Model PE-510

Micro Mutt

Technical Manual

<u>NOTICE</u>

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personnel and its customers to assist in the installation, operation and
maintenance of the Model PE-510 Micro Mutt. The information contained
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(including consequential) caused by reliance on this material as
presented.

If installation problems arise after you thoroughly review the manual,
please contact the ZETACO Customer Support Hotline at *1-612-890-5135* .

REVISION HISTORY

ECO No.	Date	Description	Pages
0328	6/28/84	New ZETACO Cover	
0523	3/3/86	New Cover	
0998	2/9/88	Added Second Switch-Type Info.	

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1.0   GENERAL DESCRIPTION

ZETACO's Model PE-510 Micro Mutt permits the operator of a
computer system to establish a communications link between
his CPU and a remote data terminal device that parallels his
own CPU to console connection. Once established, the
secondary communications path may be used by a distant
hardware or software diagnostician to resolve many
operational, equipment, or software problems.

The PE-510 is a self-contained unit designed for either
desk-top use or equipment cabinet mounting. Power is
provided by a wall plug supply. Installation requires no
modification to existing hardware or software.

Logically the PE-510 functions as a Y-switch residing in the
cable link between a main system console and the resident
console interface. Differing data transmission rates
between the CPU/console and remote terminal are reconciled
by internal character buffering and the Mutt's use of a
clear-to-send line or software X-ON, X-OFF commands.

The remote communications link is made using an asynchronous
full duplex modem operating over a standard voice grade dial
up telephone circuit. (ZETACO's Model 510-M300 Modem is
available as an option and is packaged within the Mutt
housing. It operates originate/answer over two wire
circuits at speeds to 300 BPS and is Bell 103 compatible.)

When activated, the PE-510 electronically connects the
remote terminal device into the CPU-Console data path to
allow the remote device full console privileges. Primary
data paths are selected from a 3-position control switch
located on the face of the unit. By moving the control
switch from "OFF" to "MONITOR" or "REMOTE", Mutt is
activated and the remote communications link may be used.
The remote terminal can be given CPU control while the local
console monitors activity (REMOTE MODE), or the local
console can retain CPU control while the remote terminal
monitors local activity (MONITOR MODE).

A special command set used by the PE-510 provides other
controls used in operation. These commands are keyed in by
either the local or remote console operators. Local
operator to diagnostician dialogue, masked from the CPU, is
possible and may be initiated by either operator. Sensitive
data transactions may be masked to the passive console by
using the Security Mode Feature.

PE-510 is compatible with most computers and features full
flexibility of word formats, baud rates, software vs.
hardware clear-to-send control and voltage or current level
data transmission.

FIGURE 1.1   SYSTEM FUNCTIONAL BLOCK DIAGRAMS

These diagrams illustrate the primary modes of operation of the PE-510 Micro Mutt.

OFF MODE

REMOTE MODE

MONITOR MODE

MESSAGE MODE
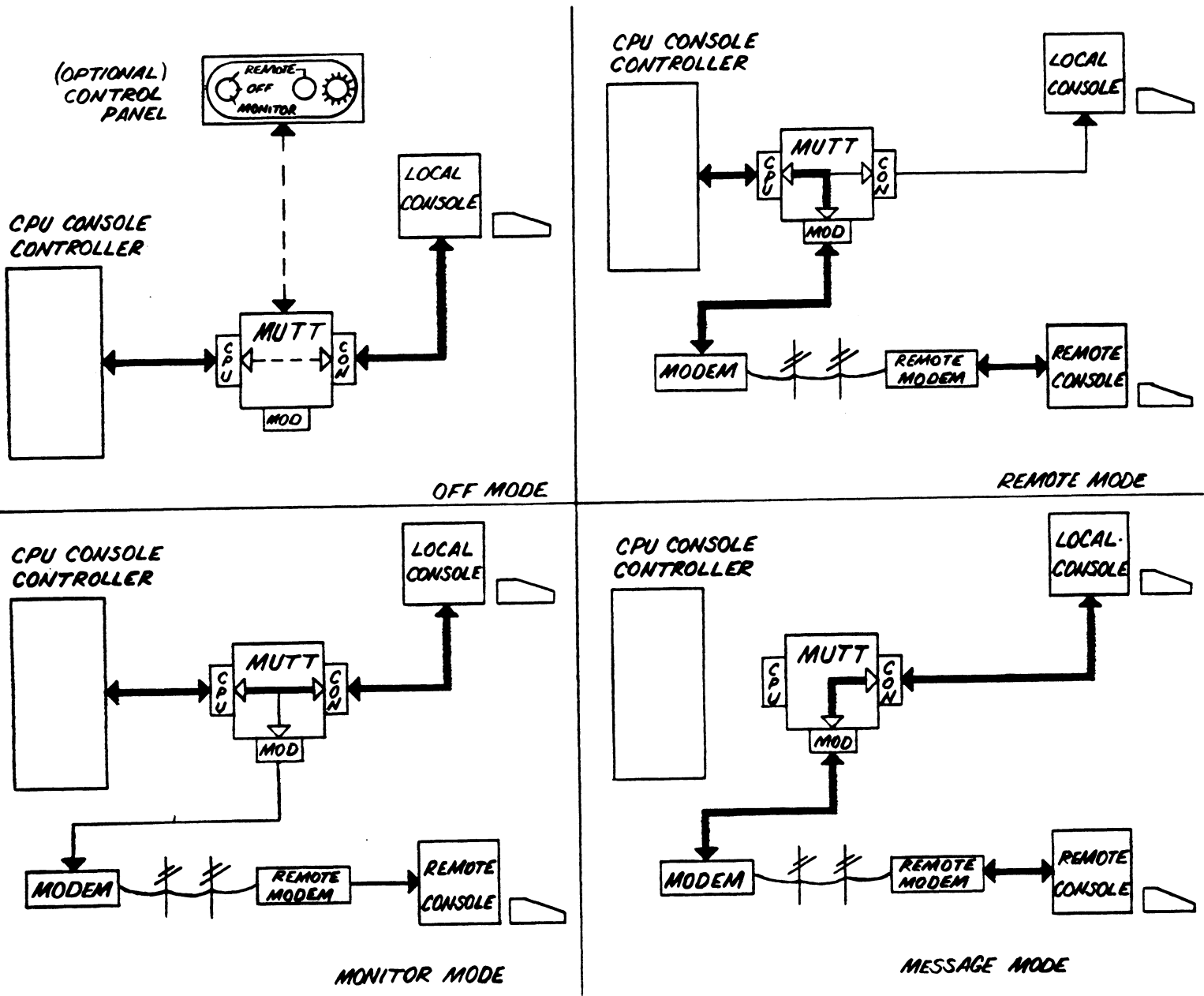
2.0 OPERATION

A 3-position control switch labeled MONITOR/OFF/REMOTE and a red light emitting diode (LED) labeled CARRIER are located in the lower right corner of the faceplate of the Micro Mutt. When the computer system is in normal operation with no external system support, the control switch must be in the "OFF" mode, Mutt is in an idle and disconnected condition.

The following sections describe in detail the procedures for operating Micro Mutt when external system support is required.

2.1 ESTABLISHING DATA LINK

To use Micro Mutt in providing external support to a computer system, a data communications link must be established with a remote terminal location. Depending on the modem arrangement used, the local operator may either initiate a call to or answer a call from the remote terminal location. After initial conversation and analysis of the problem, the local and remote operators must make the proper modem adjustments to establish the data link. If an originate/answer modem is used, be sure that the position of the ORG/ANS switch is set so that it is opposite that mode which the remote modem is using. (If the 510-M300 modem option is used, this switch is located on the rear of the unit.)

If the modem is equipped with a TALK/DATA switch, move the switch from TALK to DATA. (On the optional modem equipped units, this switch is located in the upper right corner of the faceplate. The LED labeled DATA should then be on. Detailed operating instructions for the 510-M300 modem are provided in Section 6.0.)

The data link should now be established and Micro Mutt ready for use.

2.2 PRIMARY MODE SELECTION

Primary operating mode selection is made using Mutt control switch on the faceplate. An external auxiliary control switch is available as an option, which mounts on the computer cabinet.

When the remote data link has been established, the local operator may move the control switch from OFF to MONITOR or REMOTE. This places the remote terminal in the CPU-System console data path.

The primary difference between REMOTE and MONITOR modes involves CPU control. Only one terminal may be used as system console at a time, although both operators observe all data exchanges.

o   MONITOR MODE - The local console has CPU control while the remote terminal monitors activity.

o   REMOTE MODE - CPU control is passed to the remote terminal while the local console monitors activity.

2.3   SPECIAL OPERATIONS MODE

When operating in MONITOR or REMOTE modes, other special modes of operation may be used by the local and remote operators.

MESSAGE MODE

The operators of either the remote or local terminals may use this feature, which allows messages, masked from the CPU, to be entered through the keyboards and sent from one operator to the other and vice-versa. If the data terminals are equipped with visual attribute features, Micro Mutt may be programmed to highlight the messages with a visual attribute (e.g., blink, low intensity, inverse video, etc.).

The MESSAGE Mode may be entered by either operator, at will, by keying in a two-character command sequence. (See Section 2.4.)

SECURITY MODE

This mode allows sensitive data transactions between the controlling terminal operator and the CPU to be masked from the passive (non-controlling) terminal. In MONITOR mode, the local system operator accomplishes this by switching the control switch to the OFF position, and in REMOTE mode the remote operator enters by keying in a two-character command sequence. (Section 2.4)

2.4   COMMAND SET

Commands to the PE-510 are keyed in by either local or remote operators (with the exception of Security Mode commands).

2-2

Each command must be preceded by a special Mutt-addressing
character known as the "COMMAND-ENTER" character. In OFF
mode, Micro Mutt is transparent to this character, but in
REMOTE or MONITOR modes the entry of this character signals
that a Mutt command is to follow. The Command-Enter
character is defaulted to Control-O upon power-up, but may
be user-defined. (See Section 2.5.)

When the Command-Enter character is struck, the message
"ENTER MUTT COMMAND" should appear, prompting the operator
to issue a command.

2.4.1   MICRO MUTT COMMANDS

S-SELF TEST   Runs comprehensive internal operating
                         diagnostics, including memory testing
                         and communication port testing, and
                         displays results on both local and
                         remote consoles.

1-ENTER MESSAGE   Places Mutt in MESSAGE MODE, permitting
                         dialog between terminals, masked from
                         the CPU. To end dialog, enter the
                         Command-Enter character.

5-ENTER SECURITY   (Remote operator only.) Places Mutt in
                         SECURITY MODE, masking remote
                         operator-CPU data transactions from
                         local console.

6-LEAVE SECURITY   (Remote operator only.) Takes Mutt out
                         of SECURITY MODE, allowing local
                         console to monitor CPU-remote operator
                         data transactions again.

R-RESTART   Simulates power-on initialization,
                         clearing buffers and setting
                         operational parameters to default
                         value.

P-PROGRAM   Allows operator to enter or modify
                         various software operating parameters
                         of the Micro Mutt. If the operator
                         chooses not to change a specific
                         parameter, carriage return may be
                         entered, leaving the parameter at its
                         present value. (See Section 2.5,
                         "Programming".)

CR-LIST COMMAND SET   Causes Micro Mutt command set to be
                         listed on operator's terminal(s).

The operator may use the "P" (PROGRAM) command to set up or
modify various Micro Mutt operating parameters. When the P
command is entered, Micro Mutt will list each parameter,
waiting after each for operator input. If the operator
chooses not to alter the value of a parameter, he/she may
enter a carriage return, leaving the parameter at its
default or present value. Striking the space bar sets the
parameter to its default value. The following is a list of
user-definable operating parameters, programmable by either
operator.

BUFFER SIZE	This selects between two internal buffer sizes for CPU-to-Terminal data.
S=SMALL	Selects a size of 80 characters, or approximately, one line of information on a typical CRT display. This keeps the faster (local) display from running too far ahead of the slower (remote) during large CPU data bursts, and allows for faster response time if the buffer is full when the operator enters data.
L=LARGE	Selects a size of 1150 characters, or approximately a full screen of information. This size may be desirable for certain applications.
COMMAND-ENTER CHAR	This character, which addresses the Micro Mutt and must precede all commands, may be programmed by the operator to be any single character. This character should be one not used frequently by the system operating software. (Default Value = Control-O.)
X-ON (START DATA)	This character is used by computer systems employing software controlled data flow to the local console, as opposed to a hardware control (Clear-To-Send) line. It may be necessary to change its value to match that of the operating software. (Default Value = Control-Q.)
X-OFF (STOP DATA)	This character is used in conjunction with the X-ON character to signal the CPU to stop console data transmission. It may be necessary to change its value also. (Default Value = Control-S.)

VISUAL ATTRIBUTE-OFF 0-3 Characters.

> These characters are programmable for highlighting the
> MESSAGE mode with an attribute that may be available on
> the terminals used such as low intensity, blink,
> inverse video, etc. Up to a 3-character sequence may
> be used for each. Hitting a carriage return terminates
> the string. (Default Value = NO OUTPUT.)

3.0   INSTALLATION

Installation of the PE-510 Micro Mutt involves configuring
operating parameters, chassis placement or mounting and
connection of cable assemblies.

3.1   CONFIGURING OPERATING PARAMETERS

Parameter configuration is made by adjusting switch settings
on the Mutt printed circuit board to match system
requirements for:

    Baud Rate   (Local and Remote)
    Word Format   (Local and Remote)
    EIA RS232C or 20MA Operation   (Console Interface)
    Hardware (CTS or Software (X-ON, X-OFF) Buffer Control
    Internal or External Control Switch Selection

To do this, the cover must be removed by removing the four
screws holding the cover to the bottom of the chassis.   The
cover may then be slid off the chassis over the faceplate.
The Micro Mutt board is the one nearest the bottom of the
chassis.   If the Micro Mutt has an internal modem, the modem
board is nearest the top of the chassis.

Refer to Figure 3.1 and locate switches 0, 1, 2, and 3.   The
following sections give a description of available parameter
configurations and their switch settings.

FIGURE 3.1   PE-510 Board Layout
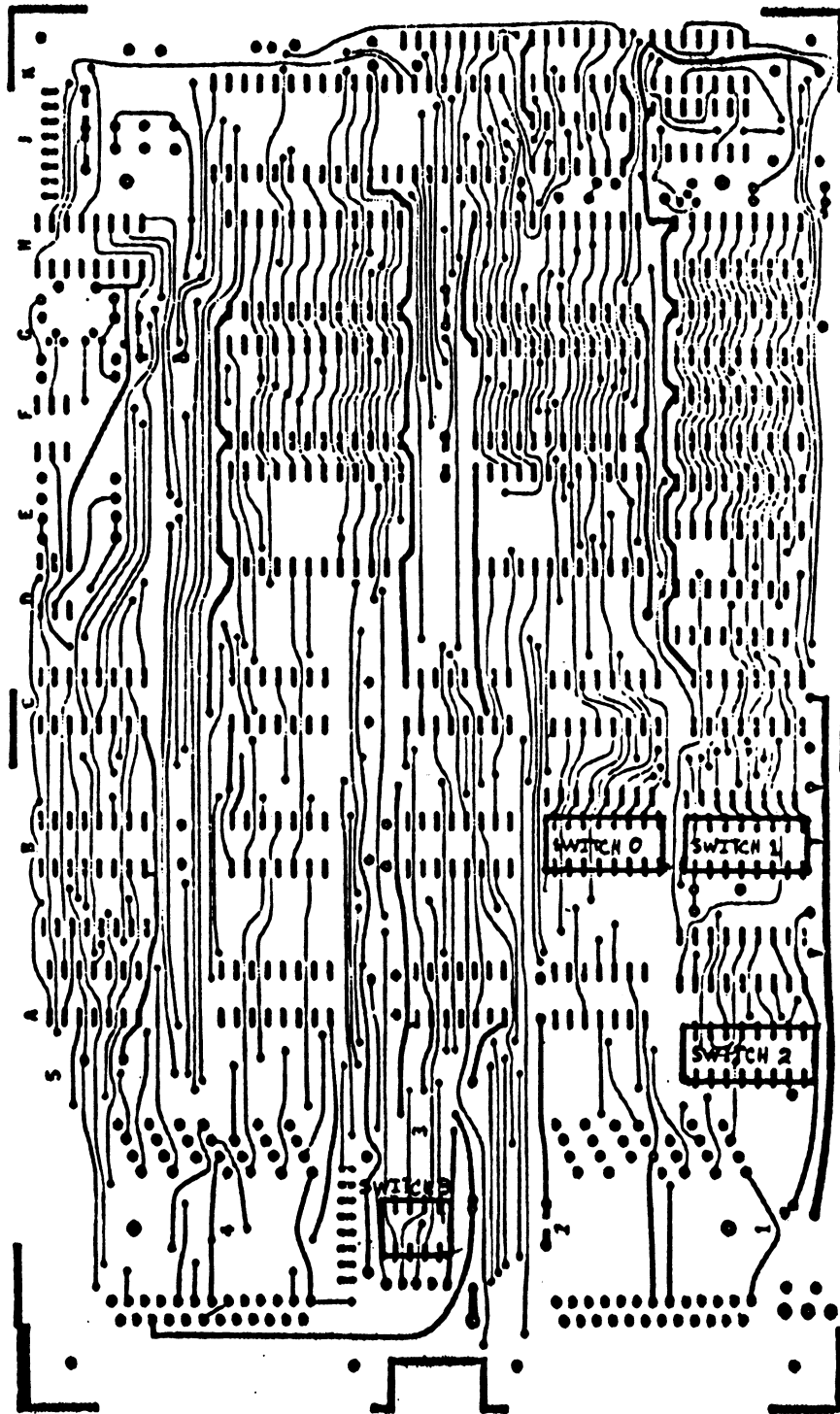
COMMUNICATION PARAMETERS

(Baud Rate, Word Format, Current Loop/RS-232C)

BAUD RATE

The Micro Mutt must be set to the same baud rate as the
CPU console controller/local console, and also to the
baud rate of the remote terminal. To change baud
rates, locate Switch 2 on the board and set according
to Table 3.1.

SWITCH INFORMATION

The drawings below show the type of switches used for baud
rate, word format, and current loop/RS232C selection. There
are 2 types of switches used, a rocker-type switch and a
slide-type switch. Both are depicted below. Each switch
has 8 positions numbered across the edge of the switch.

ROCKER SWITCH

Depress this side to CLOSE →

Depress this side to OPEN →
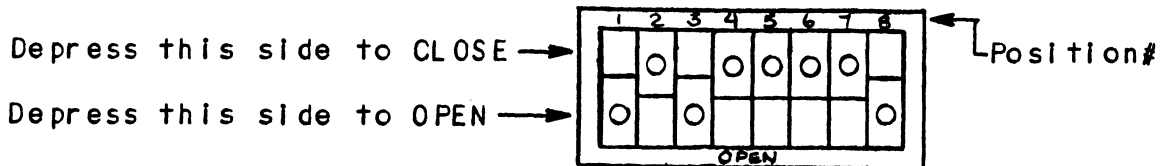
└─Position#

Switch is shown with positions 1, 3, and 8 CLOSED; all
others are OPEN.

Each position may be "OPENED" or "CLOSED" by depressing one
side of it with a pointed instrument, such as a tweezers.

SLIDE SWITCH

Slide to this side for ON position →

Slide to this side for OFF position →
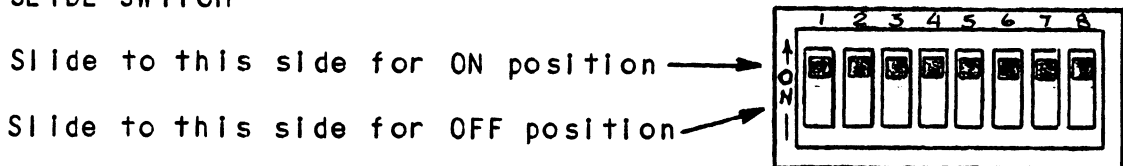
Switch is shown with all positions ON.   NOTE: ON=CLOSED

Each position may be moved to "ON" or "OFF" by sliding the
switch with a pointed instrument, such as a tweezers.

TABLE 3.1   Switch 2 Baud Rates

POSITION

	1	2	3	4	
MODEM/REMOTE TERMINAL	1	2	3	4	
CPU/LOCAL CONSOLE	5	6	7	8	BAUD RATE
	X	X	X	X	50
	X	X	X	0	75
	X	X	0	X	110
	X	X	0	0	134.5
	X	0	X	X	150
	X	0	X	0	300
	X	0	0	X	600
0 = OPEN/OFF	X	0	0	0	1200
	0	X	X	X	1800
X = CLOSED/ON	0	X	X	0	2000
	0	X	0	X	2400
	0	X	0	0	3600
	0	0	X	X	4800
	0	0	X	0	7200
	0	0	0	X	9600
	0	0	0	0	19200

WORD FORMAT

The Micro Mutt must be set to the same word format as
the CPU console controller/local console, and also to
the word format of the remote terminal. To change word
formats, locate Switch 1 on the board and set according
to Table 3.2.

NOTE: Due to the operating characteristics of the Micro
Mutt, it may be necessary to set the CPU/Local console stop
bits at ONE on the Micro Mutt, while keeping the CPU console
interface set to a TWO stop bit word format.

TABLE 3.2   Switch 1 Word Format

POSITION

| REMOTE TERMINAL | 3 | 4 | 5 | |
CPU/LOCAL CONSOLE	6	7	8	WORD FORMAT
	X	X	X	7 Bits + Even Parity + 2 Stop Bits
	X	X	0	7 Bits + Odd Parity + 2 Stop Bits
	X	0	X	7 Bits + Even Parity + 1 Stop Bit
0 = OPEN/OFF	X	0	0	7 Bits + Odd Parity + 1 Stop Bit
X = CLOSED/ON	0	X	X	8 Bits + No Parity + 2 Stop Bits
	0	X	0	8 Bits + No Parity + 1 Stop Bit
	0	0	X	8 Bits + Even Parity + 1 Stop Bit
	0	0	0	8 Bits + Odd Parity + 1 Stop Bit

TABLE 3.3   Switch 1 Current Loop/RS-232C

POSITION	FUNCTION	OPEN	CLOSED
1	Local Console Data	RS-232C	Current Loop
2	CPU Console Controller Data	Current Loop	RS-232C

3.1.2   INTERNAL/EXTERNAL CONTROL SWITCH SELECTION

Control of the mode of operation (OFF, MONITOR, REMOTE) may be controlled by either the built-on switch located in the lower right corner of the faceplate, or by an optional external control panel switch that connects to the back of the chassis. External control is reserved and currently not used. Switch 3 is the Control Selection Switch and should be set for internal switch control. Switch 3 settings are described below.

Switch 3 Control Switch Selection - ROCKER SWITCH

- To use internal switch: Switch rocker towards rear of chassis.

- To use external switch: Switch rocker towards front of chassis.

Switch 3 Control Switch Selection - SLIDE SWITCH

- To use internal switch: Switch # 2 and 4 ON, 1 and 3 OFF.

- To use external switch: Switch # 2 and 4 OFF, 1 and 3 ON.

3.1.3   HARDWARE/SOFTWARE STOP-START SELECTION

Information sent from the CPU to the Mutt must be controlled due to the difference in operating speeds of the local console and the remote terminal. To accomplish this, the Micro Mutt may either control a Clear-To-Send line to the CPU console controller (hardware control) or send a Stop Character-Start Character sequence to the computer (software control). The software stop and start characters may be user-defined (see Section 3.3.1).

To select between hardware and software stop-start, locate switch 0 on the board and set as follows.

Switch 0 Hardware/Software Stop-Start Selection

HARDWARE STOP-START: Position 8 = CLOSED/ON
SOFTWARE STOP-START: Position 8 = OPEN/OFF

3.2   CHASSIS INSTALLATION

The Micro Mutt is designed for either desk top use or
equipment cabinet mounting. If desk top use is preferred,
considerations should be taken as to distances for
connection cables to the CPU, system console, phone line
wall jack and AC power outlet.

If equipment cabinet mounting is to be used, an optional
mounting bracket must be ordered. Mounting instructions are
included with the bracket assembly.

3.3   CABLE INSTALLATION

Cable connectors and pin-out assignments vary considerably
between CPU manufacturers console interfaces and terminal
devices. Mutt cables must therefore be special ordered.
See Section 4.0 for Mutt pin-out assignments for cable
assemblies.

Three cables are necessary for Mutt operation:

- CPU I/O Cable
- Console Cable
- Modem Cable

An optional auxiliary control switch cable assembly is
available as an option.

If the 510-M300 modem option is used, other necessary cables
are provided. See Section 6.0 for detailed instructions for
connection of these cables.

To install the CPU I/O cable, remove the old console cable
from the computer (note location of cable connector).
Install the Mutt CPU I/O cable, connecting one end to the
computer backplane where the old console cable was removed,
and the other to the 25-pin connector marked "computer" on
the Micro Mutt rear panel.

Now install the Mutt console cable from the 25-pin connector
marked "Console" to the system console; and the modem cable
from the 25-pin connector marked "Modem" to the full duplex
asynchronous modem to be used.

Make sure all cables are mounted securely with the holding
screws on the connectors. Secure the CPU I/O cable to the
computer with a tie wrap. Secure all other cables so that
they are kept out of the way.

This completes the installation of the PE-510 Micro Mutt.

3.4 CUSTOMER SUPPORT HOTLINE

ZETACO, Inc. provides a Customer Support Hotline
(612-890-5138 to answer technical questions and to assist
with installation and trouble-shooting problems. The
Hotline is manned by a technical team from 8:00 a.m. to
5:00 p.m. (Central Time) Monday through Friday.

Please review the General Installation Checklist before
calling the Hotline.

3.5 WARRANTY INFORMATION

All ZETACO products are warranted free from manufacturing
and material defects, when used in a normal and proper
manner, for a period of up to two years from date of
shipment. Except for the express warranties stated above,
ZETACO disclaims all warranties, including implied
warranties of merchantability and fitness. The stated
express warranties are in lieu of all obligations of
liabilities on the part of ZETACO for damages, including but
not limited to, special, indirect or consequential arising
out of or in connection with the use or performance of
ZETACO's products.

3.6 PRODUCT RETURN AUTHORIZATION

All possible effort to test a suspected malfunctioning
controller should be made before returning it to ZETACO for
repair. However, if controller or module malfunction has
been confirmed, the board can be returned to ZETACO for
warranty repair or for time-and-material repair if it is out
of warranty. A Return Material Authorization (RMA) number
is required before shipment and should be referenced on all
packaging and correspondence.

To ensure prompt response, the information outlined in the
Material Return Information form on the following page
should be gathered before calling the ZETACO Hotline for the
RMA number. Please include a completed copy of the Material
Return Information form with the product. Each product to
be returned requires a separate RMA number and Material
Return Information form.

To safeguard the product during shipment, please use
packaging that is adequate to protect it from damage. Mark
the box "DELICATE INSTRUMENT" and indicate the RMA number(s)
on the shipping label.

GENERAL INSTALLATION CHECKLIST

CPU_____ Operating System and Rev._____

Is board replacing a previously installed subsystem?_____

Device Code of New Product:_____ Any similar subsystem in the CPU?

YES   NO   If yes, then its Device Code:_____

Configuration Facts_____

Problem Description_____

_____

Problem happens where (during DUMP, RELIABILITY, etc.)?_____

_____

Intermittent or consistent problem?_____

Does Self-test pass?_____

Priority of Board in CPU (slot)_____

BMC Priorities of other BMC Devices_____

Reviewed Interrupt and Priority Jumpers on vacant slots?_____

Tried different slot?_____

Cleaned gold-fingered contact points of board and reset board?_____

Supplied ZETACO 1/2" tape "BOOT" correctly?_____

Is disk drive set to correct unit number, and is terminator in?_____

What is sector switch setting on the disk drive?_____

Double checked PIN 1 of cable to PIN 1 of controller, backplane and

peripheral?_____

Result of ZETACO Reliability or Diagnostic?_____

_____

MATERIAL RETURN INFORMATION

All possible effort to test a suspected malfunctioning controller should be made before returning the controller to ZETACO, Inc. for repair. The speed and accuracy of a product's repair is often dependent upon a complete understanding of the user's checkout test results, problem characteristics, and the user system configuration. Use the form below to record the results of your trouble-shooting procedures. If more space is needed, use additional sheets.

Please allow our service department to do the best job possible by answering the following questions thoroughly and returning this information with the malfunctioning board.

1. Does the problem appear to be intermittent or heat sensitive? (If yes, explain.)

2. Under what operating system are you running? (AOS, AOS/VS, RDOS, etc.)

3. Describe the system configuration (i.e.; peripherals, controllers, model of computer, etc.)

4. Has the unit been returned before?   Same problem?

To be filled out by CUSTOMER:

Model #: _____
Serial #:_____
RMA #:   _____(Call ZETACO to obtain an RMA number.)

Returned by:

Your name:_____
Firm: _____
Address: _____
           _____
Phone: _____

4.0 INTERFACING

All signals are EIA Standard RS-232C unless otherwise indicated.

TABLE 4.1   Computer (CPU I/O) Connector (25S)

PIN	FUNCTION	TO MUTT	FROM MUTT
1	FRAME GROUND		
2	DATA TO CPU		X
3	DATA FROM CPU	X	
5	CLEAR TO SEND		X
6	DATA SET READY		X
7	SIGNAL GROUND		
8	DATA CARRIER DETECT		X
10	-CURRENT FROM CPU (Current Loop)	X	
12	+CURRENT FROM CPU (Current Loop)	X	
13	+CURRENT TO CPU (Current Loop)		X
14	-CURRENT TO CPU (Current Loop)		X
20	DATA TERMINAL READY		

TABLE 4.2   Console Connector (25S)

PIN	FUNCTION	TO MUTT	FROM MUTT
1	FRAME GROUND		
2	DATA FROM CONSOLE	X	
3	DATA TO CONSOLE		X
4	REQUEST TO SEND		X
5	CLEAR TO SEND	X	
6	DATA SET READY		X
7	SIGNAL GROUND		
8	DATA CARRIER DETECT		X
9	+CURRENT TO CRT (Current Loop)		X
11	-CURRENT TO CRT (Current Loop)		X
12	+CURRENT FROM CRT (Current Loop)	X	
20	DATA TERMINAL READY	X	
23	-CURRENT FROM CRT (Current Loop)	X	

TABLE 4.3   Modem Connector (25S)

PIN	FUNCTION	TO MUTT	FROM MUTT
1	FRAME GROUND		
2	XMIT DATA (TO MODEM)		X
3	RCVD DATA (FROM MODEM)	X	
4	REQUEST TO SEND		X
5	CLEAR TO SEND	X	
7	SIGNAL GROUND		
8	DATA CARRIER DETECT	X	
20	DATA TERMINAL READY		X

TABLE 4.4   Auxiliary Connector (25S)

PIN	FUNCTION	TO MUTT	FROM MUTT
1	FRAME GROUND		
2	DATA FROM AUX. UNIT	X	
3	DATA TO AUX. UNIT		X
5	CLEAR TO SEND		X
6	DATA SET READY		X
7	SIGNAL GROUND		

TABLE 4.5   Auxiliary Control Switch Connector (9S)

PIN	FUNCTION	TO MUTT	FROM MUTT
1	CARRIER LED*		X
2	DTR SELECT*	X	
3	REMOTE SELECT*	X	
5	GROUND		
9	+5 VOLTS		X

* OV, +5V Signal Levels)

5.0   SPECIFICATIONS

Physical: MAIN ASSEMBLY

Size: 5.5" x 9" x 3"
Weight: 2 pounds

POWER SUPPLY

Size: 4.75" x 2.75" x 2.25"
Weight: .75 pounds

Electrical:

Power Requirements

Power is supplied by a wall plug-in module with ground
pin and mounting tab.
INPUT VOLTAGE: 105-130 VAC, 57-63 HZ
INPUT CURRENT: .5A Max.

Communications Interface:

Communication is EIA Standard RS-232C except for
Current Loop signals, which are 20 MA.

RS-232C Signal Characteristics:

Transmit	Mark	-10 Volts Nominal
	Space	+10 Volts Nominal
Receive	Mark	-3 to -25 Volts
		+3 to +25 Volts

Environmental:

Operating Temperature:	10°C to 40°C
Operating Humidity:	10% to 90% NC
Non-Operating Temperature:	-40°C to 55°C
Non-Operating Humidity:	10% to 90%

6.0   510-M300 MODEM OPTION

The 510-M300 Modem is contained in the Micro Mutt housing
and available upon request when ordering. It is a 9 to 300
bit-per-second (bps) data modem registered by the FCC, Part
68, and certified for direct connection to the telephone
network. It is switch selectable for Manual Originate or
Manual Answer use, operates full-duplex over two wire,
dial-up phone circuits, and is Western Electric (Bell) 103
compatible.

6.1   TELEPHONE COMPANY NOTIFICATION

Before connecting the data modem to the telephone network,
the telephone company must be provided with the following:

A.   Your telephone number.
B.   The FCC Registration Number (AK396F-67636-DM-E).
C.   The Ringer Equivalence Number (0.0B).
D.   The USOC Jack required (RJ11C for this modem).

6.2   INSTALLATION

Connection of the 510-M300 modem is made using standard
telephone cords with modular jacks (type RJ11 or equivalent)
and a 25-pin jumper cable assembly, provided with the unit.

Two modular connectors on the rear of the unit allow
insertion in the line between a telephone set and telephone
company wall socket. The connector socket labeled TELCO
connects to the telephone company wall connector, and the
TELSET socket to the telephone set. To facilitate
connection, the old phone cord must be removable from either
the phone, the wall socket, or both. Unplug this cord. If
the cord was unplugged from the wall socket and remains
connected to the phone, plug the cord into the socket
labeled TELSET on the rear of the unit. If the cord was
unplugged from the telephone and remains connected to the
wall socket, plug the cord into the socket labeled TELCO.
Using the additional cord included with the unit, make the
necessary connection from the wall socket to the TELCO
socket on the rear of the unit, or from the TELSET socket to
the telephone set.

Next, using the 25-pin jumper cable, connect the DTE
connector (located in the upper right hand corner on the
rear of the unit), to the MODEM connector, located directly
below it.

6.3   OPERATION

A slide switch on the rear of the unit offers a choice of ORG or ANS positions. These designations refer only to frequency pairs employed in full-duplex data communications, and it is essential that this switch be set opposite to the way the modem is set up at the remote location.

Located in the upper right corner of the face of the Micro Mutt is the TALK/DATA switch. With the switch set to TALK, the modem will not have any effect upon normal telephone operation. You can place calls, answer calls and have voice conversations. The small red LED next to the switch labeled DATA should not be illuminated under any conditions with the switch in the TALK position.

The local operator may place or receive a call to the remote terminal site with the modem set to TALK. Once the connection has been established, and the ORG/ANS position has been determined and set, the operator may move the switch from TALK to DATA to allow for data communication. The red DATA LED should illuminate, indicating that the modem has been energized for data communication, and the telephone handset will ge "dead" because it is placed out of operation. The local operator may then hang up the phone.

When data communications are finished, the local operator may either pick up the phone and switch to TALK to resume voice communication, or just switch from DATA to TALK with the handset ON HOOK, discontinuing the phone connection.

6.4   USER DIFFICULTIES

Most data communications problems stem from improper installation and/or wrong switch settings. No communications can be established between incompatible modems.

The 510-M300 modem is capable of asynchronous communications at any data rate between dc and 300 bps. It will not work with modems set at speeds faster than 300 bps.

The combination of Data Terminal Interfaces and telephone company network characteristics is uniform enough across the United States and Canada to allow cross-communication with most other stations that adhere to RS-232C and Bell-type 103 communications practices. If you attempt international communications, you may run into difficulties that cannot be resolved with this particular modem.

Frequency pair determination is essential to full-duplex modem applications. When setting the ORG/ANS switch, it must be set opposite to the modem used at the remote location.

6.5   REPAIR AND SERVICE

The 510-M300 modem is a federally licensed device that can be only connected into the dial-up telephone network when all elements are properly adjusted and working correctly.

Any instance of user modification or attempts to repair will void the FCC certification. For this reason, all units in need of repair must be sent back to ZETACO, Inc.

6.6   TECHNICAL SPECIFICATIONS

Operation	Full duplex on 2-wire DDD Network.
Data Rate	0 to 300 bps Asynchronous.
Modulation	Phase Coherent, Frequency Shirt Keyed (FSK).
Operating Mode	Manual or Originate (selectable).

Carrier Frequencies	Transmit: Mark - 1270 ± 0.5% Hz
	          Space - 1070 ± 0.5% Hz
	
	Receive: Mark - 2225 ± 1.0% Hz
	          Space - 2025 ± 1.0% Hz

Line Impedance	600 Ohms ± 10% and Transient Protected
Transmitter Output Level	Fixed Level of -9 dBm into 600 Ohms.
Receiver Sensitivity	-8 to -46 dBm without adjustment.
Peak to Peak Distortion	(Jitter Plust Bias): Less than 10% with a local transmit level of -9 dBm and a receive level of -46 dBm with 300 baud pseudo random data.
Digital Interface	EIA-RS-232-C and TTY.
Controls & Indicators	TALK/DATA Switch - TALK connects TEL SET to line; DATA connects modem to line.

INDICATOR - Steady light indicates
unit in DATA mode. Blinking LED
indicates loss of communications.

ORIG/ANS - Switch on rear panel.

Environmental   0° to 65° C, 95% Relative Humidity,
                              Non-Condensing

FCC Registration   Model 103 O/A LP
                              Registration Number AK396F-67636-DM-E
                              Ringer Equivalence Number 0.0B
                              Data Jack - RJ11C, RJ16X

6.7   COMMUNICATIONS INTERFACES

Two connectors for communication interfacing are provided
with the 510-M300 modem. One is a 25-pin standard RS-232C
connector, labeled DTE, which when jumpered to the MODEM
connector provides the remote interface for the Micro Mutt.
The second is a 9-pin current loop connector labeled TTY,
such as used by Teletype and other terminals.

DTE CONN. (25-PIN RS-232C)		TTY CONN. (9-PIN CURRENT LOOP)	
PIN	SIGNAL	PIN	SIGNAL
2	Transmit Data	1	Receive Data
3	Received Data	2	(Non-Polarized)
7	Signal Ground	3	Transmit Data
8	Carrier Detect (Clear-to-Send)	4	(Non-Polarized)

ZETA ⬤

Please give us your comments.

Please use this form to send us your comments regarding this
Technical Manual. Your input is greatly appreciated! Problems
will be promptly addressed and action taken as necessary. If
you wish a written reply, please furnish your name and mailing
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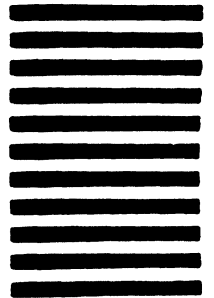
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ERRORS IN MANUAL:

SUGGESTIONS FOR IMPROVING EITHER THE MANUAL OR THE PRODUCT:

ZETACO

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