-232 cable to the PC or VDT and to the DB-9, male connector labeled “Local Port” at the rear of the Model 240M chassis. Refer to the procedure on page 16 entitled “Set Local Baud Rate” if the Baud rate for the Local Port needs to be changed.
- Connect the optional telephone line to the RJ-11 connector at the rear of the Model 240M chassis.

## Input Circuits

Events can only be recorded if the input circuits are wired properly. The polarity of each circuit must be correctly identified and appropriately wired to the input connectors.

Input circuits are wired to twelve-position, quick-disconnect terminals. Individual pairs are wired to adjacent sides of two different terminals. The positive lead of the circuit to be monitored must be connected to the left side terminal labeled “+”. The common, or return, lead must be connected to the right side terminal labeled “-”.

Wiring input circuits is made simpler if the female connectors are first removed from the male connectors secured to the chassis. Using a small, flat-head screwdriver simply insert the wire end into the terminal strip and secure the wire by tightening the screw at the side. Repeat this process for the remaining eleven positions. Reattach the connector to the male connector. Wire the remaining positive and common leads in the same manner. Care should be taken to ensure that positive and common leads are attached to the correct terminal position as well as the correct male connector.



**Tip:** if many of the input connections are made to a common point (e.g., negative battery) a multi-position terminal strip can be used to simplify the wiring. A ten-position Jumper Comb (part number 147250) from Weidmüller may be used.

Both positive and negative voltage events can be monitored, even if they occur from the same circuit (e.g., a polarity changing searchlight coil). In such cases the circuit is wired to two inputs of the Model 240M/S, one for each polarity.

The user may wish to verify the proper operation of each input. The Initial Check-out procedure starting on page 3 can be used to identify any faulty inputs.

## Applying Power

After all of the cabling is completed the power can be applied. Shortly after power is turned on the PC or VDT will display the password request. Page 9 contains an example of the password message. The front panel LCD will indicate the time and date as depicted in Figure 1.

This completes the installation procedure. The Setup Procedure can now be started.

## Setup Procedure

Before the Model 240M/S can be used the system must be set up in such a way as to reflect the operation required by the user. The following steps should be performed in the sequence listed. It is assumed that the user is accessing the system via a PC or VDT. Succeeding chapters describe how to use the front panel display and keypad, as well as how to access the system via the optional internal modem. It is further assumed that the user has not as yet altered any factory default settings and that the PC or VDT is connected to the Local Port of the Model 240M.



**Note:** the Local Port default Baud rate is 19,200 with no parity, eight data bits and one stop bit (i.e., N-8-1).

The first step in the Setup Procedure is to access the Main Menu of commands. Before the user is granted access to these commands the correct password must be entered. A typical password challenge message is shown on page 9. The factory default password is "PASSWORD" in upper-case letters. The entry must be terminated by pressing the "ENTER" key. The Main Menu will be displayed immediately after the correct password has been entered. An example of the Main Menu is shown on page 9.



**Note:** the factory default password is "PASSWORD". All assigned passwords are case sensitive.

## Main Menu (?)

### Commands

The remainder of the Setup Procedure concerns the use of commands that define operational parameters for the system. Each command is listed in the Main Menu. The commands consist of a single character (e.g., "A" and "T"). The commands are immediate acting in that when a key is pressed a response is initiated. The "ENTER" key does not need to be pressed. A few cases notwithstanding, both upper- and lower-case letters may be used. To review the list of Main Menu commands type "?".

In the descriptions that follow, each command is listed by name. The command letter is shown in parenthesis. The sequence of commands represents the recommended order of execution. Some of the Main Menu commands have additional sub-menu commands.

### Data Flow Control

Several of the setup and operational commands can generate considerable amounts of data. If the user wishes to observe this data on the screen of a PC or VDT it may be helpful to pause the data being sent by the recording system. The Pause and Resume commands may be used to provide the required data flow control.

To Pause the data being sent press the "CTRL" and "S" keys **simultaneously**. The data flow will be stopped indefinitely. To Resume data flow press the "CTRL" and "Q" keys **simultaneously**. This technique can be used to "freeze" the data at the PC or VDT as well as prevent buffer overflow at the printer. Pausing the data flow to the printer will allow the printer to empty its data buffer and thus "catch-up" with the data being sent. If the user experiences missing data or data gaps at the printer it is very likely caused by an overflowing of the printer's data buffer.

Another useful command is the Abort command. At any time during a long data printout the remainder of the data can be ignored or "Aborted" by pressing the Escape key, commonly labeled "ESC". The user can issue other commands immediately after the Abort is executed rather than wait until the long data Dump or other report is completed.

## System Configuration (C)

Before proceeding with the Setup Procedure the user may wish to verify that the Model 240M/S is configured properly with the correct number of slave chassis and inputs per slave. The System Configuration command can be used to verify several system settings.

Selecting the System Configuration command will display the following request.

```
S Set number of slaves
C Set input cards/slave
B Set local baud rate
R Reset system to factory defaults
X Exit
```

Select Command:

The use of each sub-command is described in the following sections.

## Set Number of Slaves (S)

The Model 240M/S system is shipped from the factory configured for the correct number of slave units. This number can be verified or altered by using the Set Number of Slaves command. A message similar to the following will be displayed as a response to selecting this command.

```
Number of slaves is 12
New number of slaves (ESC to quit)
```

The number of currently assigned slave units is listed in the first line of text. Should the user ever decide to expand the system by introducing additional slave units this parameter will need to be adjusted in accordance with the new requirements. Press the "ESC" key if the parameter does not require changing.

## Set Input Cards/Slave (C)

The Model 240M/S system allows a variable number of inputs to be monitored per slave chassis. Each slave can be configured with a complement of from one to ten input PCBs (i.e., 24 to 240 inputs in increments of 24). This command allows the number to be set individually for each slave chassis.



**Note:** Model 240M/S units are normally configured to monitor 240 inputs (i.e., equipped with ten input PCBs).

The response to the Set Input Cards/Slave command is listed below.

```
ESC to quit, enter to leave unchanged
Number of cards in slave 1 is 10, new number:
```

To exit the command at any time press “ESC”. To leave the setting unchanged and advance to the next slave press “ENTER”. To alter the setting enter a number from one to ten and then press “ENTER”.

## Set Local Baud Rate (B)

The Baud rate for the Model 240M’s Local Port can be assigned one of six values. The following message will be displayed in response to selecting this command.

```
Current local port baud rate is 19200
Select new baud rate, ESC to quit
0=1200 3=9600
1=2400 4=19200
2=4800 5=38400
```

To leave the Baud rate unchanged press the “ESC” key. Entering a number in the range from zero to five will change the baud rate in accordance with the list that is displayed. The “ENTER” key must be pressed to complete the command. The Baud rate for the PC or VDT must also be changed immediately to the new setting.

## Reset System to Factory Defaults (R)

After the correct system configuration has been established it is advisable to perform a Reset System command. The Reset System command performs an internal diagnostic of the Model 240 M/S. System memory is tested and for the most part it is cleared.



**Caution:** the Reset System command will permanently erase **all** Event Record data. Except as noted in Table 1 the setup database will be restored to its factory default settings.

The following precautionary message will be displayed after selecting the Reset System command.

```
About to perform a very DESTRUCTIVE system test.
Event database and programmable settings will be destroyed.
```

```
Are you sure you want to proceed (Y/N) ?
```

- To abort the Reset System command press “N”. To proceed with the reset type an **upper-case** “Y”. If yes is selected the system will immediately proceed with the reset. After a brief delay required to reinitialize the system the normal password request will be issued. Page 9 lists a typical password request message.



List of Default Values Assigned after Reset System Command	
Parameter	Default Value
Baud Rate, Local Port	19,200
Detection Times	3.0 seconds
Display Mode	Full Screen - TVI 910
Duplex, Local Port	Full
Event Name Pairs	On/Off (all inputs)
Flashing Inputs	Disabled
Input Names	Inp #1, Inp #2, etc.
Location Name	***** NOT SET *****
Number of PCBs per Slave	unchanged
Number of Slaves	unchanged
Passcode	12345678
Password, Administrative	PASSWORD
Password, Restricted	LOOKWORD
Ring Delay	2

Table 1  
Default settings

- The third line of text in the password request message lists the amount of event storage capacity. The event storage capacity should not be less than 419,428 events. If additional memory has been installed the capacity must be greater than 419,428 events. Contact MICRO-AIDE immediately if the event storage capacity is not correctly listed.

### Exit (X)

To exit the System Configuration sub-menu and return to the Main Menu press “X”.

### Toggle Full/Half Duplex (H)

Depending upon the nature of the peripheral device being used it may be necessary to have the Model 240M/S “echo” back to the device characters entered by the user. Echoing ensures that the key pressed by the user will appear at the PC or VDT. Additionally, if the peripheral is displaying double characters the recording system’s duplex setting must be changed.

To toggle between “Half” and “Full” duplex operation simply press the “H” key. The system will issue either of the following confirmation messages.

```
Duplex mode is HALF
Duplex mode is FULL
```



**Tip:** generally, the correct setting is to have the PC, VDT and system set to full duplex.

## Print the Current Date and Time (T)

All Event Records are time stamped to the nearest tenth of a second. Consequently, the date and time must be set correctly. To set the date and time press “T”. The system will respond with a message similar to the following.

```
The current time and date is 13:45:09 04-06-2000
Do you wish to change it (Y/N) ?
```

Type “N” if the date and time are both correct. Type “Y” if either setting needs to be changed.



**Note:** it is imperative that the user follow the syntax as specified by the displayed messages. A “-” must be entered between date fields. A “:” must be entered between time fields. The number of seconds must be entered. Leading zeros are not required.

The system will respond to the “Y” entry as follows.

```
Enter current date (MM-DD-YY) :
```

If the date is entered correctly the system will request that the time be entered. The last digit in the date (and time) entry is followed by “ENTER”. The following message will be issued.

```
Enter current time in military format (HH:MM:SS) :
```

The Model 240M/S uses a 24-hour, “military-style” clock. As an example, 4:00p.m. must be entered as 16:00:00. An incorrect date or time entry will result in an error message being issued.



**Note:** the real time clock and calendar in the Model 240M/S is fully Y2K compliant. It is recommended that the clock be set by the user **at least once a week**.

## Set Location Name (L)

After the date and time are set the system’s Location Name should be entered. The Location Name serves as a comprehensive ID. The name is included in several header fields. Data from various recording systems can be easily distinguished by providing each system with a unique name. To set or change the Location Name press “L”. The following message will be displayed.

```
Unit name:
***** NOT SET *****

Would you like to change the location name (Y/N)?
```

In the above example the Location Name has not been set. Type “N” if the name is correct, type “Y” to change the name. The response to “Y” is described in the following.

Please enter location name of up to 80 characters

As many as eighty upper- and lower-case letters, numbers and symbols may be entered.

## Set Input Names (N)

The Model 240M/S allows the user to assign names to circuits that are being monitored. This allows the user to easily differentiate events from several circuits. As many as twenty characters may be used to provide descriptive identities. As a convenience to the user default Input Names are assigned to each input. This allows the user to save time and bypass the Set Input Names procedure. Shown below are examples of the default name assignments.

Type "N" to either view or change the Input Names. The following message will be issued.

```
P Print input names
S Set input names
X Exit
```

Select Command:

The user may select any one of three Input Name commands. Each command is described separately in the following paragraphs.

## Print Input Names (P)

Type "P" to print a list of the assigned Input Names. In the example below, only the first few lines at the top of the list are shown. The example names are the factory default names. Each input from every slave will normally be listed in the two columns shown.

Current Input Names			
INPUT	NAME	INPUT	NAME
1	Inp #1	2	Inp #2
3	Inp #3	4	Inp #4
5	Inp #5	6	Inp #6
7	Inp #7	8	Inp #8

## Set Input Names (S)

In the event the default or previously assigned Input Names need to be changed, type "S". The following message will be displayed.

```
Name of input #1 is: Inp #1
New name (enter to skip, ESC to end or jump to another input.)
```

The first line of text always specifies the currently assigned Input Name. The user can enter the name to be assigned to Input Number 1 or press "ENTER" to leave the input unchanged and simply skip to the next input (e.g., Input Number 2). Pressing "ESC" allows the user to jump to an input out of sequence. In the example that follows Input Number 1 has been assigned a new name, "Xflash A-1". Input Number 2 has been skipped. Input Number 3 has been given a new name, "Xflash A-2".

```
Name of input #1 is: Inp #1
New name (enter to skip, ESC to end or jump to another input.)
Xflash A-1
Name of input #2 is: Inp #2
New name (enter to skip, ESC to end or jump to another input.)

Press ESC to quit or enter an input number to jump to.
3
Name of input #3 is: Inp #3
New name (enter to skip, ESC to end or jump to another input.)
Xflash A-2
Name of input #4 is: Inp #4
New name (enter to skip, ESC to end or jump to another input.)
```

In the above example the user-entered data is shown in bold type face. As a time-saving convenience to the user the Model 240M/S automatically advances to the next sequential input after a name is entered. Pressing the "ESC" key a second time will return the user to the Set Input Names sub-menu.

## Exit (X)

To exit the Set Input Names sub-menu and return to the Main Menu type "X".

## Set Event Names (O)

Input circuits that change state will create Event Records in memory. The current state of an input circuit can be generally thought of as either on or off or perhaps high or low. The Model 240M/S allows the user to define a family of names to be used to indicate various changes in state. Each member of the family is part of an Event Name Pair. As many as twelve Event Name Pairs can be defined. Each pair contains two user-defined Event Names to indicate the active and idle, high and low state of an input circuit. Each Name is limited to eight characters.

Examples of valid Event Name Pairs include: "On / Off", "High / Low", "Forward / Reverse", "Lite On / Lite Off" and "Gate Up / Gate Dwn". Any Event Name Pair can be assigned to any Input Number. This makes interpretation of Event Records less ambiguous and consequently more accurate. The same Event Name Pair can be assigned to multiple inputs.

To review, assign or create Event Names press "O". The following sub-menu of commands will be displayed. Each of the commands in the sub-menu are described in the sections that follow.

```

P Print event names for all inputs
A Assign event names to all inputs
I Assign event names to individual inputs
D Display event names
S Set event names
X Exit

```

Select Command:

### Print Event Names for All Inputs (P)

Press "P" to display the assigned Event Name Pair for each input of the system. A partial example of the default settings is shown below

Input Event Name Assignments					
INPUT	PAIR #	EVENT NAME	INPUT	PAIR #	EVENT NAME
1	1	On/Off	2	1	On/Off
3	1	On/Off	4	1	On/Off
5	1	On/Off	6	1	On/Off
7	1	On/Off	8	1	On/Off

### Assign Event Names to All Inputs (A)

This command is used to assign a single Event Name Pair to every input in the system. The Event Name Pair to be assigned must have been previously defined.

Press "A" to assign a common Event Name Pair to all inputs. A table similar to the following will be displayed.

Event Name Table					
PAIR #	EVENT NAME	PAIR #	EVENT NAME	PAIR #	EVENT NAME
1	Active/Inactive	5	On/Off	9	On/Off
2	Up/Down	6	On/Off	10	On/Off
3	Lite On/Lite Off	7	On/Off	11	On/Off
4	Forward/Reverse	8	On/Off	12	On/Off

Select an event name pair number from the table above:

Each Event Name Pair is identified by a number (i.e., 1 to 12). In the example cited above entries 1, 2, 3 and 4 have been set to non-default values. If the user types "4" followed by "ENTER" each input will be assigned the Event Name Pair "Forward / Reverse".

### Assign Event Names to Individual Inputs (I)

Each input can be assigned one of twelve possible Event Name Pairs. To assign a specific Event Name Pair to a particular input type "I". A table of names and a request similar to the following will be displayed.

Event Name Table					
PAIR #	EVENT NAME	PAIR #	EVENT NAME	PAIR #	EVENT NAME
1	Active/Inactive	5	On/Off	9	On/Off
2	Up/Down	6	On/Off	10	On/Off
3	Lite On/Lite Off	7	On/Off	11	On/Off
4	Forward/Reverse	8	On/Off	12	On/Off

Event name for input #1 is 1 (Active/Inactive)  
 New event name pair (enter to skip, ESC to jump to another input or end.)

The first line of text after the table always specifies the currently assigned Event Name Pair. The user can select a different Event Name Pair for Input Number 1 by entering a number from 1 to 12. Simply pressing "ENTER" will skip the current input, leave the assigned Event Name Pair unchanged and advance the user to the next consecutive input (e.g., Input Number 2). Pressing "ESC" allows the user to jump to an input out of sequence. Pressing "ESC" a second time allows the user to terminate the command.

After an assignment is made the Model 240M/S will automatically prompt the user for an assignment for the next sequential input.

### Display Event Names (D)

All twelve Event Name Pairs can be displayed at any time by pressing "D" and thereby selecting the Display Event Names command.

### Set Event Names (S)

Creating a set of descriptive Event Names can add significant clarity to Event Records. Type "S" to define a new set of Event Names. A message similar to the following will be displayed.

Active event name #1 is: On New name (enter to skip, ESC to jump to another entry or end.)
---

The first Event Name (of the selected pair) to be entered is always referred to as the active Event Name. The active Event Name refers to the event that occurs when sufficient voltage is applied to the input. The inactive Event Name refers to the event created when that voltage is removed from the input.

The first line of text in the message always specifies the currently assigned active Event Name for pair number 1. The active Event Name can be assigned any combination of eight characters. The user will be automatically advanced to the inactive Event Name

which is a member of the same Event Name Pair. The user can always advance directly to the inactive Event Name or active Event Name in the next Event Name Pair by simply pressing "ENTER". Doing so leaves the currently selected Event Name unchanged.

Pressing "ESC" allows the user to jump to an Event Name Pair that is out of sequence. The following message will be displayed.

```
Press ESC to quit or enter an event name pair to jump to.
```

As the message indicates pressing "ESC" a second time allows the user to terminate the command.

### Exit (X)

To exit the Set Event Names sub-menu and return to the Main Menu type "X".

## Set Input Detect Times (K)

This command allows the user to inspect and program Detection Times associated with each input assigned to the system. Detection Times are used by the Model 240M/S to qualify input signals as valid events. When a change in the state of an input occurs the system will track the duration of the new state. If the new state persists longer than the Detection Time applicable to that input an event is declared and recorded in memory. The change in state is ignored if the duration fails to meet the criterion established by the Detection Time. This process prevents the system from recording false events that would otherwise be caused by transient voltages or noise.

As a convenience to the user the Model 240M/S is preprogrammed to provide a **default Detection Time setting of 3.0 seconds**. This value will be quite satisfactory in most applications.



**Note:** the Detection Time setting for inputs assigned as Flashing requires additional explanation. Please refer to the section entitled "Set Flashing Inputs" on page 25 for details.

Press "K" to select the Set Input Detect Times command. The following sub-menu will be displayed.

```
P Print input signal detect times
A Set all input signal detect times
I Set individual input signal detect times
X Exit
```

Select Command:

Each of the commands listed in the above are described in the following paragraphs.

### Print Input Signal Detect Times (P)

Type "P" to print a list of the Detection Times. In the example below only the first few lines at the top of the list are shown. Normally, each input from every slave will be listed. The Detection Times shown are each set to the default value of 3.0 seconds.

Current Input Signal Durations					
INPUT	NAME	THRESHOLD	INPUT	NAME	THRESHOLD
1	Inp #1	3.0 Sec.	2	Inp #2	3.0 Sec.
3	Inp #3	3.0 Sec.	4	Inp #4	3.0 Sec.
5	Inp #5	3.0 Sec.	6	Inp #6	3.0 Sec.
7	Inp #7	3.0 Sec.	8	Inp #8	3.0 Sec.

### Set All Input Signal Detect Times (A)

In the event that the Detection Time for every input needs to be set to a common value different from the default or previously assigned value, type "A". The following message will be displayed.

```
Input signal durations are in units of 0.1 Seconds,
i.e. 01 for 0.1 sec. or 15000 for 1500.0 seconds.
Only values between 1 and 15000 will be accepted.

Please enter a signal detect time
```

The user must enter a value in the range from 1 to 15,000 followed by the "ENTER" key. Leading zeros are not required. The value entered is interpreted as a multiple of .1 seconds (100 msec.). Accordingly, a setting of 25 corresponds to a Detection Time of 2.5 seconds.



**Tip:** a setting of 0 is permitted. Setting the Detection Time to 0 disables event recording from the input(s) so assigned.

### Set Individual Input Signal Detect Times (I)

Typing an "I" allows the user to set the Detection Time for a specific input. This command can be very useful in detecting events from inputs that have unique timing characteristics. In response to the "I" the following message is displayed.

```
Input signal durations are in units of 0.1 Seconds,
i.e. 01 for 0.1 sec. or 15000 for 1500.0 seconds.
Only values between 1 and 15000 will be accepted.

Detect time for input #1 is: 1500.0
New detect time (enter to skip, ESC to end or jump to another input.)
```

In the following example contiguous and non-contiguous inputs have been assigned.



```
Input signal durations are in units of 0.1 Seconds,  
i.e. 01 for 0.1 sec. or 15000 for 1500.0 seconds.  
Only values between 1 and 15000 will be accepted.
```

```
Detect time for input #1 is: 1500.0  
New detect time (enter to skip, ESC to end or jump to another input.)
```

```
25
```

```
Detect time for input #2 is: 1500.0  
New detect time (enter to skip, ESC to end or jump to another input.)
```

```
35
```

```
Detect time for input #3 is: 1500.0  
New detect time (enter to skip, ESC to end or jump to another input.)
```

```
0
```

```
Detect time for input #4 is: 1500.0  
New detect time (enter to skip, ESC to end or jump to another input.)
```

```
Press ESC to quit or enter an input number to jump to.
```

```
10
```

```
Detect time for input #10 is: 1500.0  
New detect time (enter to skip, ESC to end or jump to another input.)
```

```
30
```

```
Detect time for input #11 is: 1500.0  
New detect time (enter to skip, ESC to end or jump to another input.)
```

```
Press ESC to quit or enter an input number to jump to.
```

The currently assigned Detection Time is always listed in the first line of text applicable to the selected input. For the sample data listed Input Number 1 is set to 2.5 seconds. Input Number 2 is set to 3.5 seconds. Input Number 3 has been disabled (note the "0" entry). The user then jumped to input 10 by typing an "ESC" character followed by the value 10. Input 10 has been set to 3.0 seconds. The command was then terminated by typing two consecutive "ESC" characters. The user-entered data in the above example is shown in bold type face. The "ESC" characters do not appear since they are non-printing characters. At the completion of the Set Individual Input Signal Detect Times command the sub-menu is displayed.

## Exit (X)

To exit the Set Input Detect Times sub-menu and return to the Main Menu type "X".

## Set Flashing Inputs (F)

The Model 240M/S can log flashing events. A typical flashing event occurs with a flashing light circuit. Each time the light flashes a new voltage pulse is seen at the input. However, the recording system should log only the start and end events, not an event for each pulse. Assigning the proper Detection Time to the input and identifying the input as a Flashing Input solves the problem of unwanted multiple flash events. Figure 7 illustrates the algorithm used to detect flashing events.

The Detection Time must be set to the nominal duration of the expected pulses. The pulses are also expected to be "on" and "off" for the same duration (i.e., symmetrical). The Model 240M/S is designed to allow for some variation in the duration of each pulse. As noted by Figure 7, each "on" and "off" pulse must have a duration that is 75% to 125% of the assigned Detection Time.

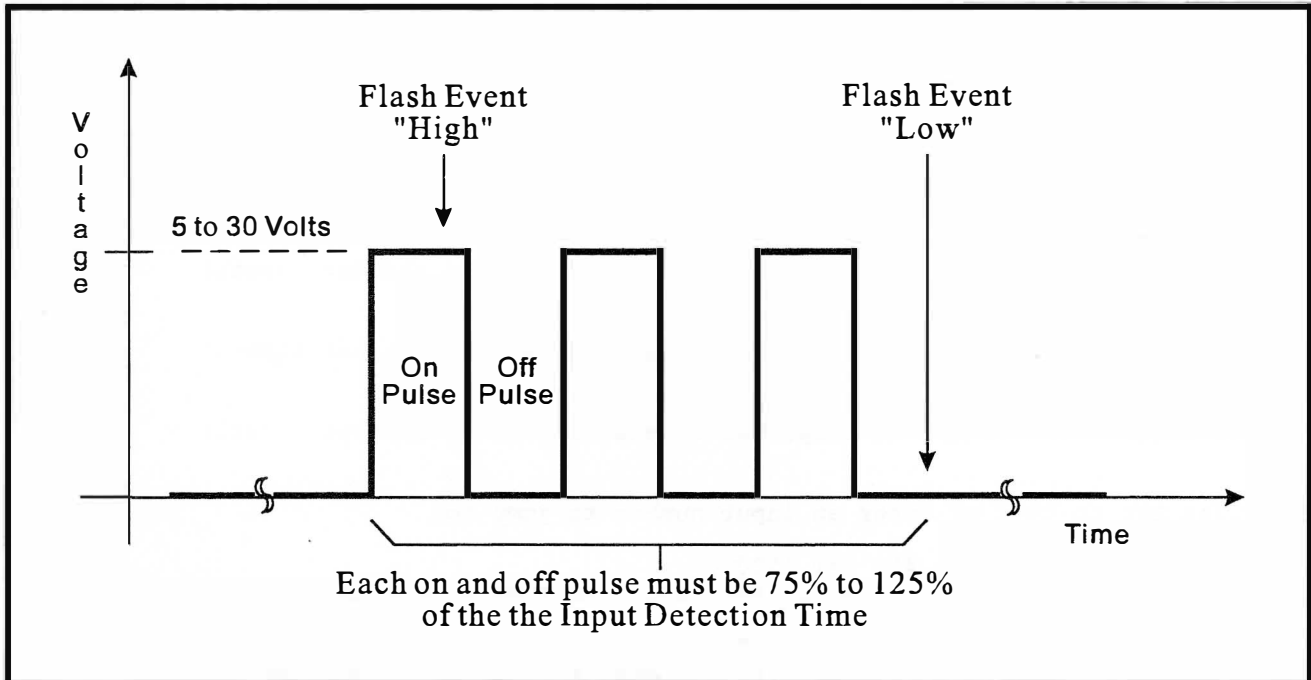


Figure 7  
Typical sequence of flashing pulses



**Tip:** use the following formula to determine the correct Detection Time for inputs that have **non-varying** flash rates.

The Detection Time in seconds must equal **30 divided by the number of flashes per minute.**

To set Flashing Inputs type "F". The following sub-menu of choices will be displayed. Each command is described in the following paragraphs.

```

C Clear all flashing inputs
P Print flashing inputs
I Set individual flashing inputs
X Exit

Select Command:
    
```

### Clear All Flashing Inputs (C)

Pressing "C" will return each input, previously assigned as flashing, to non-flashing status. The clear command acts immediately. After the command is executed the sub-menu is once again displayed.

### Print Flashing Inputs (P)

The user can display a list that specifies the flashing status of each input. Type "P" to list the Flashing Inputs. A partial printout is shown below.

Current Flashing Inputs					
INPUT	FLASHING	INPUT	FLASHING	INPUT	FLASHING
1	ENABLE	2	DISABLE	3	ENABLE
4	DISABLE	5	DISABLE	6	DISABLE
7	ENABLE	8	DISABLE	9	DISABLE
10	ENABLE	11	ENABLE	12	DISABLE

## Set Individual Flashing Inputs (I)

To assign Flashing Inputs press "S". The following message will be issued.

Respond with a Y to enable or an N to disable flashing inputs.  
Or press the ESC key to jump to another input.

Enable flashing input #1 (Y/N) ?

If the user types "N" or simply "ENTER" the input will be assigned as non-flashing. Typing "Y" assigns the input as flashing. In either case the system advances to the next consecutive input, prompting the user with a similar message.

The user can jump to another input out of the normal sequence by pressing the "ESC" key. The user is then requested to enter a new Input Number. The process of assigning Flashing Inputs continues as described in the above. Pressing "ESC" twice, consecutively, will return the user to the sub-menu.

## Exit (X)

To exit the Set Flashing Inputs sub-menu and return to the Main Menu type "X".

## Print Password (P)

The password feature embodies three distinct levels of protection against unwanted system intrusions. Access via the Local Port and the optional modem is permitted only after a proper password is entered. Two types of access are permitted via the Local Port and modem port. The first is referred to as Administrative Access, the second is referred to as Restricted Access. Administrative Access allows the user to select all of the commands that the system utilizes. Restricted Access allows the user to select only those commands that permit Event Record and setup database viewing. Under Restricted Access the user cannot change any settings employed by the system.

The third level of password protection involves the use of the Passcode feature. The Passcode protects the setup database from unwanted changes via the front panel. Pressing the front panel "SETUP" key forces the user to enter the proper Passcode.



**Note:** the factory default settings for the Administrative, Restricted and Passcode passwords are "PASSWORD", "LOOKWORD" and "12345678", respectively. Passwords are case sensitive. Upper- and lower-case letters must be entered correctly.

In a Restricted Access session the Main Menu will list the following abbreviated set of commands. Although several "Set" commands are listed only their "Print" options are accessible in a Restricted Access session.

```
This is a Restricted session.
```

```
B  Browse events by date
D  Selective dump of events
F  Set Flashing inputs
K  Set input detect times
N  Set input names
O  Set event names
Q  Query inputs
R  Retrieve database by XMODEM
S  Print live status of inputs
V  Print incoming events
X  Log off system
```

```
Select a command:
```

A message similar to the following will be displayed after selecting the Print Password command.

```
Administrative password: PASSWORD
Restricted password: LOOKWORD
Keypad Passcode: 12345678
```

```
Which password would you like to change,
Administrative/Restricted/Passcode/None (A/R/P/N)?
```

Entering an "A" or an "R" will issue the following request.

```
Enter new password (up to 10 characters):
```

If a "P" is entered the following Passcode request is displayed.

```
Enter new keypad passcode (up to 8 digits):
```

Any combination of characters not exceeding ten total may be used for the Administrative or Restricted Access passwords. The Passcode is limited to eight numbers (i.e., non-numeric characters are not accepted). Corrections are made by backspacing over characters. Before a password or Passcode is accepted it must be re-entered exactly as it was originally keyed.

If the user wishes to disable the password protection a "null" password should be defined. To set a "null" password or Passcode press the "ENTER" key in response to the request for a new password. Confirm the password or Passcode with a second "ENTER". Once the "null" password is accepted each user session can be initiated by simply pressing the "ENTER" key in response to the request for password or Passcode.

## Upload/Download Setup Parameters (U)

A Model 240M/S will require a considerable amount of data entry if every input is to be assigned an Input Name, Detection Time, etc. that differs from the default values. In the event of an accidental erasure of the setup database (e.g., Reset System command performed by mistake) each Input Name and Detection Time will have to be re-entered. The upload and download commands provide the user with a quick and simple data exchange alternative to re-entering the setup database by hand.

The Download Setup Data sub-menu command is used to transmit the setup database to a data storage system. A PC running Procomm for Windows® or HyperTerminal makes an ideal storage system. A file containing all of the setup parameters can be permanently saved on the hard disk or a diskette for later retrieval via the Upload Setup Data sub-menu command.

To initiate a download or upload of the setup database press “U”. The following sub-menu will be displayed.

```
U Upload setup data (from PC)
D Download setup data (to PC)
X Exit

Select Command:
```

## Saving the Setup Database (D)

Before the setup database can be saved the PC and communications program must be properly configured. The following list describes the correct configuration.

- **Transfer protocol:** “XMODEM”



**Note:** the failure to select the proper transfer protocol (i.e., XMODEM) is the most common mistake made in this procedure.

- **Connection:** If the system’s Local Port is being used, select “Direct connect - Com1” or “Direct connect - Com2” (whichever is available). If the modem is being used the host modem must be logged-on with the Model 240M/S.
- **Baud rate:** as required by the Local Port port, set to N-8-1.

To save the setup database to a PC file the Download sub-menu command is used. Pressing “D” will display the following message.

```
Sending setup data by XMODEM... (Ctrl-X to stop)
```

The steps necessary to complete the download depend upon which communications application is being used. The following sections describe the Procomm for Windows and HyperTerminal methods, respectively. Procomm Plus 32 and Windows 98 were used in the following procedures. Later versions of these programs may be slightly different. However, the fundamental approaches will remain valid.

### Procomm for Windows

- With the mouse, click once on the “Receive File” icon near the top center of the Procomm window. The icon appears as a downward pointing arrow. The Procomm for Windows “Receive File using Xmodem” dialog box will open.
- Select the proper disk drive and folder. Enter a file name (e.g., “setup\_10.xmd”). If the various settings are correct click on the “Save” button.
- An information box labeled “Xmodem” will appear. It will indicate the progress of the transfer. After a brief delay (depending upon the Baud rate) the information box will close and the PC may beep several times to indicate that the transfer is complete. A total of 93,056 bytes will be transferred.
- If the transfer is successful a message similar to “Transfer complete - SETUP\_10.XMD” will appear in the lower left-hand corner of the Procomm window.

### HyperTerminal

- With the mouse, click on the “Transfer” command, then the “Receive File ...” sub-command. The “Receive File” dialog box will open.
- Enter a complete folder specification that includes the drive and folder(s) name(s) (e.g., “c:\ma-temp\download”). Select Xmodem as the protocol. If the various settings are correct click on the “Receive” button.
- Another dialog box will appear. It will be labeled “Receive Filename”. Enter a filename. If the filename is correctly specified click on the “OK” button.
- An information box labeled “Xmodem file receive for ...” will appear. It will indicate the progress of the transfer. After a brief delay (depending on the Baud rate) the information box will close automatically to indicate the successful completion of the transfer.

After the transfer is completed the Upload/Download sub-menu will be displayed. It will be preceded by the following message.

```
Transfer complete
```

If the user fails to open the receive file promptly or a problem occurs with the transfer the following message will be displayed.

```
Transfer error
```

The user can then attempt a second download by once again typing “D”.

## Restoring the Setup Database (U)

Before the setup database can be restored to the system it must have been previously saved. Refer to the procedure entitled "Saving the Setup Database" on page 29. The PC and communications program must be properly configured before the database can be restored. The following list describes the correct configuration.

- **Transfer protocol:** "XMODEM"



**Note:** the failure to select the proper transfer protocol (i.e., **XMODEM**) is the most common mistake made in this procedure.

- **Connection:** If the system's Local Port is being used select "Direct connect - Com1" or "Direct connect - Com2" (whichever is available). If the modem is being used the host modem must be logged on with the Model 240M/S.
- **Baud rate:** as required by the Local Port, set to N-8-1.

To restore the setup database to the Model 240M/S from a PC file the Upload sub-menu command is used. Pressing "U" will display the following message.

```
XMODEM receiving data... (Ctrl-X to stop)
CCCCC
```

The sequence of "C" characters indicates the system is awaiting the Xmodem file.

The steps necessary to complete the upload depend upon which communications application is being used. The following paragraphs describe the Procomm for Windows and HyperTerminal methods, respectively. Procomm Plus 32 and Windows 98 were used in the following procedures. Later versions of these programs may be slightly different. However, the fundamental approaches will remain valid.

### Procomm for Windows

- With the mouse, click once on the "Send File" icon near the top center of the Procomm window. The icon appears as an upward pointing arrow. The Procomm for Windows "Send File using - Xmodem" dialog box will open.
- Select the proper disk drive and folder. Select the correct file. If the various settings are correct click on the "Open" button.
- An information box labeled "Xmodem" will appear. It will indicate the progress of the transfer. After a brief delay (depending upon the Baud rate) the information box will close and the PC may beep several times to indicate that the transfer is complete. A total of 93,056 bytes will be transferred.
- If the transfer is successful a message similar to "Transfer complete - SETUP\_10.XMD" will appear in the lower left-hand corner of the Procomm window.

## HyperTerminal

- With the mouse, click on the “Transfer” command, then the “Send File ...” sub-command. The “Send File” dialog box will open.
- Select the correct file (e.g., “setup\_11.bin”). Select Xmodem as the protocol. If the various settings are correct click on the “Send” button.
- An information box labeled “Xmodem file send for ...” will appear. It will indicate the progress of the transfer. After a brief delay (depending on the Baud rate) the information box will close automatically to indicate the successful completion of the transfer.

After the transfer is completed the Upload/Download sub-menu will be displayed. It will be preceded by the following message.

```
Transfer complete
```

If the user fails to open the send file promptly or a problem occurs with the transfer the following message will be displayed.

```
Transfer error
```

The user can then attempt a second upload by once again typing “U”.

## Exit (X)

To exit the Upload/Download Setup Parameters sub-menu and return to the Main Menu type “X”.

## Log Off System (X)

The Log Off System command is used to terminate Administrative and Restricted Access sessions.



**Note:** all sessions should be terminated by executing the Log Off System command.

If the previous user logs off of the system, access can be regained only by entering the correct password. If the previous session is not terminated with the “X” command a second user will be allowed access without having entered a correct password. To properly log off of the system enter “X”. The following message will be displayed.

```
About to log off. Are you sure (Y/N) ?
```

The Setup Procedure includes an optional step applicable only to systems equipped with a MICRO-AIDE modem. The modem allows users to access the Model 240M/S from a modem equipped host system such as a PC. If the recording system being set up does not have a modem ignore the following command.



## Set Modem Ring Delay (M) - optional

The Model 240M/S optional modem is designed to operate in “auto-answer” mode, that is it will automatically answer calls made to the telephone line. The user can set the number of rings required before the modem answers. This is referred to as ring delay.

To set the Modem Ring Delay type “M”. The following message will be displayed.

```
The current ring delay is 02
Would you like to change it (Y/N)?
```

The current ring delay is always displayed on the first line of text. To change the setting type “Y”. Enter a number in the range from 0 to 99 followed by the “ENTER” key.



**Tip:** to disable the auto-answer feature of the modem enter “0” for the Modem Ring Delay. This will prevent incoming calls from being answered by the modem.

This completes the Setup Procedure for the Model 240M/S. The system is now prepared to record events in accordance with the setup performed by the user. Since the installation and setup are critical to how the system will perform, it is advisable to review the steps taken earlier. The next chapter describes how to operate the Model 240M/S.



# Operation

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## Introduction

This chapter describes how to operate the Model 240M/S from either a VDT or PC running a suitable communications program. Both local (i.e., on site) as well as remote methods of operating the system are described. Remote operation of the system is very similar to the local method.

Before the Model 240M/S can be operated it must be properly installed and set up. A PC or VDT must be prepared to access the system. The use of the LCD panel and keypad are the subject of the next chapter.

## Multi-User Operation

A unique feature of all MICRO-AIDE recorders is their ability to handle simultaneous operation from multiple users via the modem, RS-232 port or front panel keypad. This “multi-user” feature eliminates the annoying practice in some systems of one user effectively locking-out a second or third user.

## Remote Operation

The setup and operational features of the Model 240M/S can be exercised remotely provided the system is equipped with a MICRO-AIDE internal modem. A PC equipped with a modem and a communications program makes an ideal remote access system. Event Records and other data from several distant recording systems can be easily gathered and saved to either a hard disk or diskette file.

There are two steps the remote user or host system must perform before remote access is possible. Each step is described in the following.

## Establishing a Modem Connection

A standard telephone line must be attached to the modem of the Model 240M/S. To access the recording system the host system must dial the telephone number of the Model 240M/S and wait for an answer. The distant modem will answer after a predetermined number of rings. Refer to the section entitled “Set Modem Ring Delay” on page 33. The modems at both ends will then handshake. The handshake ensures that the modems can communicate with each other at an appropriate speed. A connection is established upon the successful completion of the handshake.



**Note:** the Model 240M/S will only permit reliable connections to be established. The host modem should be programmed for LAPM, V.42bis or MNP 2-4 operation.

## Entering the Password

After the connection is established the Model 240M/S will issue a password request similar to the following.

```
Model 240MS Event Recorder. Ver 3.03 (C) 1998 Micro-Aide Inc.  
***** NOT SET *****  
Event storage capacity: 419428  
Enter password:
```

The host system must issue the correct password followed by an "ENTER". Passwords are defined in accordance with the procedure described on page 27.



**Note:** the default Administrative and Restricted Access passwords are "PASSWORD" and "LOOKWORD", respectively. Passwords are case sensitive. Upper- and lower-case letters must be entered correctly.

The host system is given three attempts to enter a correct password. A third error will result in a disconnect by the recorder. Prior to the disconnect the following message will be issued.

```
Please call back with the correct password.
```

This procedure prevents unwanted users from accessing the recording system. After the password is entered the user will be able to operate the system in a manner identical to that specified by local operation. Accordingly, the Model 240M/S will display either the Administrative Access Menu or Restricted Access Menu. Refer to pages 9 and 28, respectively.

## How to Operate the Model 240M/S

Operational commands may be executed in any sequence. The user may wish to perform operations in one sequence and then, depending upon the observed data, select a different sequence of commands. A detailed explanation of each operational command is included in the remaining sections of this chapter. Each command is listed by its name followed by its command code in parenthesis.

### Toggle Display Mode (A)

The Model 240M/S has been designed to take advantage of the unique data presentation characteristics of Video Display Terminals. Unlike printers, VDTs can be used to display new data as it occurs. The Toggle Display Mode command allows the user to select either line or full screen operation. Line Mode is typically used with printing devices. Full Screen Mode is the recommended mode for VDTs and PCs emulating terminals.



**Note:** Full Screen Mode is compatible with ANSI and Televideo TVI 910 terminals. If a PC is being used the communications program should be set to emulate one of these terminal types.

Line Mode may be used with terminals but the Full Screen data presentation is much easier to use. The sample data shown for the Print Live Status of Inputs command illustrates the difference in data presentation. Refer to page 45.

To switch between Line and Full Screen Modes press "A" repeatedly until the desired mode is selected. The Model 240M/S will indicate the current mode with one of the following messages.

```
Unit is now in Line Mode  
Unit is now in Full Screen ANSI Mode  
Unit is now in Full Screen TVI 910 Mode
```

## Browse Events by Date (B)

The Browse Events by Date command allows users to inspect a group of twenty consecutive Event Records. It can be used in Full Screen and Line Modes. The Event Records to be Browsed are specified by the starting date and time selected by the user. Additional groups of records that precede and succeed the initial group can be easily displayed.

Type "B" to Browse through Event Records. A message similar to the following will be displayed.

```
Event Active Dates  
1 04-05-00      2 04-06-00      3 04-07-00      4 04-08-00      5 04-09-00  
6 04-10-00  
There are 4715 events in 6 day(s).  
Select a starting date (RETURN for all):
```

In the example cited above, the second line of text identifies those dates for which events were recorded. The number to the left of the date is used as an identifier for the date listed. Date Identifiers range from 1 to 90. The Date Identifiers are "1", "2", "3", "4", "5" and "6" for the example shown above. If the user presses the "ENTER" key, events starting at 00:00:00 for the first date listed (i.e., Date Identifier 1) will be displayed.



**Note:** the Model 240M/S will store Event Records for ninety days, provided the maximum record storage capacity of the system has not been exceeded. Records for the ninety-first day will automatically over-write records for day one.

Records for a specific date may be displayed by simply typing the appropriate Date Identifier. An additional message similar to the following will then be issued.

```
Entry number 2 04-06-00 has been selected.  
Available events are from 03:14:22 to 23:02:29  
Enter the starting time in HH:MM:SS :
```

The second line of text in the message indicates the time span during which events were recorded. The last line of text specifies that the starting time must be entered in HH:MM:SS format. Each field must be separated by a colon character. Military time is used by the Model 240M/S. Accordingly, 12:00:01 a.m. and 11:59:59 p.m. must be entered as 00:00:01 and 23:59:59, respectively. The start time specifies the time **after** which Event Records will be reviewed. If records are to be reviewed starting at midnight the user can simply press "ENTER".

A report similar to the following will be displayed (for convenience only two records are listed in the example cited). The Location Name, Input Name and Input Number are listed in the first three fields of the Event Record. The fourth field specifies the Event Name assigned to the event for the input listed. Finally, the date followed by the time are listed.

```
Event Browse Screen
San Dimas, MP 133.4  Approach W1      1217 Lite On   04-06-00 13:11:49.7
San Dimas, MP 133.4  Approach W1      1217 Lite Off  04-06-00 13:14:55.2
Use  A - scroll up, Z - scroll down, S - search database or ESC to exit:
```

As indicated by the message at the bottom of the screen the "A" and "Z" keys may be used to scroll up and down the list of records. A "Z" will display the next twenty records, while an "A" will list twenty earlier records. If the user scrolls to the very top or bottom of the record set a message will be displayed indicating that the boundary of the record set has been reached.

To display records from a single input press "S". The following message will be displayed.

```
Enter a list of up to 30 input numbers,
separated by spaces, you wish to query
(3841-4112 for special events, invalid input numbers will be ignored).
```

As the message above indicates as many as thirty inputs may be reviewed. The last line of text in the message refers to Special Events in the range from 3841 to 4112 which can also be reviewed. These are described in the section entitled "Special Events" on page 43. The Input Numbers, including those for Special Events, may be entered in any sequence. A space must separate each number. After the numbers are selected press "ENTER". The Event Records will be listed in chronological order using the same format as the example cited earlier. The records will start from the time and date position the Browse command last referenced.

If no Event Records are stored the following message will be displayed immediately after the Browse command is selected.

```
There is no event recorded in the database
```

To exit the Browse Events by Date command press "ESC".

## Selective Dump of Events (D)

The Selective Dump of Events command is the most versatile method by which Event Records may be displayed and saved to a PC file. The Browse and Query features are generally used to augment the Dump process. The Dump report may contain forward or reverse chronologically ordered Event Records. Unlike the Browse feature a Dump may be used to list Event Records that have occurred in a specific time range.

Type "D" to Dump Event Records. A message similar to the following will be displayed.

```

                                Event Active Dates
1 04-05-00      2 04-06-00      3 04-07-00      4 04-08-00      5 04-09-00
6 04-10-00

There are 4715 events in 6 day(s).
Select a starting date (RETURN for all):

```

If the user presses the "ENTER" key all recorded events starting from 00:00:00 for the date specified by Date Identifier 1 will be displayed. Prior to actually Dumping the records the following request will be issued.

```

The entire database has been selected
Will the report be in the reverse chronological order (Y/N) ?

```

Typing a "Y" will order the records in reverse time (i.e., newest records followed by oldest records). Typing any character other than "Y" will order the records starting with the oldest records. The records will then be displayed as specified. The Dump will automatically terminate when the last record in memory is displayed. The user will then be returned to the Main Menu.



**Tip:** it is possible for the Dump command to issue tens of thousands of Event Records. If the user wishes to Pause, Resume or Abort the Dump the following keys should be pressed: "CTRL+S", "CTRL+Q" and "ESC", respectively. Refer to the section entitled "Data Flow Control" on page 14 for additional details.

A different Dump procedure is used if Event Records for a specific time period are needed. In the example cited earlier in this section, the second line of text identifies those dates for which events were recorded. The number to the left of the date is used as an identifier for the date listed. Date Identifiers range from 1 to 90. The Date Identifiers are "1", "2", "3", "4", "5" and "6" for the example cited.



**Note:** the Model 240M/S will store Event Records for ninety days, provided the maximum record storage capacity of the system has not been exceeded. Records for the ninety-first day will automatically over-write records for day one.

Records for a specific date may be displayed by typing the appropriate Date Identifier number followed by the "ENTER" key. After the Date Identifier is entered an additional message similar to the following will be issued.

```
Entry number 2 04-06-00 has been selected.
Available events are from 03:14:22 to 23:02:29
Enter the starting time in HH:MM:SS :
```

The second line of text in the message indicates the time span during which events were recorded. The last line of text specifies that the starting time must be entered in HH:MM:SS format. Each field must be separated by a colon character. Military time is used by the Model 240M/S. Accordingly, 12:00:01 a.m. and 11:59:59 p.m. must be entered as 00:00:01 and 23:59:59, respectively. The start time specifies the time **after** which Event Records will be reviewed. If records are to be reviewed starting at midnight the user can simply press "ENTER".

After specifying the starting time the ending date must be selected. Accordingly, the following request will be displayed.

```

                                Event Active Dates
1 04-05-00      2 04-06-00      3 04-07-00      4 04-08-00      5 04-09-00
6 04-10-00

There are 4715 events in 6 day(s).
Select the ending date:
```

After the ending Date Identifier is selected the ending time must be entered in response to the following request. Simply type "ENTER" to Dump events through midnight.

```
Entry number 3 04-07-00 has been selected.
Available events are from 04:17:39 to 20:44:07
Enter the ending time in HH:MM:SS :
```

Finally, the user is allowed to select either forward or reverse ordering of the records. The time period specified by the user will precede the ordering request. A sample message is shown below.

```
Start at: 04-06-00 12:00:00
End at: 04-07-00 08:00:00
Will the report be in the reverse chronological order (Y/N) ?
```

Event Records meeting the date, time and ordering criteria specified will then be displayed. A partial listing of records is shown below.



Press ESC key any time to stop printing.

EVENT REPORT GENERATED ON 09:53:45 04-13-2000

San Dimas, MP 133.4	Approach W1	1217	Lite On	04-06-00	13:11:49.7
San Dimas, MP 133.4	Approach W1	1217	Lite Off	04-06-00	13:14:55.2

## Event Record Format

Every data Dump includes a header that lists the time and date the report was generated. The Model 240M/S details Event Records in a single line of text that contains six distinct data fields. From left to right, each field is described below.

- **Location Name:** The first twenty characters of the Location Name are used to specify the recording system.
- **Input Name:** The input is identified by the twenty-character name assigned by the user.
- **Input Number:** This field is assigned by the system and cannot be altered by the user. It can be used to identify the physical input and slave chassis.
- **Event Name:** This is the eight-character designation given by the user to identify the state of the input when the event was recorded.
- **Date:** The date the event was recorded is listed in MM-DD-YY format.
- **Time:** The time the event was recorded is listed to the nearest tenth of a second.

For the example cited above input 1217 changed to a state referred to by the user as “Lite On”. The same input changed states again 3 minutes, 5.5 seconds later. The second state is referred to as “Lite Off”.

## Erase Oldest Events (E)

The Model 240M/S is designed with a “circular” memory. When the number of stored events exceeds the memory capacity of the system the newest or most recent events will over-write the oldest events. In this way the system decides that the oldest events are expendable because it is likely that they were already transmitted or reviewed. Event Records are also over-written if more than ninety days of data are recorded in memory. The Erase Oldest Events command is very useful in clearing test data that, if left in memory, could prove to be confusing to other users.

The Erase Oldest Events command allows the user to take manual control of the “freeing-up” of memory. The command will only permit the user to erase events from memory for the oldest day during which events were stored. Additionally, the command allows the user to specify a time of day prior to which the erasure will actually occur. In this way partial days may be erased. If more than one day needs to be erased the command must be used again.



**Note:** only Event Records will be erased. Setup information entered by the user such as Input Names, Detection Times, Location Name, etc., will not be erased.

To erase records from the oldest day type “E”. A message similar to the following will be issued.

Only events recorded on 04-05-00 can be deleted.  
Select the target event where the deletion stops:  
Enter the event time in HH:MM:SS :

The user may enter a specific time prior to which events will be erased. The time must be entered in military format. If a partial day is selected the system will immediately erase the selected events and then issue a message that lists the number of events erased. An example message is shown below.

There were 762 removed from the database.

If the user wishes to erase the entire day the "ENTER" key should be pressed (i.e., no time of day is specified). The following warning will be displayed.

Starting event not found. Will delete the entire day.  
Do you want to proceed (Y/N) ?

The erasure will be performed immediately and the user will then be returned to the Main Menu.

## Query Inputs (Q)

The Query Inputs command is typically used to output a subset of Event Records stored in memory. Unlike the Selective Dump of Events command it allows the user to list records from specific inputs. Unlike the Browse procedure it outputs records in an uninterrupted sequence from start to finish. The command further streamlines the process of reviewing those records of particular interest to the user. Records are displayed using the same format as described in the section entitled "Event Record Format". Refer to page 41.

To use the Query Inputs command type "Q". The following message will be displayed.

```

                                Event Active Dates
1 04-05-00      2 04-06-00      3 04-07-00      4 04-08-00      5 04-09-00
6 04-10-00

There are 4715 events in 6 day(s).
Select a starting date (RETURN for all):
```

The Query Inputs command allows the user to select a start and end date and time period for which Event Records will be displayed. The procedure for selecting the time period is identical to that used by the Selective Dump of Events command. Refer to the description that starts on page 39 for details regarding this procedure.

After the time period is selected the system will issue the following request.

Enter a list of up to 30 input numbers,  
separated by spaces, you wish to query  
(3841-4112 for special events, invalid input numbers will be ignored).

As the message above indicates as many as thirty inputs at a time may be Queried. The last line of text in the message refers to Special Events in the range from 3841 to 4112 which can also be reviewed. These are described in the section entitled "Special Events". The Input Numbers, including those for Special Events, may be entered in any sequence. A space character must separate each number. After the numbers are selected press "ENTER". If the user fails to select any inputs the system will display records for all inputs (i.e., as in the Dump procedure).

Finally, the user is allowed to select either forward or reverse ordering of the records. The time period specified by the user will precede the ordering request. A sample message is shown below.

```
Start at: 04-06-00 12:00:00
End at: 04-07-00 08:00:00
Will the report be in the reverse chronological order (Y/N) ?
```

The format used by each record is identical to that used by the Selective Dump of Events command. The Pause, Resume and Abort commands may be used to control the flow of records. After the last record is displayed the user will be returned to the Main Menu.

### Special Events

The Model 240M/S allows its user to inspect records that reference three important system functions. The first function specifies when the master is powered down, consequently causing each of the slave units to temporarily store Event Records in their local memory. The second function specifies when a slave unit is powered down and thus not able to record events for that group of inputs. The third function specifies when a slave unit is not in communication with the master. The Model 240M/S identifies each of these functions by a set of distinct Event Records that are saved in memory. They can be retrieved and inspected like any other Event Record.

A combination of Input Names, Input Numbers and Event Names are used to identify each of the Special Events. Listed below is an example of six Special Event Records.

```
San Dimas, MP 133.4  MASTER UNIT          POWER OFF          04-06-00 23:12:40.0
San Dimas, MP 133.4  MASTER UNIT          POWER ON           04-06-00 23:12:43.0
San Dimas, MP 133.4  SLAVE #16           POWER OFF          04-06-00 23:40:38.5
San Dimas, MP 133.4  SLAVE #16           POWER ON           04-06-00 23:40:47.5
San Dimas, MP 133.4  SLAVE # 5  COMMUNICATION ON    04-06-00 23:55:15.6
San Dimas, MP 133.4  SLAVE # 5  COMMUNICATION OFF   04-06-00 23:55:20.6
```

The first two records listed above indicate that the master was powered down for three seconds starting at 23:12:40.0. The third and fourth records indicate that slave number 16 was powered down for nine seconds starting at 23:40:38.5. The last two records indicate that the master lost communications with the fifth slave for five seconds starting at 23:55:15.6. In each of the examples cited the Special Events can be identified by the assigned Input Name (e.g., "MASTER UNIT", "SLAVE #5") and Event Name (e.g., "POWER ON", "COMMUNICATION ON"). The Input Name and Event Names assigned to Special Events cannot be changed by the user.

Special Events can be reviewed by using the Query and Browse commands. Special Events are assigned Input Numbers not associated with physical inputs. Refer to Table 2 for a list of Input Numbers and names assigned to Special Events.

Special Event Assignments		
Input Number	Input Name	Type of Event
3841 / 3842	SLAVE #1	Power / Communication
3857 / 3858	SLAVE #2	Power / Communication
3873 / 3874	SLAVE #3	Power / Communication
3889 / 3890	SLAVE #4	Power / Communication
3905 / 3906	SLAVE #5	Power / Communication
3921 / 3922	SLAVE #6	Power / Communication
3937 / 3938	SLAVE #7	Power / Communication
3953 / 3954	SLAVE #8	Power / Communication
3969 / 3970	SLAVE #9	Power / Communication
3985 / 3986	SLAVE #10	Power / Communication
4001 / 4002	SLAVE #11	Power / Communication
4017 / 4018	SLAVE #12	Power / Communication
4033 / 4034	SLAVE #13	Power / Communication
4049 / 4050	SLAVE #14	Power / Communication
4065 / 4066	SLAVE #15	Power / Communication
4081 / 4082	SLAVE #16	Power / Communication
4097	MASTER UNIT	Power

*Table 2  
List of assignments for Special Events*

To review Special Events simply enter the Input Number as required by the Query and Browse commands. Both "ON" and "OFF" events will be displayed for each Input Number specified.



**Note:** while the master is powered down or is not able to communicate with a slave unit(s) events will continue to be recorded and logged by the affected slave(s). Events that occur during the outage will be made available to the master for inspection by the user shortly after power is restored to the master or the communications problem is resolved.

## Retrieve Database by XMODEM (R)

Xmodem is a communications protocol used by many data gathering systems. It allows data to be exchanged in such a way that transmission errors can be reliably detected and corrected. Most communications applications designed for use with PCs provide Xmodem operation (e.g., Procomm and HyperTerminal).

MICRO-AIDE has developed a PC-based application that provides many enhanced Event Record storage, search and presentation features. The application is referred to as Graphical Event Analyzer (GEA). Among the many benefits of GEA is its “point-and-click”, graphical user interface. This allows the user to become very proficient at selecting and reviewing Event Records with minimal knowledge of the command syntax used by the recorder. An additional benefit is that Event Records can be polled using GEA in a fraction of the time required by the Dump command which relies upon ASCII transmission. The Retrieve Database by Xmodem command is only used by the GEA software.



**Note:** contact MICRO-AIDE sales for information concerning its Graphical Event Analyzer.

## Print Live Status of Inputs (S)

The Print Live Status of Inputs command provides a “snapshot” of the present state of each input for a given slave chassis. If the user is accessing the system via a PC or VDT the live status report should be presented in one of the Full Screen Modes. Refer to the section entitled “Toggle Display Mode” on page 36. In Full Screen Mode the terminal will display continuously updated input status.

To view the live status of inputs for a selected slave chassis type “S”. The following request will be displayed.

```
Live status for slave (1-16) ?
```

The user must enter the number (e.g., 1 to 16) of the slave whose inputs will be reviewed.

An example of the report in Full Screen Mode is shown below. The status of all 240 inputs for slave number three is listed. The active state of an input is indicated by an “X”. The inactive state is indicated by a “.”. For the sample data shown below inputs 481, 483 and 624 are active, the other inputs are inactive. As each input changes state the display will be immediately updated to reflect the new status. Press “ESC” to terminate the status display.

```

Press ESC key to exit.
                                Live Input Status for Slave 1
                                11:01:32  04-13-2000
INPUTS
481 - 504  X . X . . . . .
505 - 528  . . . . .
529 - 552  . . . . .
553 - 576  . . . . .
577 - 600  . . . . .
601 - 624  . . . . . X
625 - 648  . . . . .
649 - 672  . . . . .
673 - 696  . . . . .
697 - 720  . . . . .
    
```

A partial listing of the same sample data presented in Line Mode appears below. The status of each input is indicated at the moment the report was generated. Inputs are referenced by their assigned Input Names, which in this case are all set to default values. The state of each input is also identified by its assigned Event Name. Finally, the active and inactive states are further identified by the labels "HIGH" and "LOW", respectively.

INPUT	NAME	STATUS	INPUT	NAME	STATUS
481 Inp #481		Forward HIGH	482 Inp #482		Off LOW
483 Inp #483		Lite On HIGH	484 Inp #484		Off LOW
485 Inp #485		Off LOW	486 Inp #486		Off LOW
487 Inp #487		Off LOW	488 Inp #488		Off LOW

In Line Mode, after the inputs are listed the user is automatically returned to the Main Menu.

The Print Live Status of Inputs command can be very useful in verifying that inputs are wired correctly. It can be used to quickly determine if inputs are operating properly and if the assigned Detection Times are set in accordance with the timing characteristics of the monitored circuits.

### Print Incoming Events (V)

The Print Incoming Events command allows the user to display Event Records in real time. Immediately after an event is detected it will appear at the PC or VDT. This command can be very useful in tracking events that are occurring while the user is on-line with the system. It can also be used to perform a check of the inputs prior to installation of the system.

To Print Incoming Events type "V". The following message will be displayed.

Entering Channel View mode. Press ESC anytime to exit.

The system will display events as they occur. The format of each record is identical to that used by the Selective Dump of Events command. Refer to the description starting on page 41. The Model 240M/S will continue to display events until the user presses the "ESC" key.

This concludes the description on how to operate the Model 240M/S locally and remotely. The user should remember to use the Log Off System command to end the current session. An explanation of the Log Off System command can be found on page 32. The next chapter describes the use of the front panel LCD and keypad.





# **Display and Keypad**

---

## **Introduction**

The Model 240M/S is designed to provide its user with the greatest degree of versatility and functionality. All MICRO-AIDE Event Recorders come equipped with a front panel mounted Liquid Crystal Display (LCD) and keypad. Together these features allow the user to perform all of the setup and operational procedures required to effectively use the Model 240M/S. The advantage to the user is that a printer or VDT peripheral device, although convenient, is not required to operate the system.

Setup and operation of the Model 240M/S from the front panel is somewhat different than operation via a peripheral device. The tasks to be performed and the end results are identical but the methods employed are different. This chapter describes the methods that are unique to front panel operation. Figure 1 provides an illustration of the LCD panel and keypad used by the Model 240M.

## **Front Panel Description**

### **Liquid Crystal Display**

The LCD panel consists of a backlit display approximately 3.2" by .7" in size. It is configured to present two lines of data. Each line can contain twenty alpha-numeric characters and symbols. Display characters are large and can be viewed easily from several feet away. The super-twist design of the LCD panel provides a viewing angle of  $\pm 20^\circ$  from the level of the display.

As a convenience to the user the contrast level of the display may be adjusted. This can be helpful when the system is exposed to very hot or cold temperatures. The potentiometer that controls the contrast level is located on the Power Supply PCB in the Master Section. Refer to Figure 2.

### **Keypad**

The keypad consists of sixteen individual keys. Each key is clearly labeled and features a "snap-like" action. Keys are spaced .75" apart to minimize "double hits". A special editing technique that uses the left "←" and right "→" arrow keys allows for alphabetic characters to be entered. The arrow and "ENTER" keys also provide for quick menu item selection. The left arrow key may be used to delete an incorrect numerical entry.

## **How to Use the Keypad**

Unless otherwise stated, letters and names shown in upper-case text contained in quotation marks refer to specific keys on the keypad (e.g., "BROWSE"). This convention is used throughout the remainder of this chapter.

After power is applied to the Model 240M/S it will attempt to boot its firmware. The LCD will identify this process with a message that reads "Booting System...". If an internal modem is installed it will be initialized. At the completion of the boot-up the following message will be briefly displayed.

Micro-Aide 240MS Event Recorder 3.03
---

The reference to firmware version “3.03” may vary depending upon the system. The firmware version number should be written down and saved in the event service ever needs to be performed on the system. After the boot and modem initialization procedures are completed the system will automatically enter the Idle Mode of operation. There are three operational modes; each is described in the following.

## IDLE Mode

The current date and time are displayed by the LCD while the system is in Idle Mode. It is the “at rest” condition of the system. An example of the date and time display is shown below.

TIME	DATE
19:05:56	04-06-00

The Model 240M/S utilizes the 24-hour, military time convention (e.g., 7:00pm is shown as 19:00:00). The LCD will, once every minute, provide a five-second-long reminder message that the Setup and Browse Modes can also be accessed.

In Idle Mode the date and time display can also be automatically interrupted with new Event Records. Each new event will be displayed only briefly. This process is useful in verifying that the system is continuing to detect state changes. Newer events will over-write older events. An example of an Event Record is shown below.

04-06-00 19:26:23.4 1217 Approach1 L-Off
---

## Event Record Format

Each record consists of five fields. The date followed by the time measured to the nearest tenth of a second is shown on the first line. The Input Number starts the second line. It is followed by the **first nine characters** of the Input Name. LCD size restrictions prevent the entire twenty possible characters from being displayed. The last field indicates the first five characters of the assigned Event Name. When assigning Input and Event Names it is recommended that the first several characters be as descriptive as possible.

## Browse Mode

Browse Mode allows the user to quickly review Event Records in either forward or reverse chronological order. Events are selected by date and optionally by Input Number. To Browse through events press the “BROWSE” key. The following message will appear briefly.

Use ←→ to select a DATE and press ENTER
--

If events have been stored the display will indicate from one to ninety dates for which events may be Browsed. Dates are listed in MMDDYY format with no separator characters. A typical display of four dates is shown below.

```
040500 040600 040700
040800
```

A six-character flashing cursor will initially highlight the first date. The arrow keys may be used to select the desired date. When the cursor is over the correct date press “ENTER”. A brief message to the user that military time is used will be displayed. It will be followed by a request to enter a start time. The start time specifies the time **after** which events will be displayed.

```
Enter time (HHMMSS):
```

Using the numbered keys enter a six-digit time in HHMMSS format. Press “ENTER” to complete the entry. If the “ENTER” key is pressed without specifying a time the events for the entire day can be Browse. Incorrect time entries will be indicated by an error message.

The display will then indicate the first Event Record meeting the date and time criteria selected by the user. A sample Event Record is depicted and described on page 50. The left and right arrow keys may then be used to review records in forward or reverse chronological order. The limits of the record set will be indicated by a message stating either “BEGINNING OF DATA” or “END OF DATA”. To exit Browse Mode and return to Idle Mode press “ESC”.

## Query by Input Number

Records may also be Queried while in Browse Mode. When a record is being displayed press the “BROWSE” key. The following Input Number request will be displayed.

```
QUERY: Please enter
an input number:
```

After entering a valid Input Number followed by the “ENTER” key, the first record meeting the date, time and Input Number criteria will be displayed. The arrow keys may be used to scroll through the selected records. However, only records meeting the Input Number specification will be displayed. If no records are found that meet the search specifications a message will be displayed briefly. To exit Query search and return to Idle Mode press “ESC”.

## Special Events

The Model 240M/S can log into its memory Event Records that specify important operational conditions. These Event Records are identified by special Input Numbers. Refer to page 43 for a definition of Special Events.

Special Events can be Queried in the same manner as events from physical inputs. The user simply enters the number of the Special Event. Input Numbers associated with Special Events are listed in Table 2.

This completes the description of the Browse Mode.

## Setup Mode

Setup Mode allows the user to set up the Model 240M/S to a specific set of application requirements. The various commands that can be executed from the keypad form a subset of those performed via a peripheral device. Only a few commands are not applicable to the keypad (e.g., Toggle Display Mode). The results from a keypad performed command are indistinguishable from those performed via a peripheral device. Accordingly, the setup descriptions that are a part of Chapter 2 may be used to provide a more detailed explanation of the keypad commands.

To enter Setup Mode from Idle Mode press the “SETUP” key. The following message will be displayed. The user must enter the correct Passcode before any setup command can be executed.

Enter the passcode:



**Note:** the factory default Passcode is “12345678”.

Passcodes are assigned numeric values only. If the user fails to enter the correct Passcode the following message will be displayed.

Incorrect passcode

Assuming the correct Passcode is entered a brief explanation of the arrow keys will follow. Finally, the LCD menu of commands will be displayed as shown below.

Clock	DTime	Flash
Iname	Uname	Ename

If the user advances the cursor past the “Clock” or “Modem” commands the following additional commands will be displayed.

InpEN	Modem	PCode
SPort	RESET	

Table 3 provides a brief explanation of each of the LCD commands.

Setup Commands	
Name	Description
Clock	Set Date and Time
DTime	Set Detection Times
Flash	Enable Flashing Inputs
Iname	Set Input Names
Uname	Set Location Name
Ename	Set Event Names
InpEN	Assign Event Names to Inputs
Modem	Set Modem Ring Delay
PCode	Set Passcode
SPort	Set Local Port Baud Rate
RESET	Reset System

Table 3  
List of LCD commands

To select an LCD command advance the cursor to the desired command and press “ENTER”. The various information messages that appear on the LCD can be immediately canceled by pressing an arrow key or other key applicable to the command’s syntax.



**Note:** if the user fails to select a command within thirty seconds the system will automatically return to the Idle Mode. This prevents a user from inadvertently leaving the system accessible to a second user and thus defeating the Passcode security feature.

### Clock - Set Date and Time

To change the present date and time select “Clock”. The following request will be issued.

Enter date (MMDDYY):

The date must be entered in the form MMDDYY without any separator characters. Press “ENTER” to accept the current date. The following time request will be displayed.

Enter time (HHMMSS):

The time must be entered in the form HHMMSS without any separator characters. The time must be entered using 24-hour military time. Press “ENTER” to accept the current time. If the time is properly defined the system will immediately change the date and time. It will then display the command menu. Invalid date and time entries will be indicated by an error message.



**Tip:** if the current date is correct simply press the “ENTER” key to advance directly to the time selection step.

## DTime - Set Detection Times

After a brief title message the following sub-menu will be displayed.

```
List Set ALL inputs
Set individual input
```

As the sub-menu indicates the user may list Detection Times, or set all or selected inputs. Each of the three choices are explained below.

### List

To display the Detection Time settings for all or selected inputs select "List". The LCD will display information similar to the following.

```
Input 1: 3.0Sec
Input 2: 3.0Sec
```

To advance to the next input press the right arrow key. To scroll back one input press the left arrow key. To jump to a specific input press the "ESC" key. The following request for an Input Number will be issued.

```
Input number to jump
to (ESC = quit):
```

Any Input Number consistent with the number of slave units may be specified. To exit the List command press "ESC" again rather than entering an Input Number. The user will be returned to the command menu.

### Set All Inputs

The Set ALL Inputs command allows the user to set a Detection Time **common to all inputs**. After selecting the command, the following reminder message will be displayed.

```
Signal Durations are
in units of 100 msec
```

The user is then requested to enter a Detection Time in response to the following.

```
Enter a duration
for all inputs:
```

The Detection Time must be in the range of 0 to 15,000, which is the equivalent of 0 to 1,500 seconds. Pressing the "ENTER" key completes the entry. A setting of "0" will prevent all inputs from recording events. As a precaution the user is asked to confirm the setting by responding to the following request.

```
35 was entered.  
Confirm:ENTER or ESC
```

In the above example a duration of 3.5 seconds was selected. Pressing the "ENTER" key will complete the command.

### **Set Individual Input**

The user may wish to assign a variety of Detection Times by Input Number. The Set Individual Input command provides this capability.

After selecting the command the user is reminded that Detection Times are set in multiples of 100 milliseconds (.1 seconds). The next message, shown below, appears briefly and indicates that the "ESC" key may be pressed to either jump to a specific Input Number or to quit the command.

```
Press ESC anytime to  
Quit or Skip inputs.
```

The user is requested to respond to the following message.

```
Enter a duration for  
input # 1:
```

Any number between 0 and 15,000 may be specified. Press the "ENTER" key when the number is correct. If the number is in the correct range the system will automatically advance to the next Input Number and issue a message similar to the above. If the user presses "ESC" instead, a message requesting an Input Number will be displayed. Any Input Number consistent with the number of slave units may then be specified. Pressing "ESC" a second time will display the command menu.

### **Flash - Enable Flashing Inputs**

The Model 240M/S is fully compatible with Flashing Inputs. Refer to page 25 for an explanation of Flashing Inputs. Upon selecting the Flash command the following message will be briefly displayed.

```
Use ← → to scroll  
ESC to skip or exit
```

As the message indicates the left and right arrow keys may be used to advance to the next Input Number. The state of the selected input will then be displayed as follows.

```
Input# 1 is set to  
NORMAL
```

If the setting for the Input Number specified is acceptable press “ESC” or an arrow key to advance to another input. Otherwise, press “ENTER” to toggle the setting (i.e., NORMAL to FLASHING or FLASHING to NORMAL).

If the user presses “ESC” the following message will be displayed.

```
Input number to jump  
to (ESC = quit):
```

Any Input Number consistent with the number of slave units may be specified. Press “ENTER” to advance to the selected input. Pressing “ESC” a second time in response to the above message will return the user to the command menu.

## **Iname - Set Input Names**

Individual Input Names may be assigned by using the Iname command. Although the Model 240M/S provides default names that can be very useful, the user may wish to identify circuits with names specific to a particular application.

The first message displayed after selecting the Iname command is a sub-menu asking the user to either list or set Input Names. The message is shown below.

```
Naming Inputs  
List name  Set name
```

Both selections are described in the next section.

### **List Name**

The following message explaining the use of the arrow and “ESC” keys will be briefly displayed.

```
Use ← → to scroll  
ESC to skip or exit
```

The name of the first input will then be displayed as shown below. In the example cited the default name for Input Number 1 is shown. All twenty characters of the Input Name, if assigned, will be displayed.

```
Input    1 is named  
Inp #1
```

To advance to the next input press the right arrow key. To select an input out of sequence press “ESC”. The following message will be displayed.

```
Input number to jump  
to (ESC = quit):
```



Any Input Number consistent with the number of slave units may be specified. Pressing "ESC" a second time will return the user to the command menu.

## Set Name

*(Alpha-numeric Editing Procedure)*

The Set Name command allows the user to assign non-default names to specific inputs. The first message appears briefly, it reads as follows.

```
Press ESC anytime to
Quit or Skip inputs.
```

The next message requests the user to enter an Input Name for the specified input. A typical message is shown below.

```
Name of input # 1:
_
```

- The first character of the name to be entered assumes the left-most position of the second line (i.e., directly above the underscore character). Assigning Input Names involves the use of a special editing technique. Letters and symbols are selected one at a time by using the "BROWSE" and "SETUP" keys. To assign an alpha-numeric name follow the steps listed below.
- The character to be entered will always be positioned directly above the underscore character. The underscore character is used to identify the cursor. The left and right arrow keys are used to position the cursor.
- Press the "BROWSE" key repeatedly to scroll forward through the set of characters and symbols. Lower-case letters follow upper-case letters. They are followed by symbols. Press the "SETUP" key to scroll backwards through the same set of characters and symbols. Numbers may be entered directly from the keypad.



**Tip:** hold the "BROWSE" or "SETUP" keys down to scroll quickly through the entire set of eighty-four characters.

- Press the right arrow key to advance the cursor to the next character position. Press the left arrow key to position the cursor where a previously assigned character is to be overwritten or corrected.



**Note:** characters are deleted only if they are overwritten. **Pressing the left arrow key will not delete characters.** They must be overwritten.

**Tip:** the space character appears as a normal underscore character. It occurs immediately after the ? character. The underscore character appears as a double underscore.

- Repeat the above steps until all of the characters have been entered.
- Complete the name assignment by pressing the "ENTER" key.

The system will then automatically advance to the next sequential input. To jump to a specific input press the “ESC” key. The following request for an Input Number will be issued.

```
Input number to jump
to (ESC = quit):
```

Any Input Number consistent with the number of slave units may be specified. To exit the Set Name command press “ESC” again rather than entering an Input Number. The user will be returned to the command menu.

## Uname - Set Location Name

The Location Name (also referred to as the Unit Name) allows the user to identify a particular Model 240M/S with a descriptive name. The name may be any combination of letters and numbers not exceeding twenty total.

Selecting Uname will briefly display a message similar to the following.

```
Current unit name:
***** NOT SET *****
```

In the example cited the Location Name is set to the factory default value. The following message will then direct the user to either change or accept the name shown.

```
Change? ENTER or ESC
***** NOT SET *****
```

Pressing the “ESC” key will return the user to the command menu. Pressing “ENTER” will display the message shown below.

```
Enter new unit name:
_
```

The new Location Name must be entered by using the same Alpha-numeric Editing Procedure employed by the Iname command. Refer to the description on page 57.



**Note:** the Location Name may contain as many as eighty characters if it was defined via the Local Port or modem using the Set Location Name (i.e., “L” command). Because the LCD panel will only display twenty characters per line it will only show the first twenty characters of the name.

**Note:** if the user elects to create a Location Name via the keypad the name will be limited to twenty characters.

## **Ename - Set Event Names**

Event Names are used by the Model 240M/S to add description to Event Records. Event Names are discussed in the section entitled "Set Event Names" on page 20. The Set Event Names keypad command allows the user to create a set of Event Names.

After selecting the command the following menu will be displayed.

```
Event names Setup
List name  Set name
```

As the command menu indicates the user may either list or define the Event Names. Both selections are described in the following section.

### **List**

The Model 240M/S allows the user to define as many as twelve Event Name Pairs. To view the current set of Event Names select the "List" command. The LCD will display information similar to the following.

```
Event pair 1 named
Lite On/Lite Off
```

The number of the Event Name Pair is listed in the first line of text. It will range from one to twelve. The Event Names are listed in the second line of text. The active Event Name is listed first. It is followed by the inactive Event Name. The "/" character separates the two names.

To advance to the next Event Name Pair press the right arrow key. To scroll back one Event Name Pair press the left arrow key. To jump to a specific Event Name Pair press the "ESC" key. The following request for an Event Name number will be issued.

```
Event number to jump
to (ESC = quit):
```

Any number from one to twelve may be entered. To exit the List command press "ESC" a second time. The user will be returned to the command menu.

### **Set Name**

The Set Name command allows the user to define each of the twelve possible Event Name Pairs. After selecting the command a message describing the use of the "ESC" key will be briefly displayed. It will be followed by the message shown below.

```
Active name # 1:
_
```

The cursor, which appears as an underscore character, will be located at the first character position of the second line. The user can then proceed to enter the active Event Name for the first pair. The Alpha-numeric Editing Procedure described on page 57 is used to define each Event Name.

After the active Event Name is defined the system will automatically advance to the inactive Event Name for the same pair. After it is defined the next Event Name Pair is automatically selected. To jump to a specific Event Name Pair press the "ESC" key. The following request for an Event Name number will be issued.

```
Event number to jump  
to (ESC = quit):
```

Any number from one to twelve may be entered. To exit the Set Name command press "ESC" a second time. The user will be returned to the command menu.

## **InpEN - Assign Event Names to Inputs**

After the Event Names have been defined they can be assigned to inputs by using the InpEN command. A title message will be displayed briefly after selecting the command. It will be followed by the message listed below.

```
List Set ALL inputs  
Set individual input
```

The user can list, assign an Event Name to all inputs, or assign to a single input. Each of the three selections is described in the following section.

### **List**

To display the Event Names assigned to an input select the "List" command. The LCD will display information similar to the following.

```
Input    1 event name  
10 Lite On/Lite Off
```

The Input Number is listed in the first line of text. The first data field in the second line of text indicates the number of the Event Name Pair (e.g. "10" for the sample data listed). The number of the Event Name Pair will range from one to twelve. Finally, the assigned Event Name Pair is shown. The active Event Name is listed first. It is followed by the inactive Event Name. The "/" character separates the two names.

To advance to the next input press the right arrow key. To scroll back one input press the left arrow key. To jump to a specific input press the "ESC" key. The following request for an Input Number will be issued.

```
Input number to jump  
to (ESC = quit):
```

Any Input Number consistent with the number of slave units may be specified. To exit the List command press “ESC” again rather than entering an Input Number. The user will be returned to the command menu.

### **Set All Inputs**

The Set All Inputs command will assign a common Event Name Pair to every input in the system. After selecting the command the following message will be displayed.

```
Enter event name #  
for all inputs:
```

The user must then enter a valid Event Name number in the range from one to twelve. After the entry is completed the user will be asked to confirm the assignment. A message similar to the following will be displayed.

```
10 was entered.  
Confirm:ENTER or ESC
```

The user will then be returned to the command menu.

### **Set Individual Input**

The user may wish to assign a particular Event Name to a specific input. The Set Individual Input command provides this capability.

After selecting the command the message shown below appears briefly. It indicates that the “ESC” key may be pressed to either jump to a specific Input Number or to quit the command.

```
Press ESC anytime to  
Quit or Skip inputs.
```

The user is requested to respond to the following message.

```
Enter event name #  
for input # 1:
```

The number of any Event Name Pair ranging from one to twelve may be specified. Press the “ENTER” key when the number is correct. If the number is in the correct range the system will automatically advance to the next Input Number and issue a message similar to the above. If the user presses “ESC” instead, a message requesting an Input Number will be displayed. Any Input Number consistent with the number of slave units may then be specified. Pressing “ESC” a second time will display the command menu.

## Modem - Set Modem Ring Delay

The Set Modem Ring Delay command applies only to Model 240M/S systems equipped with an internal modem. The modem operates in "auto-answer" mode. The number of rings that occur prior to the modem answering is set by the Modem command.

The following message will be displayed in response to selecting the Modem command.

```
Modem Ring Delay: 02
Enter new Delay :
```

Any number in the range 0 to 99 can be specified. A setting of "0" will disable the "auto-answer" feature. That is, calls will not be answered with this setting. The user will be returned to the command menu after the delay is set.

## PCode - Set Passcode

The Set Passcode command allows the user to deny access to the system by unauthorized individuals who may attempt to alter the setup parameters via the front panel.

Selecting the Set Passcode command will briefly display the following message (assuming that the Passcode has not been changed from its factory default setting of "12345678").

```
Current passcode:
12345678
```

It will be followed by the request shown below.

```
Change? ENTER or ESC
12345678
```

To abort the Set Passcode command and return to the command menu press "ESC". To change the Passcode press "ENTER". The following message will be displayed.

```
Enter new passcode:
```

The Passcode can only contain numeric values. As many as eight numbers may be used to define the Passcode. After the new Passcode is entered the following message will direct the user to re-enter the Passcode.

```
Re-enter to verify:
```

If the user correctly re-enters the Passcode the procedure is completed and the user will be returned to the command menu. If a mistake is made the procedure for entering a new Passcode will start again.

## SPort - Set Local Port Baud Rate

The Local Port Baud rate may be set to one of six values ranging from 1200 to 38,400 Baud. The factory default Baud rate is 19,200. To change the Local Port Baud rate select the SPort command. The following two messages will be briefly displayed.

```
Local Port #1  
baud rate setting
```

```
Use ←→ to pick baud  
rate and then ENTER
```

Finally, the Baud rate selection menu will be displayed as follows.

```
1200  2400  4800  
9600 19200 38400
```

The arrow keys may be used to select a new setting. The new Baud rate will take effect immediately after pressing the "ENTER" key.

## RESET - Reset System

The Reset command will erase all Event Records from memory and restore the setup database to its default values. This command should be performed with great care since data will be permanently lost. However, the system configuration (i.e., number of slaves and PCBs per slave) will not be altered.

The Reset command will briefly issue the following two precautionary messages.

```
You've chosen a very  
DESTRUCTIVE command.
```

```
It erases ALL events  
and user configs.
```

It will be followed by the request shown below.

```
Are you totally sure  
(ENTER=Yes ESC=No) ?
```

Pressing "ESC" will return the user to the command menu. Pressing "ENTER" will execute the Reset. The system will then reinitialize itself. The LCD will display several messages that indicate the progress of the initializing process. After executing the Reset command the setup database will be restored to the values listed in Table 1.

This concludes the description on how to use the front panel keypad and display. The next chapter describes general maintenance techniques that may benefit the user in case of problems.





# Maintenance

---

## Introduction

The primary purpose of this chapter is to describe the recommended trouble-shooting methods to be used with the Model 240M/S. It should be referred to if ever a questionable symptom arises during the operation of the system.

The Model 240M/S is designed to provide its user with many years of trouble-free operation. There are **no user serviceable parts** in the system. There are **no consumable items or supplies** that need to be replaced or replenished. The user may, occasionally, need to wipe dust away from the external surfaces of the system. This should be done with a clean, dry cloth. The mechanical design of the chassis provides the electronic assemblies with a nearly sealed environment. Due to the low power consumption of the system ventilation holes are not required. The inside of each chassis should remain clean indefinitely.

## PCB Removal and Insertion

Except for possibly turning the power on and off, the user should never have need to open a unit. However, if a PCB ever needs to be inspected or replaced it should be performed in accordance with the following procedure. Figures 2 and 5 illustrate the position of each PCB inside both chassis types.

- Open the front cover. Turn the power off by placing the switch mounted on the PCB labeled "POWER" to the down position.
- Carefully remove any cables attached to connectors mounted on the PCB. Refer to Figures 8 and 9 for details on where the various internal cables are terminated.
- Using the PCB ejector as a lever remove the circuit board from the chassis. Care should be taken to prevent electrostatic discharges from damaging the PCB (see below).
- Inspect or replace the PCB. Refer to the OPTO IN PCB Switches procedure on page 70 for special instructions regarding these PCBs. OPTO IN PCBs have a dark blue ejector color.

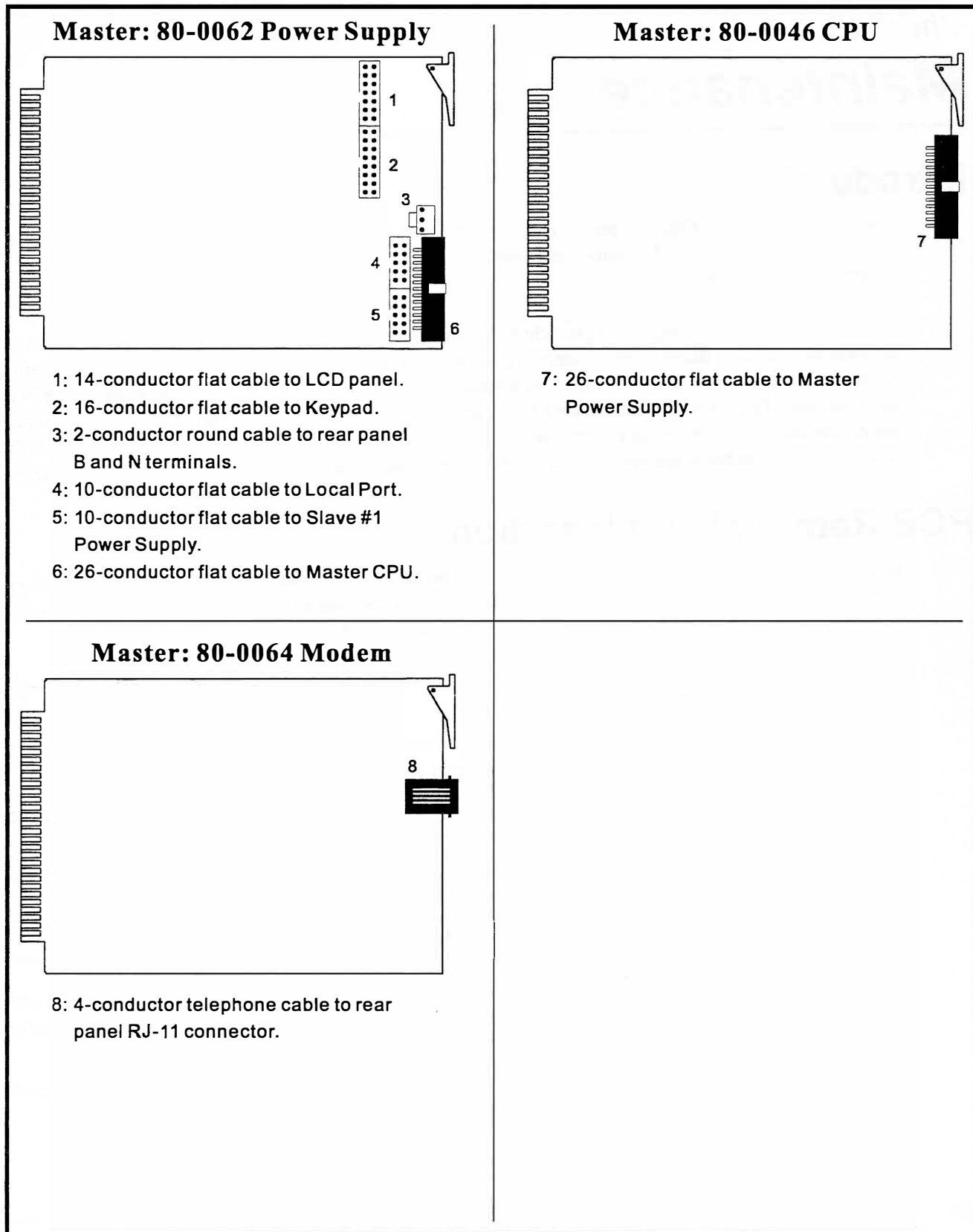


**Note:** earlier Model 240M/S systems used the 80-0023 OPTO IN PCB.

- Install the PCB by aligning its edges with the plastic card guides secured to the chassis top and bottom sheet metal. Push the PCB forward into its mating connector. When the PCB is fully seated a slight snap should be felt.
- Reattach any cables to their respective PCB connectors. Cables are keyed, so they can be inserted in only one direction. Do not force a cable into a connector. They should seat easily if they are aligned properly.
- Power can now be reapplied. Close the front cover.



**Caution:** never insert a PCB when the power is on! Damage to the PCB may occur. Electrostatic discharges can cause serious damage to many electronic components. When handling PCBs it is recommended that the user wear a wrist grounding strap.



**Master: 80-0062 Power Supply**

**Master: 80-0046 CPU**

- 1: 14-conductor flat cable to LCD panel.
- 2: 16-conductor flat cable to Keypad.
- 3: 2-conductor round cable to rear panel B and N terminals.
- 4: 10-conductor flat cable to Local Port.
- 5: 10-conductor flat cable to Slave #1 Power Supply.
- 6: 26-conductor flat cable to Master CPU.

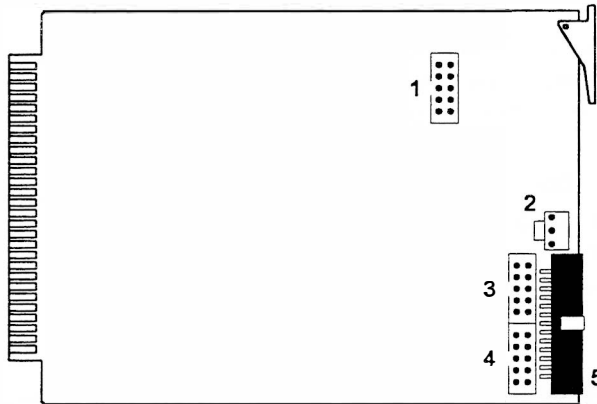
- 7: 26-conductor flat cable to Master Power Supply.

**Master: 80-0064 Modem**

- 8: 4-conductor telephone cable to rear panel RJ-11 connector.

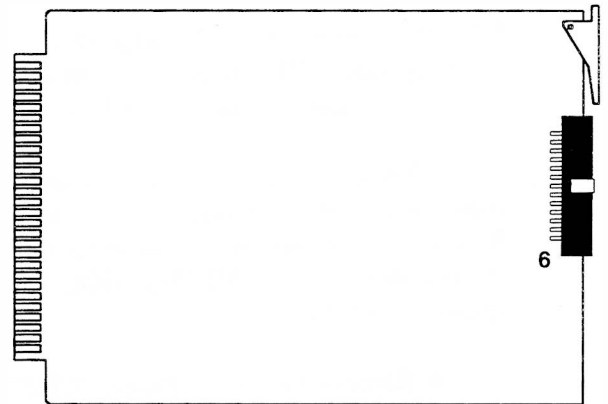
Figure 8  
Master PCB cable terminations

**Slave: 80-0062 Power Supply**



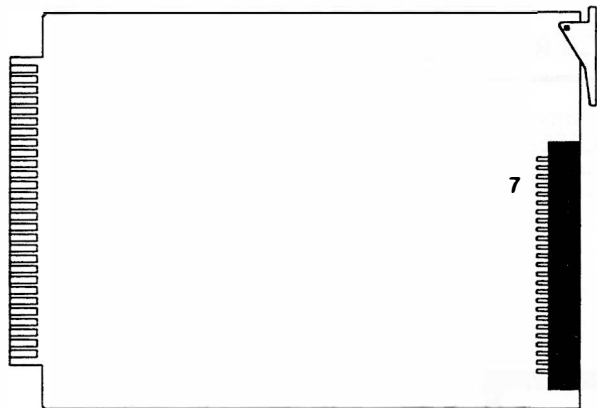
- 1: 4-conductor round cable to front panel LEDs.
- 2: 2-conductor round cable from Master Power Supply.
- 3: 10-conductor flat cable to Diagnostic Port.
- 4: 10-conductor flat cable from Master Power Supply.
- 5: 26-conductor flat cable to Slave CPU.

**Slave: 80-0046 CPU**



- 6: 26-conductor flat cable to Slave Power Supply.

**Slave: 80-0065 Opto-Input**



- 7: 50-conductor flat cable to rear panel input terminals.

*Figure 9*  
*Slave PCB cable terminations*

## Updating the Firmware

Like any microprocessor-based product the Model 240M/S relies upon the execution of a stored program for its operation. The program, referred to as firmware, is stored in a special Integrated Circuit (IC). The IC is an Erasable Programmable Read Only Memory (EPROM) device.

MICRO-AIDE will, from time to time, update the firmware for the Model 240M/S. The update may require a change of the firmware used by the master or slave(s), or both. Updates may provide additional features or expanded performance. Customers interested in updating their firmware can do so with little or no assistance from MICRO-AIDE. The steps listed below must be followed whenever a firmware update is performed.

- Remove the PCB labeled "CPU" from inside the appropriate chassis. Follow the procedure entitled "PCB Removal and Insertion" on page 65.
- Using a small, flat-head screwdriver remove the existing EPROM IC from its socket. Carefully review Figure 10 for the location of the correct IC.
- If requested to do so, return the removed EPROM to MICRO-AIDE customer service.
- Insert the new, updated EPROM in the vacated socket. The **small indentation** on the IC must be **facing to the right**. Some ICs will indicate Pin 1 with a small dot. In such cases the dot must be oriented towards the **upper right-hand corner** of the socket. The **two columns of pins at the extreme right edge** of the socket must be vacant if the EPROM is a twenty-eight pin IC. Refer to Figure 10.
- Inspect the EPROM to ensure that pins are not bent underneath the IC. Ensure that all 28 (or 32) pins are properly inserted within the socket.
- Re-install the CPU PCB according to the PCB Removal and Insertion procedure.

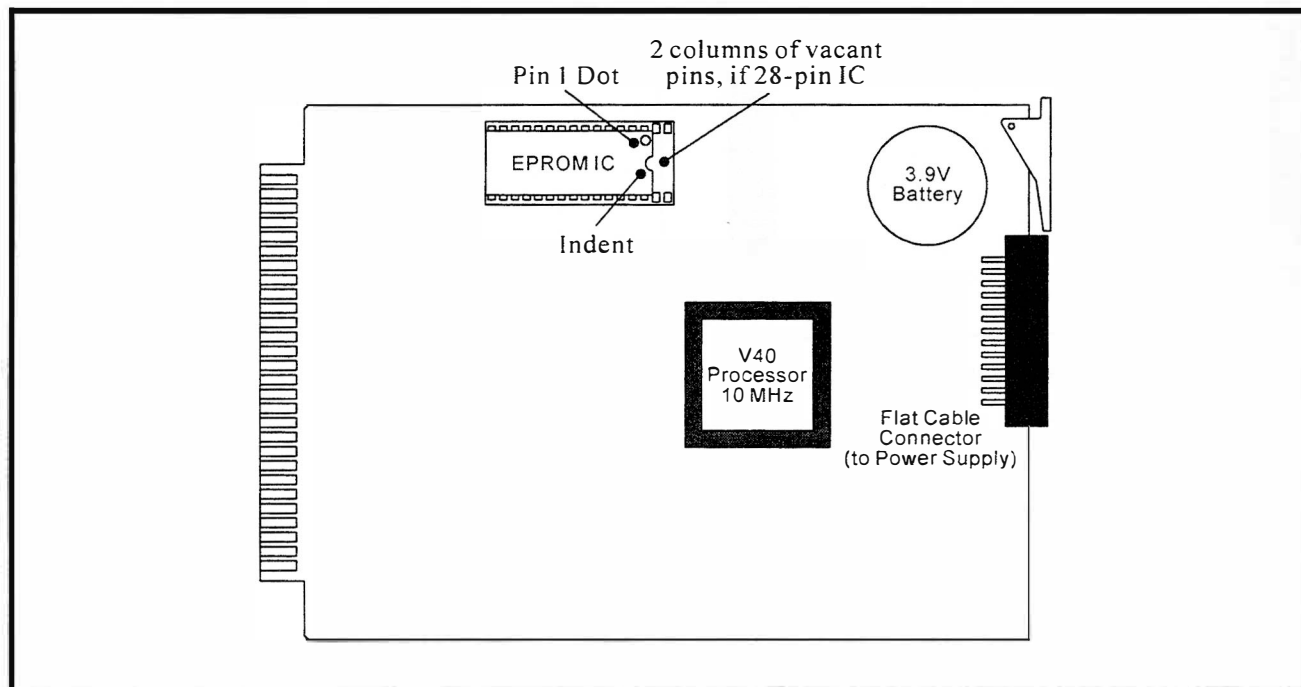


Figure 10  
Location of EPROM IC, 80-0046 CPU PCB



**Note:** after completing the firmware update procedure it may be necessary to perform a Reset System command. A reset should be performed only if recommended by MICRO-AIDE customer service technicians. Refer to page 16 for a description of the Reset System command.

When power is applied the system should boot-up and begin normal operation. If it fails to boot-up, review the steps listed above to isolate the problem. The EPROM may have been incorrectly installed.

## Setting the Slave ID

The Model 240M/S system can be equipped with as many as sixteen slaves. The first slave section is always housed within the Model 240M chassis. Subsequent slave sections are housed in separate Model 240S units. The system assigns Input Numbers to groups of 240 inputs by identifying each slave section by a unique identification code. The Input Numbers for each group will only be correct if the Slave ID is assigned properly. The Slave ID is controlled by jumper settings located on each of the slave 80-0062 Power Supply PCBs. A field of four jumper pins controls the Slave ID. Refer to Figure 11. The correct jumper setting for each slave section is illustrated in Figure 12.

## Network Termination Settings

The Model 240M/S system uses an Arcnet LAN to facilitate communications between the master and each of the slave units. The LAN is physically implemented as a series of short cable connections between each chassis in the system. To avoid communication errors the network must be properly terminated at its end points. Accordingly, the Model 240M and the last Model 240S (i.e., slave section with greatest ID number) must be configured to terminate the network. **All other slave sections must have their termination option disabled.**

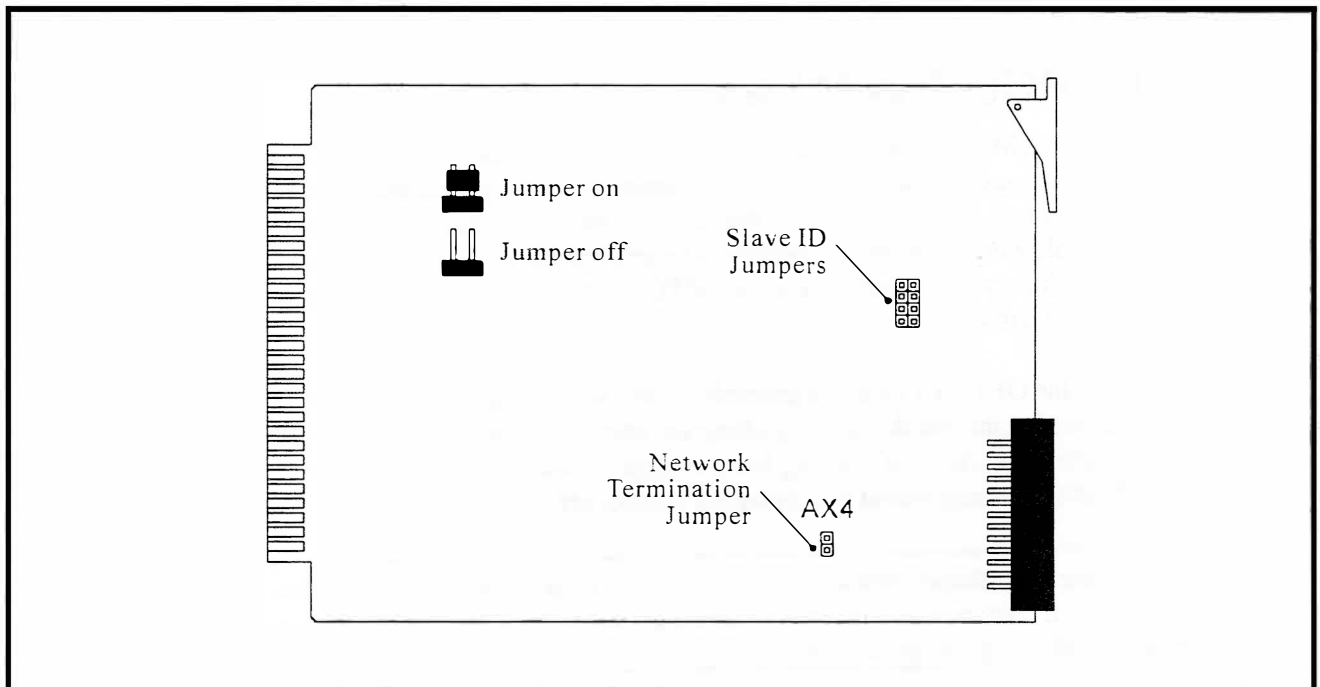


Figure 11  
Slave ID jumpers, 80-0062 Slave Power Supply

Slave 1 Part of 240M		Slave 5		Slave 9		Slave 13	
Slave 2		Slave 6		Slave 10		Slave 14	
Slave 3		Slave 7		Slave 11		Slave 15	
Slave 4		Slave 8		Slave 12		Slave 16	

Figure 12  
Slave ID assignments

Figure 11 illustrates the location of the network termination jumper. Like the Slave ID jumpers it is located on the 80-0062 Power Supply PCB. The Model 240M network termination setting is located on its 80-0062 Power Supply PCB.



**Note:** only the master and last slave should be configured to terminate the network.

## OPTO IN PCB Switches

Each Model 240M/S chassis is typically equipped with ten OPTO IN PCBs. Each PCB has a capacity of twenty-four input circuits. The microprocessor “reads” information from these PCBs. The Input Number forms part of the information that must be read accurately. To ensure that the Input Number is correct several switches and/or jumpers must be set properly on each OPTO IN PCB. Figure 13 illustrates the location of the switches/jumpers on the OPTO IN PCB. Table 4 lists the correct switch/jumper settings for each PCB position.

Switches on the OPTO IN PCB are generally “On” when pushed to the up position. However, to ensure the correct setting inspect the labeling along the edge of the switch body. Some PCBs may use jumpers instead of switches. An “On” setting is equivalent to installing the jumper across the appropriate pins. An “Off” setting is equivalent to leaving the jumper off.



**Caution:** the user should never change OPTO IN PCB switch settings unless directed to do so by MICRO-AIDE customer service technicians. However, if a replacement PCB is sent by the factory the user may need to set the switches to match those of the PCB being replaced.

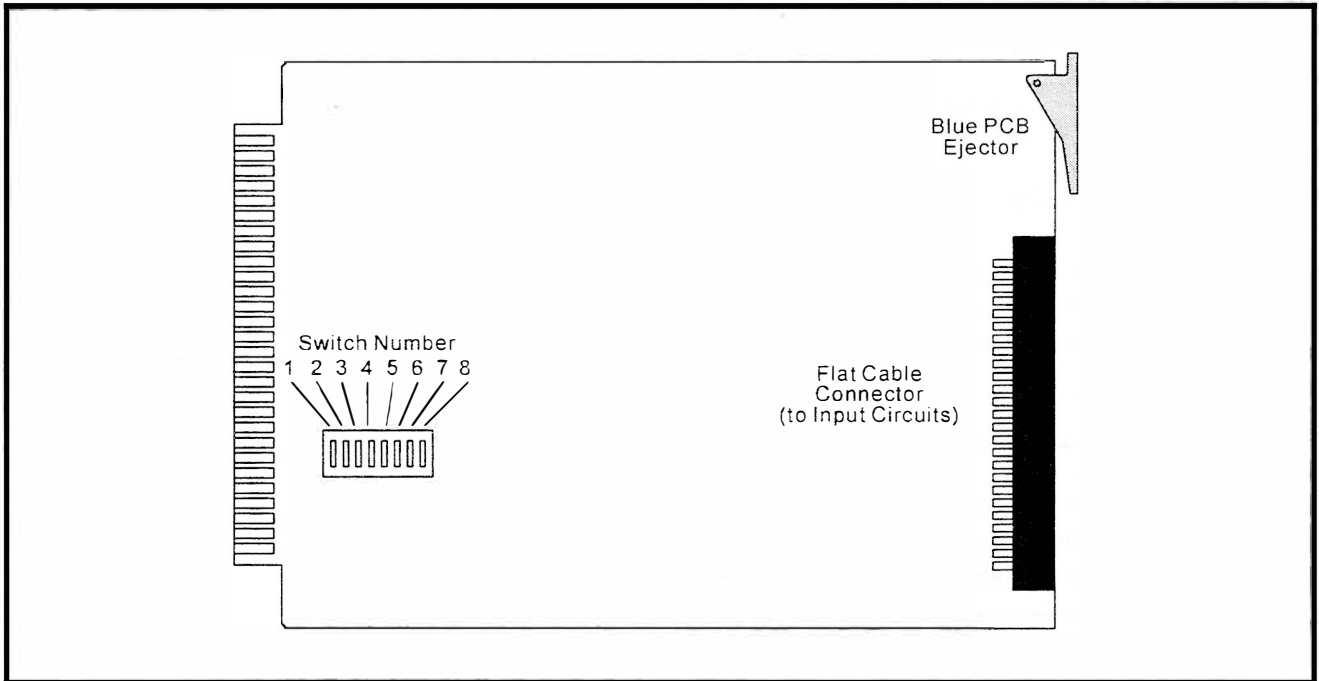


Figure 13  
Input Number switches, 80-0065 OPTO IN PCB

PCB Positions	Input Numbers	Switch Number							
		1	2	3	4	5	6	7	8
1 (at left)	1 - 24	Off	Off	Off	Off	On	Off	On	On
2	25 - 48	Off	Off	Off	Off	On	Off	On	Off
3	49-72	Off	Off	Off	Off	On	Off	Off	On
4	73-96	Off	Off	Off	Off	On	Off	Off	Off
5	97-120	Off	Off	Off	Off	Off	On	On	On
6	121-144	Off	Off	Off	Off	Off	On	On	Off
7	145-168	Off	Off	Off	Off	Off	On	Off	On
8	169-192	Off	Off	Off	Off	Off	On	Off	Off
9	193-216	Off	Off	Off	Off	Off	Off	On	On
10 (at right)	217-240	Off	Off	Off	Off	Off	Off	On	Off

Table 4  
OPTO IN switch settings by PCB position

## Diagnostic Tests

A set of three diagnostic commands are included with the Version 3.03 (and later) firmware. The commands allow the user to perform a comprehensive test of the EPROM, RAM and front panel keypad. The tests can only be performed from a peripheral device connected to the Local Port or via a modem connection. The tests cannot be performed from the front panel.

To initiate a test the user must have Administrative Access to the system and be prepared to execute a Main Menu command. Pressing the “~” (tilde) key will display the following message.

```
Access Code:
```

The correct Access Code is “DIAGNOSTICS”. Press the “ENTER” key to complete the entry. To hide the code the system will display an “\*” for each keystroke. The Access Code is case sensitive. The following message will be displayed after entering the correct code.

```
command:
```

To list the diagnostic commands press “?” followed by “ENTER”. The following list will be displayed.

```
E (EPROM checksum test)
R (RAM self test)
K (keypad test)
X exit
command:
```

The use of each command is described in the following sections.

### EPROM Test (E)

The Model 240M/S master and slave firmware can be verified using the EPROM Test. To start the EPROM Test press “E” followed by “ENTER”. The following message will be displayed.

```
EPROM checksum test, continuous (Y/N) ?
```

**The EPROM Test is completely non-destructive to the operation of the system.** Consequently, it can be performed repeatedly without disturbing the normal operation of the system. To initiate a single test press “N”. To run multiple tests press “Y”. A message similar to the following will be displayed in response to a request for continuous testing.

```
Checksum=28fe
Slave 1 checksum=3616
Pass 5
```



The checksums “28fe” and “3616” in the message above apply only to V3.03 firmware for the master and slave units, respectively. The checksum for each slave unit will be listed in sequence by slave number. The checksums calculated by the EPROM Test should be compared to the checksums written on the label of the EPROM ICs. Discrepancies should be reported to MICRO-AIDE customer service technicians.

The “Pass” number listed in the sample data applies only to the continuous testing method. The number of passes is incremented each time the EPROM Test completes a checksum calculation. Any calculation that results in a different checksum will be reported in a separate line of text.



**Tip:** MICRO-AIDE recommends that five passes of the EPROM Test be performed.

The user must terminate a continuous test by pressing the “ESC” key.

## RAM Test (R)

The master unit stores Event Records and the setup database in Random Access Memory (RAM). The RAM Test allows the user to verify the proper operation of the RAM resident in the Model 240M. **It is not able to test the RAM in the Model 240S units.** To start the RAM Test press “R” followed by “ENTER”. The following message will be displayed.

```
On line memory test, continuous (Y/N) ?
```

**The RAM Test is completely non-destructive to the operation of the system.** Consequently, it can be performed repeatedly without disturbing the normal operation of the system. To initiate a single test press “N”. To run multiple tests press “Y”. A message similar to the following will be displayed in response to a request for continuous testing.

```
Pass 1, 0 errors
Extended bank 0, 512K 20000-9ffff
.....
Extended bank 1, 512K 20000-9ffff
.....
Extended bank 2, 512K 20000-9ffff
.....
Extended bank 3, 512K 20000-9ffff
.....
```

The sample message shown above reflects a master unit with the minimum RAM configuration of four ICs (banks 0 to 3). The exact message response to the test will vary with the amount of installed RAM. A test failure should be reported to MICRO-AIDE customer service technicians. Each 4 Mbit RAM IC is installed in a socket located on the 80-0056 Memory Expansion PCB.



**Tip:** MICRO-AIDE recommends that three passes of the RAM Test be performed.

The user must terminate a continuous test by pressing the “ESC” key.

## Keypad Test (K)

The Keypad Test allows the user to verify the operation of the Model 240M keypad. To start a test press “K” followed by “ENTER”. The correct number must be displayed each time a numeric key is pressed. The left and right arrow keys will appear as “<” and “>”, respectively. The “BROWSE”, “SETUP”, “ESC” and “ENTER” keys will be displayed as “B”, “S”, “E” and “N”, respectively.



**Note:** the appearance of spurious or multiple characters is an indication of a faulty keypad.

To terminate the Keypad Test press the “ESC” key.

## Exit (X)

To exit the Diagnostic command and return to the level of the Main Menu press “X” or “ESC”.

# Slave Diagnostic Commands

The Slave Diagnostic Commands can be used in the event of a master unit or network communications failure. The commands allow the user to access Event Records and perform the most critical setup database functions (e.g., date, time and detection time programming).

Each Model 240S chassis contains an RS-232 port labeled “Diagnostic”. It is located at the rear panel. The Slave Diagnostic Port is similar to the Local Port used by the Model 240M. It can be accessed by using the same RS-232 cable and N-8-1 data format setting. However, its Baud rate is fixed at 19,200. The peripheral device should be set for full duplex operation.



**Note:** the Model 240M chassis does not provide a Diagnostic Port to its slave section (i.e., slave 1)

To list the diagnostic commands press “?” followed by “ENTER”. Each command is listed below.

```
C  System reset
D  Dump events
F  Set Flashing inputs
K  Set input detect times
S  Print live status of inputs
T  Print the current date and time
```

Command (? for help) :

Except as noted below, the Slave Diagnostic Commands function in a manner identical to their Model 240M counterparts.

- **All commands:** only the slave unit that is currently accessed by the user is affected by commands executed by the user.
- **Dump Events:** all Event Records currently stored in the slave but not yet transferred to the master will be Dumped. The Dump Events command does not allow the user to select a specific range of dates or times for the Dump.



**Caution:** the slave System Reset command will erase all Event Record data currently stored in the slave memory but not yet transferred to the master. **Data loss will occur!**

## Slave Test Commands

An abbreviated list of test commands is also available. Like the master, they can be accessed by pressing the “~” (tilde) character. Entering the word “DIAGNOSTICS” in upper-case letters will display the following message.

```
command:
```

Pressing “?” followed by “ENTER” will display the menu of test commands as follows.

```
E (EPROM checksum test)
R (RAM self test)
X exit
command:
```

Each test command functions like its Model 240M counterpart.

## Checking the RAM Battery

### CPU RAM

The Model 240M/S stores the entire setup database and all of the Event Records in Random Access Memory (RAM). Some, but not all, of this RAM is installed in the master and slave CPU PCBs. Low power CMOS-type RAM ICs are used. A PCB mounted lithium battery is used to insure that the data saved in the RAM ICs will be retained if power to the system is interrupted. The battery provides a very small, but adequate, amount of power to the RAM ICs when power is off. **There is no drain on the battery when power is applied to the system.** Conversely, the longevity of the battery will be shortened if the system remains powered off for extended periods of time. With normal system operation the battery should not need to be replaced for ten years.

MICRO-AIDE recommends that the battery be checked once a year. A single battery can be found on each of the 80-0046 CPU PCBs (master and slave versions). Figure 10 illustrates the location of the battery. The battery terminals can be accessed on the backside of the PCB. The battery voltage should measure at least 2.5V. If the battery voltage is less than 2.5V contact MICRO-AIDE customer service for instructions on how to proceed.

### Memory Expansion RAM

The Model 240M unit contains additional RAM that is located on the optional 80-0056 Memory Expansion PCB. Event Records are stored in RAM ICs located on the Memory Expansion PCB. It also contains a lithium battery that should be checked once a year.

## Trouble-shooting Guide

The following guide is provided to assist the user in resolving problems that may occur with the operation of the Model 240M/S. It can be especially helpful when attempting to operate the system for the first time. Procedures for resolving both local and remote problems are listed. Where multiple steps are indicated it is recommended that they be performed in the order listed. Removal of PCBs must be done in accordance with the procedures described earlier in this chapter.

If the user is unable to resolve the problem, MICRO-AIDE customer service technicians should be contacted. The user will be asked to state the problem, related symptoms, and indicate any operations or conditions that have a bearing on the problem. If available, the results of any diagnostic tests should be reported. If the system has an installed modem it may prove to be helpful in diagnosing the problem from the MICRO-AIDE factory. The user will be asked to provide the appropriate telephone number and correct password.

<b>Trouble-shooting Guide</b>	
<b>Symptom or Problem</b>	<b>Resolution</b>
No indication of power	Measure +10 to +36 VDC at the B and N power terminals. Inspect fuse on Power Supply PCBs.
PC or VDT does not display data	Check cable connection to Local Port. Verify cable is assembled per Figure 14. Check Baud rate setting. Check if light on front panel labeled "Terminal" illuminates.
Data at PC or VDT is garbled	Check Baud rate setting. Verify the following: 8 data bits, 1 start bit and 1 stop bit.
Printer is missing data or performing odd mechanical motions	Printer data buffer is being overflowed. Use Pause and Resume commands to control data flow to printer.
Characters entered at keyboard do not appear, or appear doubled	Use Toggle Full/Half Duplex command to change setting.
Initial Check-out procedure fails on all inputs	Make sure polarity of test voltage is applied correctly. Check Detection Time setting, set to 3.0 seconds or less. Check inputs using Print Live Status of Inputs command. Check network cabling at master.
Event Records are not being created on some inputs	Check input wiring, especially polarity. Check if Detection Time is too long for event. Check if Detection Time setting of 0 has disabled input.
Event Records are not being created by a specific slave unit	Check if slave "Network" LED is flashing. Check network cabling at appropriate slave unit. Run EPROM Diagnostic test to check network at slave unit. Check network termination setting at slave Power Supply PCB.
Input Numbers do not match input where event occurred	Check input wiring. Check switch settings on OPTO IN PCBs. Check ID jumper settings on slave Power Supply PCB.
Flashing Inputs create multiple Event Records	Inputs are not assigned as Flashing. Detection Time is set too short.
Upload/Download of setup database fails	Verify that XMODEM protocol is being used.
Full Screen Mode shows incorrect data fields	Verify that VDT or PC emulation is set for ANSI or Teletype 910 operation.
Modem does not answer	Check phone line connection. Modem Ring Delay setting must be non-zero.
Modem answers but modems fail to connect	Check modem Baud rate at host end. Host modem is not compatible with Event Recorder modem. Test the host modem on another auto-answer system.

*Table 5  
Guide to trouble-shooting techniques*

This completes the User Manual for the Model 240M/S Event Recorder. Two appendices have been provided. They list specifications and options applicable to the Model 240M/S.



**Note:** comments the reader may have on how to improve this manual are welcomed. Comments should be forwarded to the Director of Marketing, MICRO-AIDE CORPORATION.



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## Appendix A

# Specifications

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### Physical

#### Size (each chassis)

L: 17" H: 5.75" D: 10.5"  
L: 43cm H: 15cm D: 27cm

#### Weight

240M: 19 lbs., 8.5 Kgs.  
240S: 17 lbs., 7.5 Kgs.

---

### Environmental

#### Storage

Temperature: -40°F to +185°F,  
-40°C to 85°C

Humidity: 0 to 95%,  
non-condensing

#### Operating

Temperature: -22°F to +162°F,  
-30°C to 72°C

Humidity: 0 to 95%,  
non-condensing

---

### Mounting

Standard: desktop mounting or  
19" rack mounting

Optional: 23" rack mounting  
brackets available

---

### Construction

#### Chassis

Clear anodized aluminum

Front panel thumb screws allow  
access to inside

#### Electrical

Plug-in printed circuit boards,  
each identified by name

---

### Power

#### Isolation

Minimum 2,000 VAC isolation to  
B & N power terminals

#### Voltage

Nominal: 12 VDC

Range: 10 to 36 VDC

#### Consumption

240M: 7 Watts with modem

240S: 3 Watts

---

### Capacities

#### Slave Units

0 to 15

#### Inputs

240 to 3,840 in multiples of 240

#### Event Storage (240M)

Standard: 419,428 Event Records

Optional: maximum of 1,677,712  
in multiples of 104,857

Memory Full: newest data  
over-writes oldest data, 91<sup>st</sup> day  
over-writes oldest day

#### RS-232 Ports

One per chassis, suitable for use  
with a PC, VDT or printer

Baud Rate: 1200, 2400, 4800,  
9600, 19200 and 38400

Bit format: N-8-1

Emulation: TTY, ANSI and TVI-910

#### Liquid Crystal Display (240M)

2 lines by 20 characters

Alpha-numeric, upper- and  
lower-case

Viewing area: 2.9" by .5"

#### Front Panel Keypad (240M)

16 keys, push-button switches

0-9, left and right arrow, Browse,  
Setup, Esc and Enter

---

### Input Circuits

#### Input Impedance

5,000 ohms minimum

#### Voltage Range

5 to 30 VDC

#### Detection Timing

User defined, from .1 sec. to  
1,500 sec. in multiples of .1 sec.

Compatible with non-varying  
flashing circuits

---

### Input Isolation

#### Input to Ground

Minimum 3,800 VDC

---

### Input Isolation (continued)

#### Any Input to Adjacent Input

Minimum 1,500 VDC

#### Modem (240M option)

Meets FCC part 68 standards

---

### Connectors

#### Inputs

Paired "+" and "-" into screw-  
down, quick-disconnect  
terminals

Wire Size: 12-22 AWG

#### RS-232 Ports

DB-9 male connectors mounted  
on rear panel

Each configured as DCE

#### Network (Arcnet)

240M: DB-9 female

240S: DB-9 female, 1 in, 1 out

#### Power

Battery B and N to No. 6 screw  
terminals

#### Telephone Line (240M)

Female RJ-11 jack and No. 6  
screw terminals

---

### Indicators

#### LCD Panel (240M)

Backlit for enhanced visibility

Setup and data retrieval  
commands selected from  
multiple menus

#### LEDs

240M: Green; Power, Terminal  
and Modem

240S: Green; Power, Terminal  
and Network

---

### Memory

#### Type

Non-volatile, Event Records and  
Setup Database are saved in  
battery backed-up memory

#### Storage Longevity

1 year min. with power off

**Specifications**  
(continued)

**Internal Clock**

**Accuracy**

+/- 1 minute per month (20 ppm)

**Resolution**

Event Records are time stamped to nearest .1 second

**Operation**

Full calendar, auto-adjusted for leap year

Non-volatile with power off

Year 2000 compliant

**Password Protection**

**Administrative Level**

Access to all commands, 10 characters

**Restricted Level**

Access to Event Record viewing only, 10 characters

**Front Panel**

Numerical Passcode protects against setup alterations, 8 digits

**Modem (240M option)**

**Type**

Internal, plug-in PCB

V.32bis, 14400 Baud, data compression and error correction

**Usage**

Remote access via auto-answer operation

**Compliance**

Designed to meet FCC part 68

MICRO-AIDE reserves the right to make changes, at its sole discretion, to the specifications contained herein.

**Peripheral Cables**

Available from MICRO-AIDE or retail electronic and computer supply stores.

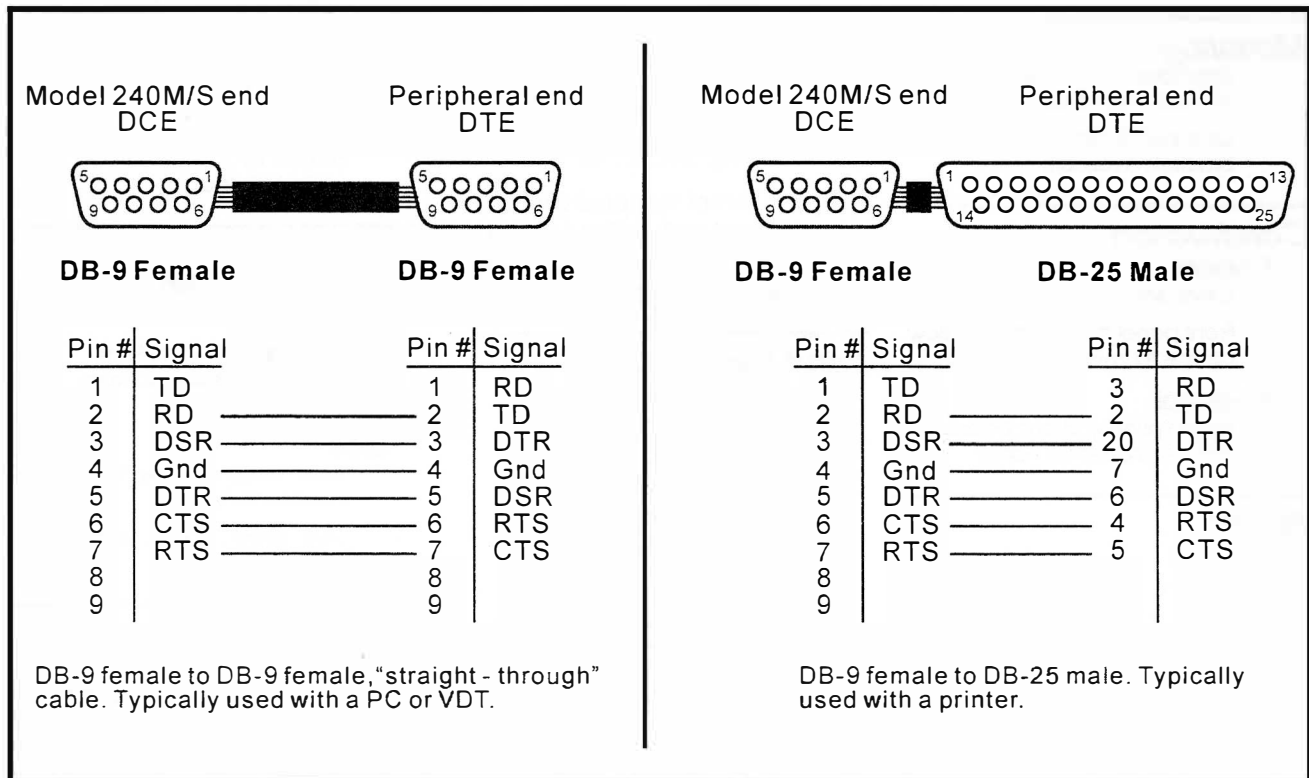


Figure 14  
Model 240M/S peripheral cables



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## Appendix B

# Options and Accessories

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### Options

#### AC Input Monitoring

**P/N 80-0065-1:** Used to monitor AC voltage input circuits, supports 24 inputs

Replaces 80-0065 PCB

#### Memory Expansion

**P/N 80-0056-XX:** Memory PCB

Adds 104,857 Event Records per memory chip;  
1,677,712 Event Records maximum

#### Mounting

**P/N 31-0001:** 19" rack mounting brackets

**P/N 31-0002:** 23" rack mounting brackets

#### Front Panel

**P/N 31-0010:** Protective LCD and Keypad lid

**P/N 31-0020:** Locking latches

---

### Accessories

#### Current Monitors

**HCS-4:** 4 inputs, 1 to 20 Amps, AC or DC

#### Battery Charger Monitors

**CSI-1:** 1 input, voltage and current

**CSI-4:** 4 inputs, voltage and current

#### Voltage Monitors

**LBD-4:** 4 inputs, DCV only

**LVD-4:** 4 inputs, ACV and DCV

#### External Modem

**PIM:** Power Isolated Modem, 14.4K Baud

#### Jumper Combs

**P/N 147250:** Weidmüller 10-position shorting clip used to connect multiple inputs to a single point (e.g., common return)

#### Cables

**Standard:** DB-9 to DB-9 (1 included)

**Optional:** DB-9 to DB-25 (upon request)

Contact MICRO-AIDE when ordering any options or accessories. List requested items as described in the above.



## MATERIAL RETURN

In the event the customer identifies a malfunction in any product, call or write MICRO-AIDE and obtain a Return Material Authorization (RMA) number from the customer service department. Return the product to MICRO-AIDE, freight prepaid, with a note (in-warranty repair) or a purchase order (out-of-warranty) for the repair listing the following information:

- RMA number issued by MICRO-AIDE
- Return shipment address
- Name and e-mail address or telephone number of person familiar with the problem
- Brief description of the problem (include any printouts that may have a bearing on the problem)
- Method of payment for repair costs (out-of-warranty)
- Send product to the following address:

### **MICRO-AIDE CORPORATION**

685 Arrow Grand Circle

Covina, CA 91722

Tel: 626-915-5502 Fax: 626-331-9484

E-mail: [support@micro-aide.com](mailto:support@micro-aide.com)

## LIMITED WARRANTY

MICRO-AIDE warrants its products to be free from defects in material and workmanship for a period of five (5) years from the date of shipment. This warranty is in lieu of any other warranty, expressed or implied. In no event shall MICRO-AIDE be held liable for incidental or consequential damage resulting from (1) the use of any of its products, or (2) any alleged breach of this warranty provision. MICRO-AIDE's liability shall be limited to repairing or replacing, at its sole discretion, any defective product which is returned in accordance with the MICRO-AIDE Material Return Policy.

Product that has been subjected to abuse, misuse, alteration, accident, lightning damage, neglect or unauthorized installation or repair shall not be covered by this warranty. MICRO-AIDE reserves the right to make a final decision as to the existence of any failures and the cause of such failures. No warranty is made with respect to custom equipment or products produced to buyer's specifications except as mutually agreed upon in writing.

**MICRO-AIDE CORPORATION**

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