Model CTT-1

Terminal Translator
Technical Manual

NOTICE

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If installation problems arise after you thoroughly review the manual, please contact the ZETACO Customer Support Hotline at (612) 941-9480.

REVISION HISTORY

ECO No.	Date	Description	Pages
0328	6/28/84	New ZETACO Cover	
0523	3/4/86	New Cover	
0998	2/9/88	Added Second Switch-Type Info.	

PREFACE

The Cray Terminal Translator-1 (CTT-1) is a product based on ZETACO's Micro Mutt and will hereafter, in the Technical Manual and schematics, be referred to as the Micro Mutt. The following list of changes are the primary differences between the CTT-1 and the Micro Mutt.

I.   Special Firmware Changes that do the Following:

   A.   Defaults to large buffer size upon power-up.

   B.   Command Enter Character default value changed to Control Y.

   C.   Addition of a New Command called External Strobe.

II. Added hardware changes that provide power to the AUX Port Connector. The changes are:

   A.   P3-25 to +5V

   B.   P3-18 to +12V

   C.   P3-11 to -12V

   D.   P3-7 to GND

   E.   J400 installed (connects signal ground to frame ground)

The Cray Terminal Switch-1, when in use, is self-explanatory with the following two exceptions.

   1.   Two port select will allow Command C to select between Channel 0 and 1 only.

   2.   Bypass switches do not make connection to the CTT-1 for the pair/controlled by the switch (i.e., bypass 0 and 1; never switch with Command C although LEDS will still say that the channels are active.)

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

1.0   GENERAL DESCRIPTION

ZETACO's Mirco 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 Micro Mutt 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 Micro Mutt 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 asynchronus
full duplex modem operating over a standard voice grade dial
up telephone circuit.

When activated, the Micro Mutt 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 three-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 Micro Mutt provides other
controls used in operation. These commands are keyed in by
either the local or remote console operators.

Local operator to diagnostician dialog, 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.

Micro Mutt 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.

SYSTEM FUNCTIONAL BLOCK DIAGRAMS

The following diagrams illustrate the primary modes of operation of Micro Mutt.

FIGURE 1.1   MODES OF OPERATION

OFF MODE

REMOTE MODE

MONITOR MODE

MESSAGE MODE
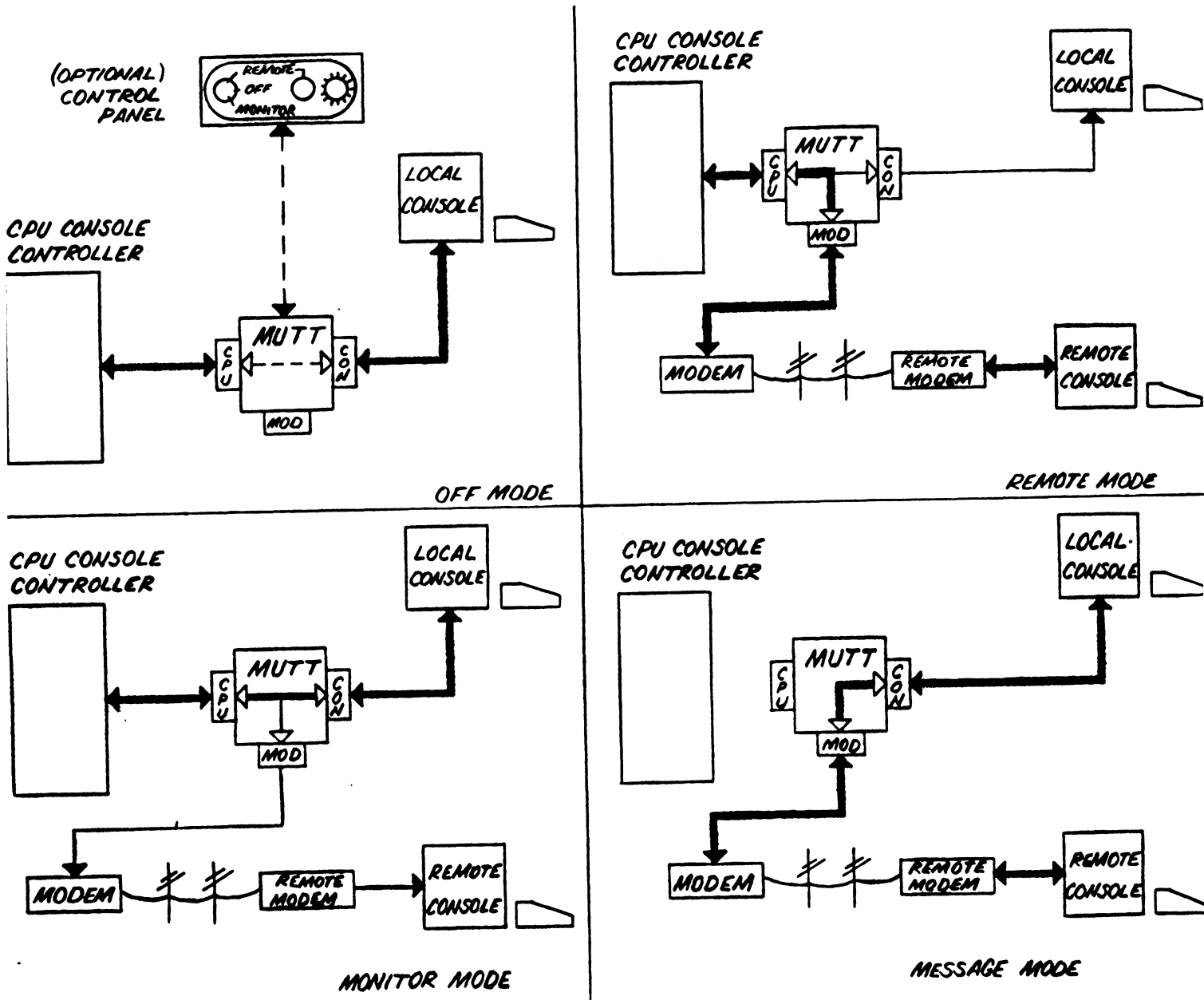
2.0　　　　　OPERATION

A three 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" position. In the OFF mode, Mutt is 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 the 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 modem is equipped with a TALK/DATA switch, move the switch from TALK to DATA. 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.

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.

- In MONITOR MODE, the local console has CPU control while the remote terminal monitors activity.

- In 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 (i.e., 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

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 Micro Mutt are keyed in by either local or remote operators (with the exception of security mode commands).

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 to Micro Mutt that a Mutt command is to follow. The Command-Enter character is defaulted to CONTROL-Y 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.

2-EXIT MESSAGE   Takes Mutt out of MESSAGE MODE.

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.

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.)

C-EXTERNAL STROBE   Causes a 15 microsecond pulse to appear
                           on Pin 5 of J3 (AUX PORT), which is
                           used to toggle a counter in the Cray
                           Terminal Switch Panel. The command
                           also causes the present buffer contents
                           to be cleared out.

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

CR-NULL   Leave Command Mode.

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-Y.)
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-ON   (0-3 Characters)

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.

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
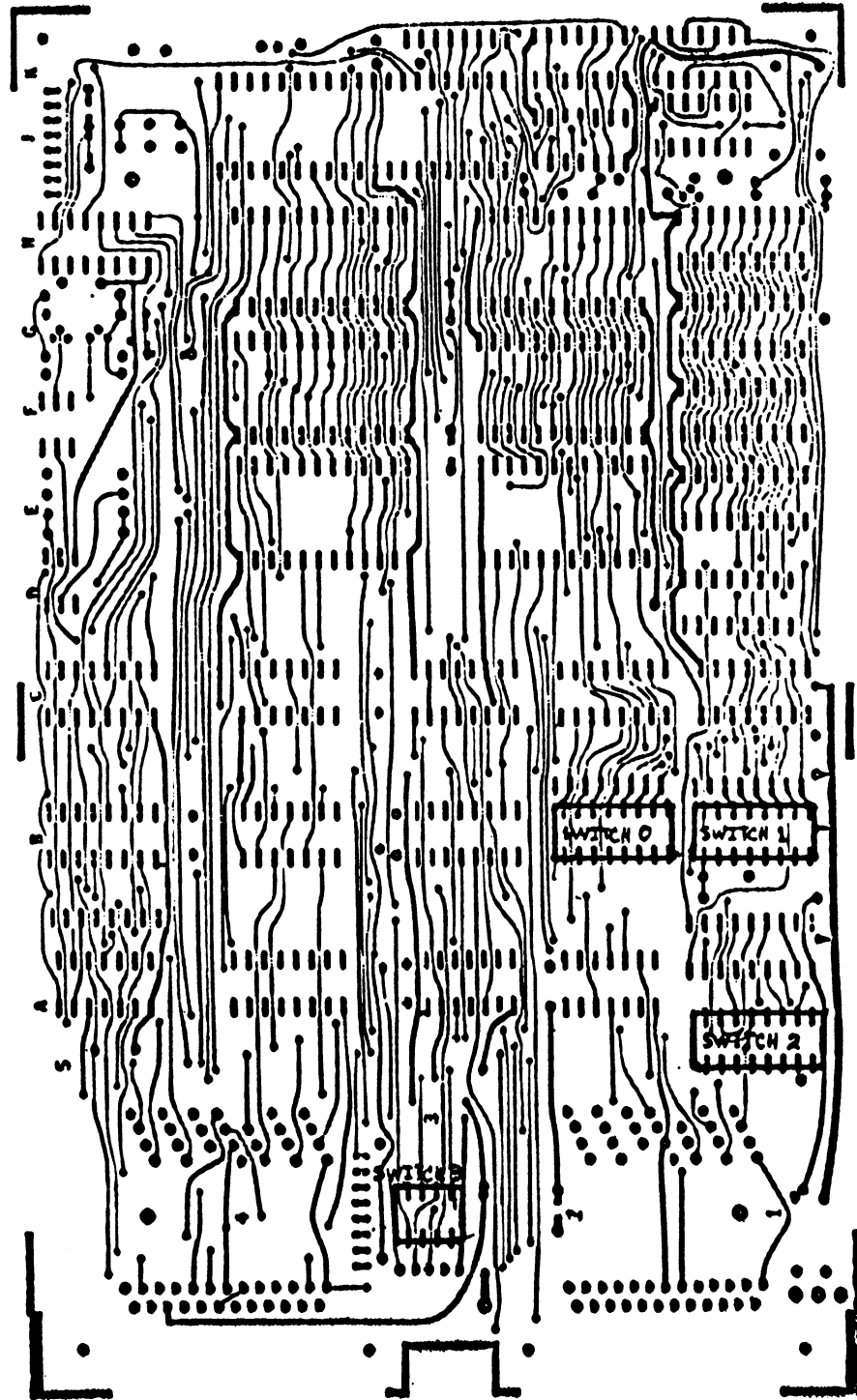
3.1.1 COMMUNICATION PARAMETERS

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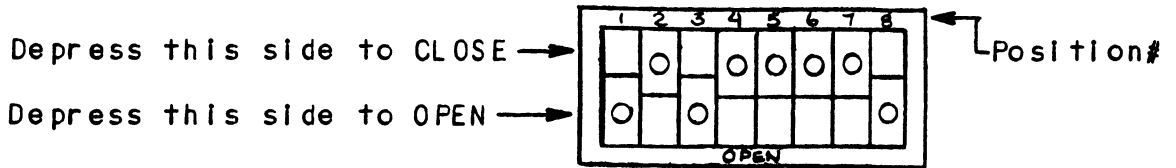
Switch is shown with positions 1, 3, and 8 CLOSED; all others are OPEN.

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 →
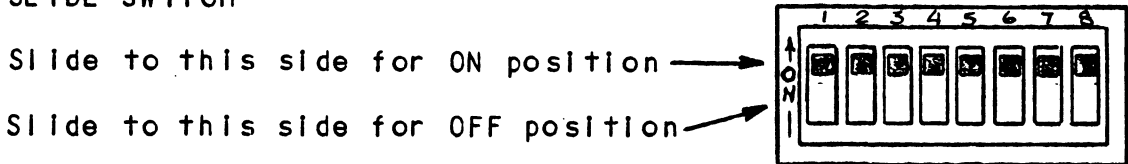
Switch is shown with all positions ON. NOTE: ON=CLOSED

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				
MODEM/REMOTE TERMINAL	1	2	3	4	
CPU/LOCAL CONSOLE	5	6	7	8	BAUD RATE

|	Pos 1/5	Pos 2/6	Pos 3/7	Pos 4/8	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

<table>
<tr><td></td><td></td><td colspan="3">POSITION</td><td></td></tr>
<tr><td>REMOTE TERMINAL</td><td></td><td>3</td><td>4</td><td>5</td><td></td></tr>
<tr><td>CPU/LOCAL CONSOLE</td><td></td><td>6</td><td>7</td><td>8</td><td>WORD FORMAT</td></tr>
<tr><td></td><td></td><td>X</td><td>X</td><td>X</td><td>7 Bits + Even Parity + 2 Stop Bits</td></tr>
<tr><td></td><td></td><td>X</td><td>X</td><td>0</td><td>7 Bits + Odd Parity + 2 Stop Bits</td></tr>
<tr><td></td><td></td><td>X</td><td>0</td><td>X</td><td>7 Bits + Even Parity + 1 Stop Bit</td></tr>
<tr><td>0 = OPEN/OFF</td><td></td><td>X</td><td>0</td><td>0</td><td>7 Bits + Odd Parity + 1 Stop Bit</td></tr>
<tr><td>X = CLOSED/ON</td><td></td><td>0</td><td>X</td><td>X</td><td>8 Bits + No Parity + 2 Stop Bits</td></tr>
<tr><td></td><td></td><td>0</td><td>X</td><td>0</td><td>8 Bits + No Parity + 1 Stop Bit</td></tr>
<tr><td></td><td></td><td>0</td><td>0</td><td>X</td><td>8 Bits + Even Parity + 1 Stop Bit</td></tr>
<tr><td></td><td></td><td>0</td><td>0</td><td>0</td><td>8 Bits + Odd Parity + 1 Stop Bit</td></tr>
</table>

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

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

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

Switch 3 Control Switch Selection - SLIDE SWITCH

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

o   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.

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

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 connetor
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 Micro Mutt.

3.4   CUSTOMER SUPPORT HOTLINE

ZETACO, Inc. provides a Customer Support Hotline
(612-941-9480) 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		
11	-12V		X
18	+12V		X
25	+5V		X

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

* 0V, +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%

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 address. Thank you.

Date_____

Name_____Title_____

Firm_____

Address_____

City/State/ZIP_____

TECHNICAL MANUAL TITLE_____

DOCUMENT NUMBER_____REVISION_____

ERRORS IN MANUAL:

SUGGESTIONS FOR IMPROVING EITHER THE MANUAL OR THE PRODUCT:

Business Reply Mail

FIRST CLASS   PERMIT NO. 939   HOPKINS, MN 55343

POSTAGE WILL BE PAID BY ADDRESSEE

ZETA ⚡

6850 Shady Oak Road
Eden Prairie, MN 55344