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PREFACE

1.0 INTRODUCTION TO ACT-4 MANUAL

This manual describes how to install and operate the Access Control Terminal, Model 4 (ACT-4). ACT-4 was developed and is produced by Monitor Dynamics, Incorporated (MDI), a leader in integrated Security, Access, Fire, and Energy control networks.

Section 1 of this manual describes the ACT-4's features and specifications. **Section 2** contains the information needed to design and install an ACT-4 access control system. **Section 3** describes the ACT-4 editing functions. **Appendix A** contains all the information that the typical user needs to know about the ACT-4. This section is designed to be reproduced by the customer as an ACT-4 training aid for new ACT-4 users. **Appendix B** contains excerpts from the RTU-100/200 Installation and Operation Manual which are intended to aid in the ACT-4 system design and installation process.

1.1 General Information

The ACT-4 is used to control the access to a single door. Numerous ACT-4s can be connected to MDI's SAFEnet system to provide coordinated protection for a facility or group of facilities of virtually any size. The ACT-4 offers the customer the potential to greatly reduce system wiring requirements since ACT-4s communicate with the SAFEnet system using a single pair of wires (RS-485 Multidrop) and the ACT-4 can control the door strike mechanism and monitor the door loop. Specifics about ACT-4 wiring are contained in Section 2 of this manual.

The ACT-4 requires the user to enter both a valid Personal Identification Number (PIN) and a valid magnetic stripe access card (ACT-4KM), or Wiegand access card (ACT-4KW) or Identification Number (ACT-4K) before permitting entry to the area secured by the ACT-4. The ACT-4 PIN can be four, five, or six digits in length. The ACT-4 PIN length has been set at the factory.

The SAFEnet system allows the customer to easily configure the ACT-4 access control system for a variety of applications, including Two Person Rule, Anti-Passback, and PIN disable or enable. Consult the MDI SAFEware Manual for more details on these features.

1.1.1 ACT-4 I.D. and PIN Entry and Display Modes

The ACT-4 uses an unmarked keypad in combination with a four line, 80 character Liquid Crystal Display (LCD) for Identification number (ACT-4K) and PIN entry. The LCD tells the user the number or function assigned to the key. The Editor can set the ACT-4 to present numbers in a horizontal, vertical, or a rotational manner during I.D. PIN entry. The horizontal display is shown in Figure 1-1, and the vertical display in Figure 1-2.

FIGURE 1-1: HORIZONTAL DISPLAY

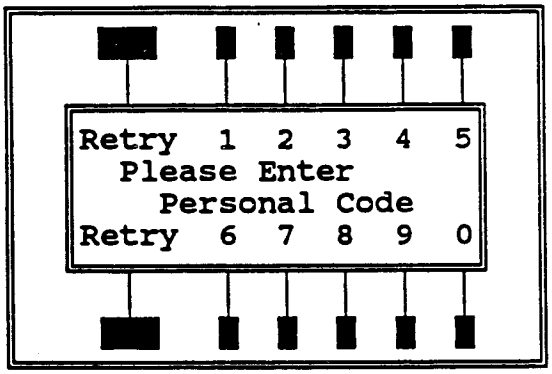
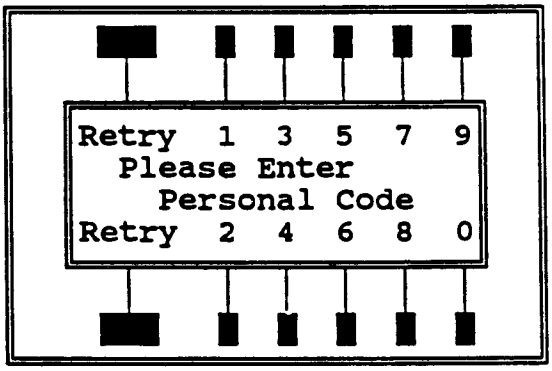


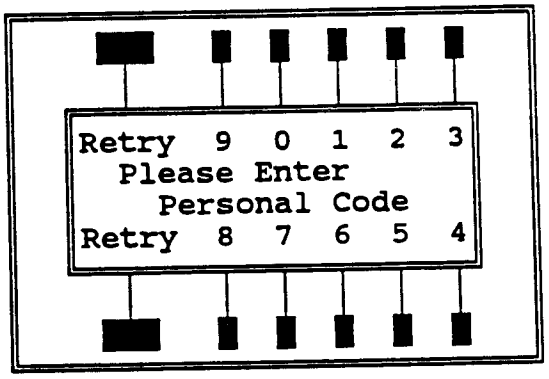
FIGURE 1-2: VERTICAL DISPLAY



The rotational display mode makes it impossible for anyone but the user to determine the PIN being entered. PIN secrecy is preserved since the assignment of numbers to keys on the keypad changes every time the user attempts to gain entry to the secured area, and watching the user enter the PIN will provide the observer with no information concerning the identity of the PIN.

The rotational dynamic display orders the numbers sequentially but changes their location each time a key on the ACT-4 is pressed. Figure 1-3 shows an example of a rotationally dynamic display.

FIGURE 1-3: ROTATIONAL DISPLAY
(ONE OF MANY POSSIBLE DISPLAYS)



When using a Rotationally dynamic display the user finds the new arrangement of numbers and begins to enter the PIN based on the new arrangement.

1.1.2 Display Viewing Angle

The ACT-4 LCD has a small viewing angle. This keeps everyone but the user from seeing the information on the ACT-4 display (this effect can be seen by looking at the face of an electronic watch from different angles). The LCD viewing angle can be adjusted up and down using the tilt controls that appear on the ACT-4 Initial Display (Figure 3-1) and the Sign On Display (Figure 3-2). This allows people of different heights to use the ACT-4 comfortably.

1.1.3 Internal Card Reader

The ACT-4KM and ACT-4KW models contain an internal card reader which is used to read the information on a magnetic stripe on the back of the access control card (ACT-4KM), or the information contained in a Wiegand access control card (ACT-4KW). The ACT-4 system will determine whether the combination of the PIN and the card information is valid before permitting entry to the secured area. An external card reader can also be connected to the ACT-4KM or ACT-4KW so that both entry to and exit from the secured area can be controlled by access cards.

1.1.4 ACT-4 Displays and Speaker

The ACT-4 LCD is a twenty character by four line alpha-numeric format display. The LCD provides displays which are used for data entry and to present user information. A red Light Emitting Diode (LED) is mounted on the face of the unit to indicate the grant/deny status of an access request transaction.

The LED is continuously illuminated when access is granted, and flashes several times when access is denied. A grant/deny LED is also mounted on the external card reader used for exit control. The LED will also flash when the ACT-4 is waiting for a response from the SAFEnet controller. The grant/deny LED is bright enough so that its status can be observed by anyone in the area of the ACT-4.

The ACT-4 has an internal speaker which sounds every time a key on the keypad is depressed. This provides the user with feedback that the ACT-4 has recognized the key depression.

1.2 SAFEnet System Features

ACT-4 is designed for use with MDI's SAFEnet system. SAFEnet is an integrated system which provides Security, Access, Fire, and Energy control. SAFEnet is a distributed computer system, meaning that system tasks are partitioned among various parts of the system.

1.2.1 Introduction to the SAFEnet System

The top level of the SAFEnet system is the Central Processing Unit (CPU). The CPU manages the activities of the system, and provides the high-level human interface which is used by security and other personnel to manage the system. Users' card or I.D. numbers and ACT-4s are "enrolled" into the SAFEnet system using workstations connected to the CPU. The next level is the Pre-Processing Unit (PPU). The PPU is a communications device which is responsible for directing signals between the CPU and the next level of devices, the Remote Terminal Unit (RTU).

1.2.2 Remote Terminal Unit

The RTU provides the interface between the ACT-4 and the SAFEnet system. Sensors and actuators are also connected to the SAFEnet system via the RTU. Different interface circuit cards are used to connect various devices to the RTU. The ACT-4 is connected to the RTU by the Four-wire Interface Module (FIM) circuit board. The FIM is the device which transfers information from the ACT-4 into the RTU.

RTUs can be connected to a wide variety of card readers. An RTU which is used to control ACT-4s can only be connected to ACT-4s. Other types of readers can be used in the system as long as they are connected to different RTUs, and the readers use cards with the same information format.

An RTU can contain either one or two FIMs. Each FIM can be used to interface with one to eight ACT-4s. A single SAFEnet system can be connected to over eight thousand ACT-4s.

If for any reason the ACT-4 has to wait for a reply from the RTU, it will display "Waiting for Message From RTU" on the screen, and

will flash the red LED. The RTU will rarely take more than one to two seconds to respond to the ACT-4.

1.2.3 Door Monitor and Control Features

The ACT-4 can monitor door position (open or closed) and/or control the door strike mechanism which unlocks the door following an access grant. The RTU can also be used to perform these functions. In systems where installation costs are the primary concern these functions should be performed by the ACT-4, and in systems which require very high levels of security these functions should be performed by the RTU. The ACT-4 system advantage is that it provides the user with the flexibility to work in a variety of configurations to give the user precisely the level of desired security at the best possible cost.

The ACT-4 provides Form C (both Normally Open and Normally Closed) relay connections capable of switching up to two amperes of current for the door strike control.

If the door position switch and strike control are connected to the RTU, the position switch is connected to the Remote Interface Module (RIM) and the door strike is connected to the Zero Power Relay (ZPR) Board.

If the door is propped or forced open, the RTU will send an alarm message to the CPU, and the ACT-4 will sound an alarm tone and present a "Please Close Door" message on the display.

1.2.4 Tamper Alarm

The ACT-4 is equipped with a Tamper Switch which is designed to detect an authorized entry into the ACT-4 enclosure, or the removal of the ACT-4 from its mounting surface. Tamper alarms are reported by the ACT-4 to the CPU. The ACT-4 will ignore card or I.D. entries when it is in a tamper alarm mode.

1.2.5 ACT-4 Loss of Communications with the RTU

The RTU talks to the ACT-4 approximately ten times a second. If the ACT-4 fails to respond properly to the RTU for more than one and a half seconds the RTU will report the loss of communications to the CPU. The actual channel number of the ACT-4 which has failed will be reported to the CPU to aid service personnel in identifying the faulty unit.

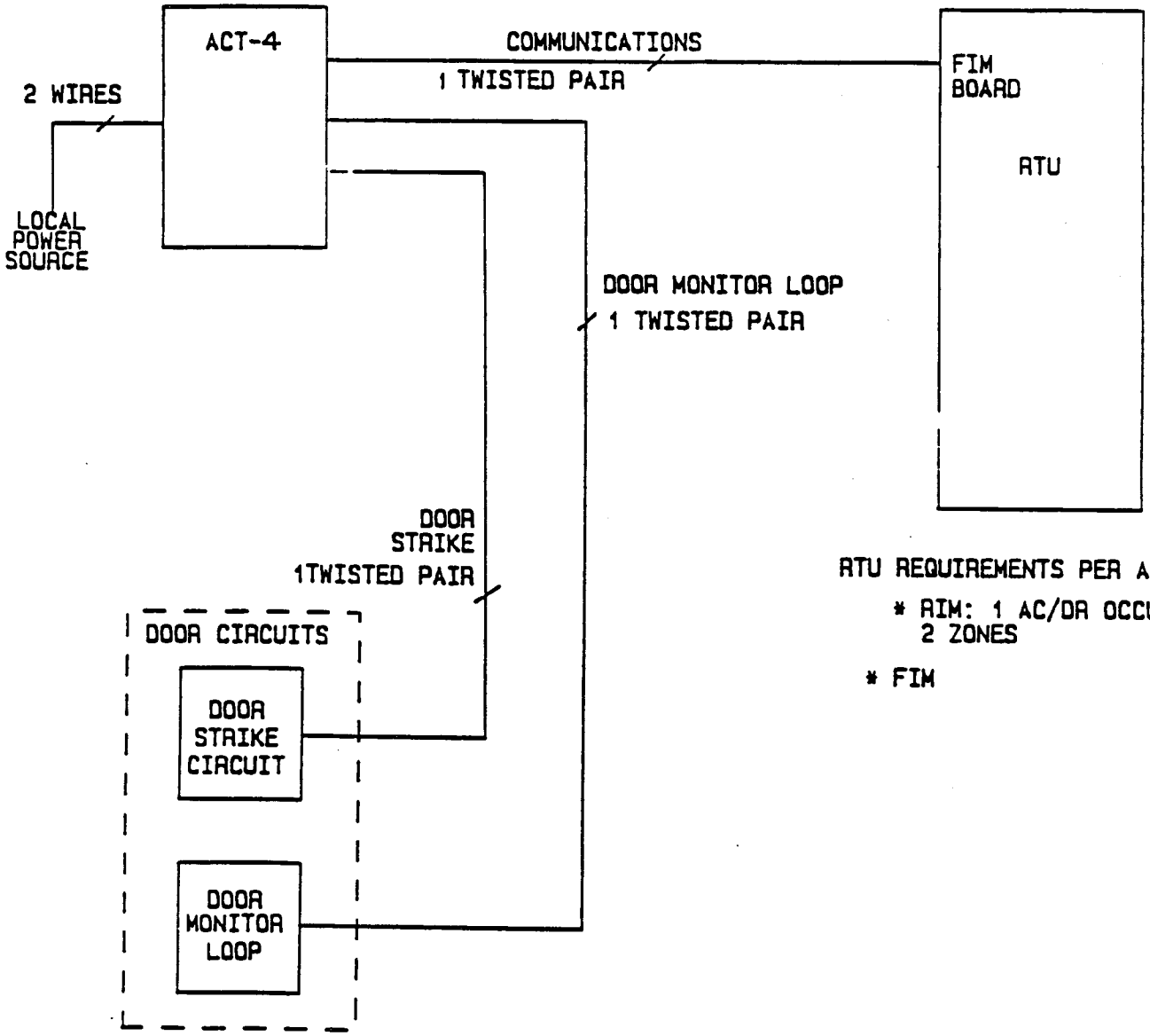
1.2.6 ACT-4 System Block Diagrams

The figures on the following two pages are block diagrams showing the connections between the ACT-4 and the RTU. Figure 1-4 shows the minimum set of connections, and Figure 1-5 shows the maximum set of connections. Figure 1-6 shows a typical ACT-4/RTU data connection scheme. Refer to Section 2 of this manual for a full description of these connections.

ACT-4 / RTU WIRING

MINIMUM ACT-4 / RTU CONNECTIONS

* LOCAL DOOR STRIKE CONTROL
* LOCAL DOOR LOOP MONITORING



RTU REQUIREMENTS PER ACT:

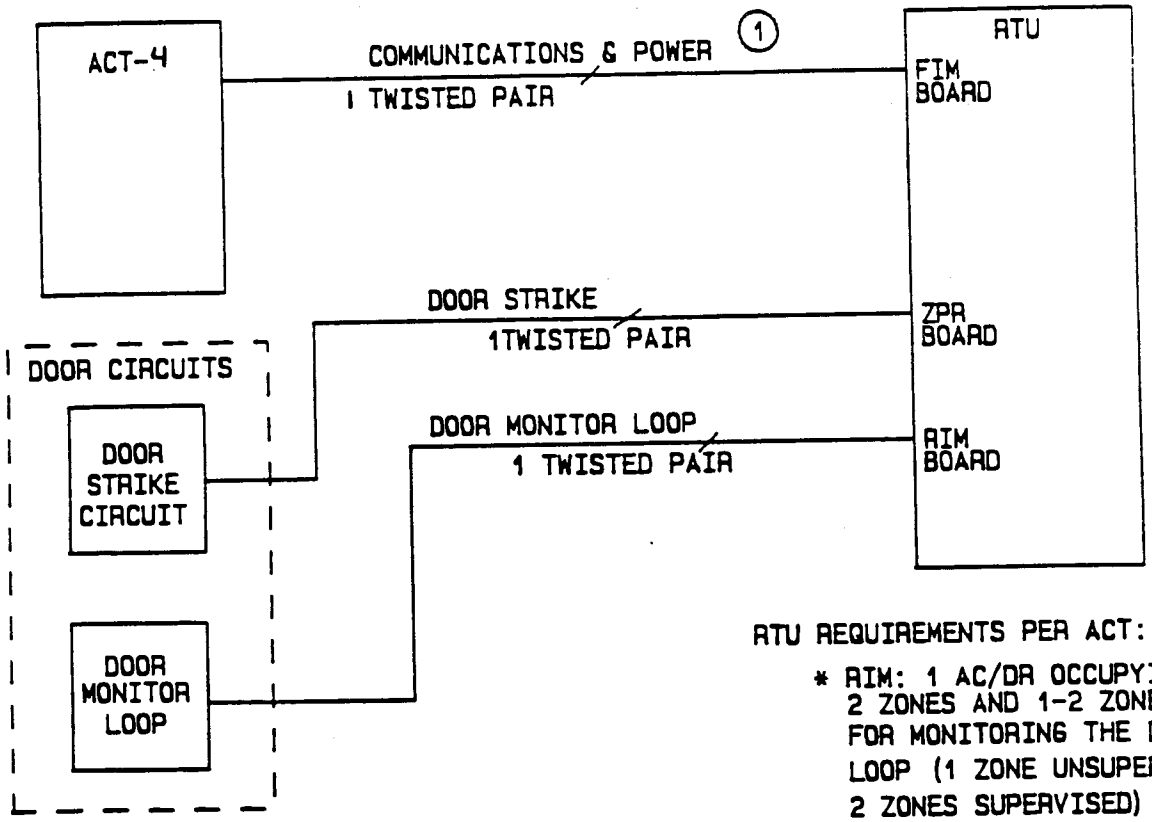
* RIM: 1 AC/DR OCCUPYING 2 ZONES
* FIM

NOTES: 1. ALL WIRES ARE TWISTED PAIRES WITH A MAXIMUM LENGTH OF 1000 FEET AND A MINIMUM WIRE GAGE OF 22 AWG. IF ACT-4 IS POWERED FROM RTU MAXIMUM LENGTH IS 300 FEET. CALCULATE SIZE AND LENGTH OF STRIKE WIRE BASED ON ACTUAL CIRCUIT USED.

ACT-4 / RTU WIRING

MAXIMUM ACT-4 / RTU CONNECTIONS

* REMOTE DOOR STRIKE CONTROL
* REMOTE TAMPER ALARM CIRCUIT



RTU REQUIREMENTS PER ACT:

* RIM: 1 AC/DR OCCUPYING 2 ZONES AND 1-2 ZONES FOR MONITORING THE DOOR LOOP (1 ZONE UNSUPERVISED. 2 ZONES SUPERVISED).

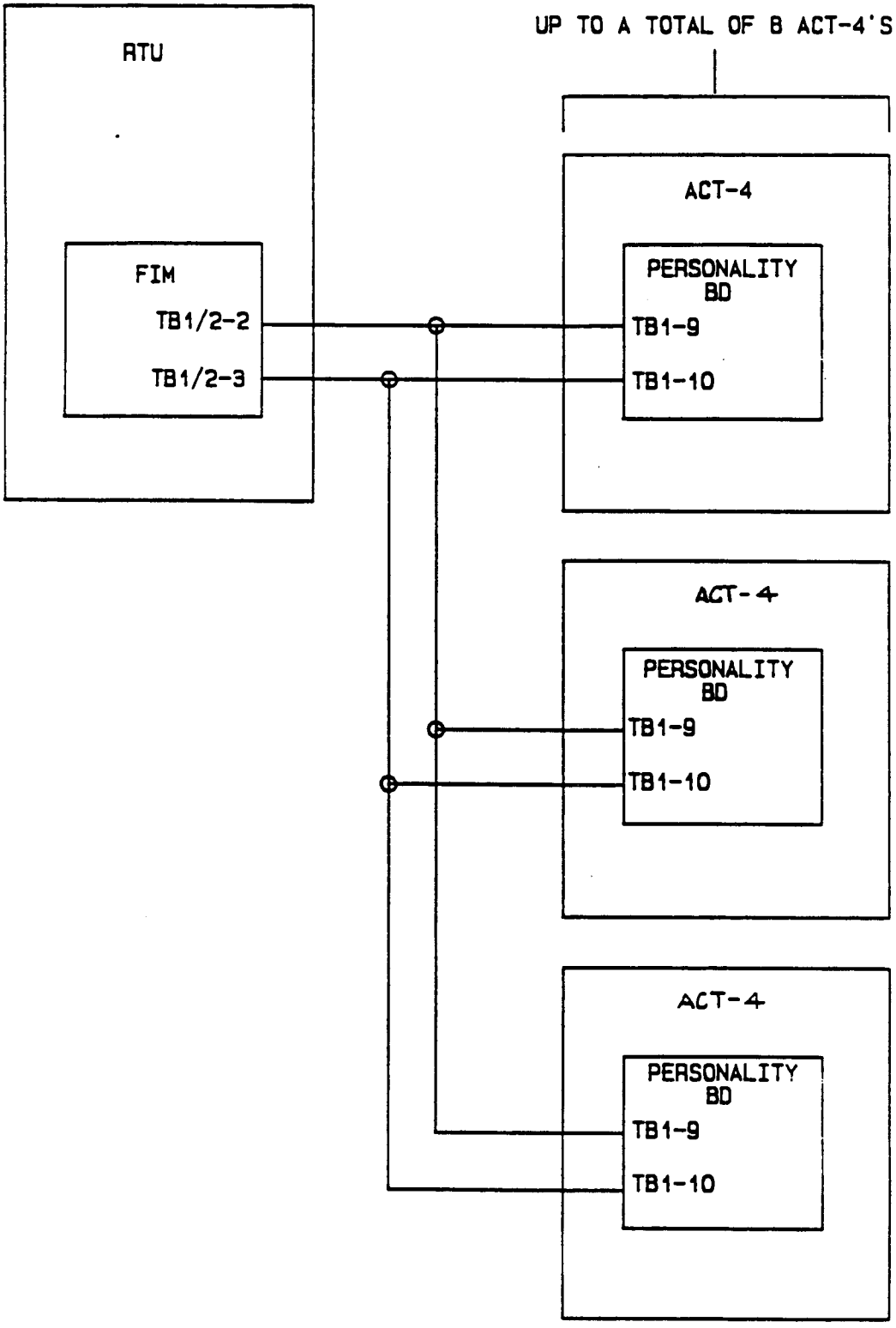
* FIM

*ZPR

NOTES: (1.) IF ACT-4 IS POWERED FROM RTU, CONSULT RTU POWER CONSUMPTION WORKSHEET (RTU MANUAL, P6 75) AND ADD 100MA FOR EACH ACT-4 TO DETERMINE REQUIRED NUMBER OF RTU BATTERIES AND TO INSURE THAT MAXIMUM CURRENT LEVEL IS NOT EXCEEDED. USE LOCAL TRANSFORMER FOR ACT-4 POWER IF MAX LEVEL IS EXCEEDED.

2. ALL WIRES ARE TWISTED PAIRS WITH A MAXIMUM LENGTH OF 1000 FEET AND A MINIMUM WIRE GAGE OF 22 AWG. IF ACT-4 IS POWERED FROM RTU MAXIMUM LENGTH IS 300 FEET. CALCULATE SIZE AND LENGTH OF STRIKE WIRE BASED ON ACTUAL CIRCUIT USED.

ACT-4 / RTU COMMUNICATIONS CONNECTIONSWIRING
SINGLE LOOP MODE



1.3 Specifications

This section lists and describes the specifications of the ACT-4.

SPECIFICATION	DESCRIPTION
DIMENSIONS Outer Casting:	7 1/8" (height) x 5" (width) x 2 1/4" (depth)
COMPOSITION MATERIAL Outer Casing:	die cast aluminum
TAMPER PROTECTION	a strategically positioned tamper switch protects against the unauthorized opening of the ACT-4 enclosure or the removal of the ACT-4 reader from its mounting surface
EXTERNAL POWER SUPPLY OUTPUT AC Mode:	9-15 Volts AC, 50-60 Hz
DC Mode:	6-12 Volts DC
POWER CONSUMPTION Typical:	250 milliwatts
Maximum:	625 milliwatts
MEMORY BACKUP POWER SUPPLY	rechargeable 160 mAh nickel cadmium battery
DISPLAY Technology:	an integral, eighty character alpha-numeric LCD configured in four lines of twenty characters
Format:	full English prompts with both dynamic and static PIN labeling. Upper and lower case letters, numbers, and punctuation marks
Vertical Viewing Angle:	from 40 degrees above the horizontal to 30 degrees below the horizontal
Backlight:	green LED array with forty-eight elements
Lens Filter:	light control film to help reduce glare and to provide viewing privacy

KEYPAD	
Technology:	a tactile feedback, 12-key keypad configured in two rows of six keys, sealed with silicon rubber. Keys use selectively positioned, conductive silicon rubber and gold-plated foil contacts for long life
Functions:	all functions and digits are dynamically labeled and allocated
AUDIBLE ANNUNCIATOR	
Technology:	a multiple frequency, piezo-electric transducer. Musical tones used to annunciate key depressions
MICROPROCESSOR MEMORY	
Program Storage:	32K EPROM
Data Storage:	8K Static RAM with battery backup
CARD READER (ACT-4KM or ACT-4KW only)	
Technology:	magnetic stripe (ACT-4KM) or Wiegand (ACT-4KW) card reader
Auxiliary Input:	external magnetic stripe (ACT-4KM) or Wiegand (ACT-4KW) card reader connections for exit reader
RELAY CONTACT CONNECTIONS	one form C (normally open and normally closed connections) rated at two amperes for door strike control

2.0 ELECTRICAL AND MECHANICAL INSTALLATION

2.1 Unpacking

The following items are typically included in the shipping package of the ACT-4. Check the invoice for the quantities of the individual items that have been ordered and verify that these quantities are correct.

ACT-4 Front Cover with associated electronics installed
ACT-4 Back Plate with Personality Board attached
ACT-4 10 Volt AC Transformer power supply
Editor Card
ACT-4 Manual
Security tool bit & 4 Blue Jumpers
1 1N4001 Diode
1 End Of Line 1 K-ohm Resistor, 1%
1 End Of Line 3.01 K-ohm Resistor, 1%

The ACT-4 is shipped with the Front Cover attached to the Back Plate.

2.2 Wiring Instructions

It is recommended that the external ACT-4 connections required for the application be determined and documented prior to beginning the installation. The ACT-4 requires only low voltage wiring. Unless local electrical codes or the end user requires it, there is no need to use conduit. All distances should be limited to 1000 feet or less, and Number 22 American Wire Gauge (AWG) wire or any heavier gauge should be used. Twisted pair is recommended. If the ACT-4 is powered from the RTU the maximum cable length is 300 feet for 22 AWG, 450 feet for 20 AWG, and 750 feet for 18 AWG.

The ACT-4 strike output relay is rated at 250 Volt-Amperes (resistive) with a maximum current switching capacity of two amperes. The gauge and length of the door strike cable must be determined by the installer.

Figure 2-1 shows all of the connection points to the ACT-4. These points are located on Terminal Block 1 of the Personality Board, which is attached to the ACT-4's Back Plate. **PIN 19 OF THE TERMINAL BLOCK MUST BE CONNECTED TO A GOOD ELECTRICAL GROUND, SUCH AS A COLD WATER PIPE!** Failure to connect the ACT-4 to a good electrical ground may result in unsatisfactory performance and/or damage to the ACT-4 and associated equipment.

2.2.1 Electrical Power Wiring

The ACT-4 will work with either an AC or a DC power adapter. The ACT-4 is factory-supplied to work with AC power. If a DC power source is used, Blue Jumpers must be installed between E1 and E2, and between E5 and E6 jumper locations on the Personality Board

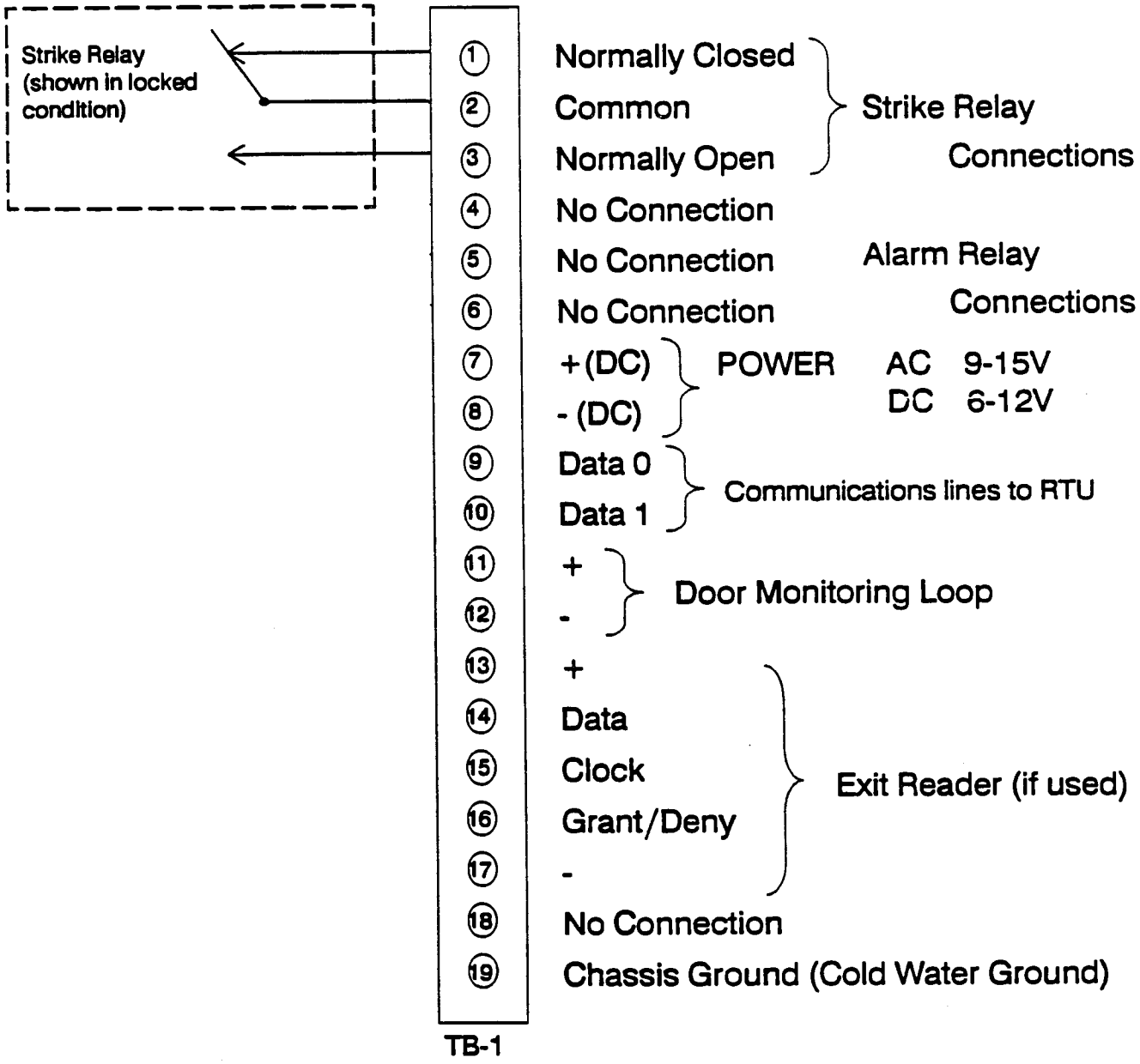


FIGURE 2-1
Personality Board Interconnect Drawing

(the Personality Board is attached to the ACT-4 Rear Panel).

The ACT-4 requires an AC input of 9 to 15 volts. The AC transformer supplied with the ACT-4 will supply this voltage when connected to a 110 VAC supply. The ACT-4 requires a DC input between 6 and 12 volts. The ACT-4 must be connected to a supply capable of delivering a minimum of 625 milliwatts for either AC or DC power.

If DC power is used, great care should be taken to properly wire the DC power connections so that the plus terminal from the transformer power supply is connected to the ACT-4's plus terminal, and likewise that the minus terminals are also properly connected. Failure to properly connect these terminals may result in great damage to the ACT-4.

Three power supply configurations are shown in Figure 2-2. Note that the ACT-4 can be powered from the Four-wire Interface Module (FIM) in the RTU. If the ACT-4 is powered from the RTU, care must be taken so that the RTU maximum current level is not exceeded, and that the RTU has the proper number of batteries for backup power. The RTU Power Consumption Worksheet (reproduced in Appendix B of this manual) should be used for this calculations. Three or fewer ACT-4s can be powered from the RTU. Use Table 2-1 to determine which connections to use when powering ACT-4s from a FIM.

TABLE 2-1: ACT-4/FIM POWER CONNECTIONS

ACT #	Voltage Polarity	FIM Conn's
1	Positive	TB1-1
1	Negative	TB1-4
2	Positive	TB2-1
2	Negative	TB2-4
3	Positive	TB1-5
3	Negative	TB1-8

2.2.2 Communications Wiring to the RTU

The ACT-4 communicates with the RTU using two data wires connected to the FIM. These lines are used for RS-485 bi-directional, differential, multidrop communications. Bi-directional capability reduces the number of wires required to communicate with each ACT-4 to two. Differential capability provides superior performance in electrically noisy environments. Multidrop means that more than one (in fact, up to eight) ACT-4 can be connected to a single pair of communications wires.

Multidrop communications systems use an addressing system so that the Master Communicator (in this case, the RTU) can inform the other devices connected to the wire pair (the ACT-4s) who is being talked to. Sections 2.2.2.1 and 2.2.2.2 explain how to set up

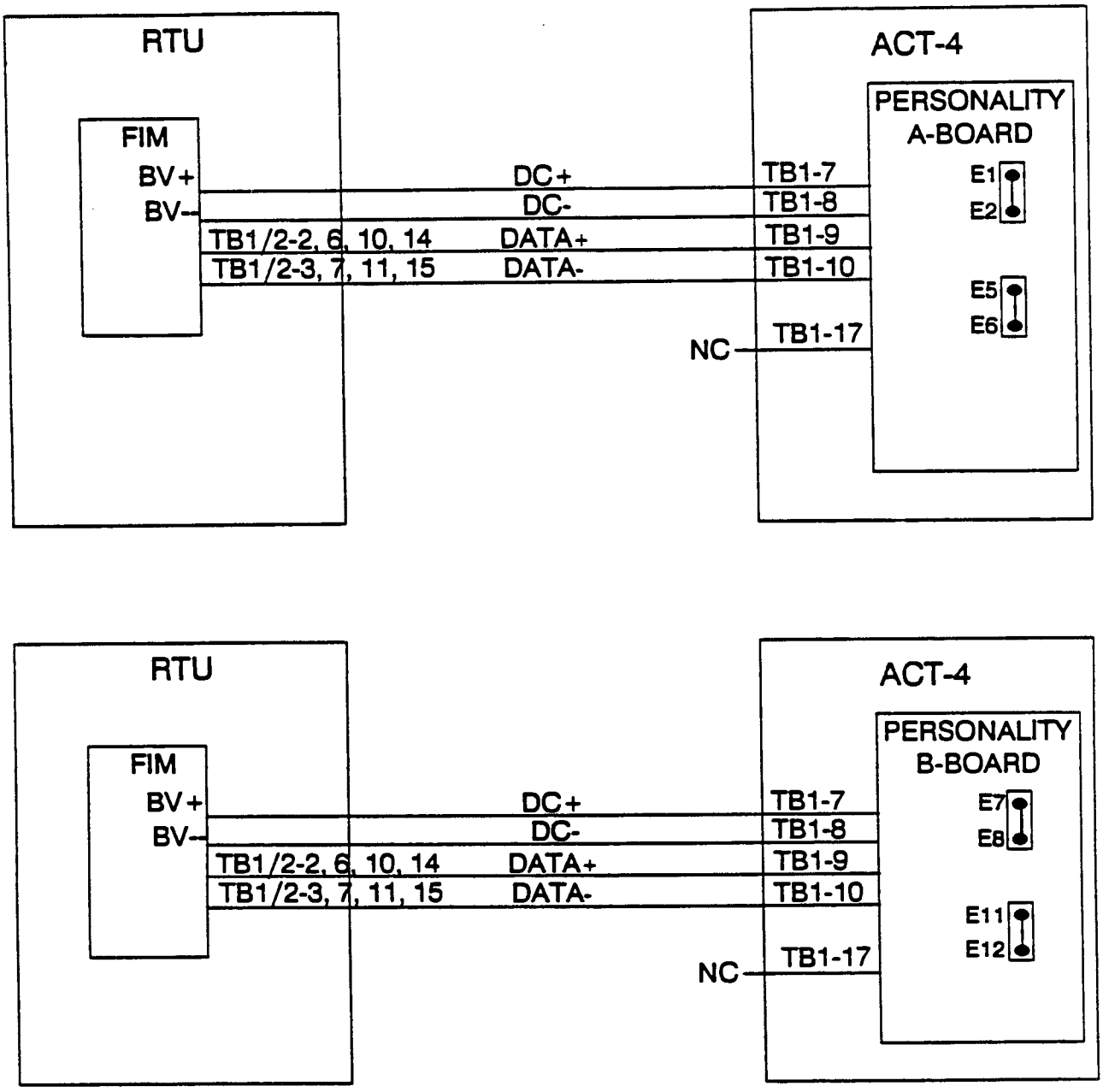


FIGURE 2-2A:

POWERING ACT-4 FROM RTU (DC POWER)

NOTES:
1. E1 MUST BE JUMPERED TO E2, AND E5 MUST JUMPERED TO E6 FOR 6-7 VDC OPERATION (PERSONALITY A-BOARD).
2. E7 & E8, E11 & E12 MUST BE JUMPERED FOR 6-7 VDC OPERATION (PER SONALITY B-BOARD).
3. DC+ AND DC- ARE ONE PAIR, DATA+ DATA- ARE ANOTHER PAIR.

NOTE
Jumpers between E1, E2 and E5,
E6 not installed for AC operation.

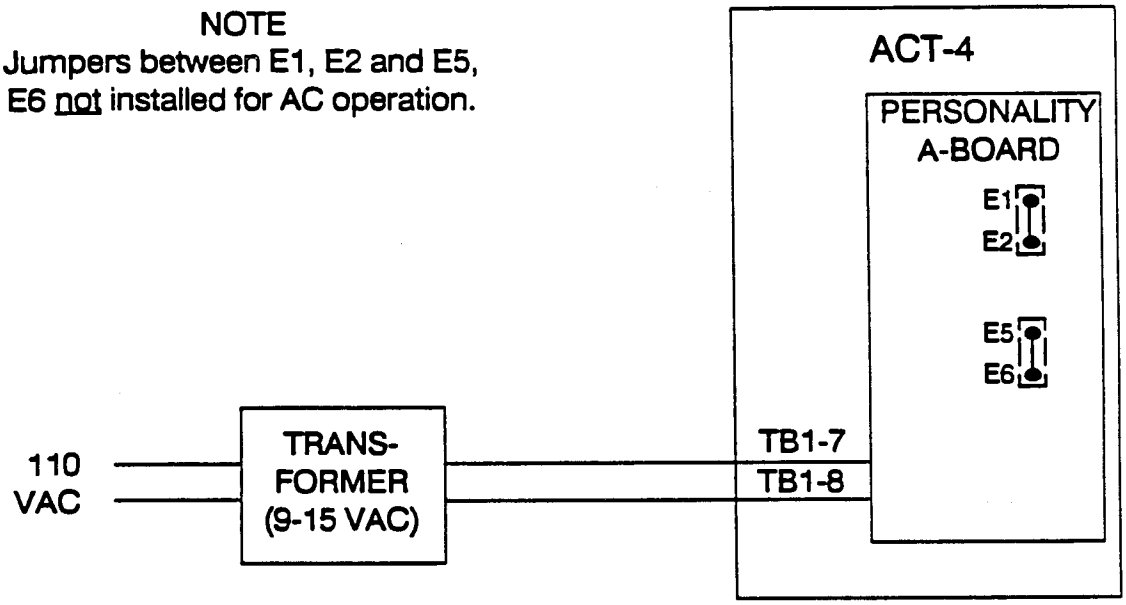


FIGURE 2-2B:
POWERING ACT-4 FROM AC TRANSFORMER

NOTE:
E1 & E2, E5 & E6 require jumper installation for 6-7 VDC operation. This will bypass the full wave bridge rectifier. Thus, power polarity must be observed.

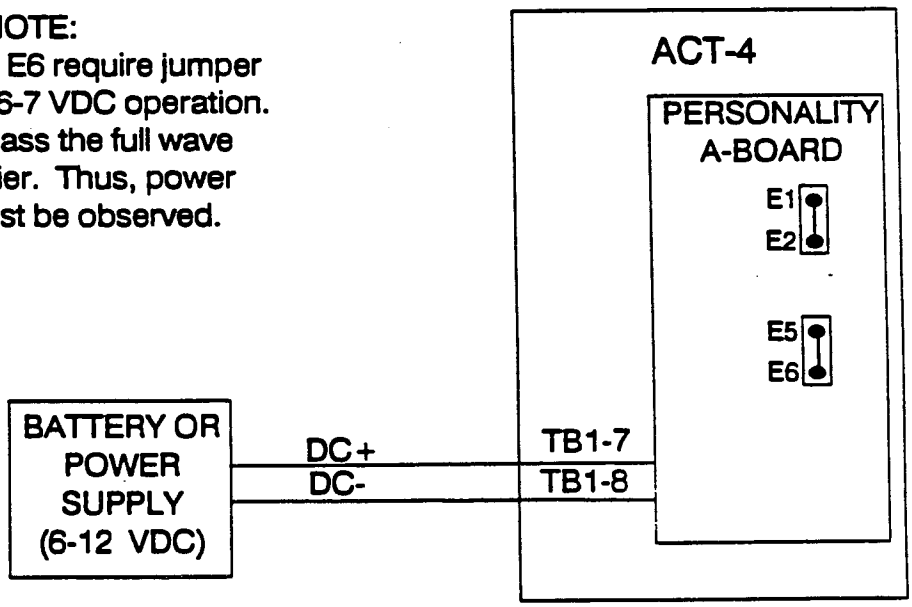


FIGURE 2-2C:
POWERING ACT-4 FROM DC
POWER SOURCE

these addresses in the ACT-4 and the RTU.

Each ACT-4 and each Exit Reader occupies a single "logical channel". ACT-4s use logical channels (as opposed to physical channels) since up to eight ACT-4s or a combination of four ACT-4s and four Exit Readers can be connected to a single pair of wires going to the RTU. Channel assignments are made inside the ACT-4 by setting up jumpers in a jumper block. Channel assignments are made inside the RTU using RIMs.

2.2.2.1 ACT-4 Addressing

To assign an ACT-4 to a channel, first locate jumper block J1 on the ACT-4's Processor Board. It is located in the upper left corner of the board. Jumper 1 is at the top of the block and jumper 4 is at the bottom. Use Table 2-2 to determine which jumpers to install in this jumper block. Note that any of the eight channels can be assigned to any ACT-4, but only one ACT-4 can be assigned to a specific address. If the ACT-4 is connected to an Exit Reader the ACT-4 must be assigned to one of the even channels (0, 2, 4, or 6) and the next channel must not be assigned to any ACT-4. This scheme is used because the Exit Reader will "occupy" the next address.

TABLE 2-2: ACT-4 CHANNEL JUMPERS

	ACT-4 J1 Jumper Installation			
Channel #	1	2	3	4
0	No	No	No	No
1	Yes	No	No	No
2	No	Yes	No	No
3	Yes	Yes	No	No
4	No	No	Yes	No
5	Yes	No	Yes	No
6	No	Yes	Yes	No
7	Yes	Yes	Yes	No

The ACT-4's channel number will appear in square brackets on the bottom line of the display after the ACT-4 has been powered up. This method can be used to verify that the ACT-4 has been set to the proper channel.

2.2.2.2 RTU Addressing

The RTU will not communicate with its ACT-4s unless there are access control Zone Interface Modules (ZIMs) installed in the proper zones in the proper RIMs. RIMs are used to inform the RTU that an ACT-4 is connected to it. Access control ZIMs such as AC/DRs must be installed into the RIMs for allocation purposes. These ZIMs must occupy either zones 5 and 6 or zones 7 and 8 of the RIM with one ZIM used for each ACT-4. One ZIM must be installed for each ACT-4 and each Exit Reader connected to the RTU. A

maximum of eight readers can be connected to a single RTU; this would require a minimum of four RIMs and eight ZIMs.

If an Exit Reader is connected to the ACT-4, the Exit Reader must be allocated by installing a ZIM in a RIM for the Exit Reader. The Entry Reader ACT-4 ZIM must be installed in zones 5 and 6 and the Exit Reader ZIM must be installed in zones 7 and 8 of the same RIM.

RIM addresses and zones are used to make ACT-4 channel assignments. RIM addresses are determined by jumper block JA which is located on the lower right corner of the RIM. Only jumper 1, which is on the left side of JA, and jumper 2, which is just to the right of jumper 1, are needed for this determination. The ZIM which is used to allocate the ACT-4 to even addresses (0, 2, 4, 6) must be installed in socket Z3 on the RIM; this ZIM controls RIM zones 5 and 6. The ZIM for odd addresses (1, 3, 5, 7) is installed in Z4 and controls zones 7 and 8.

Table 2-3 shows the relationship between ACT-4 channel numbers and RIM addresses and zones.

TABLE 2-3: ACT-4/RIM ADDRESSING

ACT-4 Channel	RTU Address Jumper 1	RTU Address Jumper 2	Zone
0	None	None	5/6
1	None	None	7/8
2	Installed	None	5/6
3	Installed	None	7/8
4	None	Installed	5/6
5	None	Installed	7/8
6	Installed	Installed	5/6
7	Installed	Installed	7/8

2.2.2.3 Data Connections to the FIM

ACT-4 data connections to the RTU are made using Four-wire Interface Modules (FIMs) located in the RTU. There are two data lines (DATA0 and DATA1) which must be connected. The data lines should be a twisted pair of wires.

There are four different schemes that can be used to connect ACT-4s to FIMs. In Scheme 1, up to eight ACT-4s are connected to a single FIM channel. In Scheme 2, up to four ACT-4s are connected to one of two FIM channels. In Scheme 3, up to two ACT-4s are connected to one of four FIM channels. In Scheme 4, a single ACT-4 is connected to eight FIM channels. Schemes 1, 2 and 3 require a single FIM board, and Scheme 4 requires two FIMs. Scheme 2, 3 and 4 might be used in particularly noisy electrical environments where noise isolation is important, or in those instances where maintenance considerations outweigh installation considerations.

Jumper block JP4 on the RTU-175 Processor Board is used to select one of these schemes. JP4 is located on the lower right corner of the Processor Board next to connector J3. Jumpers 1 (extreme left) and 2 (just to the right of jumper 1) are used for this selection. No jumpers should be installed in JP4 for Scheme 1. Only jumper 1 is installed for Scheme 2. Only jumper 2 is installed for scheme 3. Both jumper 1 and jumper 2 are installed for scheme 4.

Use Table 2-4 to determine which ACT-4 channel is assigned to which FIM channel. Note that for Schemes 1, 2 and 3 the data wires can be "daisy chained" from one ACT-4 to another and finally to the FIM.

TABLE 2-4: ACT-4/FIM CHANNEL ASSIGNMENTS

ACT-4 Channel #	Scheme #	FIM #	FIM Channel #
All Channels	1	1	1
0 thru 3	2	1	1
4 thru 7	2	1	2
0 and 1	3	1	1
2 and 3	3	1	2
4 and 5	3	1	3
6 and 7	3	1	4
0	4	1	1
1	4	1	2
2	4	1	3
3	4	1	4
4	4	2	1
5	4	2	2
6	4	2	3
7	4	2	4

Table 2-5 shows the terminal block connections on the FIM which are used for each of the four FIM channels. Note that either Terminal Block 1 (on the left side of the FIM) or Terminal Block 2 can be used for each channel.

TABLE 2-5: FIM CHANNEL CONNECTIONS

FIM Channel	Data Polarity	Terminal Block Connections
1	Plus	TB1/TB2-2
1	Minus	TB1/TB2-3
2	Plus	TB1/TB2-6
2	Minus	TB1/TB2-7
3	Plus	TB1/TB2-10
3	Minus	TB1/TB2-11
4	Plus	TB1/TB2-14
4	Minus	TB1/TB2-15

2.2.3 Strike Relay Circuit

The door controlled by the ACT-4 will typically be locked and unlocked by an electric strike mechanism. The door strike can be connected either to the ACT-4 or to the RTU.

2.2.3.1 Door Strike Considerations

Most applications will require the use of the normally closed (power to lock) strike relay contact to comply with local fire codes. This contact is connected to the relay common when the door should be locked, and is disconnected from the common when the door should be unlocked. The fire alarm system used to protect the secured area should provide an output signal that can be used to unlock the secured door by interrupting electrical power to the strike mechanism.

Where required by the nature of the application or when local codes permit, the normally open (power to unlock) strike relay connection may be used. This reduces power consumption by the strike circuit, and it allows the system to fail in a secure manner. If the strike controller (either the ACT-4 or the RTU) is removed from the circuit, or if a short or open occurs in the strike circuit, the strike mechanism will lock the door.

2.2.3.2 Door Strike Wiring Connections

The ACT-4 and the ZPR use the same type of relays to control the strike circuit. These are form C relays (both normally open and normally closed contacts are provided). They are rated at 250 Volt-Amperes (resistive) and are capable of switching up to two amperes of current.

The ACT-4 door strike control relay connections are shown in Figure 2-1. The ZPR controls door strikes according to ACT-4 channel number. The ZPR connections are shown in Table 2-6.

TABLE 2-6: ACT-4 CONNECTIONS TO THE ZPR

ACT-4 Channel #	ZPR Type Connections	ZPR Terminals
0	Normally Open	TB1-1
0	Common	TB1-2
0	Normally Closed	TB1-3
1	Normally Open	TB1-5
1	Common	TB1-6
1	Normally Closed	TB1-7
2	Normally Open	TB1-9
2	Common	TB1-10
2	Normally Closed	TB1-11
3	Normally Open	TB1-13
3	Common	TB1-14
3	Normally Closed	TB1-15
4	Normally Open	TB2-1
4	Common	TB2-2
4	Normally Closed	TB2-3
5	Normally Open	TB2-5
5	Common	TB2-6
5	Normally Closed	TB2-7
6	Normally Open	TB2-9
6	Common	TB2-10
6	Normally Closed	TB2-11
7	Normally Open	TB2-13
7	Common	TB2-14
7	Normally Closed	TB2-15

2.2.3.3 Catch Diodes

Catch diodes **MUST** be mounted across the strike relay coils to prevent the possibility of damage to the ACT-4 or ZPR strike relays from the induced voltage that is caused by switching the strike mechanism. A 1N40001 diode has been shipped with the ACT-4 for this purpose. Be sure to connect the diode so that its polarity is correct. Figure 2-3 includes a drawing of the 1N4001 showing the band on the diode and the diode polarity.

2.2.4 Door Switch Connections

A switch must be used to indicate whether the door controlled by the ACT-4 is open or closed. This is done so that the system can

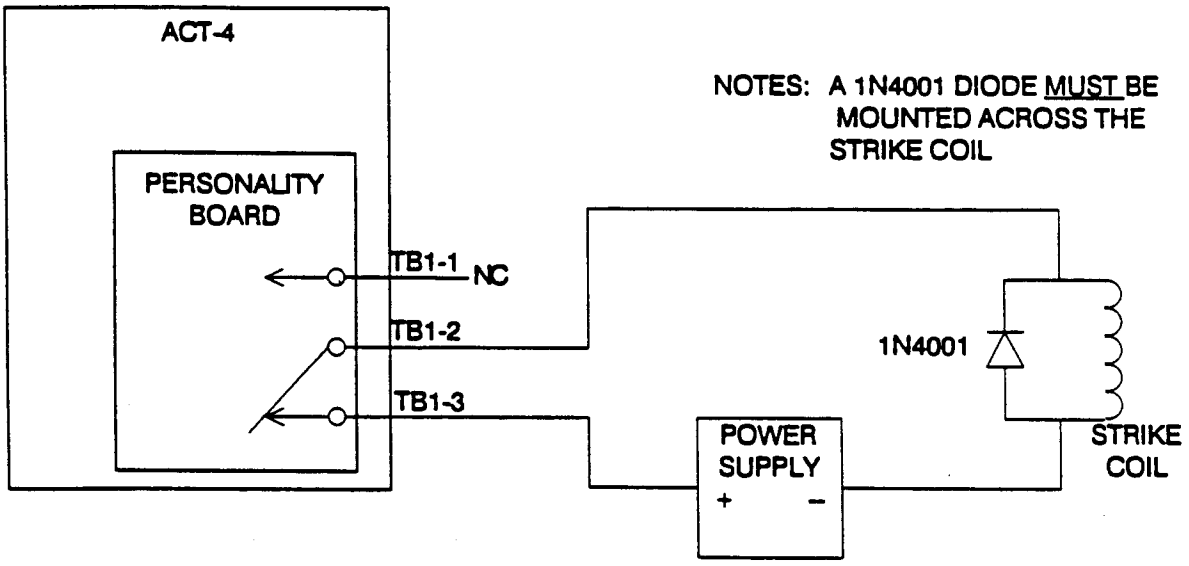


FIGURE 2-3A:
ACT-4 STRIKE CONNECTION-FAIL SAFE (LOCK ON POWER)

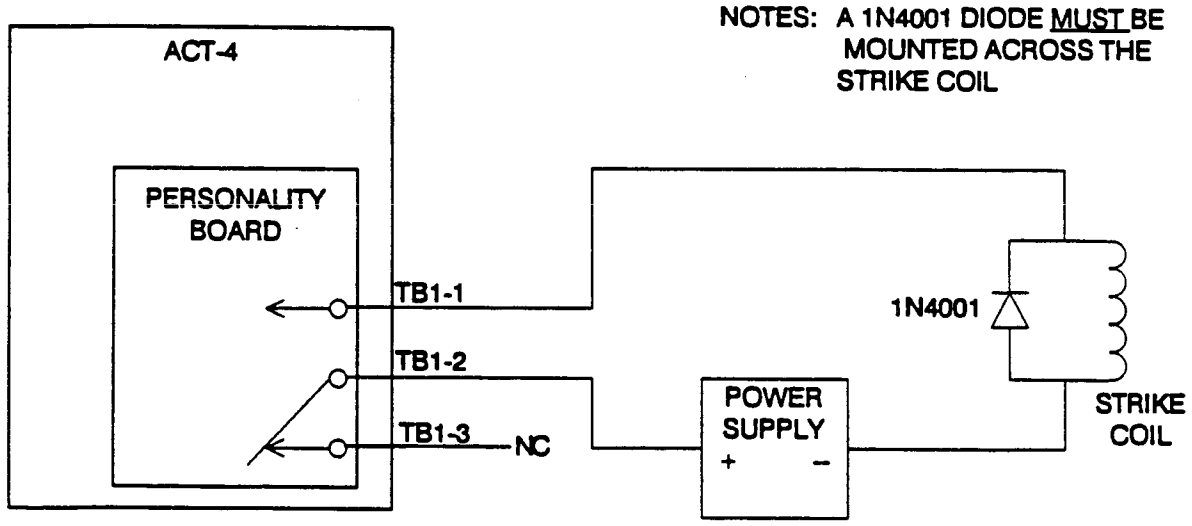


FIGURE 2-3B:
ACT-4 STRIKE CONNECTION-FAIL SECURE (UNLOCK ON POWER)

determine whether a door alarm condition exists. The door switch can either be connected to a RIM to the ACT-4. The door switch is part of the door monitor loop. Figure 2-4A shows a schematic of the ACT-4 door monitor loop, and Figure 2-4B shows a schematic of the RTU door monitor loop. Note that door switches are closed when the door is closed, and open when the door is open.

If the door switch is to be part of the RIM door monitor loop use Table 2-3 to determine which RIM and zone pair works with the ACT-4. Each ACT-4 is assigned to a unique RIM zone pair. This assignment is made by ACT-4 channel number. The door switch for the door controlled by the ACT-4 must be connected to the RIM zone pair assigned to that ACT-4. Use Terminal Block 2 on the RIM (the right side of the board) for door switch connections. Notice that there are four terminals on this block labeled "L" and that they occur in two pairs. Use the top pair for zones 5 and 6, and the bottom pair for zones 7 and 8.

2.2.5 Exit From the Secured Area

The door position is constantly monitored either by the ACT-4 or by the RTU. Unauthorized door openings (ones without a valid access request) will be reported by the RTU as an alarm. One of two methods must be used to exit the secured area so that alarms are not reported: either a Request to Exit switch or a Exit Reader must be connected into the system.

2.2.5.1 Exit Reader

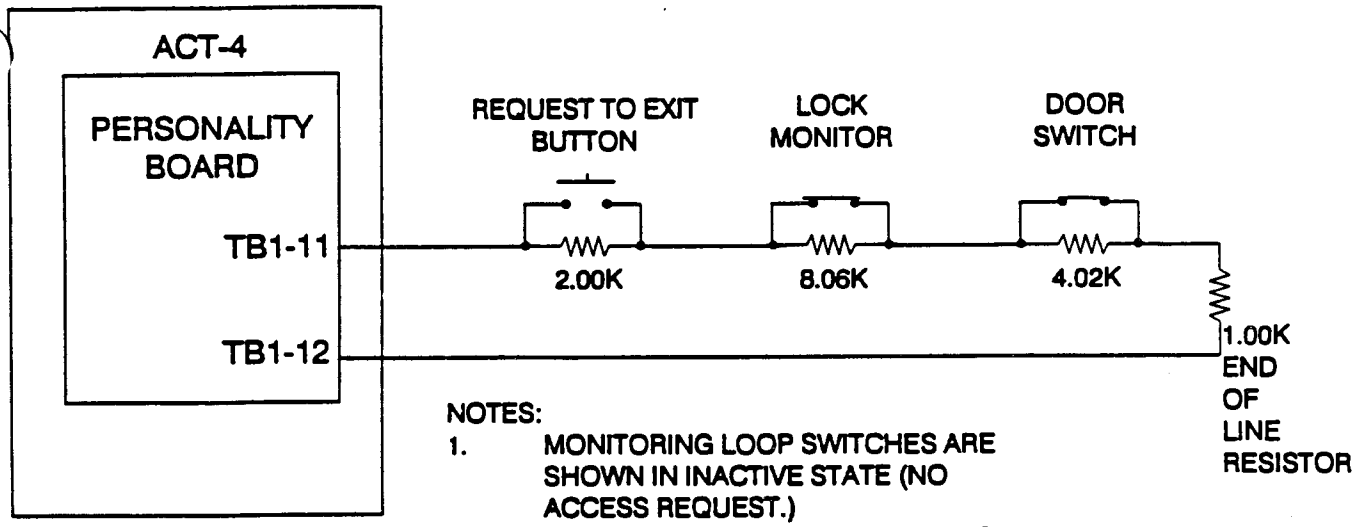
If an Exit Reader is used it must be connected to the ACT-4. The ACT-4 must be assigned to an even channel (0, 2, 4, or 6) and the Exit Reader is assigned to the next odd channel. The Exit Reader connections are shown in Figure 2-5. Only the following types of Exit Readers can be used: the ACT-0M or the MSR-1 (with ACT-4KMs), or the ACT-0K or the WSR-1 (with ACT-4KWs). The same cards must be used for both entry to and exit from the secured area.

2.2.5.2 Request to Exit Switch

If an Exit Reader is not used, then a Request to Exit switch must be connected to the door monitoring loop. This should be a normally open momentary switch, and should be attached in parallel with the End of Line resistor. The Request to Exit Switch should be connected to the same door monitor loop that is used for the door switch described in Section 2.2.4. Door loop monitor schematics are shown in Figure 2-4.

2.2.6 Door Monitor Loop Terminations

Either the ACT-4 or the RTU door monitor loop will be used to sense door position and possibly requests to exit. The unused door loop must be properly terminated to avoid improper door alarms. If the ACT-4 door monitor loop is not used, install a 3.01 K-ohm 1%



NOTES:
1. MONITORING LOOP SWITCHES ARE SHOWN IN INACTIVE STATE (NO ACCESS REQUEST.)
2. ALL RESISTORS ARE 1% TOLERANCE.
3. LOCK MONITOR IS OPTIONAL

FIGURE 2-4A:
ACT-4 DOOR MONITOR LOOP

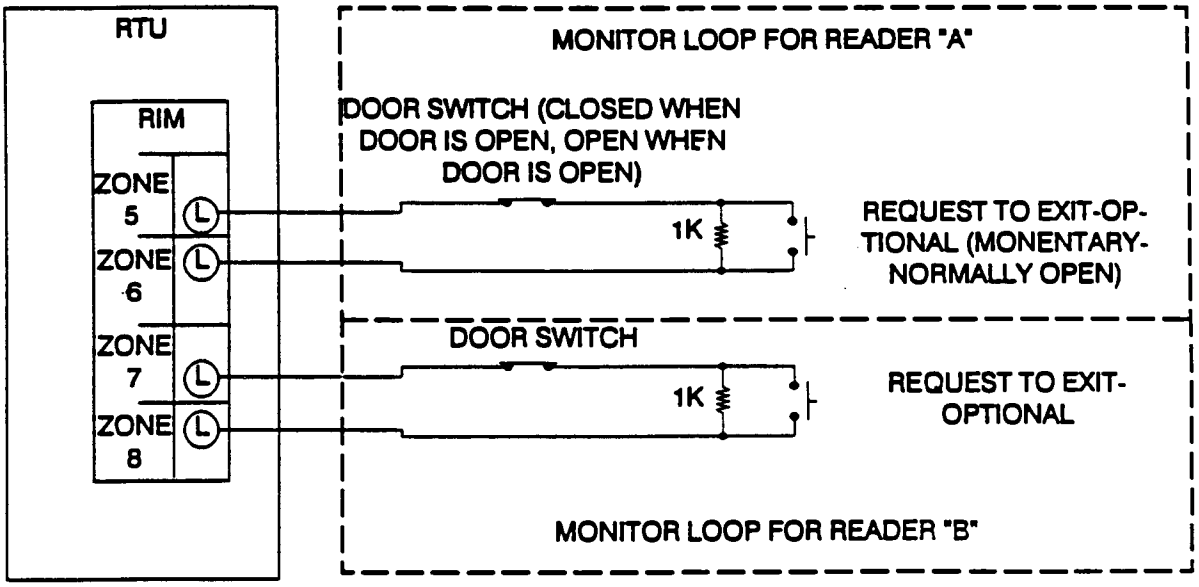


FIGURE 2-4B:
RTU DOOR MONITOR LOOP

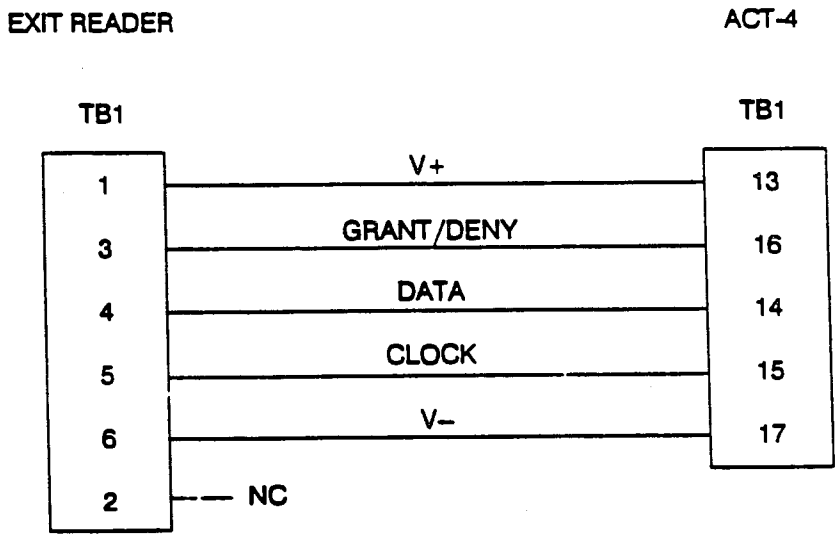


FIGURE 2-5:
EXIT READER CONNECTIONS
TO ACT-4

resistor between terminals 11 and 12 on the Personality Board. If the RTU loop is unused, install a 1 K-ohm 1% resistor between the two terminals marked "L" on the RIM's TB2 terminal block. Consult Section 2.2.2.2 to determine the correct RIM and zone for this installation.

2.2.7 Tamper Switch

The ACT-4 contains a Tamper Switch which is used to detect unauthorized entry into the terminal. If the Front Cover is removed from the Back Plate, or if the ACT-4 is removed from its mounting surface, the Tamper Switch will be activated. Tamper alarms are reported by the ACT-4 to the RTU and CPU using standard data communications.

2.3 Mounting the ACT-4

The ACT-4 is designed to be mounted indoors or outdoors. The gasket on the Front Panel provides the ACT-4 with a water-tight seal once the Front Panel is attached to the Back Plate. The ACT-4 mounts on a 2 gang electrical switch box or directly on the wall. Care should be taken to make sure that the tamper switch on the Back Plate makes contact with and is completely depressed by the wall or box when it is attached to the mounting surface. The dimensions of the ACT-4, location of the tamper switch, the mounting holes, and the hole for the service cord are shown in Figure 2-6.

The first step is remove the ACT-4 Front Cover from the Back Plate. This is done by removing the two security screws from the bottom of the ACT-4, pulling the Front Cover gently away from the Back Plate at the bottom, and unhinging the two pieces from each other at the top.

The next step is to mechanically mount the Back Plate. Determine where to mount the ACT-4, run the service cord (including the power wires, data lines, door strike wires, tamper alarm connections, and Exit Reader connections as required) to the location, pull the service cord through the half inch hole in the center of the Back Plate and the Personality Board, and screw the Back Plate onto the mounting surface. After the Back Plate has been mounted, connect the service cord to the 19 position terminal block on the Personality Board.

Once the connections have been completed, connect the two 16 pin light blue flat cable connectors from the Front Cover to the long, black 32 pin header located on the opposite side of the Personality Board from the terminal strip. (Note: the ACT-4 has been designed for easy connections; if the connectors don't seem to fit right, then they probably aren't connected properly.)

After the two Front Panel flat cables have been attached to the Personality Board, connect power to the ACT-4 and make sure that the unit is operating properly by pressing any key on the keypad.

The display should look like Figure 3-1. If it doesn't, check the wiring to the unit. After this test has been successfully completed, depress the Reset Switch on the Processor Board. The Processor Board is attached to the Front Cover, and the Reset Switch is mounted in the upper right corner of the board near the grove on the top inside surface of the Front Cover.

Fit the tongue at the very top of the Back Plate into the grove on the top inside surface of the Front Panel. (Note: The tongue may have to be loosened slightly to permit a proper fit. This fit should be checked prior to installation.) This provides a hinge arrangement that will make it easy to mechanically attach the Front Panel to the Back Plate.

Swing the Front Panel down so that its back surface is flush with the Back Plate. This may require a modest amount of force. Look through the screw holes on the bottom of the Front Panel to confirm that they are aligned with the holes in the Back Plate. Take the two security screws and the special screwdriver bit, and complete the ACT-4 electrical and mechanical installation by securing these screws into the holes on the bottom of the Front Panel.

2.4 Battery Charging

The ACT-4 contains a battery to back up the internal RAM and to provide backlighting for the display. The battery has been charged in the factory, but it is recommended that the unit be connected to the electrical power source for 24 hours prior to use to insure the maximum charge.

2.5 Final Installation

ACT-4 installation is completed by entering the card data base into the CPU and configuring the CPU to communicate with the ACT-4. Consult the SAFEnet SAFEware Manual for these procedures.

The ACT-4 comes equipped with factory-installed options for parameters such as keypad display mode. No further action is required to use the factory defaults. Consult Section 3 for procedures to change these settings.

The ACT-4 can be configured from the CPU to operate in a number of different modes, such as with or without PIN, Two Person Rule, and Anit-Passback. Consult the SAFEware Manual for details on enabling and disabling these features.

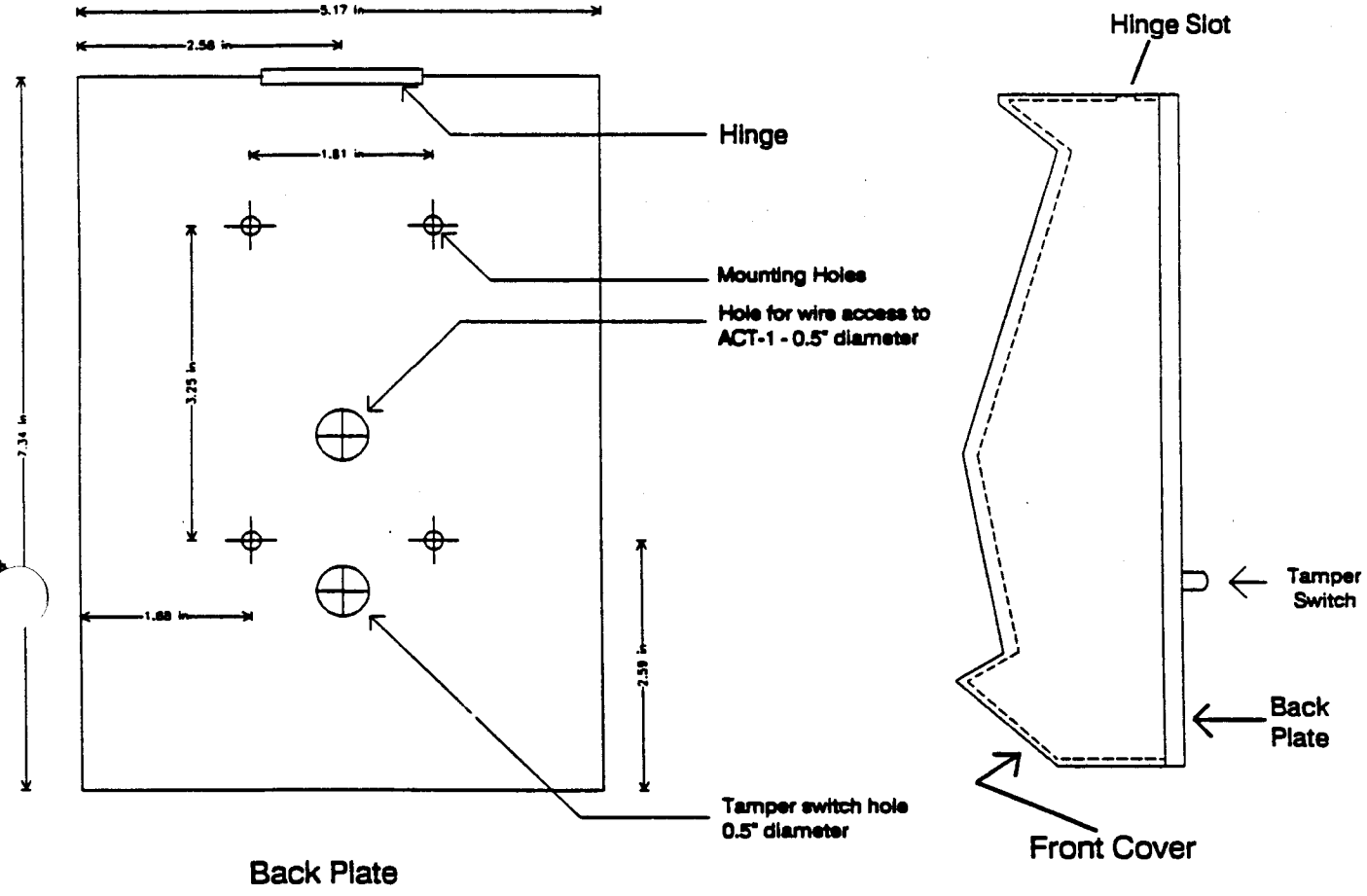


FIGURE 2-6
ACT Mechanical Drawing

3.0 ACT-4 EDITOR FUNCTIONS

3.1 Introduction

Several ACT-4 settings can be changed by the Editor to tailor the ACT-4 to a particular application. These settings include the PIN display mode, the door open and close time, and the message that appears when the ACT-4 is activated by a keypad depression.

The following steps should be taken to change the ACT-4 settings.

1. **The Editor should enter the Main Editor Menu.**
2. **From the Main menu, the Editor should enter the Setup Menu, or the Label Editing Menu.**
3. **The Editor makes any desired changes to the ACT-4 settings.**
4. **The Editor exits from the menu and returns to the Main Editor Menu.**
5. **The Editor exits from the Main Editor Menu which completes the customization and returns the ACT-4 to its normal operating state.**

The ACT-4 is part of a family of access control terminals. Several menu options which are displayed by the ACT-4 do not pertain to this model. This section describes which options are and are not applicable to the ACT-4.

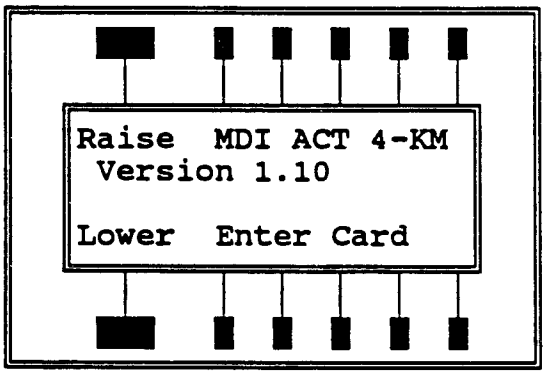
3.2 Main Editor Menu

This section describes the Main Editor Menu, which is the starting point for all ACT-4 Editor functions.

3.2.1 Entering The Main Editor Menu

The first step in entering the Main Editor Menu is to depress any one of the buttons on the keypad to activate the ACT-4. The ACT-4 Initial Display, shown in Figure 3-1, will appear. The Firmware version will be displayed. The ACT-4 requires version 1.10 or higher for proper operation.

FIGURE 3-1: ACT-4 Initial Display

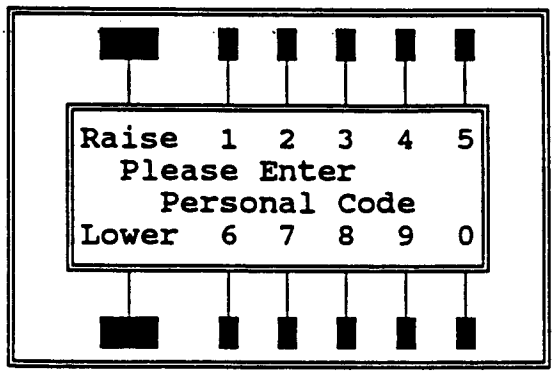


Note that the word "Card" will be replaced with "I.D." for ACT-4Ks. The "Raise" and "Lower" keys refer to the display tilt feature. Repeatedly pressing the "Raise" key will tilt the display upward, and repeatedly pressing the "Lower" key will tilt the display downward.

All displays time out and the display goes blank if no key is pressed within five seconds after the last key depression. This feature insures that the ACT-4 is not accidentally left in the Editor mode. It is suggested that the Editor be familiar with the procedures contained in Section 3 prior to beginning them so that key strokes can be entered within the prescribed time limits.

The next step is to swipe the Editor Card through the card reader (ACT-4KM or ACT-4KW) or to enter the Editor I.D Number. (Note: Mag stripe cards are swiped through the reader from right to left and Wiegand cards are swiped through from left to right.) Once this has been done the message shown in Figure 3-2 will be displayed. This is the User Sign On Display.

FIGURE 3-2: User Sign On Display



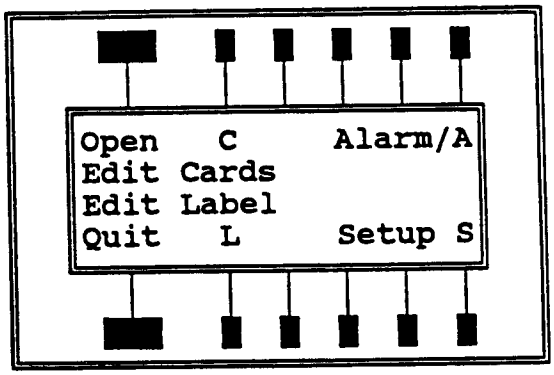
The Editor's PIN code should now be entered. The ACT-4 is shipped with a factory-installed Editor PIN. This is normally 1234 for four digit PIN configurations, 12345 for five digit configurations, and 123456 for six digit configurations. The Editor PIN should be changed the first time the Editor uses the ACT-4.

Once the first digit of the PIN has been entered, the keys labeled "Raise" and "Lower" will be relabeled "Retry". Use the "Retry" key to restart the PIN entry sequence if the wrong key is pressed.

3.2.2 Main Editor Menu Description

After the Editor PIN is entered the message shown in Figure 3-3 is displayed. This is the Main Editor Menu.

FIGURE 3-3: Main Editor Menu



Note that the word "Cards" will be replaced by "I.D.s" for ACT-4Ks. This menu is used by the Editor to select any of the ACT-4 supervisory features. Some of the menu selections are valid only for other versions of the ACT series. The following paragraphs will explain which features can be selected from this menu.

3.2.2.1 Door Access

The button above the word "Open" is used in ACT-1 and ACT-2 applications, and has no effect for the ACT-4.

3.2.2.2 Data Base Access

The button above the letter "C" is used to gain access to the ACT-1 and ACT-2 Data Base. This selection is used in the ACT-4 to change the Editor's PIN. Once the data base menu appears, swipe the Editor card through the reader or key in the I.D. or card number, then enter the new PIN.

3.2.2.3 Alarm Menu Access

The button above the letter "A" is used to gain access to the Alarm Menu, which is used to analyze alarm conditions for the ACT-1 and ACT-2 terminals.

3.2.2.4 Quit

The button below the word "Quit" is used to exit from the programming mode and return to the access control mode. Pressing "Quit" will display the message shown in Figure 3-1.

3.2.2.5 Initial Display Message Editing

The button below the letter "L" is used to edit the information that appears on lines two and three of the ACT-4 Initial Display shown in Figure 3-1. The procedures for editing this information are described in Section 3.5.

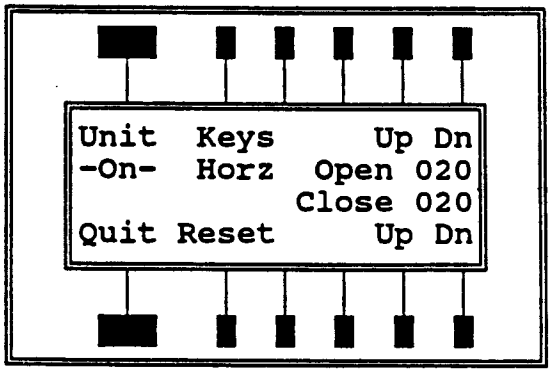
3.2.2.6 Setup Menu Access

The button below the letter "S" is used to gain access to the Setup Menu. This is the selection that should be made to change the factory default settings.

3.3 Setup Menu

The ACT-4 Setup Menu is entered from the Main Editor Menu (Figure 3-3) by pressing the button below the letter "S". After the Editor selects "S", the Setup Screen shown in Figure 3-4 is displayed.

FIGURE 3-4: Setup Screen



The keys in this screen have the following interpretations.

3.3.1 Door Lock Control

The button above the word "Unit" is used in ACT-1 and ACT-2 applications, and has no effect for the ACT-4.

3.3.2 Keypad Display

The button above the word "Keys" is used to set the display format for the ACT-4's keypad. This button allows the Editor to select one of the three display modes described in Section 1.1: Horizontal, Vertical, or Rotational.

The Editor selects the desired mode by pressing this key until that mode is displayed. When "Horz" is displayed the keys are assigned in the horizontal mode shown in Figure 1-1. "Vert" indicates that the vertical mode shown in Figure 1-2 has been selected.

The third method of displaying numbers for the keypad is MDI's rotationally dynamic mode. In this mode the buttons are labeled a different way each time the reader is used. This mode provides a high degree of security because it prevents anyone from noting a PIN entry pattern.

3.3.3 Door Lock Time Period Adjustment

The buttons above the "Up" and "Dn" on the top row of the display and the buttons below the "Up" and "Dn" keys on the bottom row of the display shown in Figure 3-4 are used in ACT-1 and ACT-2 applications, and have no effect for the ACT-4.

3.3.4 Quit

The button below the word "Quit" returns the display to the Main Editor Menu.

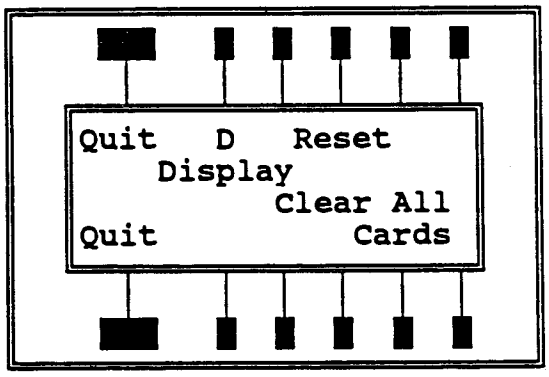
3.3.5 Reset Menu Access

Pressing the key below the word "Reset" causes the Reset Menu to be displayed.

3.4 Reset Menu

The Reset menu is shown in Figure 3-5.

FIGURE 3-5: Reset Menu



The button above or below the word "Quit" takes the system back to the Setup Menu.

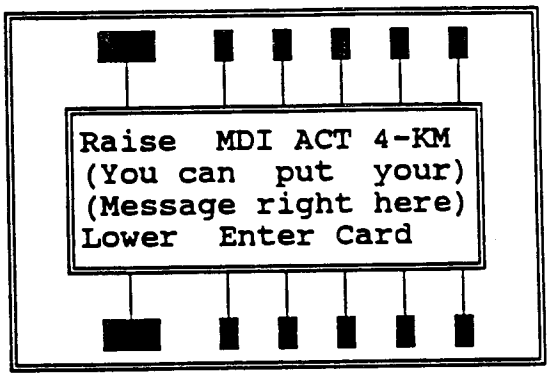
The key above the "D" clears any label that has been entered on the second and third lines of the ACT-4 Initial Display (Figure 3-1) during a label editing session. This gives the Editor a "clean slate" to work with. (Label editing is explained in Section 3.5).

The key below the word "Cards" (or "I.D." for ACT-4K) is used to reset the ACT-1 and ACT-2 Data Bases. This key has no effect on the ACT-4.

3.5 Entering A Label

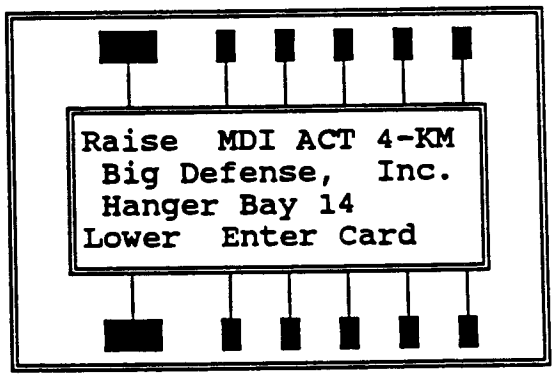
The ACT-4 Initial Display (shown in Figure 3-1) contains two lines which the Editor can edit to customize the display for the customer's application. The User Sign On display is repeated in Figure 3-6 showing the area of the display that can be edited.

FIGURE 3-6: ACT-4 Initial Display Showing The Label Editing Area



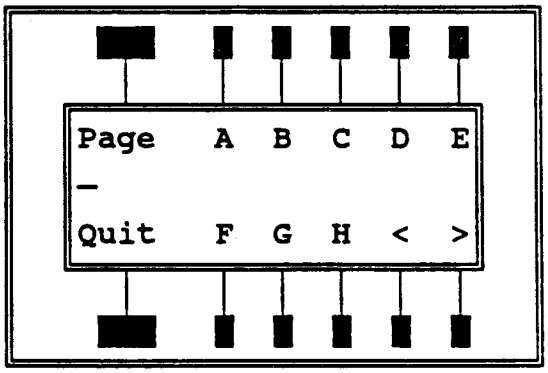
An example of a way that the ACT-4 Initial Display might be customized is shown in Figure 3-7.

FIGURE 3-7: ACT-4 Initial Display Customized for Big Defense, Inc.



The screen which is used to enter a label on lines two and three of the ACT-4 Initial Display (Figure 3-1) is shown in Figure 3-8. This screen is entered from the Main Editor Menu.

FIGURE 3-8: Label Entry Screen



The label Entry Screen uses an underline for a cursor. The cursor is moved by pressing the keys below the "<" and ">" symbols. Text is entered by moving the cursor to the desired position and pressing the key corresponding to the desired character. The character will then be positioned at that place on the display. When all the text has been entered, press the "Quit" key to store the new display and return to the Main Editor Menu.

The ACT-4 can display symbols for only eight characters at a time. However, a wide range of characters are available for entry onto the User Sign On screen. There are nearly eighty different characters in all, including both upper and lower case letters, numbers, and punctuation marks. This allows virtually any desired message.

To use characters from eight character lists other than the one displayed, press the "Page" key until the list with the desired character in it is displayed on the screen. There are ten screens in all. There is no way to back up to the previous page; to cycle back to the previous page press the "Page" key nine times.

4.0 CONCLUSION

This concludes the ACT-4 User Manual. Every effort has been made to assure the accuracy of this manual, and to make its descriptions as clear as possible. If you have problems understanding this manual, or if you find errors in it, send a letter to the ACT Engineering Manager at the following address.

Richard Pedersen
ACT Engineering Manager
Monitor Dynamics, Inc.
9518 Ninth Street
Rancho Cucamonga, California 91730

APPENDIX A: ACT-4 USERS MANUAL

A.1 Introduction

There are three types of ACT-4s: ACT-4KM which uses a magnetic stripe access control card, ACT-4KW which uses a Wiegand access control card, and ACT-4K which uses a user Identification Number. Mag Stripe cards have a brown stripe running across the back side of the card. Wiegand cards have no such stripe.

To begin using the ACT-4, swipe your access control card through the slot of the ACT-4's card reader (ACT-4KM or ACT-4KW) or press a key on the keypad until the display lights up and begin entering your I.D. number (ACT-4K). Be certain that the card is placed face-up and upside down in the card reader slot. Mag Stripe cards should be swiped through the slot from right to left, and Wiegand cards should be swiped through from left to right.

Press the "Raise" key to raise the display, or the "Lower" key to lower the display. These keys adjust the display's viewing angle so that you can read the display messages no matter what your height is.

The next step is to enter your Personal Identification Number (PIN). Simply press the keys that correspond to the digits in your PIN. You can see which numbers are assigned to which keys by looking at the display.

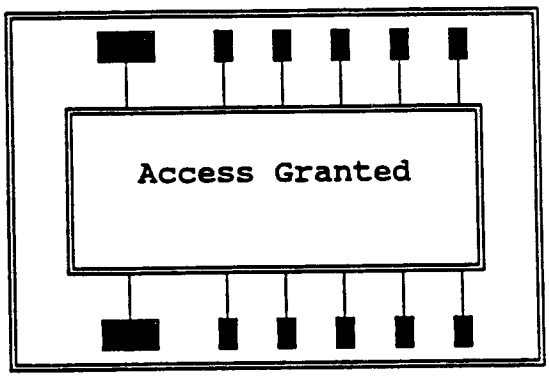
After you press the first digit of your PIN, the keys labeled "Raise" and "Lower" will be relabeled "Retry". If you make a mistake in entering any digit but the last digit, press either one of the "Retry" keys and re-enter your PIN from the beginning. Once you have entered the PIN, the ACT-4 will check with the system controller to make sure that the PIN and card number are correct. The ACT-4 will display a "wait" message while this is taking place.

If you make a mistake in entering your PIN, or if you enter the wrong PIN, the ACT-4 will ask you to re-enter the PIN. You are allowed to make four erroneous PIN entries. If the ACT-4 cannot validate the PIN within four tries, you will have to re-enter your card.

A.2 Valid Card and PIN Entry

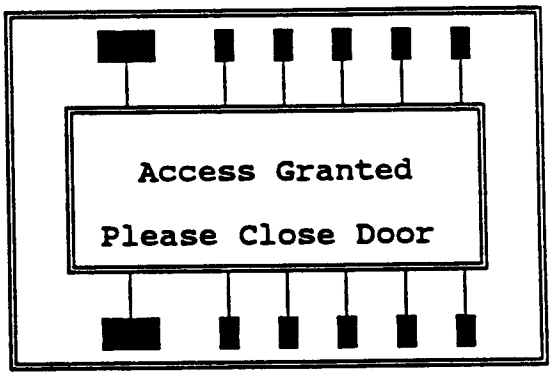
If you are successful in entering a valid card (or I.D.) and PIN, the ACT-4 will grant you access to the secured area. When access is granted, the ACT-4 displays the message shown in Figure A-1, and turns the Grant/Deny Light on continuously and unlocks the door.

FIGURE A-1: Access Granted Message



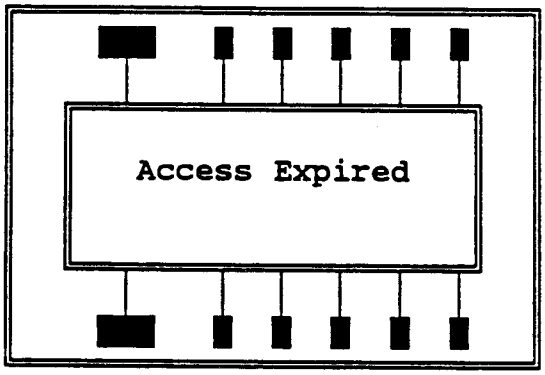
After the door is opened, the screen changes to include the reminder shown in Figure A-2.

FIGURE A-2: Access Granted Message



If you take too long to open the door, the ACT-4 will display the message shown in Figure A-3 and deny you access.

FIGURE A-3: Access Expired Message



If you see this message, wait until the ACT-4 asks you to enter you card and try again, this time opening the door more quickly.

If you hold the door open too long you will cause an alarm condition.

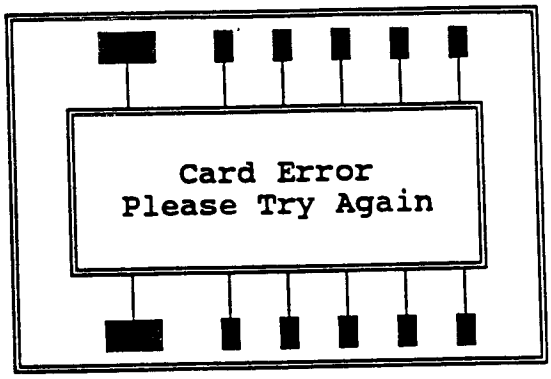
A.3 ACT-4 User Error Messages

The following ACT-4 messages are used to indicate that the ACT-4 is unable to grant you access to the secured area. If you see one of these messages, take the recommended action that accompanies the message description.

A.3.1 Card Reader Error Message

If you make a mistake in entering your access control card or I.D. number the ACT-4 will display the message shown in Figure A-4. The word "Card" will be replaced by "I.D." for ACT-4Ks. Section A.1 describes the proper method for entering cards and I.D.s. Re-read this section and enter your card or I.D. again according to the recommended procedure.

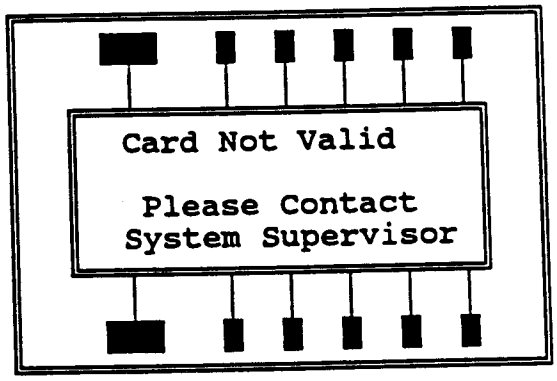
FIGURE A-4: Card Reader Error Message



A.3.2 Invalid Card Message

If your account has been disabled you will see the message shown in Figure A-5. The word "Card" will be replaced with "I.D." in ACT-4Ks. Contact the ACT-4 System Supervisor if you see this message.

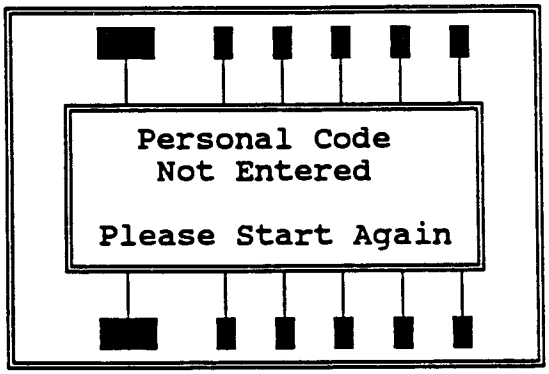
FIGURE A-5: Invalid Card Message



A.3.3 PIN Entry Timeout Message

If you do not enter your PIN fast enough, the ACT-4 will display the message shown in Figure A-6. If you see this message, re-enter your PIN more quickly.

FIGURE A-6: PIN Timeout Message

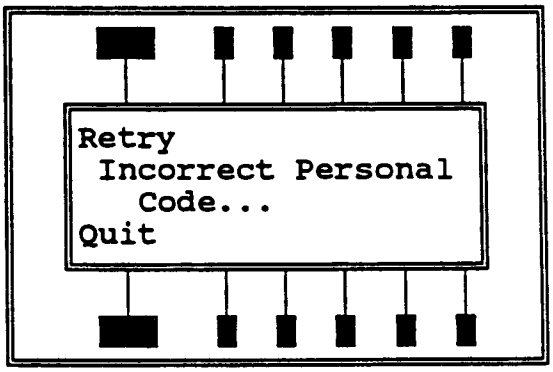


The timeout feature is a "necessary evil". It is required to prevent people from tampering with the ACT-4 system. You can reduce the likelihood of timing out during PIN entry by memorizing your PIN and by gaining familiarity with the use of the ACT-4.

A.3.4 Invalid PIN Message

If the ACT-4 determines that you have incorrectly entered your PIN, it will display the message shown in Figure A-7, flash the Grant/Deny LED, and sound the "Access Denied" tune. Press the "Retry" key if you want to try to enter your PIN again, or press the "Quit" key if you do not.

FIGURE A-7: Invalid PIN Message



Remember that you only have four tries at entering your PIN correctly.

APPENDIX B

This section contains information about the RTU that will be helpful when planning the installation of an ACT-4 system. The information has been copied from MDI's RTU-100/200 Installation and Operation Manual, Revision 7, dated June 16, 1989. The page numbers from the RTU Manual have been retained so that the manual can be more easily referenced if the need arises.

The following information is included. On Page 20 (referenced page numbers are RTU Manual page numbers) is a drawing of the RTU-175B Processor Board showing the location of the JP4 jumper block.

Pages 33 through 35 pertain to the RIM. RIM zones are clearly marked on the drawing on Page 36. ZIMs are described on Page 34. Protection wiring, which is applicable to the Request to Exit switch, is discussed on Page 35. A two wire protection zone was suggested for the Request to Exit switch, but any of the three possible protection wiring schemes may be used.

Page 75 is included for purposes of determining whether the RTU current level will be exceeded in the system by powering one or more ACT-4s from the RTU. Use 100 milliamperes per ACT-4 in the calculations.

Similarly, each RTU-200 has an eight-address capability (1 supervisory address for the RTU 175 processor can be shared with the first RIM plus 1 address for each additional RIM).

Sample Address (RTU-200):

008 = Supervisory Address and RIM #1
009 = RIM #2
010 = RIM #3
011 = RIM #4
012 = RIM #5
013 = RIM #6
014 = RIM #7
015 = RIM #8

Keep in mind when assigning address that the arrangement of RIM assignments is exactly what displays on the CRT during status reports. Columns of sixteen address appear in different colors, depending on the condition of the RTUs. An organized RIM assignment results in a system that is easy to monitor. A suggested hint is to place all the supervisory assignments at related address. Multiples of 4 or 8 would produce straight rows of color display.

SAMPLE CRT DISPLAY

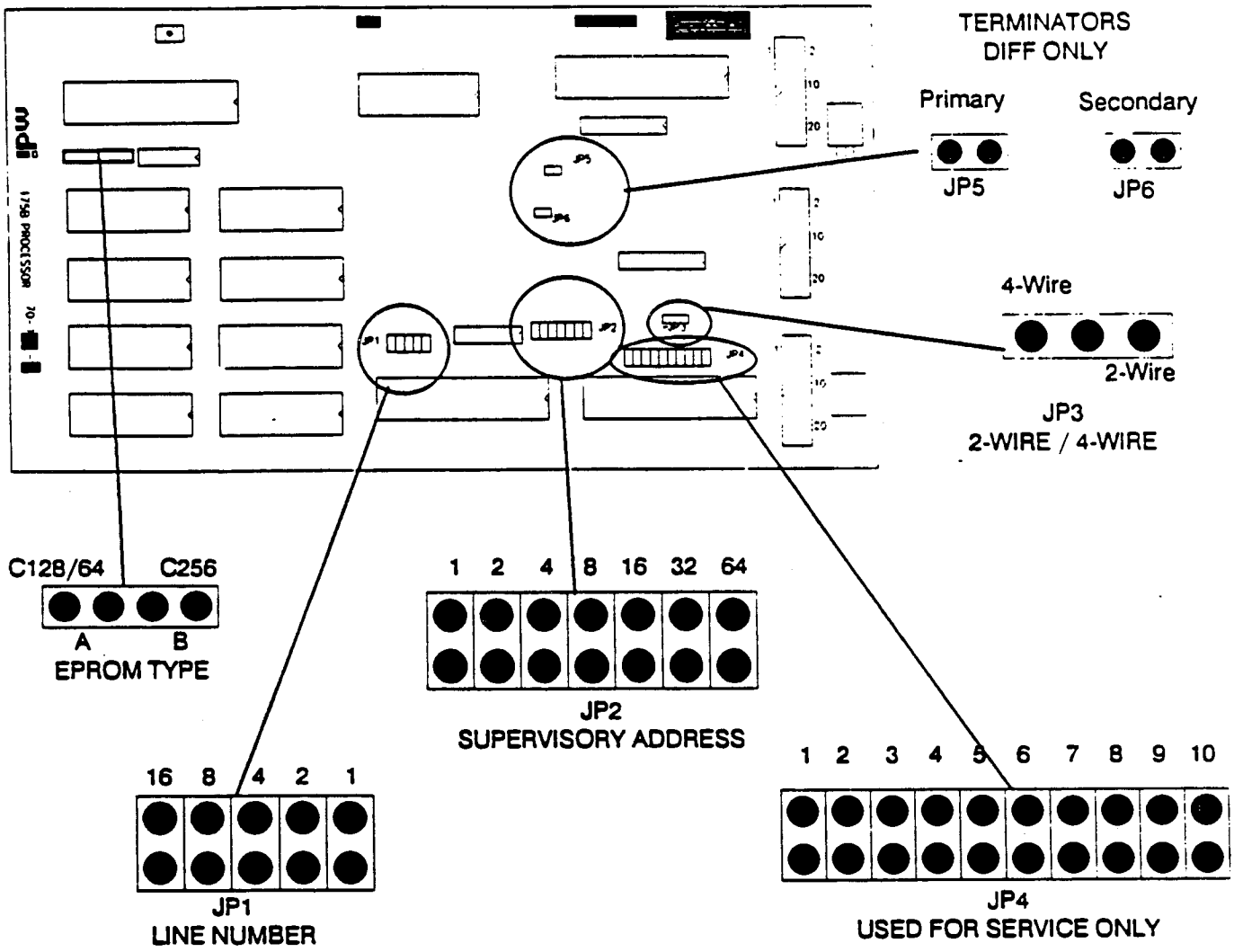
Suggested Supervisory addresses

⟹ 00	16	32	48	64	80	96	112
01	17	33	49	65	81	97	113
02	18	34	50	66	82	98	114
03	19	35	51	67	83	99	115
⟹ 04	20	36	52	68	84	100	116
05	21	37	53	69	85	101	117
06	22	38	54	70	86	102	118
07	23	39	55	71	87	103	119
⟹ 08	24	40	56	72	88	104	120
09	25	41	57	73	89	105	121
10	26	42	58	74	90	106	122
11	27	43	59	75	91	107	123
⟹ 12	28	44	60	76	92	108	124
13	29	45	61	77	93	109	125
14	30	46	62	78	94	110	126
15	31	47	63	79	95	111	127

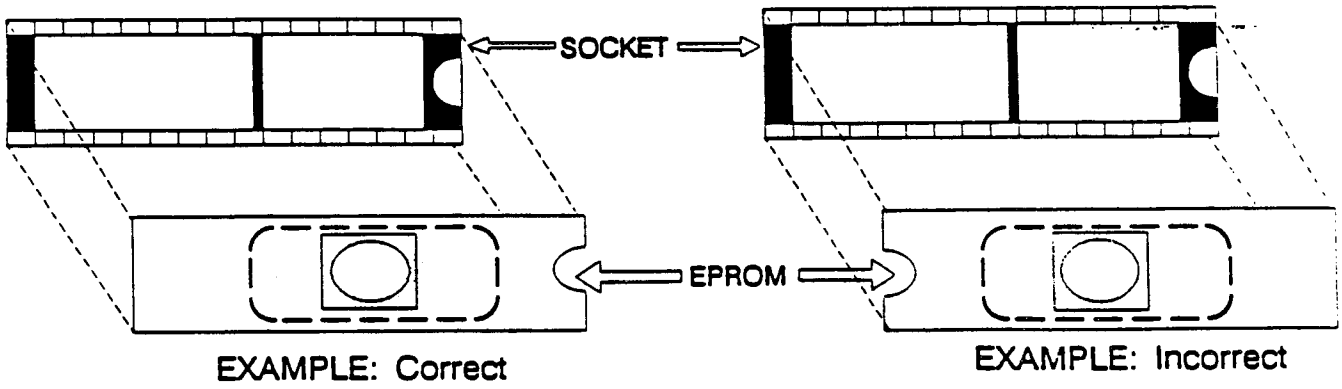
Another hint for effective addressing is to leave room for expansion within the groups of 2, 4 or 8. Additional RIMs can functionally be assigned anywhere within their RTUs block of sixteen. However, for the sake of visual display, it makes sense to leave space in an organized manner.

Example: If you have three RIMs and the supervisory address to assign, create a block of four and leave the final address free. This allows for expansion, and this also means that the next supervisory address falls on a multiple of four.

000 - Supervisory "A" and RIM "A" #1
001 - RIM "A" #2
002 - RIM "A" #3
003 - Empty Spare
004 - Supervisory "B" and RIM "B" #1



RTU-100/200 175B Processor Board

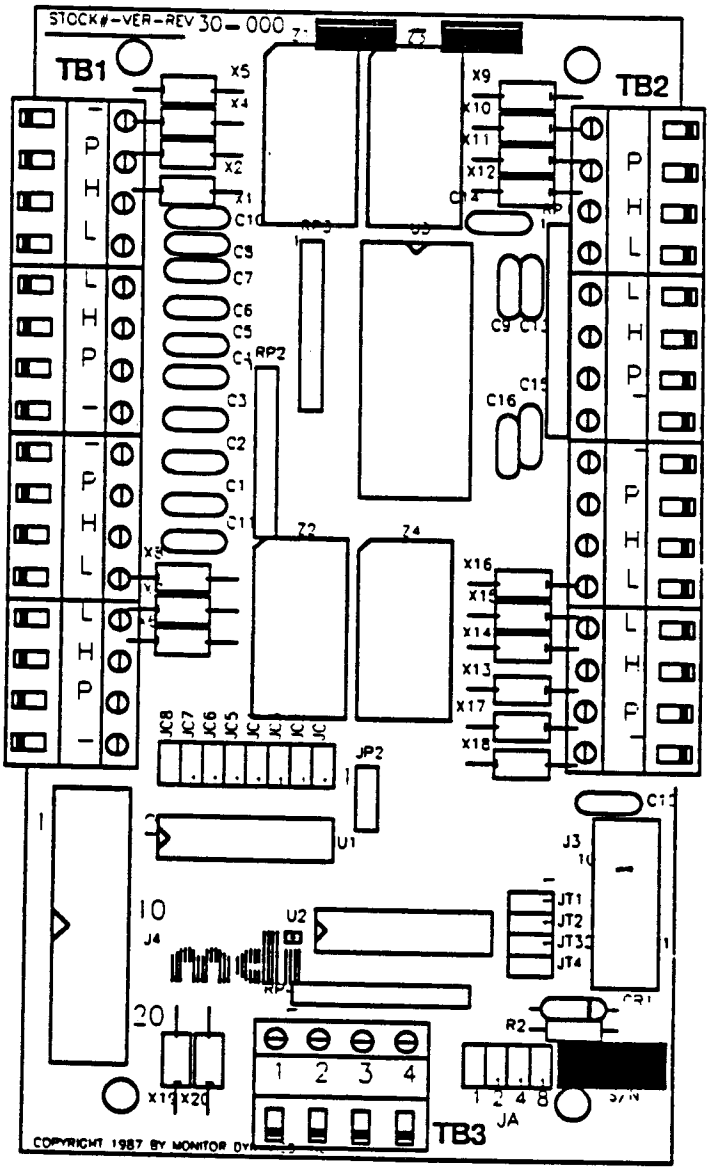


EPROM Installation

NOTE: EPROM must have label covering UV window

Remote Input Module (RIM-8)

ZONE #1
ZONE #2
ZONE #3
ZONE #4



ZONE #5
ZONE #6
ZONE #7
ZONE #8

TB3 Definition

Terminal 1 = Chassis Ground
Terminal 2 = Display Strobe Select
Terminal 3 = CIM-EXP Select
Terminal 4 = Day/Night Buss

JC Jumper Definition

1 = Enable Zone 1 for TLD Operation
2 = Enable Zone 2 for TLD Operation
3 = Enable Zone 3 for TLD Operation
4 = Enable Zone 4 for TLD Operation
5 = Enable Zone 5 for TLD Operation
6 = Enable Zone 6 for TLD Operation
7 = Enable Zone 7 for TLD Operation
8 = Enable Zone 8 for TLD Operation

JP2 Definition

1 to 2 Multiple Arming Control
2 to 3 Single Arming Control

JT Jumper Definition

1 = Normal Alarm
2 = Access Control/Annunciation
3 = Unused
4 = Unused

ZIM Locations

Z1 ZIM controls Zones 1 and 2
Z2 ZIM controls Zones 3 and 4
Z3 ZIM controls Zones 5 and 6
Z4 ZIM controls Zones 7 and 8

JA Address Legend

0=OPEN X=JUMPERED

1	2	4	8	
0	0	0	0	= 0
X	0	0	0	= 1
0	X	0	0	= 2
X	X	0	0	= 3
0	0	X	0	= 4
X	0	X	0	= 5
0	X	X	0	= 6
X	X	X	0	= 7
0	0	0	X	= 8
X	0	0	X	= 9
0	X	0	X	= 10
X	X	0	X	= 11
0	0	X	X	= 12
X	0	X	X	= 13
0	X	X	X	= 14
X	X	X	X	= 15

REMOTE INPUT MODULE - GENERAL

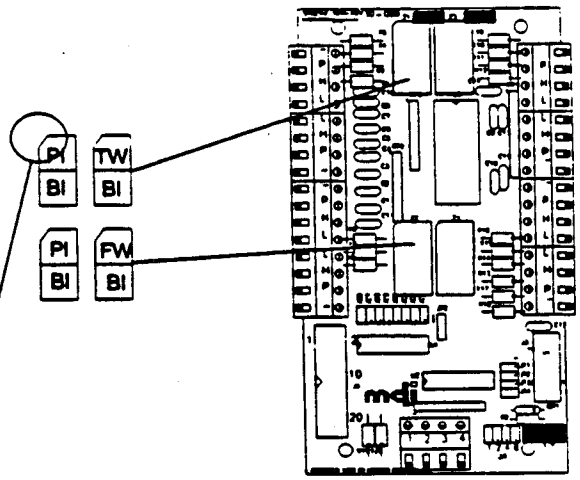
The Remote Input Module (RIM) is the termination module for the zones requiring input sensing capabilities. Each RIM monitors up to eight (8) 2-wire unsupervised or four (4) 2 or 4-wire supervised zones. Each RIM card occupies a multiplex address and is easily modified by changing Zone Indentification Modules (ZIM's). The RIM is also the interface for Remote Display Modules (RDM), Remote Display Drivers (RDD), Remote Output Modules (ROM) and Card Access.

ADDRESSING THE RIM

Set the addresses on JA of the Remote Input Modules (RIM) according to Table 3 in Section 4 by placing jumpers on JA 1-8. A "0" is an open and a "1" is jumpered. No two RIM addresses may be duplicated in the same cabinet (See RTU Processor Section on addressing).

ZONE IDENTIFICATION MODULE

Install the Zone Identification Modules (ZIMs) as determined by the site survey. Each eight zone RIM card is configured for zone identification by using 4 ZIM modules. The ZIM module plugs into the RIM card and provides zone "personality" for two zones. While most users will standardize on four or five basic ZIM types, a wide variety of zone identification modules are available to accomodate practically every protection device, circuit type or output mode. Be sure to orient the ZIM modules with the flat corner in the upperleft position as shown.



ARMING

Arming control will allow the opening or closing of accounts by several different means as described below.

* Simple = Arming using switch or 4-digit keypad code (hardwired)
* User ID = Arming using 64 5-digit keypad codes (EPROM)
* Multi Simple = 2-8 keypads per RTU (hardwired)
* Multi User ID = 2-8 keypads per RTU (software)
* Card ID = Arming via cardreader and keypad
* See page 15

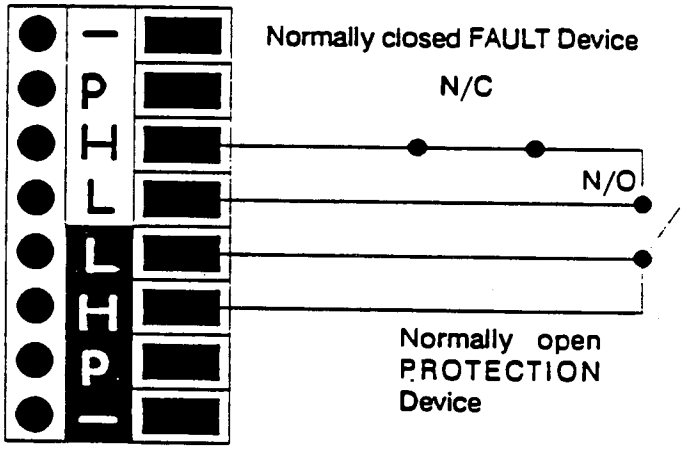
When in the "DAY" mode, intrusion zones (BI and ED ZIM's) will be masked and all remaining zones will be monitored and reported. While in the "NIGHT" mode all alarms regardless of type will be monitored.

PROTECTION WIRING

The protection wiring is installed according to the zone types determined by the site survey. Use the site survey planning sheets PL2 generated previously to determine the type of protection required. The wiring of the protection zones must match the requirements determined by the ZIM type. There are three basic wiring configurations as follows:

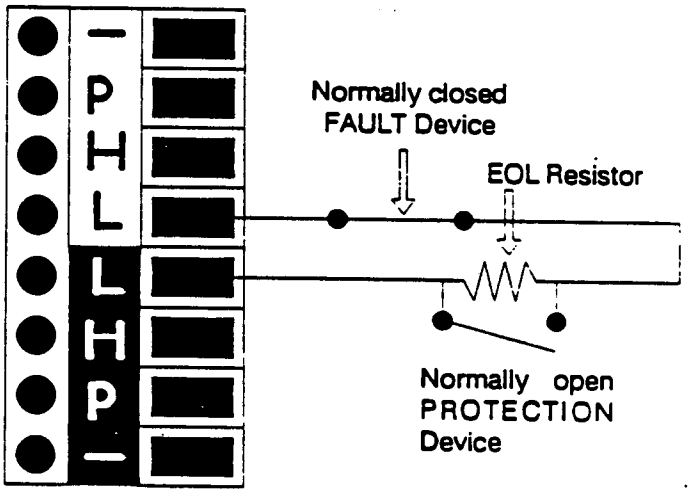
FOUR WIRE (WITH LINE FAULT)

In the example provided, a 4-Wire circuit is shown connected to 2 zones. The first zone provides line fault reporting and the second zone monitors the device status. This circuit may be connected to zones 1 & 2, 3 & 4, 5 & 6 or 7 and 8 depending on ZIM placement. ZIM types might be FW/FD, FW/FI, FW/PI, FW/PS etc. No End Of Line (EOL) resistor is required with a 4-Wire circuit.



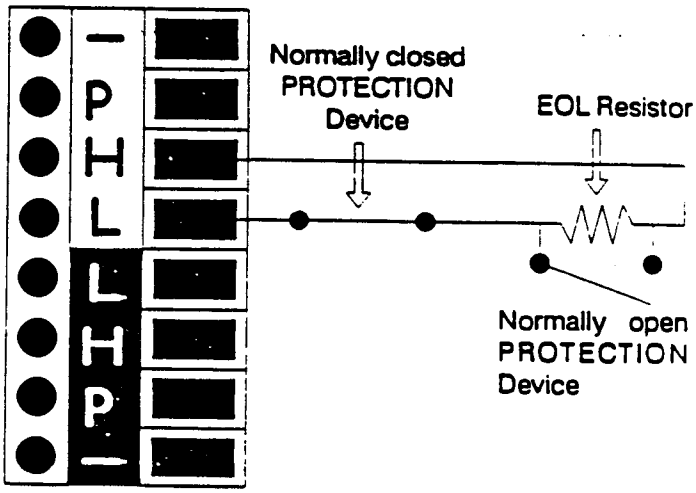
TWO WIRE (WITH LINE FAULT)

In the example a 2-Wire circuit is shown connected to 2 zones. This circuit may be connected to zones 1 & 2, 3 & 4, 5 & 6 or 7 & 8. Device may be either normally open or normally closed. Line fault is accomplished by use of a 1,000 ohm EOL resistor. ZIM types might include TW/FD, TW/FI, TW/PI, TW/PS etc.



TWO WIRE (UNSUPERVISED)

In this example a 2-Wire unsupervised device has been conected to any one of eight zones of the RIM. ZIM types may include HI, HS, PI, PS, MS, SP etc. Two single zone types must be defined for each ZIM ordered (i.e. PI/PI or PI/HI). Arming (S2) and SP ZIM's require no EOL resistor.



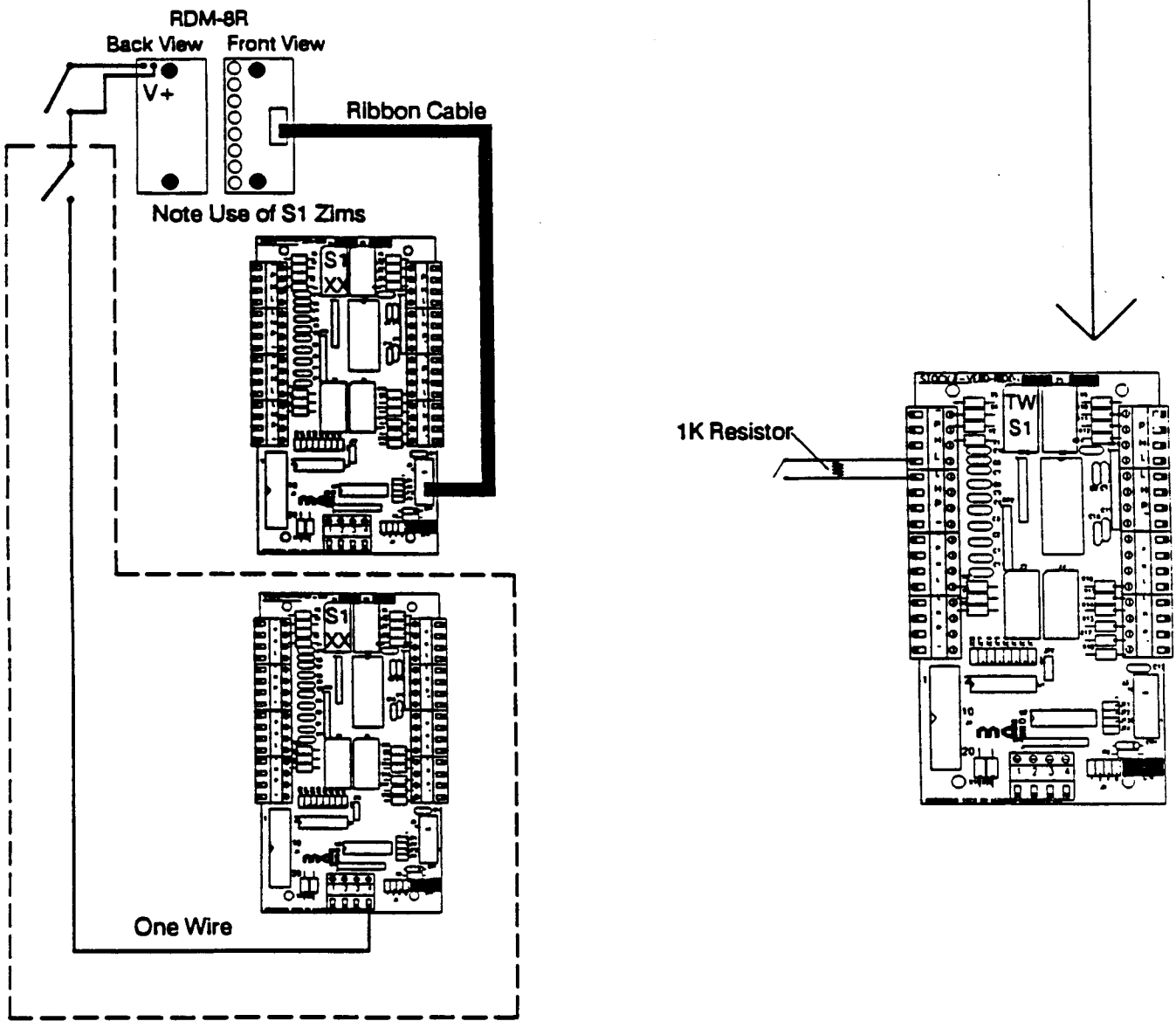
ANNUNCIATION

Annunciation for RTUs requires Basic Arming Control (DN) firmware and the use of AN zim modules. Please consult factory for use.

S1 INSTALLATION FOR DAY/NIGHT CONTROL VIA SWITCH

The drawing below illustrates the proper wiring techniques for Day/Night control via a switch (using a new RIM only). The area inside the dashed line is for multiple Day/Night switches.

NOTE: With Version 700/900 RTU Firmware the switch may be connected to L,L of a TW/S1 ZIM in Zones 1 and 2. Open Zone is Line Fault, Balanced Zone is Days/Access, and Shorted Zone is Nights/Secure.



CHAPTER TWELVE
Power Consumption Worksheet

ASSEMBLY	REV(S)	Stock #	BOARD NAME	VERSION NAME	CURRENT PER BOARD	BOARD QTY	TOTAL CUR'NT PER BOARD TYPE
100576	A and B	70-1XX	Processor *plus either*	*Treat the Processor plus TELCO Board Combination as one board on this worksheet*			
100177	A	70-01X	Telco or				
200007	A	70-01X	Telco	Release Date: 01-01-88 Mux-Mux, Mux-Dial, Dial-Dial Diff-Diff Diff-Dial	 60MA 110MA 120MA		
100227 200003	 A	30-000 30-000	RIM-8	Remote Input Module	16MA		
100440		30-005	ROM-8	Remote Output Module	16MA		
100440		30-015	ROAM-8	Remote Output Addressable Module	20MA		
100440		30-010	AOM-8	Addressable Output Module	20MA		
				Card Readers (with or without PIN) (Excluding Prox RDRs)	16MA		
100550 200027	 A	30-020 30-020	CIM-2 CIM-2	(With or without CIM-EXP) Release Date:04-01-88	15MA 15MA		
100187 100399 100403 200019	A A A	30-030 30-035 30-036 30-038	RDM-8R RDM-8KL RDM-8KU RDM-8KUD	8 LED Display Only Simple Keypad Analog UserID Digital UserID	10MA 10MA 10MA 10MA		
100376 200023 100376 200023	A A 	500-005 500-006 500-015 500-016	DCP-8U DCP-8UD DCP-16U DCP-16UD	Analog UserID Digital UserID Analog UserID Digital UserID	10MA 10MA 20MA 20MA		
100528	A	500-020	DCP-32	Display Expansion Module	40MA		
100428	A	30-040	RDD-2	Remote Display Driver	10MA		
TOTAL CURRENT CONSUMPTION:							

Maximum backup power available for 24 hours with	
1 Battery	125MA
2 Batteries	250MA
3 Batteries	375MA

Total Current Not To Exceed 450MA

ACT-4 Addendum

On all ACT-4 units, by default, the reader will lock and disable itself whenever the tamper switch is not depressed. As a result, a message will be displayed at the bottom of the screen: **"Unit is Locked"**. The locking feature will follow the tamper condition; that is, the reader is locked on tamper and reader's operation is normal with no tamper. This locking feature is now an editor function on ACT-firmware *Version 4.11* or above.

To use the option, access the editor menu. There is a sign within the square brackets '[ ]' which indicates whether the unit will lock on tamper condition. Find the alarm "Lck" (lock) key which is to the left of the alarm "Stat" (status) key. By pushing this lock on alarm key, the display will toggle between '[+]' and '[-]' signs. The *Plus* '+' sign will lock the unit in the event of a tamper. The *Minus* '-' sign will keep the unit in normal operation even when tamper occurs.

Note: Before using this option, there must be *No* tamper; otherwise the ACT-4 unit will remain locked even when the lock option is disabled with an editor card. This strict requirement is designed to assure that the ACT unit is properly installed.

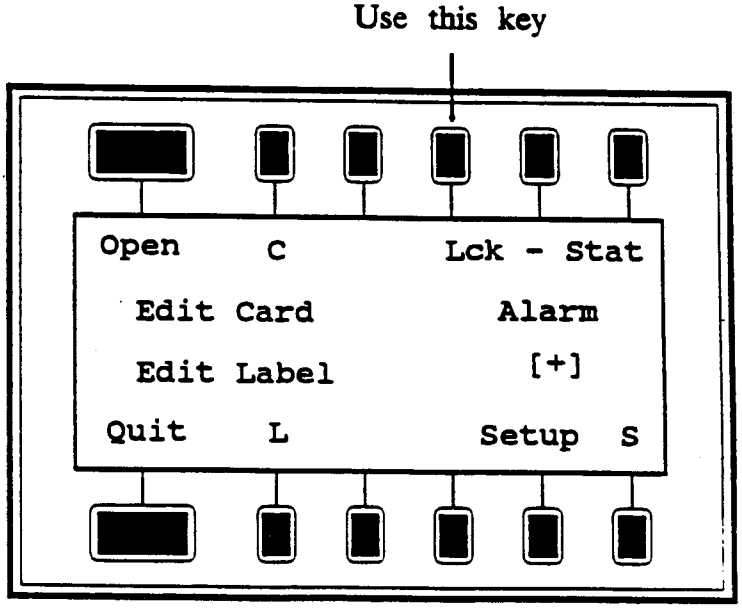


Figure A: Editor Main Menu.

Disabling Tamper Switch

All ACT units' tamper switch can be bypassed. Determine the type of reader and follow the appropriate instructions.

Wiegand Reader:

With the reader's back plate removed and internal parts exposed, look at the inside bottom of the ACT unit near the tamper switch. There are two (2) red wires with connectors. Join the two connectors to disable the tamper switch. (See *Figure B*)

Magstripe Reader:

With the reader's back plate removed and internal parts exposed, find a small circuit board inside the bottom of the ACT unit near the tamper switch. Near the upper left hand corner of the board, remove the tan connector from *J2* and replace it with a jumper to short out *J2*. This complete the disabling of tamper switch. (See *Figure C*)

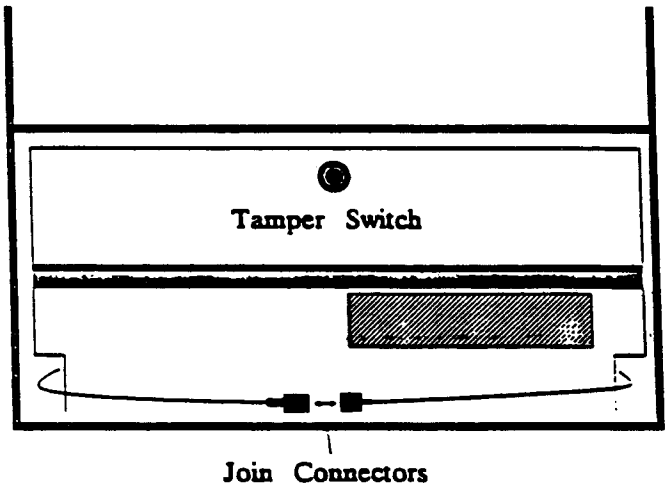


Figure B: Wiegand Reader.

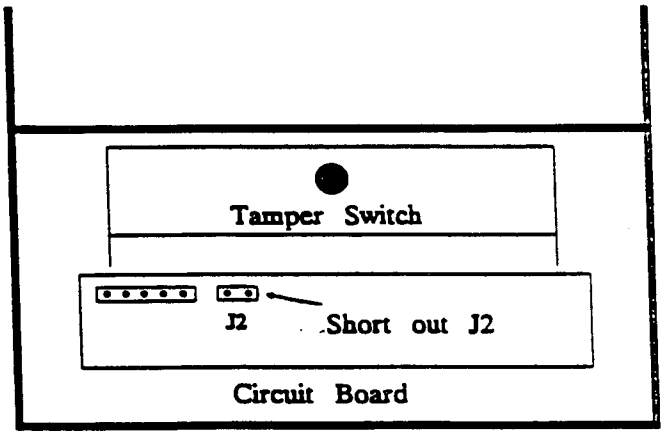


Figure C: Magstripe Reader.

ACU

Installation and Operations Manual

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ACU-6

ARMING CONTROL UNIT INSTALLATION and OPERATIONS MANUAL

SAFEnet SYSTEM

- SECURITY - ACCESS CONTROL - FIRE - ENERGY -

DOCUMENT #: UC-N00009.02

Revision #2

Ultrak

June 14, 1999

PREFACE

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Monitor Dynamics' equipment generates, uses, and can radiate radio frequency energy. It must be installed and operated in accordance with all instruction manuals provided, otherwise it may cause interference to radio and telephone communications.

The equipment has been tested and found in compliance with the limits for Part 15 and Part 68 of F.C.C. rules, which are designed to provide reasonable protection against such interference when operated in a commercial and industrial environment.

F.C.C. Rules and Regulations can be purchased by writing to the superintendent of documents, U.S. Government Printing Office, Washington D.C. 20402.

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LIST OF FIGURES

1.0 INTRODUCTION TO THE ACU-6

This manual is intended to provide information on the installation and operation of the ACU-6 Arming Control Unit. This product is developed and produced by Monitor Dynamics, Incorporated (MDI), a recognized industry leader in integrated Security, Access Control, Fire, and Energy control network systems. The ACU-6 is designed to be a low-cost Arming Control Station with operational characteristics similar to the ACT-5 Arming Control Station, and using the Soft User I.D. program functions for Opening and Closing of secured areas. For information on Soft User I.D. software, please refer to the MDI SAFEnet SOFT USER I.D. MANUAL.

Section 1 of this manual describes the ACU-6 features and specifications. Section 2 contains the information needed to install an ACU-6 Arming Station. Section 3 details the ACU-6 operation, including local editing and configuration functions as well as on-line operational features.

1.1 GENERAL INFORMATION

The ACU-6 Arming Control Unit is used to open/close (arm/disarm) an area of alarm zones for one or more designated RTU addresses. The ACU-6 operates very similarly to the MDI ACT-5 Arming Control Station, with the exception that the ACU-6 includes the capability to control more than one area or address from a single unit. Each ACU-6 can be configured, through it's firmware, to control from 1 to 8 addresses (RIMs), or Accounts, within the same RTU. Each address, or RIM, to be controlled as a separate account must have an S5 ZIM installed in the zone #1 location. Through a series of keyboard commands, an operator would then select which account they are going to open or close at that time.

A network of up to eight (8) ACU-6 units can be interfaced to a single RTU. Each ACU-6 is connected to, and communicates with the RTU via a 22 AWG, 2-wire twisted pair cable to a standard Four-wire Interface Module (FIM), or ACT Interface Module (AIM), communicating with the RTU through the use of standard 2-wire RS-485 techniques.

The ACU-6 is a compact, esthetically pleasing unit that is easily mounted on most walls or flat surfaces via a 2-, 3-, or 4-gang electrical box. Each unit includes an LCD display, data entry keys, a small piezo buzzer for audible feedback, and the microprocessor and other electronics all housed in a solid metal enclosure which is secured to the mounting back plate with four (4) security screws (see Figure 1-1). Each ACU-6 can be powered directly from the RTU TELCO board or by a local DC power supply.

1.2 ACU-6 LCD DISPLAY AND KEYPAD

The ACU-6 Arming Control Unit includes a 4-line, 80-character LCD Display (4 lines of 20 characters each) which is used for displaying operational data, user prompting, data entry, and key labeling. The LCD display is surrounded by 12 unlabeled, "soft" keys, which are arranged with 6 keys above and 6 keys below the display.

The keys of the ACU-6 are used for data selection and PIN entry, with each key dynamically labeled on the LCD display by the unit's microprocessor to guide the user through a variety of data entry functions and operations. Section 3 of this manual will show each of the screen displays and describe the functions associated with that screen. In most cases, the keys are assigned menu functions to be selected by the user. When number entries are required, the ten (10) smaller keys are used, with the two (2) larger keys then used for functions such as "Select", "Cancel", etc.

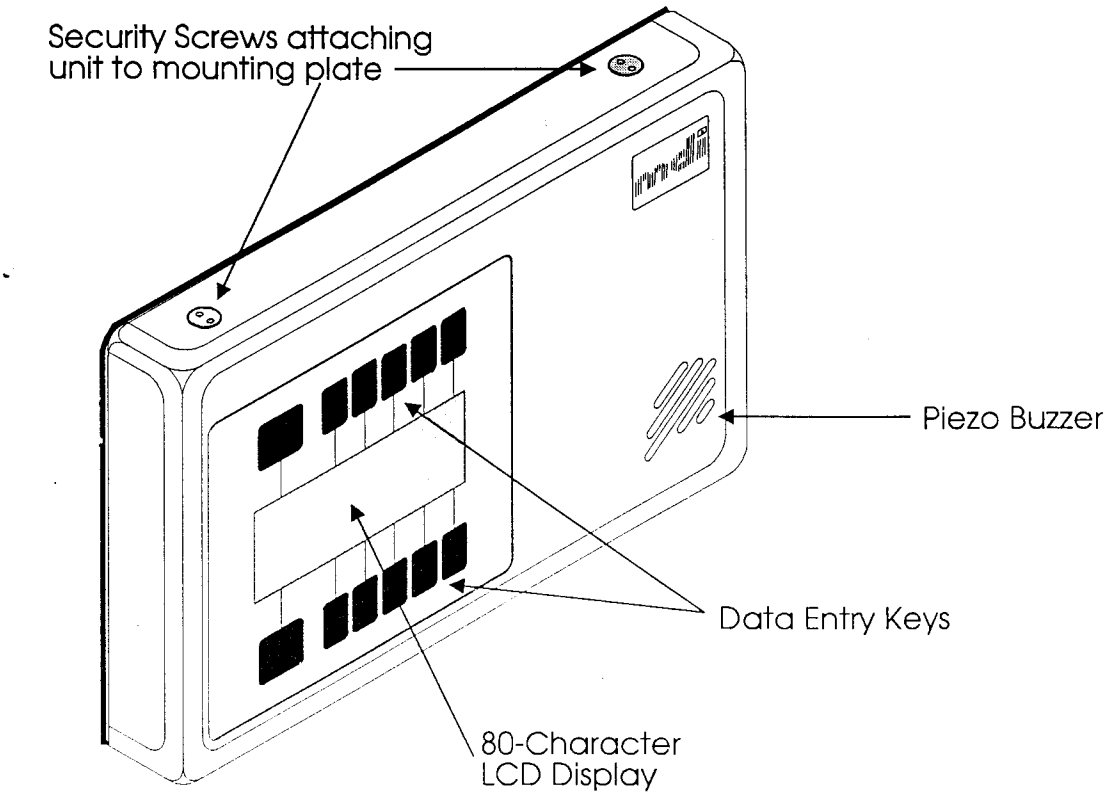


Figure 1-1. ACU-6 ARMING CONTROL UNIT

1.3 OPERATIONAL OVERVIEW

The ACU-6 Arming Control Unit is used to Open and Close (Arm and Disarm) defined, configured alarm ACCOUNTS by authorized system users. When an Account is "OPEN", all of the Burglar /Intrusion alarm zones included in that Account are disabled and will not report. All other types of alarms are not effected. When an Account is closed, all alarms are monitored and reported normally. To open or close an Account, the user must enter a valid Man Number and I.D./PIN number combination which is verified by the RTU Processor and the command then implemented. The Man Number and I.D./PIN numbers are configured at the Central Computer System and then downloaded and stored in the RTU Processor board memory.

In an idle state, the LCD display of the ACU-6 unit will be blank. To activate the display for use, simply press any key on the front of the unit and the LCD will wake up and typically display a data screen similar to that of Figure 1-2 below.

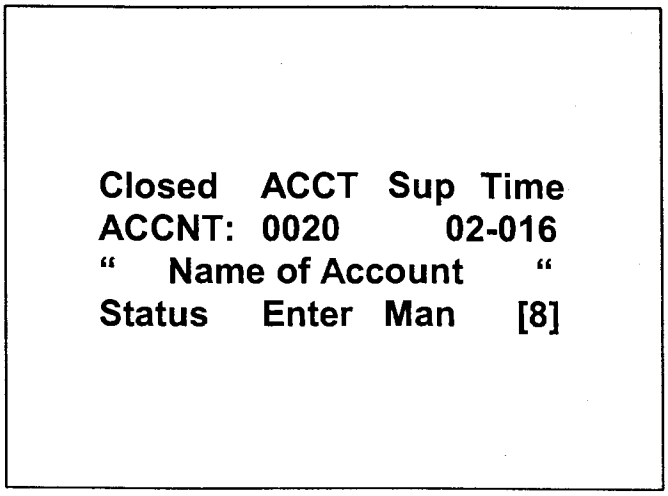


Figure 1-2. ACU-6 STARTING SCREEN DISPLAY

From this screen, the system user sees the number and name of the Account that the ACU-6 is presently set to control (center 2 lines), as well as the "OPEN/CLOSE" state of that Account (upper left of display). The user then has selectable options to:

1) Enter a "**Man** Number/I.D." to Open or Close the present Account.
2) Request to see the "**Status**" of the alarm points of the present Account.
3) Select and Change the Account ("**ACCT**") being controlled.
4) Select the Supervisor ("**Sup**") function to define database parameters (password req.).
5) Request to display the current Date and Time ("**Time**") (Figure 1-3 below).

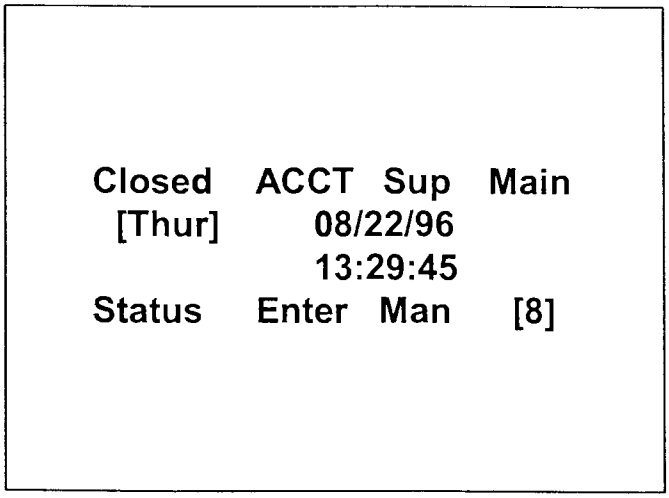


Figure 1-3. ACU-6 DATE & TIME DISPLAY SCREEN

1.4 LCD DISPLAY VIEWING ANGLE

The ACU-6 LCD screen has a narrow viewing angle. This keeps all but the user from seeing the information on the ACU-6 display (this effect can be seen by looking at the face of an LCD electronic watch from different angles). The LCD viewing angle can be adjusted up and down by turning the adjustment screw located on the back of the electronics board. This must be done prior to the final mounting of the unit to the mounting back plate on the wall. The viewing angle has an adjustment of approximately 25-30 degrees up and down in order to essentially aim the display for the best viewing based on how high on the wall the unit is mounted. Further details on adjusting the viewing angle are provided in Section 2 of this manual.

1.5 ALARM REPORTING

Communication from the RTU to the ACU-6 Arming Control Unit is supervised, in that when the ACU-6 fails to communicate with the RTU, an *SFault+2* (security fault on zone #2) will be reported by the RTU to the Central Computer CPU. The ACU-6 interfaces to the RTU via 2-wire RS-485 into a Four-wire Interface Module (FIM), or ACT Interface Module (AIM).

It should be noted that since the ACU-6 can control up to eight (8) accounts (eight S5 ZIMs) within the same RTU, that one ACU-6 will be responding and communicating with the RTU on up to eight (8) different addresses. The ACU-6 will automatically start responding to the polls from the RTU for other addresses if no other device responds to those polls, therefore the *SFault+2* and *SFault-2* for the other addresses will be created and restored by the one common ACU-6 unit.

1.6 ACU-6 SYSTEM BLOCK DIAGRAM

Figure 1-4 below is a block diagram showing the basic connections to the ACU-6. Refer to Section 2 of this manual for full details of these connections and ACU-6 installation.

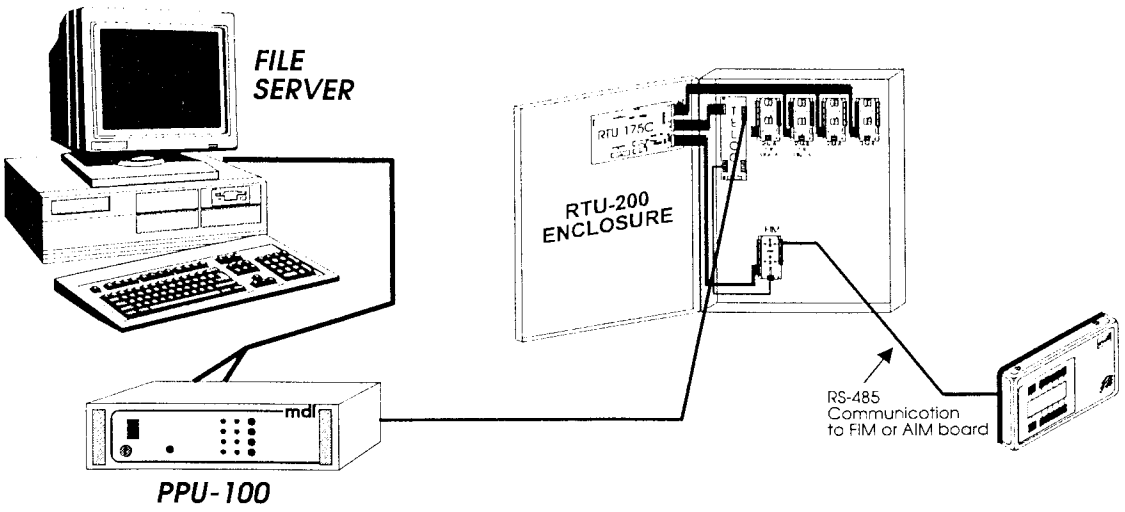


Figure 1-4. ACU-6 INTERCONNECTION BLOCK DIAGRAM

1.7 SPECIFICATIONS

The following information provides technical specifications of the ACU-6

SPECIFICATION	***DESCRIPTION***
DIMENSIONS	
Outer Casting:	4.25" (height) X 8" (width) X 1" (depth)
MATERIAL COMPOSITION	
Outer Casing:	Die cast aluminum
TAMPER PROTECTION	
	An input connection point is provided on the ACU-6 Circuit Board, but no tamper switch is provided with the unit.
POWER SUPPLY REQUIREMENTS	
Input Voltage	6-12 Volts DC (Powered from RTU or separate Power Supply)
POWER CONSUMPTION	
Standby:	45 mA
Active (LCD backlight ON):	80 mA
CLOCK/CALENDAR	Software Clock. Date/Time downloaded from RTU
MEMORY BACKUP POWER	None
DISPLAY	
Technology:	An integral, eighty character alpha-numeric LCD configured in four lines of twenty characters.
Format:	Full English prompts with both dynamic and static PIN (security code) labeling. Upper and lower case letters, numbers, and punctuation marks
Vertical Viewing Angle:	Adjustable via hardware control (adjustment screw).
Backlight:	Green LED array with forty-eight elements
Lens Filter:(optional)	Light control film to help reduce glare and to provide viewing privacy

KEYPAD

Technology:	A tactile feedback, 12-key keypad configured in two rows of six keys, sealed with silicon rubber. Keys use selectively positioned, conductive silicon rubber and gold-plated foil contacts for long life
Functions:	All functions and digits are dynamically labeled and allocated

AUDIBLE ANNUNCIATOR

Technology:	A single frequency, piezo-electric transducer. Emits audible beeps with each key depression

MICROPROCESSOR MEMORY

Program Storage:	32K EPROM
Data Storage:	8K Static RAM
ACU-6 Communications	RS-485 half-duplex Asynchronously at 600, 1200, or 2400 baud (factory default is 2400 bps)

2.0 ACU-6 INSTALLATION

The following paragraphs of this chapter contain information and instructions for the mechanical and electrical installation of the ACU-6 Arming Control Unit, including the physical dimensions and mounting of the unit, power and communication line connections, as well as other installation and/or setup procedures which are required in understanding the proper operation of the ACU-6. Proper installation of the ACU-6 is essential to ensure effective and trouble-free system operation. In most cases, problems can be traced back to improper power, ground, or wiring connections. Faulty power, grounding conditions, and/or any other improper installation techniques and/or conditions can cause system errors, problems, or failures in the overall system operation. Failure to comply with the installation requirements and procedures detailed herein may be grounds for MDI to void the warranty of the equipment installed. The basic tasks and recommended order of installation of the ACU-6 units described herein are as follows:

1. Mounting of the ACU-6 on the wall. *(Paragraph 2.3)*
2. Installation and connection of the required cable conduits (if required). *(Paragraph 2.4)*
3. Installation and connection of power and ground cabling. *(Paragraph 2.5 & 2.6)*
4. Installation and connection of Data Communication Line cabling. *(Paragraph 2.7)*
5. ACU-6 addressing and jumper settings. *(Paragraph 2.8)*
6. System power up and basic checkout. *(Paragraph 2.9)*

All equipment must be installed in accordance with applicable Federal, State, and/or local codes.

**** CAUTION ****

Electronic circuitry is susceptible to damage caused by Electrostatic Discharge (ESD). Always take appropriate precautions to prevent component damage due to ESD while installing and working with the RTU panels and associated equipment. A grounding strap attached to the body (such as a wrist strap) is recommended by MDI for the best protection, however, if one is not available, always ground yourself to earth ground prior to touching any parts of the ACU-6 Arming Control Unit or its components. MDI cannot be held responsible for circuit or equipment damage due to ESD.

2.1 UNPACKING

The following items are typically included in the shipping package of the ACU-6. Check the invoice for the quantities of the items ordered and verify that the quantities are correct.

- 1 ACU-6 Arming Control Unit with Mounting Back Plate
- 4 Security Screws for attaching Mounting Back Plate to ACU-6 Assembly
- 1 Security Screw tool bit, part #05-662 *(1 for every 4 ACU-6 units ordered)*
- ACU-6 Installations & Operations Manual *(typically 1 for every 5-10 ACU-6 units)*

If the shipping container or box is damaged upon receipt, contact MDI Marketing Support Department prior to opening the package. If the equipment received does not correspond with the order or to the shipping list, or if the package appears to be missing pieces or components, or if the equipment appears to be damaged upon receipt, contact the MDI Marketing Support Department for assistance in correcting any discrepancies with the order.

If defective equipment must be returned to MDI, whether is was damaged in transit or if it failed during system operation, a Returned Material Authorization (RMA) Number must be obtained from the MDI Marketing Support Department prior to shipping the equipment. Always keep a copy of the original shipping list for any equipment received, as this will be the reference for part numbers and date of receipt.

2.2 TOOLS/EQUIPMENT REQUIREMENTS

Some basic tools, test equipment and installation materials will be required to perform a proper installation the ACU-6 unit. Verify that the equipment and materials in the following list are available prior to stating the installation process:

1. Common hand tools typically required for such an installation, such as screwdrivers, wire cutters, wire strippers, nut drivers, pliers, etc.
2. System interconnect cabling and wiring, as required for each applicable task.
3. A 2-gang, 3-gang, or 4-gang electrical box of the appropriate type based on the wall type and location of where the ACU-6 is to be installed. Ensure appropriate size mounting bolts and screws are included.
4. Appropriate size and quantity of cable conduit, connectors, bushings, etc. as needed for proper cable installation and routing. (if conduit is required)
5. Soldering Iron to solder wiring interconnections.
6. Electrostatic Discharge (ESD) grounding strap.
7. Volt-Ohm Multimeter for signal level verification and/or troubleshooting.

2.3 ACU-6 MOUNTING

The ACU-6 is designed to be mounted indoors only. The ACU-6 mounting back plate is designed to mount on a 2-gang, 3-gang, or 4-gang electrical switch box with appropriately spaced mounting holes for each. A minimum 2-gang box should be used. The ACU-6 can also be mounted directly to the wall, with the appropriate mounting fasteners for the wall-type, provided the interconnect cabling can be properly routed into it. The dimensions of the ACU-6 and the back plate and mounting holes are shown in Figure 2-1.

Determine the exact location where the ACU-6 is to be mounted. Use the dimensions shown in Figure 2-1 to ensure sufficient space is allocated for proper mounting and usage of the unit. If an electrical box is to be used for the installation, measure and cut an appropriate size hole in the wall and securely mount the electrical box into the wall. The ACU-6 back plate will mount directly on the electrical box with the appropriate size screws. If the ACU-6 is to be mounted directly to the wall, measure and cut a hole large enough for the cables and mount the back to the wall with Toggle or Lag bolts appropriate for the type of wall.

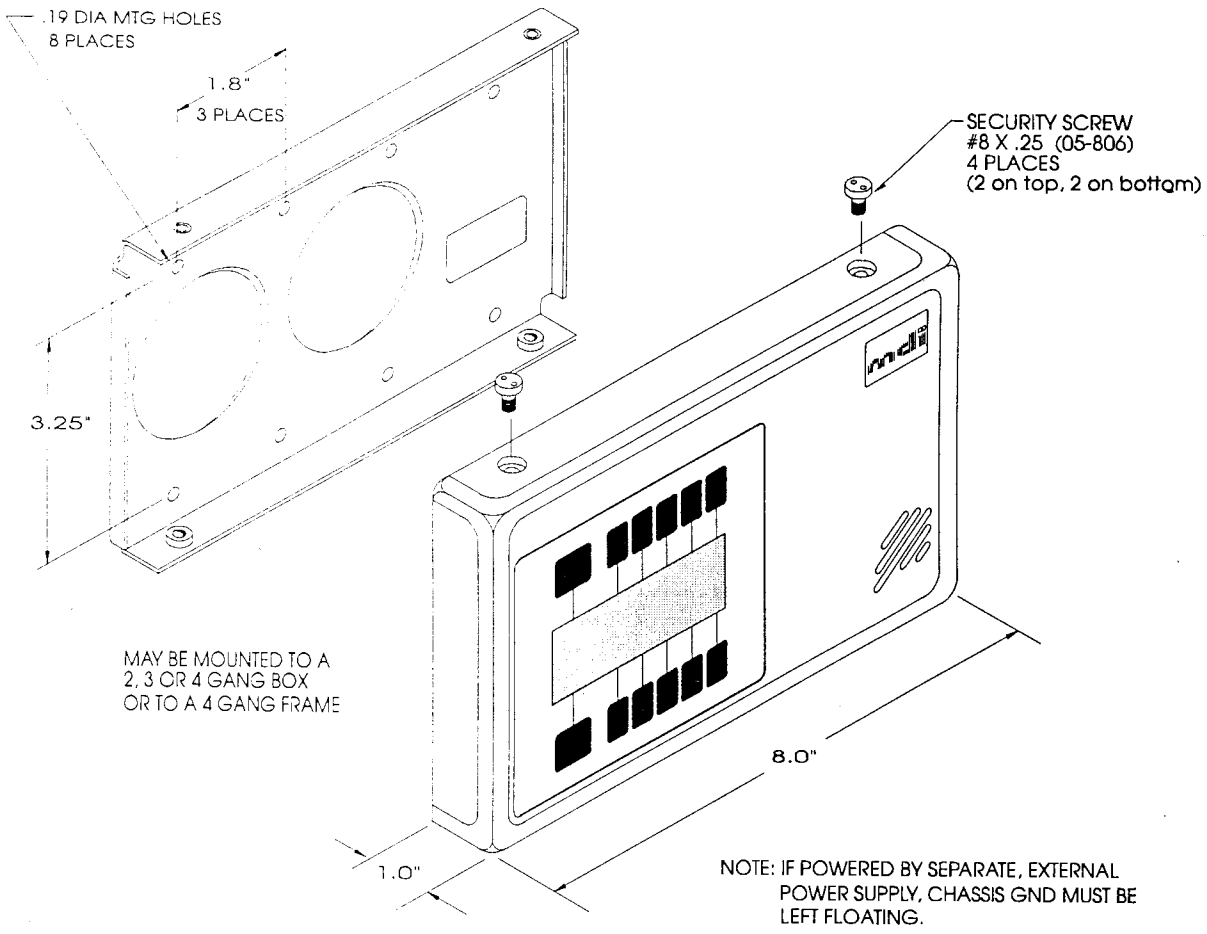


Figure 2-1. ACU-6 MOUNTING DIMENSIONS

To prepare the ACU-6 for mounting, first remove the mounting Back Plate from the ACU-6 Assembly. This is done by removing the four security screws from the unit (two on top and two on the bottom) and pull the back plate gently away from the front assembly. Mount and fasten the back plate to the wall with the appropriate screws into the electrical box or into the wall fasteners and verify that it is level and secure with sufficient surrounding space for proper operation. Remove it again, if desired, for cable installation.

2.4 CONDUIT INSTALLATION (If required)

With the ACU-6 mounting location established, and the necessary electrical box or connections installed for the back plate, the required cabling can be pulled in. Since the ACU-6 requires low voltage wiring only, conduit is normally not required unless local electrical codes or the End-User require it. If conduit is required for the particular installation, install it into the necessary locations above the ceiling and/or down into the wall and connect it into the electrical box with the proper connectors. All of the ACU-6 required wiring may be installed in one conduit.

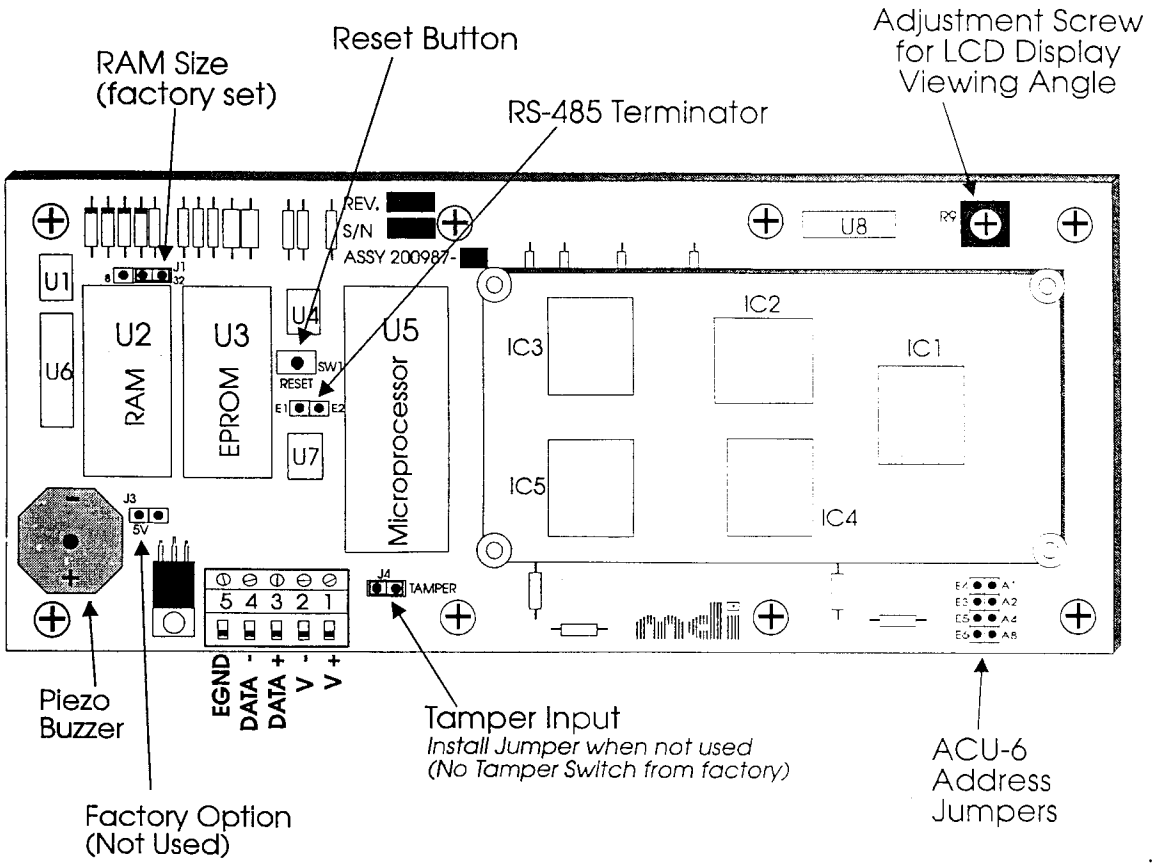


Figure 2-2. ACU-6 CIRCUIT BOARD

2.5 EARTH GROUND

The ACU-6 Arming Control Units require a solid earth ground (e.g. metal conduit or cold water pipe) using a minimum of an 18 AWG stranded copper wire. Establish a good Earth Ground connection to a metal cold water pipe or similarly grounded conduit, and connect this wire to terminal block TB1-5 of the ACU-6 Circuit Board (see Figure 2-2). **A good quality ground is critical to the proper operation of the ACU-6 units.**

2.6 POWER CONNECTIONS

The ACU-6 requires an input voltage of 6-12 VDC. A primary source of power is directly from the TELCO Board within the RTU enclosure. The 6 VDC output from TB1-5 and TB1-6 of the TELCO Board is connected to the FIM board, or to the AIM board (depending on which interface is used) which then provides the current limited 6 VDC output to the ACU-6, which connects at TB1 terminals 1 & 2. The connections for the AIM interface are shown in Figure 2-3, and the connections for a FIM interface are shown in Figure 2-4. A separate external 6 or 12 VDC power supply may also be used to power the ACU-6, however, it MUST be connected with a floating ground. (For U.L. Certified sites, external power must be U.L. Listed, Class 2 supply.)

If powering the ACU-6 with 6 VDC from the RTU, the power and communication may be in the same cable which should be a minimum of 22 AWG, 2 twisted pair with overall shield (BELDEN Cable #8302), at a maximum distance of 500 feet. If a greater distance than 500 is required, the ACU-6 must be powered locally with a separate 6 or 12 VDC power supply. Power connections at the ACU-6 are V+ to TB1-1 and V- to TB1-2.

If a local 6 or 12 VDC power supply is used for the ACU-6, the communication-only cable should be a 24 AWG, single twisted pair with overall shield (BELDEN Cable #9841), at a maximum distance of 1000 feet.

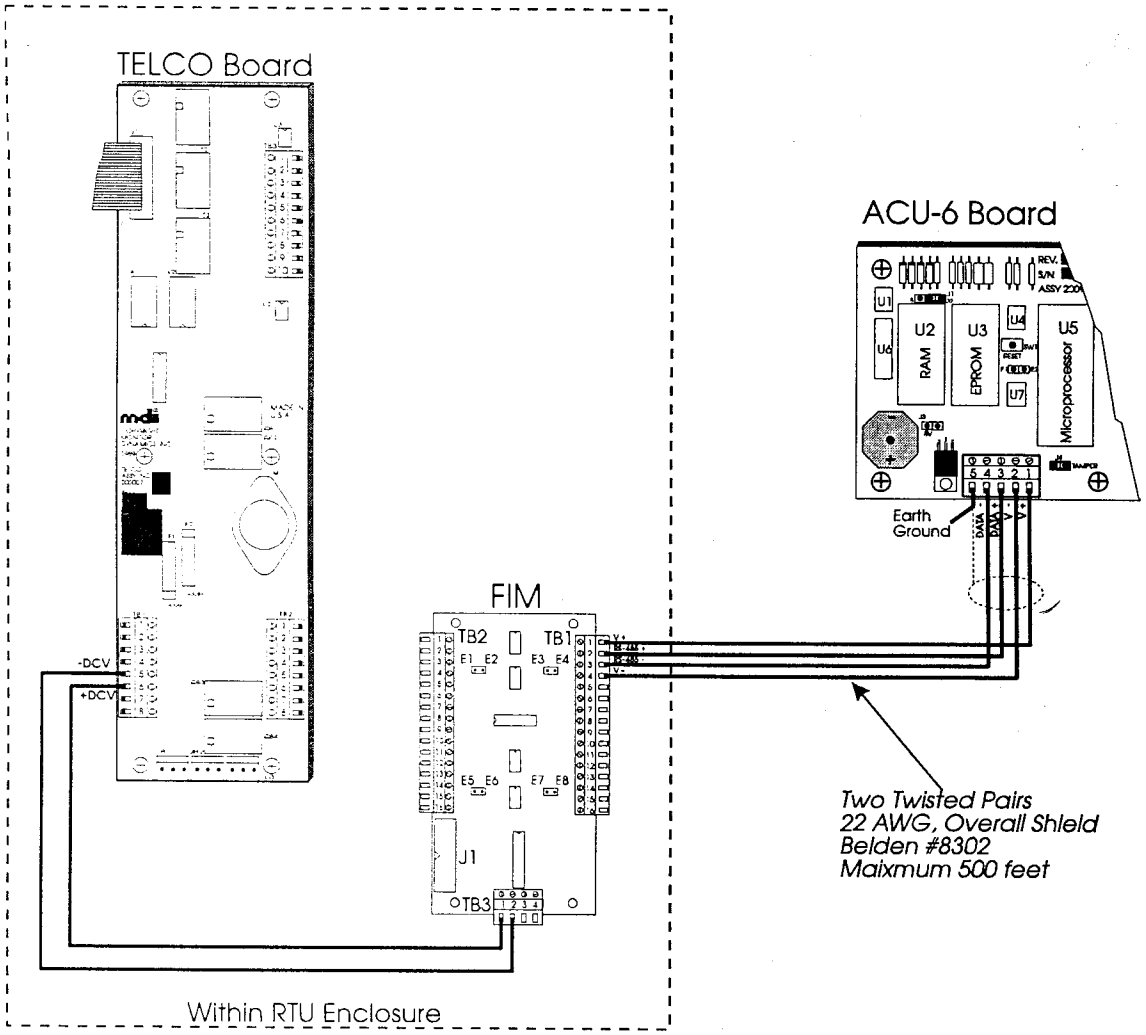


Figure 2-3. ACU-6 TO FIM CONNECTIONS

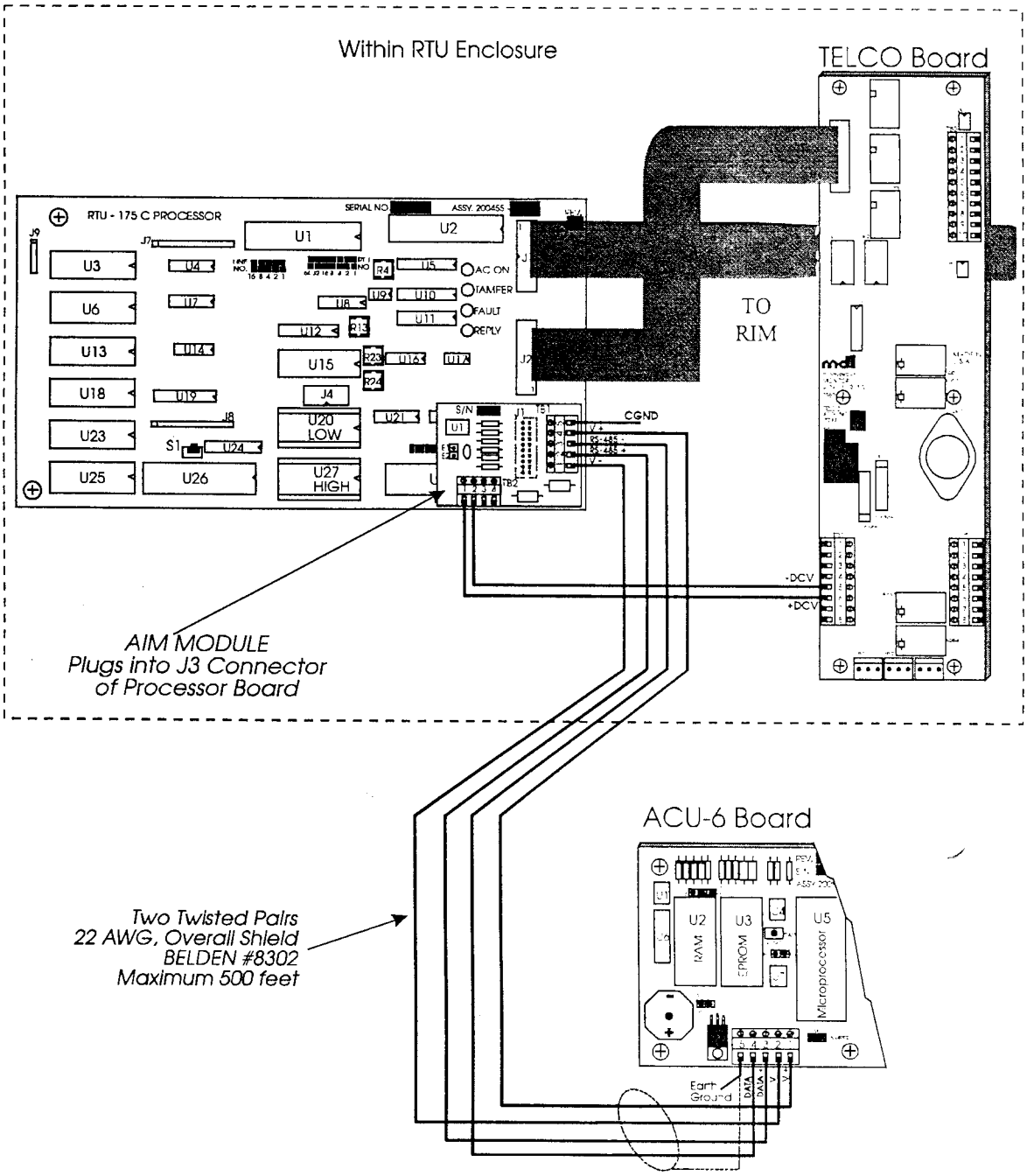


Figure 2-4. ACU-6 TO AIM CONNECTIONS

2.7 COMMUNICATION LINE CONNECTIONS

Since the ACU-6 Arming Control Unit is capable of controlling up to eight (8) separate Accounts, a typical installation may actually use only one (1) ACU-6 per RTU. However, from 1 to 8 ACU-6 units may be connected to a single RTU, in the same manner as ACT-5 stations. In fact, ACU-6 and ACT-5 devices may be mixed together on the same line into the same RTU.

If the ACU-6 is being powered with a local 6 or 12 VDC power supply, a single twisted pair cable, BELDEN #9841, is used for communication from the ACU-6 to the RS-485 standard Four-wire Interface Module (FIM), or ACT Interface Module (AIM). If the ACU-6 is to be powered from the RTU, use a two twisted pair cable, BELDEN #8302, to provide communication and power (see Figures 2-3 and 2-4). The RS-485 Data Lines will connect at the ACU-6 with Data+ to TB1-3 and Data- to TB1-4. DC power connections at the ACU-6 are V+ to TB1-1 and V- to TB1-2. When connecting the ACU-6 communication and power to the FIM or to the AIM, always be sure to observe proper polarity.

The ACU-6 Arming Control Unit can interface into the RTU via a FIM or an AIM. The AIM is a newer MDI module that provides an RS-485 communication interface for MDI ACT units to the RTU processor board in exactly the same manner as the FIM board, with the exception that the AIM board provides only ONE (1) communication channel with one set of connections. The AIM connects directly into the J3 connector of the RTU Processor Board (see Figure 2-4), instead of the ribbon cable that would connect to a FIM board. Therefore an RTU may utilize an AIM or a FIM, but not both. Up to eight (8) ACU-6 and/or ACT units can interface to the RTU with the AIM board, but since there is only one channel, all eight units must be multidropped on a single RS-485 line. This interface technique is the same as the ACT Scheme #1, shown in Figure 2-6, and is the only scheme available when using the AIM board. Point-to-point connections are detailed in Figure 2-4.

If using a FIM interface, each FIM has four (4) independent RS-485 line drivers. Each line driver provides a separate communications *Channel.* The following table shows the connections for each channel of the FIM board:

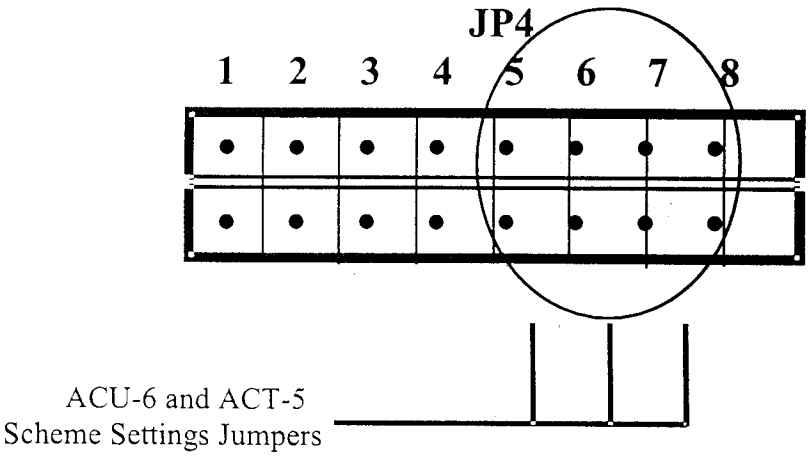
Channel	Films Connections (*TB1 or TB2*)		ACU-6 TB1
0	V+ out	1	1
	Data+	2	3
	Data -	3	4
	V - out	4	2
1	V+ out	5	1
	Data+	6	3
	Data -	7	4
	V - out	8	2
2	V+ out	9	1
	Data+	10	3
	Data -	11	4
	V - out	12	2
3	V+ out	13	1
	Data+	14	3
	Data -	15	4
	V - out	16	2

Note: Both sides of the FIM have identical connections, which therefore provides two (2) sets of connections for each channel; (*TB1 is identical to TB2*).

The necessary channel connections will depend on how many ACU-6 and/or ACT-5 units will be connected on a single communication line, which will then determine the required communication scheme. There are eight (8) possible communication wiring schemes by which the ACU-6 units can be connected to the FIM(s). These are again exactly the same as the ACT-5 units. The scheme selection is set on the RTU processor board jumper block *JP4*, jumpers 5, 6, and 7, using a Binary Coded Decimal (BCD) format (jumper 5 = 1 bit, jumper 6 = 2 bit, and jumper 7 = 4 bit). (Further details can be found in the RTU 100/190/200 Installation Manual.)

Schemes 1, 2, 3, and 4 are used when the RTU either has no Access Control requirements, or when the Access Control ACT units (ACT-4, ACT-E, or ACT-D) are to be connected on the same communication lines into the same FIM boards as are the ACU-6 or ACT-5 units. These schemes would use FIM boards #1 and possibly FIM #2. Schemes 5, 6, 7, and 8 use the same connection and wiring techniques but are used when the ACU-6 and/or ACT-5 units are to be connected on completely separate lines into separate FIM boards of the RTU. With Schemes 5, 6, 7, and 8, the FIM boards would be FIM #3 and, if all units are separate home runs, FIM #4.

Each of the eight (8) communication Schemes are illustrated in Figures 2-5, 2-6, 2-7, and 2-8 on the following pages. With reference to the Scheme illustrations, determine the type of interface to be used and set the required wiring scheme by inserting jumpers on the correct pins (#5, #6, and/or #7) based on the wiring techniques required and the table shown below.



SCHEME #		JUMPER 5	6	7	DESCRIPTION
1	*(Fig. 2-5)*	-	-	-	Addresses 8 thru F connected on Channel #0, FIM #1
2	*(Fig. 2-6)*	X	-	-	Addresses 8 thru B on Channel #0, Addresses C thru F on Channel #1, FIM #1
3	*(Fig. 2-7)*	-	X	-	Addresses 8 & 9 on Channel #0, Addresses A & B on Channel #1 Addresses C & D on Channel #2, Addresses E & F on Channel #3, FIM #1
4	*(Fig. 2-8)*	X	X	-	Address 8 to Channel #0, Address 9 to Channel #1, Address A to Channel #2, Address B to Channel #3 of FIM #1. Address C to Channel #0, Address D to Channel #1, Address E to Channel #2, Address F to Channel #3 of FIM #2.
5	*(Fig. 2-5)*	-	-	X	Same as Scheme #1, except connected to FIM #3, separate from Access Control.
6	*(Fig. 2-6)*	X	-	X	Same as Scheme #2, except connected to FIM #3, separate from Access Control.
7	*(Fig. 2-7)*	-	X	X	Same as Scheme #3, except connected to FIM #3, separate from Access Control.
8	*(Fig. 2-8)*	X	X	X	Same as Scheme #4, except connected to FIM #3 and FIM #4, separate from Access Control.

Figure 2-5. 175C PROCESSOR BOARD CONNECTION SCHEMES JUMPER SETTINGS

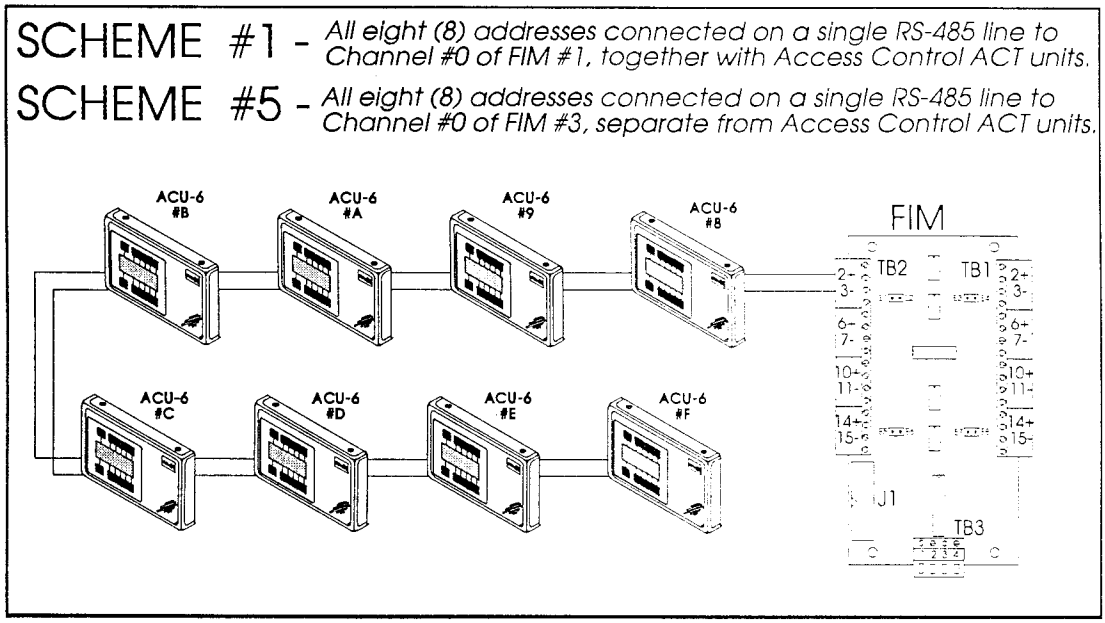


Figure 2-6. ACU-6/ACT-5 CONNECTION SCHEMES #1 & #5

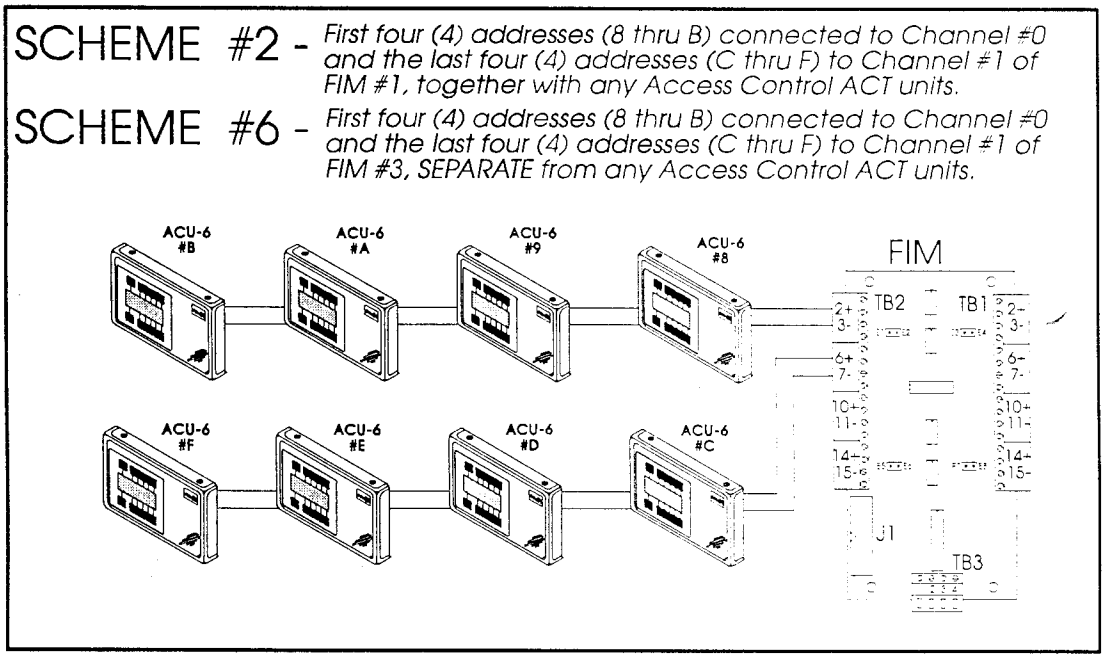


Figure 2-7. ACU-6/ACT-5 CONNECTION SCHEMES #2 & #6

SCHEME #3 - *Two addresses each on Channel #0 (8 & 9), Channel #1 (A & B), Channel #2 (C & D), and Channel #3 (E & F) of FIM #1, together with Access Control ACT units.*

SCHEME #7 - *Two addresses each on Channel #0 (8 & 9), Channel #1 (A & B), Channel #2 (C & D), and Channel #3 (E & F) of FIM #3, completely SEPARATE from any Access Control ACT units.*

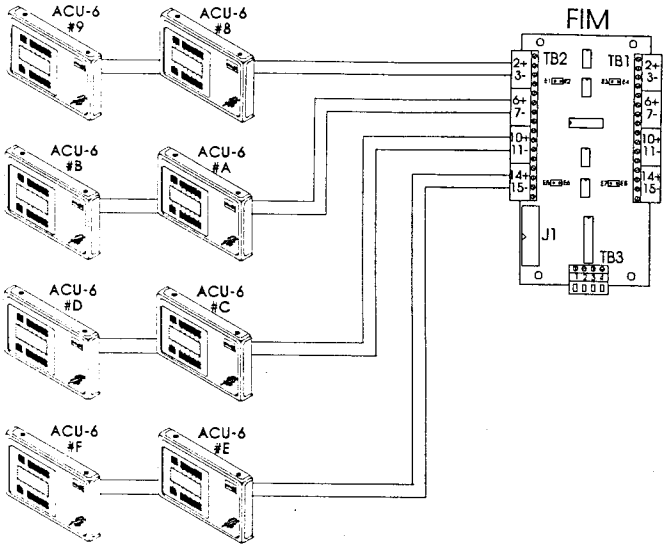


Figure 2-8. ACU-6/ACT-5 CONNECTION SCHEMES #3 & #7

SCHEME #4 - *Each of the eight (8) possible ACU-6 or ACT-5 units Interfaced into separate Channels of two (2) FIM boards, FIM #1 and FIM #2, together with any Access Control ACT units.*

SCHEME #8 - *Each of the eight (8) possible ACU-6 or ACT-5 units Interfaced into separate Channels of two (2) FIM boards, FIM #3 and FIM #4, completely SEPARATE from any Access Control ACT units.*

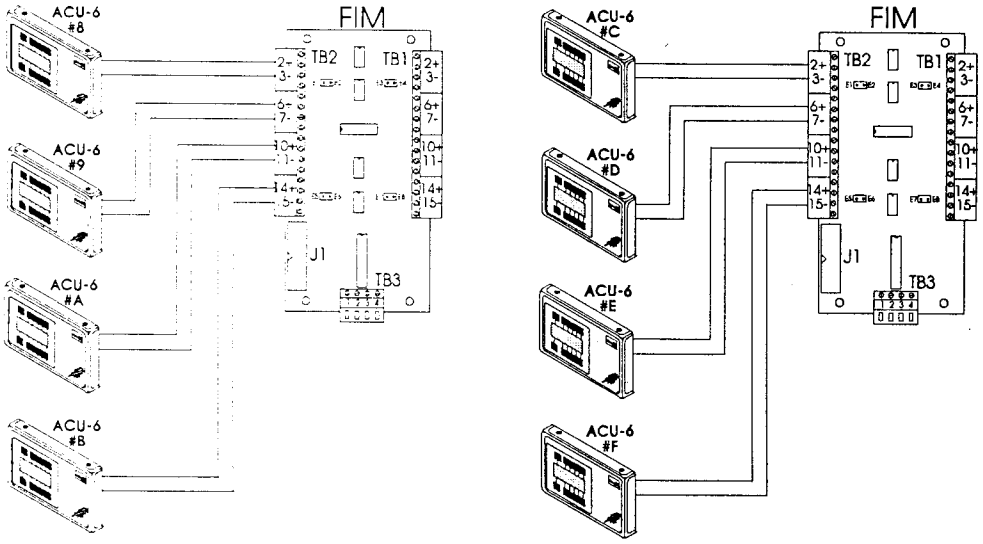


Figure 2-9. ACU-6/ACT-5 CONNECTION SCHEMES #4 & #8

2.8 ACU-6 ADDRESSING AND JUMPER SETTINGS

Before the ACU-6 can be powered up and communication established with the RTU, the unit's communication Address and other jumper selectable parameters must be set and/or verified.

The ACU-6 Arming Control functions within the RTU are based on the location of an '**S5**' ZIM in a RIM board. The RTU Processor Board will not even attempt to communicate with the ACU-6 (or an ACT-5) without an 'S5' ZIM installed somewhere in the RTU. An RTU is capable of supporting up to eight (8) 'S5' ZIMs. Each 'S5' ZIM is installed in the zone #1 position of a RIM board and corresponds to an "ACCOUNT" (group of intrusion alarm zones) that is to be controlled (armed/disarmed) by an ACU-6 or an ACT-5. So there is a direct correspondence between an 'S5' ZIM and an Arming Control Unit. In order for the RTU Processor Board to communicate with the ACU-6 or ACT-5 unit, they must be set with the proper communication address. That address is completely based on the RIM address of the corresponding 'S5' ZIM. Each 'S5' ZIM corresponds to an associated ACU-6 (or ACT-5) Arming Control Unit.

The Addressing of ACU-6 units, as with the ACT-5's, must always start with 8, and is then determined by the associated RIM address, therefore, the address of any ACU-6 will always be *"8 + the lower 3 bits of the RIM address"*. If the 'S5' ZIM is installed in the first RIM of the RTU, which is addressed as "0", the address of the ACU-6 will be "8". This is the same if the RIM address is "8", because the lower 3 bits are still equal to "0". If the corresponding 'S5' ZIM is in a RIM addressed as "5", the corresponding ACU-6 address will be "D"hex (13 decimal), determined by adding 8 + 5 which equals 13 (or D hexidecimal). If the ACU-6 is not addressed correctly according to the address of the associated RIM and 'S5' ZIM, the ACU-6 WILL NOT COMMUNICATE with the RTU. (See Figure 2-2 for location of address jumpers.)

Since the ACU-6 has the added feature or capability of controlling multiple accounts, it will actually be responding to, and communicating with the RTU Processor Board on multiple addresses. Therefore, if an ACU-6 is to be used to control multiple accounts, the ACU-6 Address should always be set to correspond to the lowest addressed RIM with an 'S5' ZIM that is to be controlled by that ACU-6. The unit will then automatically assume, and respond to, any other unassigned 'S5' addresses within that RTU.

Set the ACU-6 address using the jumpers A1, A2, A4, and A8, as shown below:

	JUMPERS			
ADDRESS	**A1**	**A2**	**A4**	**A8**
8	-	-	-	X
9	X	-	-	X
A (10)	-	X	-	X
B (11)	X	X	-	X
C (12)	-	-	X	X
D (13)	X	-	X	X
E (14)	-	X	X	X
F (15)	X	X	X	X

Other hardware jumpers and settings to verify are as follows (see Figure 2-2 for location):

J4 - TAMPER: The ACU-6 board provides an input for a Tamper Switch. In the standard factory configuration, a tamper switch is not provided and, therefore, a jumper is inserted across these pins. Ensure that the jumper is installed at J4 unless a special tamper switch is installed by the dealer or system installer.

E1 to E2 - RS-485 LINE TERMINATION: If multiple ACU-6 and/or ACT-5 units are connected on a common RS-485 communication line, this jumper should be installed on the unit that last, or the farthest from the RTU on the communication line.

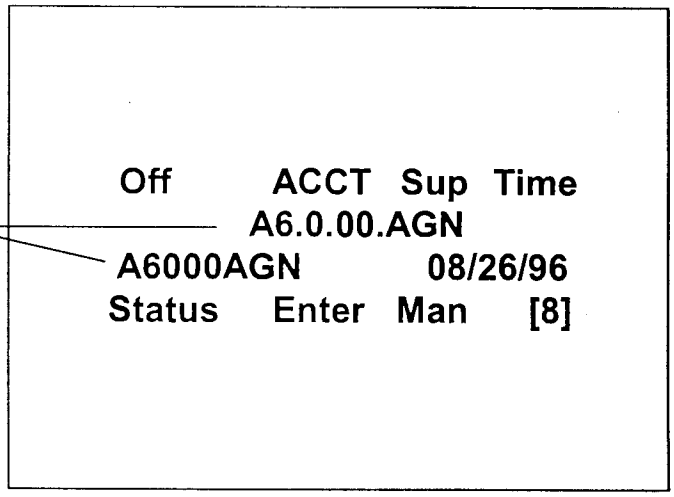
J1 - RAM SIZE: This is a Factory Set jumper that should not be changed unless instructed to do so by an authorized MDI Technician.

LCD VIEWING ANGLE ADJUSTMENT: The LCD Display of the ACU-6 is adjustable as to the angle of viewing. When the mounting location of the ACU-6 has been set, this adjustment screw should be used to set the angle of the display for the overall best viewing.

SW1 - RESET SWITCH: Whenever any of the jumpers and/or address settings is changed, the ACU-6 must be reset to restart the processor and properly read all of the board settings.

2.9 ACU-6 POWER-UP

When all of the connections and jumper settings are completed and verified, and the unit mounting is complete, the ACU-6 should be ready for power-up. Always verify your input voltage from the power source with a multimeter prior to connecting and applying power to the ACU-6. When power is first applied to the ACU-6, the initial LCD screen display should be as shown below in Figure 2-10. This screen may only appear for a short time (1-3 seconds) as the screen will change when communication is established with the RTU.



Firmware Version & Release Date

Figure 2-10. ACU-6 INITIAL POWER-UP LCD SCREEN

The data displayed in the center of the LCD at power-up is the ACU-6 Firmware Version and Revision Level as well as the date of release for that version.

When communication is established from the ACU-6 to the RTU, a short 'BEEP' will be heard, and the LCD screen will immediately change to a display similar to Figure 2-11 below.

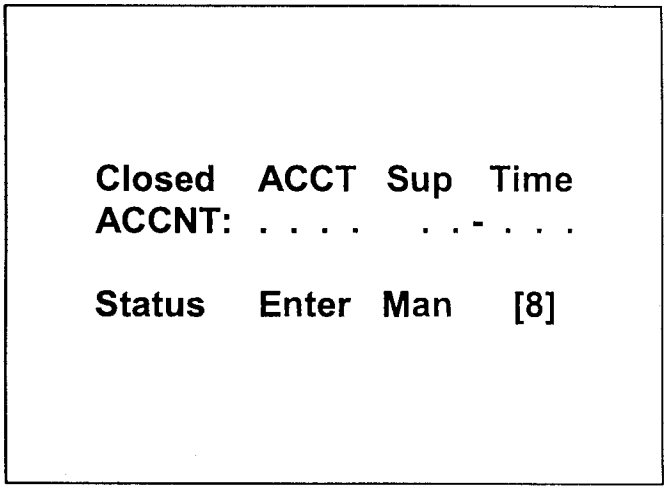


Figure 2-11. ACU-6 INITIAL ON-LINE LCD SCREEN

The Account information is initially blank (. . . .) until data has been requested and downloaded to the ACU-6 memory. Pressing the "**Time**" key (upper right key) will change the display to the date/time screen, shown below, with the date and time starting at default until it is downloaded from the RTU.

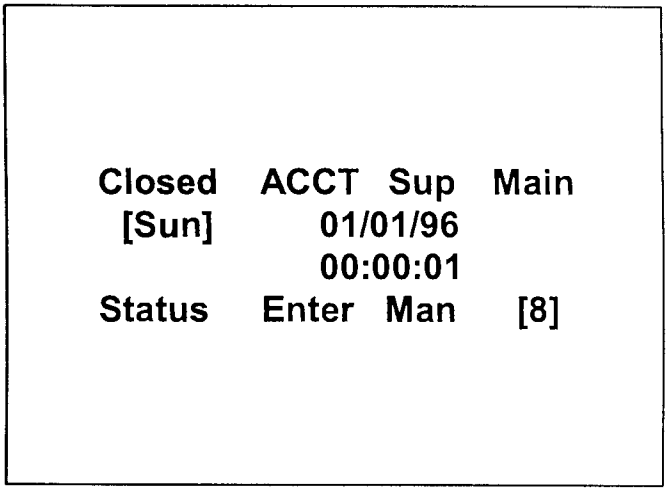


Figure 2-12. ACU-6 INITIAL DATE/TIME SCREEN

The ACU-6 is now ready for database downloading, configuration and on-line operation.

3.0 ACU-6 OPERATION

The following paragraphs of this chapter will provide information and instructions for the On-line Usage and Operation of the ACU-6 Arming Control Unit, including descriptions of each LCD screen display, database parameter configuration procedures, data download and status request functions, as well as the Account Open/Close and other available user commands.

As previously described, the ACU-6 includes a 4-Line, 80 Character LCD screen with 12 membrane-type "soft" keys around the LCD screen. These keys are dynamically labeled according to the function being performed at the time. The following paragraphs will provide detailed descriptions of the screen displays and keystrokes of the various ACU-6 operations.

To save power, the LCD screen is normally not activated. The ACU-6 has an internal active screen display timer which is typically set to 15 seconds at the factory. After approximately 15 seconds of no activity, the LCD screen will always turn off. This time is a user-configurable parameter set in the parameter section of the ACU-6 Firmware EPROM. At any time, to activate the screen, simply press ANY of the keys around the display, and the LCD screen will light up.

3.1 GENERAL OPERATION USER FUNCTIONS

In general day-to-day usage, the ACU-6 provides functions to display Date/Time information, to request and display account information for multiple accounts, and to request and display alarm zone status in multiple formats, such as a multiple zone status matrix display or even specific zone status for a selected zone. All of these functions are non-protected functions and available to any user without an access code or special PIN number.

When you press a key to activate the LCD screen of the ACU-6, the data screen that will typically be displayed should look like Figure 3-1 below.

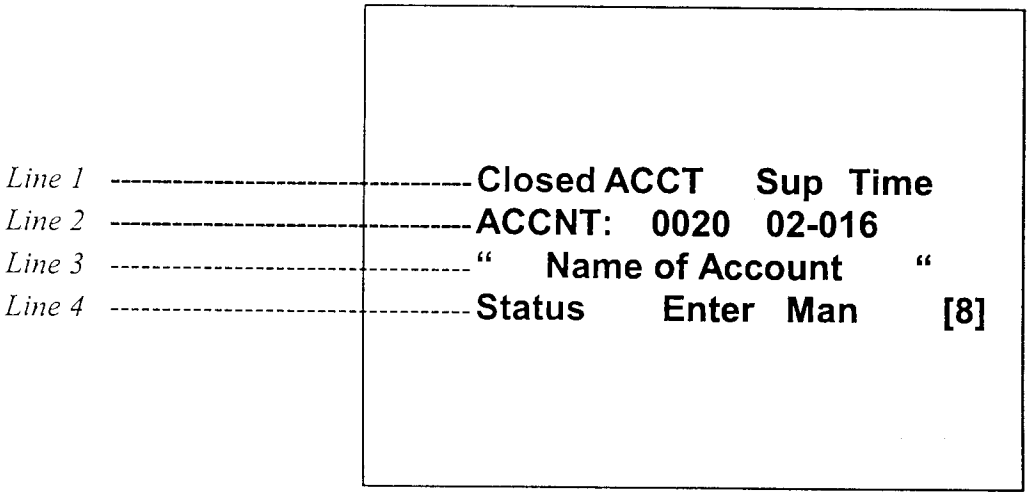


Figure 3-1. TYPICAL LCD SCREEN DISPLAY

The data displayed on the screen would be interpreted line-by-line as follows:

LINE 1 INFORMATION:

Closed: This field displays the current state of the account being displayed; either *OPEN*, *CLOSED*, *EN-DL* (entry delay), *EX-DL* (exit delay) or *OFF* (unit not communicating with RTU, or not the active account).

ACCT: Press the key above this word to change the screen for requesting further account information or to scroll through and select one of the other accounts assigned to the ACU-6. The selected Account's data will display on lines 2 & 3.

Sup: Press the key above this word to go into the "Supervisor Database" mode used for the database setup of special ACU-6 features. Use of this key requires a special "PIN" or "ID Number" to access the programs and is not used by normal subscribers or system users.

Time: Press this key to change the LCD screen to display the current time and date.

LINE 2 INFORMATION:

ACCNT: The 4-digit number following this is the designated Account Number (from the Host CPU database) and address (LINE # - RTU #) of the RIM and ZIM for this account.

LINE 3 INFORMATION:

Designated Text Name of the displayed Account (such as "Main Vault Area" or "Research Lab") as is configured and downloaded from the Host CPU database.

LINE 4 INFORMATION:

STATUS: Press the key below this word to go into the status display mode. This function allows the user to select and display alarm zone and control output status for the zones of the selected account.

Enter Man (or Enter PIN or En MAN/PIN): Pressing one of the keys below this text will prompt the user to enter a Valid Man Number and ID Number, typically used to Open and Close an area, or to generate special commands.

[8]: This field will always be a single-digit number or letter that displays, for a technician, the communication address of the ACU-6. This will be different for each account controlled by this ACU-6 and will depend on the address of the RIM and ZIM associated with the account selected and displayed. The actual Address Jumper setting on the ACU-6 circuit board should always be the lowest address of all the accounts being controlled.

From this initial LCD menu screen, a system user can now select one of five (5) functions:

1. Select another Account or further Account information by pressing a key above the "**ACCT**".
2. Select the Date/Time display by pressing the upper right key above the "**Time**" label.
3. Check the status of alarm and control zone by pressing the lower left key below "**STATUS**".
4. Log on as a user to Arm, Disarm, Mask or Unmask alarm zones by pressing any key under "**Enter Man**" and enter an authorized Man Number and I.D. code.
5. Change the ACU-6 setup parameters in the Supervisor mode by pressing the key above "**Sup**" and entering the authorized supervisor I.D. code.

3.1.1 Account Selection Key ("ACCT")

Press a key above "**ACCT**" to access the Account selection screen (Figure 3-2 below). The screen will display information for the Account that is presently selected and active. If the ACU-6 was just powered up, the Account information would be blank, similar to that of Figure 2-11.

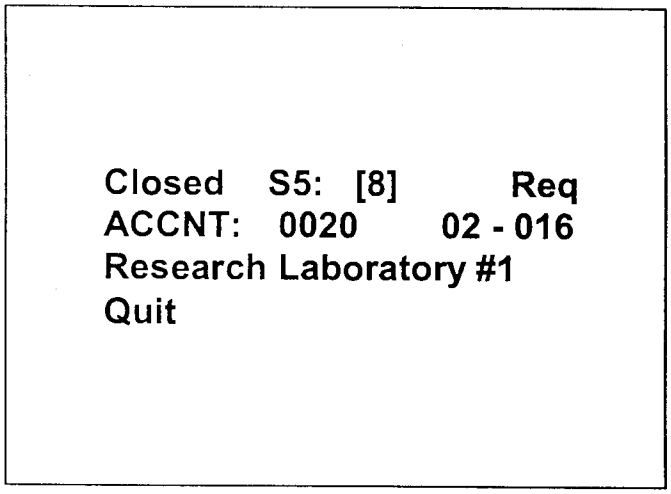


Figure 3-2. ACU-6 ACCOUNT SELECT/REQUEST SCREEN

If the ACU-6 was already on-line and the database downloaded, lines 2 and 3 would contain account information similar to Figure 3-2 above. If the Account information is blank, press the "**Req**" key to download it. The displayed screen data fields and key labels are as follows:

"S5: [8]": Indicates to a technician the ZIM type installed in the RIM and the address of the RIM and the account.

"Req": Label of the key (upper right key) used to request a download from the Host CPU of the Account's name and number. When the ACU-6 has been just powered up, as shown in Figure 2-11, this is the first thing to do in order to download the Account information to work with.

When the "**Req**" key is pressed to request the Account information, the screen will display the following message:

Waiting for RTU Acknowledgment Req. Accnt Name Wait RTU Downloading

When the data is received, the screen will be updated with the Account #, the Line # and RTU Address #, and the Account text name, as in Figure 3-2.

"Quit": Pressing this key will exit back to the previous or main screen.

The up and down arrow keys are used to scroll up or down through the other accounts assigned to the ACU-6, and select an account for subsequent operations. For example, if the same ACU-6 is used to control two or more accounts, the user would first select the account to be controlled and then proceed with the "STATUS" request functions or the "Enter Man" function for commands. The user must ensure that the correct Account name and/or number is displayed and then press "**Select**".

If a system user approaches the ACU-6 and the ACU-6 display is not displaying the desired Account, press the up or down arrow in order to find the desired Account. When one of the arrow keys is pressed, the screen display will change to show the next Account available to be controlled by that ACU-6, similar to that of Figure 3-2A below.

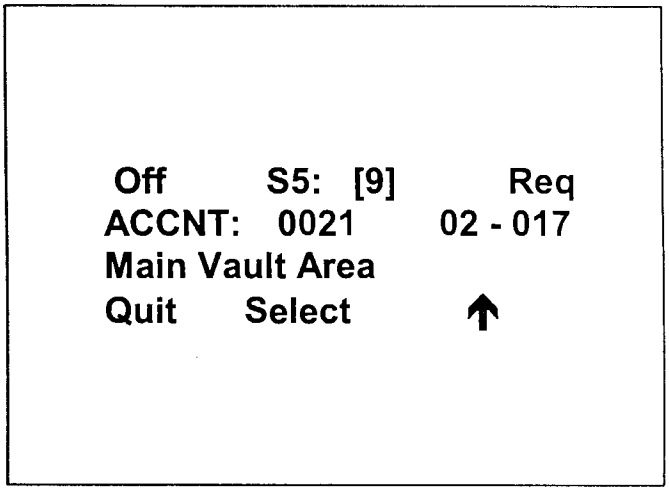


Figure 3-2A. Account Selection Data Screen

Notice that when one of the arrow keys was pressed for the next account, the key label "**Select**" appeared on the bottom row. Also notice that the Account status (upper left) shows the account as "**Off**" because it is not the active, on-line Account for the ACU-6.

When the screen is displaying the desired Account, press a key below the "**Select**" label and the ACU-6 will then be in control of that Account for command purposes and status information. When the "**Select**" key is pressed, the Account status in the upper left of the screen should change from "**Off**" to either "**Open**" or "**Closed**".

3.1.2 Date/Time Display Key ("Time")

When the "**Time**" key is pressed, the ACU-6 displays the current date and time as shown below. The Date and Time is downloaded from the Host CPU four times an hour with the command performed at 14, 29, 44 and 59 minutes after the hour. The ACU-6 keeps time with an internal software clock. If the time in the ACU-6 is incorrect, or the unit was just powered up, either wait for the next CPU download, or use the CLOCK-SET function in the supervisor mode.

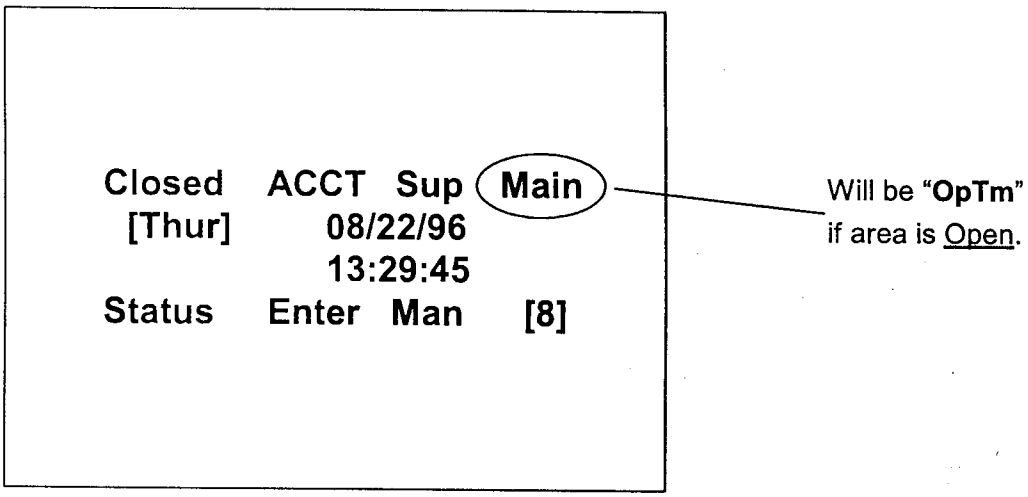
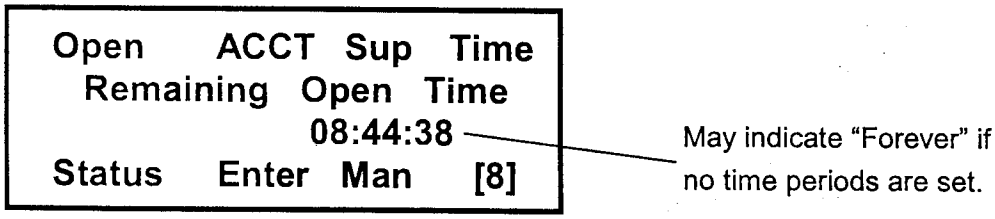


Figure 3-3. ACU-6 DATE/TIME DISPLAY SCREEN

The "**Main**" key (upper right key) returns the user screen to the initial main menu screen. If the selected Account is in an OPEN state, instead of CLOSED as shown above, the key labeled "**Main**" will be replaced with "**OpTm**", which stands for 'Open Time'. Pressing that key will display the time remaining for the Area (account) to be OPEN before it is scheduled to be CLOSED. All of the other labeled function keys which are the same as the initial main menu screen will function from this screen as well.



3.1.3 Status Request Key ("STATUS")

When the appropriate Account is selected and displayed on the LCD screen, the user may wish to request a display of the status of the alarm zones and/or control points within that account or area, by pressing the "**STATUS**" key (lower left big key). The Status function screen of the ACU-6 (see Figure 3-4) allows the user to select and view, in various formats, the alarm input and control output states of the points assigned to the selected account.

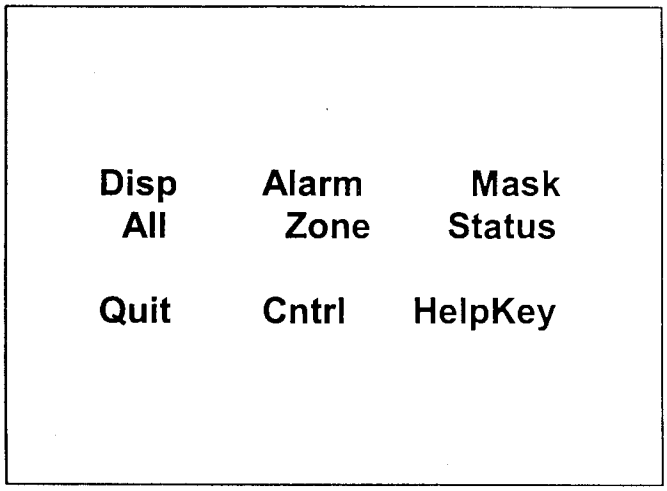


Figure 3-4. ACU-6 STATUS REQUEST SCREEN

The menu items on this screen select the type of status, or how the status is displayed. These status methods include:

Disp All: Displays the status of all alarm zones, masked alarm zones, and control points for this account, in matrix format.

Alarm Zone: Displays all off-normal alarm zones, one at a time, using the full descriptive text name which was defined and downloaded from the Host CPU.

Mask Status: Displays all masked alarm zones, one at a time, using full descriptive text.

Cntrl: Displays all set controls, one at a time, using full text names.

HelpKey: Displays three screens of "help" to aid in decoding matrix display.

Quit: Returns to main screen.

3.1.3.1 "Disp All" - Zone Status Matrix Display

If the "**Disp All**" key (upper left) is pressed, the screen shown in Figure 3-5 will display the status of all the alarm points assigned to the previously selected account. This display will show up to 64 zones arranged as a matrix of 16 zones (2 addresses) per line of the display screen.

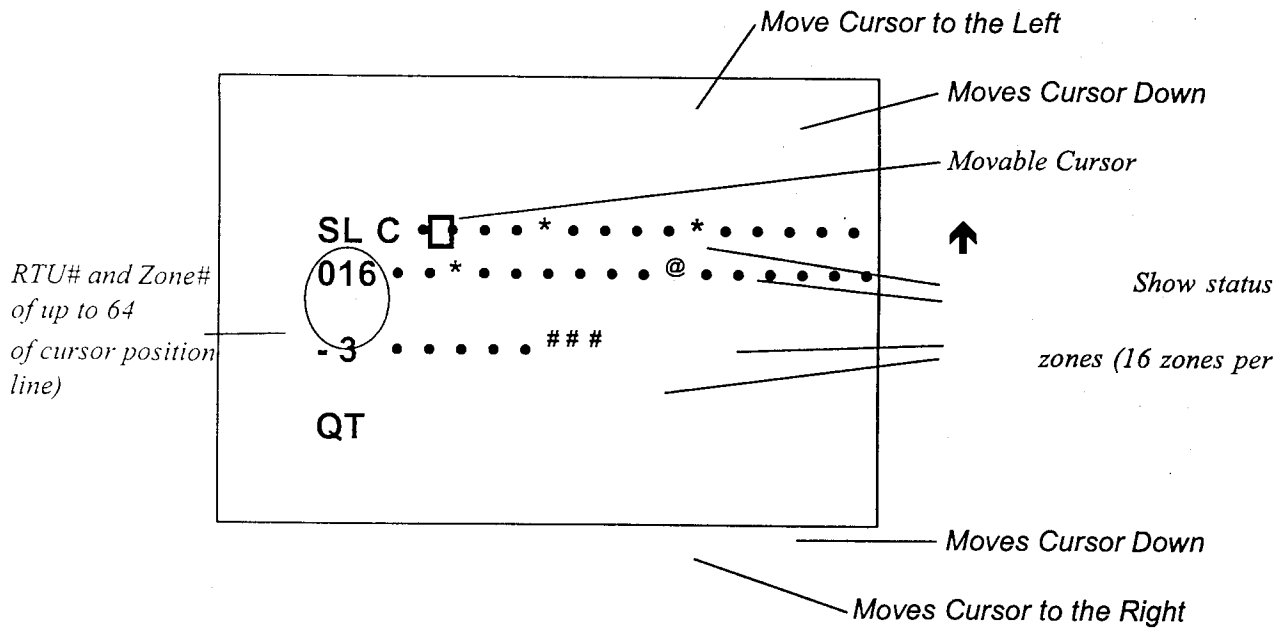


Figure 3-5. ACU-6 "DISPLAY ALL" STATUS SCREEN

A block cursor (reverse video) shows the current alarm zone selection. The cursor may be moved to the right (second key from lower right), to the left (second key from upper right), moved up (upper right key) and moved down (lower right key). The RTU address and zone number of the zone where the cursor is positioned are displayed at the left of lines 2 and 3 of the display. The rest of the screen will display the status of the applicable alarm zones, with different text characters used to indicate the actual state of the displayed zones. This display is a dynamically updated display as well, since the status indication of the alarm zones will change on the LCD screen if the actual state of the alarm zones change while being displayed.

The "**SL**" key is used to select the zone where the cursor is positioned for a detailed zone description and full text status (see paragraph 3.1.3.2 below). The "**QT**" key is used to quit this screen and return to the previous one. Since the screen space is allocated to display up to 64 zones, there is not enough room on the screen to display the move right and move left arrows, or the codes for each zone state. The "**HelpKey**" function can be used to show the user the un-labeled keys, and to explain the symbols used for the zone indicators. (See paragraph 3.1.3.4).

3.1.3.2 Selected Zone Status Screen

In the above described "Display All" status screen, a particular alarm zone may be selected for displaying a more detailed zone description and status in plain text. This is done by pressing the Select ("**SL**") key function when the cursor is highlighting the desired alarm zone, which will cause the ACU-6 to then display detailed information pertinent to that point, as shown in Figure 3-6 below. This display can be used to look at only one point or it can be used to scroll through all of the points, alarm and control, of a particular address.

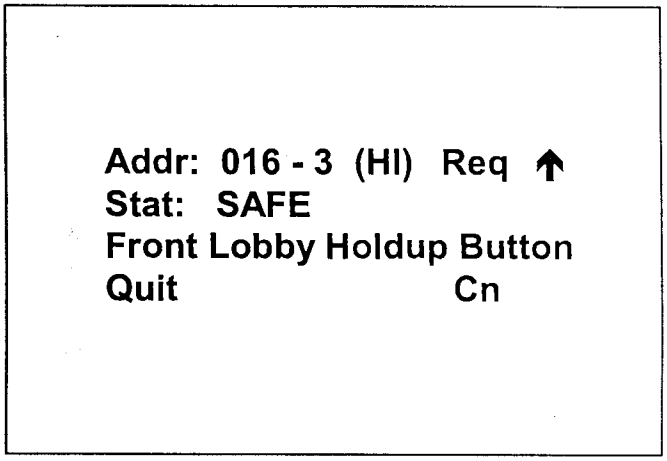


Figure 3-6. ACU-6 SELECTED POINT STATUS SCREEN

The fields in the display are as follows:

Addr: 000-5 (HI): Indicates the address, zone number and, in parenthesis, the zone type based on the ZIM that is installed in the RIM for this zone location. (HI = Holdup/Duress zone with Instant bell output).

Stat: This line will show a text description of the actual status of the zone number, simultaneously showing the alarm, mask, and control status of the point number, such as Safe, Alarm, Mask, Open, Closed, Control, etc.

Zone Name: The third line will display the zone name, as downloaded from the CPU.

Req: Pressing the key above this word will generate a request for the zone description to be downloaded from the Host CPU. This would be used if the zone text area was blank or possibly not accurate.

Cn: Switches the zone name on the 3rd line from displaying the Alarm zone name to showing the Control Output Point name, indicating the descriptive text of the control point with same point number. While displaying Control Point name, the label of this button will change to "**Zn**" to indicate the selection for going back to displaying the Alarm Zone name.

The up and down arrow keys scroll the display to the next higher or lower point number within the same RTU address.

Quit: Returns to the previous screen.

The features of this screen can be very useful for technicians while installing and/or troubleshooting ACU-6 and RTU panel problems. This status feature allows the user to step through the status of each alarm input zone and control output point for each RIM.

3.1.3.3 "Alarm Zone", "Mask Status", and Control ("Cntrl") Display Modes.

From the "**STATUS**" request screen, the ACU-6 provides selections to request "**Alarm Zone**" status, "**Mask Status**", and Control Point status ("**Cntrl**") for the previously selected Account. These selections provide the user with a quick way to receive information on points that are off-normal or not in a secure mode.

"**Alarm Zone**" - This selection will display the status and point information of **only** those alarm zones that are presently in an active Alarm or Fault (SFault or FFault) condition. If there are multiple points, the up and down arrows are used to scroll the display to other points.

If there are NO alarm points that are presently in an ALARM or FAULT condition, the screen will display the message:

NO ALARMS FOUND

"**Mask Status**" - This selection will display the status and point information of **only** those alarm zones that are presently in an active **Mask** condition. The status of the point will be shown as simply "MASK", or "ALARM-MASK" if the point is actually in an alarm condition but also masked. If there are multiple points, the up and down arrows are used to scroll the display to other points.

If there are NO points that are presently in a MASK condition, the screen will display the message:

NO MASKS FOUND

"**Cntrl**" - The Control selection will display the status and point information of **only** Control Output zones that are presently in an active, or Set condition. If there are multiple points, the up and down arrows are used to scroll the display to other points.

If there are NO control points that are presently in an active control, or SET condition, the screen will display the message:

NO CONTROLS FOUND

When an off-normal alarm, or mask, or active control exists, the status screen that is displayed will be the same as shown in Figure 3-6, with the appropriate text and status descriptions for that point and point type. The up and down arrow keys scroll to the next off-normal condition, rather than the next point address (as in the matrix display).

3.1.3.4 Status Mode "HelpKey"

The different status display screens use a number of different alpha character codes to help reduce a zone status to a single character in order for them to fit on the screen. A Help feature is provided in the ACU-6 to assist the user in interpreting these different codes. From the "**STATUS**" request screen, pressing the key below the label "**HelpKey**" will provide the display of the initial HELP screen, show on Figure 3-7, which indicates labels for the keys used to move around the matrix style status display.

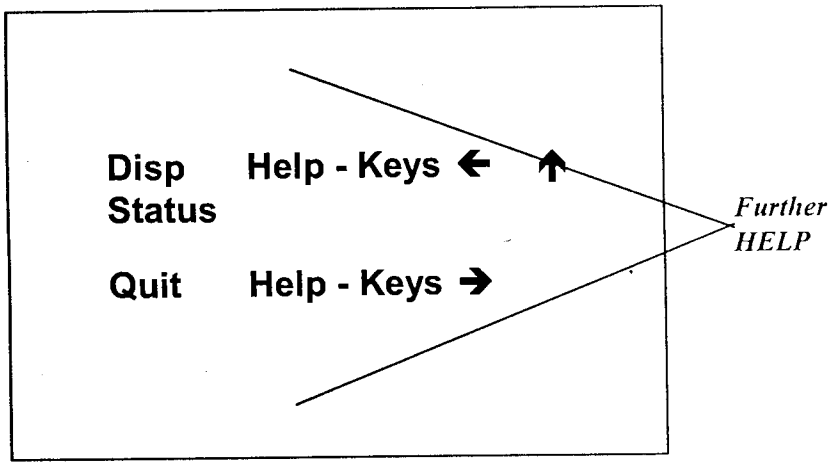


Figure 3-7. ACU-6 INITIAL USER HELP SCREEN

Pressing one of the keys above or below the words "HELP" will display the first of three HELP screens providing descriptions of the point status codes as well as further key labels. The "**Page**" key (upper left big key) scrolls through these three screens. A short description of the status display codes is as follows:

Account States
O = Account Open
C = Account Closed
N = Entry delay timing in progress
X = Exit delay timing in progress
W = Warning Timer in progress

Zone Status
• = All Safe
* = Active Alarm/Fault
# = Active Mask
@ = Active Alarm & Mask
c̲ = Control Point Set
a̲ = Active Alarm & Control Set
m̲ = Active Mask & Control Set
*̲ = Active Alarm & Mask & Control Set

Abbreviations
SL = Select Zone
QT = Quit
Ex = Exit Menu

3.2 ACCESS CODE PROTECTED FUNCTIONS

The functions described so far in this chapter can be performed by any user without the requirement to enter an access code or I.D. number. This section will now describe the ACU-6 functions that are protected by access codes.

The MDI SAFEnet system provides and supports two different methods of controlling system users (subscribers) at arming stations. One method is the "Account User ID" method, in which up to 99 system users (individuals assigned unique access codes) per Account are configured at the Host CPU and stored in the CPU's database, as well as downloaded to some types of Arming Stations. Another method is the "Unique PIN" method which requires and uses the Host CPU system's access control database with a special "unique" field to hold a PIN number. The first method allows complete control of each "Account" by any or all of the appropriately defined Account subscribers, but requires some extra management steps if any person is to be assigned access privileges to multiple Accounts (or separate systems within a location). The second method requires the configuration and assignment of Arming Stations just as if they were access control card readers, allowing any one person access to as many Accounts (systems) as is required while using the same PIN I.D. code. The second method does, however, require the RTUs to be configured with an access control database, which is an additional cost factor. The ACU-6 capabilities support both methods of System user control. Which method is currently used is configured at the ACU-6 via a "Supervisor" command. All access code protected functions of the ACU-6 can be accessed and utilized with either of the user control techniques.

In the discussions below, the word "MAN" or "MAN NUMBER" will refer to the Account-based (99 user) user access method, and the terms "PIN" or "ID NUMBER" will refer to the unique PIN method using the access control database.

The Access Code protected commands consist of:

1. NORMAL OPEN/CLOSE ACCOUNT - Used to Open and Close an Account typically if the account has no active alarm nor masked zones. An account can be "Opened" but cannot be normally "Closed" if the account has any off-normal zones.

2. FORCE CLOSE - Used by a privileged user to force an account to close if it has active or masked alarm zones. Active alarm zones that cannot be returned to "Safe" would be masked and then the account "Force Closed".

3. MASK/UNMASK - Used by a privileged user to manually mask or unmask an alarm input zone from the ACU-6 keypad. This is typically performed in conjunction with a "Force Close" command if an alarm zone cannot be secured for some reason.

To access these commands, the user must first enter a valid Man Number Code or a valid PIN Number, depending on what the LCD screen prompt is asking for. The prompt is based on the mode that was set by a Supervisor setting. From the ACU-6 main screen, select the "**Enter Man**" (or "**PIN**") function by pressing one of the lower corresponding small keys. The Access Code Entry screen shown in Figure 3-8 will be displayed.

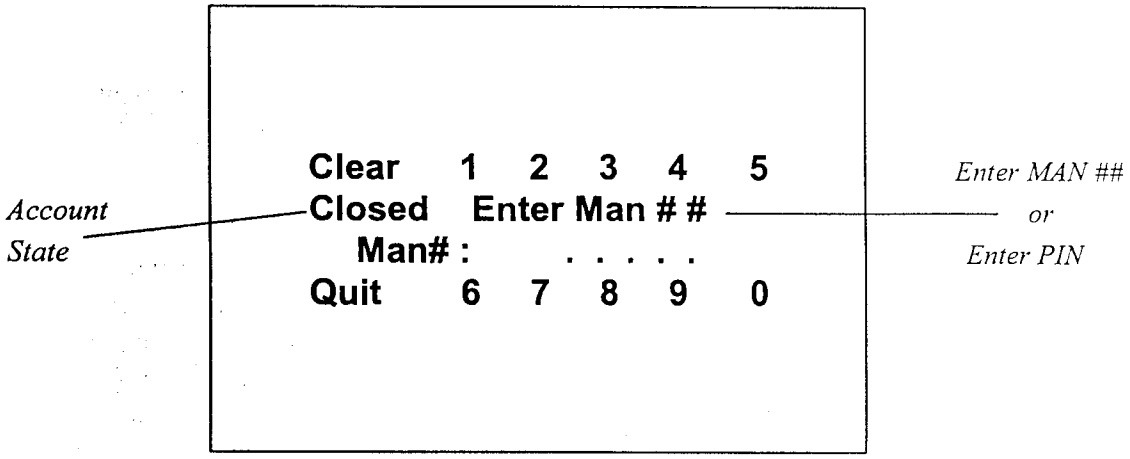


Figure 3-8. ACU-6 ACCESS CODE ENTRY SCREEN

The present Account status (in this example, "**Closed**") is displayed, along with the entry prompt based on the Access Mode to be utilized ("**Enter Man ##**" or "**Enter PIN**"). Enter the user Man Number or PIN number based on the numerical labels now shown for the keys. As soon as the first number key is pressed, the "**Quit**" key (lower left) label will be replaced with the label "**Enter**". The "**Clear**" key (upper left) will clear any key entries and allow the user to start over. "**Clear**" will also change the "**Enter**" back to "**Quit**" until the first key is again pressed.

In the "Man Number" mode, the first 2 digits entered on the keypad represent the assigned Man Number of the individual (man number 01-99), and will display on the screen. The remaining 3 digits entered are the security code digits which will display as "*" to protect the code integrity. If the PIN mode was selected, all of the entered numbers (4, 5 or 6 digits) are displayed as "*".

Once the security code has been properly entered, press the "**Enter**" key (lower left). If the security code digits entered are incorrect for the Man Number used, the screen will display "**Invalid Security Code**", and the screen display will return to the initial Main Screen.

If the "Man #" or "PIN" number is completely invalid or not defined, the screen will display:

Invalid Man/PIN/Cmnd

Please Contact System Supervisor

Should the user's Man number code, or PIN code be missing from the RTU database, the message "**WAITING FOR DOWNLOAD**" will display while the Host CPU is transmitting the codes and data to the remote RTU.

If a valid Man Number/Security Code or PIN is properly entered and verified by the ACU-6, the User Command Screen will be displayed.

3.2.1 User Command Screen

When a valid access code (Man # or PIN) has been entered, the user is presented with the User Command Screen (Figure 3-9), which provides the user command options.

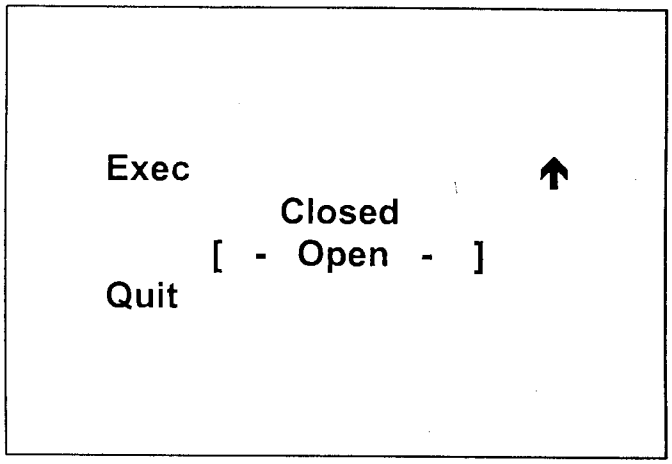


Figure 3-9. ACU-6 USER COMMAND SCREEN

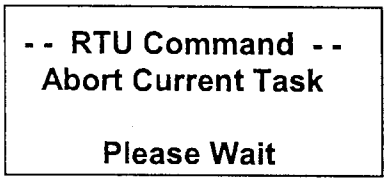
The functions of this screen are as follows:

"**Exec**" The "**Exec**" function executes the selected command. In the example above, the system is currently shown as "**Closed**" (line #2), and the selected pending command, shown in the brackets, will be to "**Open**" the Account. The selected command will be executed (if possible) when the "**Exec**" key is pressed.

↑ The Up and Down arrows are used to scroll through the available, or authorized, commands which can be selected and executed. The possible commands available are:

A. OPEN/CLOSE
B. MASK/UNMASK (appears only if "Privileged" User capability)
C. FORCE CLOSE (appears only if "Privileged" User capability)

"**Quit**" This key will exit the User Command Screen back to the Main screen after displaying the message:



3.2.1.1 Normal "OPEN/CLOSE" Command

The most often used command from the User Command Screen will be the normal "Open" Account command or normal "Close" Account command. These commands are used to Open and Close (Arm & Disarm) an area or account under normal circumstances, typically with no outstanding off-normal conditions within the area.

An authorized user performs the Open command to simply disarm the applicable Burglar/Intrusion alarms within the area (motions detectors, door contacts, etc.) to allow those who work in the area to move about freely without setting off alarms. The Close command will re-arm the alarm zones for normal monitoring and is performed when the area is to be completely vacated and locked back up. The normal Close command cannot be performed if there are any active Alarm conditions, or active Mask conditions in the area. The active alarms must be cleared before the Close command can be executed, or, if those alarms cannot be cleared, they must be masked and the "Force Close" command must be used. In order to perform a "Mask/UnMask" command or a "Force Close", the user must be using a Man # access code with "*Privileged*" access.

When a Close command is executed, the system will normally go into an "Exit Delay Timer" mode, which delays the actual execution of the close command for a preset time period to allow the user to exit the area without setting off alarms. The "Exit Delay Timer" screen (Figure 3-11) is discussed below in paragraph 3.2.1.4. If the Close command is attempted on an area with existing active Alarm conditions or active Mask conditions, the screen will display an error such as:

Closed Error **--- Alarm Active ---**	**OR**	**Closed Error** **--- Mask Active ---**

3.2.1.2 "FORCE CLOSE" Command

If a normal "Close" command cannot be executed due to outstanding Off-Normal Alarm point conditions, an authorized user may essentially override the system by performing a "**Force Close**" command. The "**Force Close**" command will close and Arm the area (account) even though the area has active alarm conditions, however, those active alarm points must be MASKED before the Force Close command can be executed. The User, or the Man Number and code entered, must have "Privileged" Arm/Disarm capabilities as configured at the Host CPU. A Man Number without the privileged attribute cannot perform the Force Close nor the Mask/Unmask commands.

To perform a "**Force Close**" command, first Mask the alarm points that are currently active and cannot be cleared (refer to paragraph 3.2.1.3 below). From the User Command Screen discussed in paragraph 3.2.1, press the Up or Down arrows until the "**Force Close**" command is displayed in the center of the screen. Press the "**Exec**" key to execute the command. If all of the outstanding alarm conditions have been properly masked, the Close command function will be started and the "**Exit Delay**" screen (Figure 3-11) will appear on the LCD of the ACU-6

3.2.1.3 "MASK/UNMASK" Command

In order to "**Force Close**" an account that has an active off normal alarm condition (for example, a broken door sensor on a roll-up door), the user must first "**Mask**" the offending alarm zone. This requires the User's Man Number code to have been assigned the "*Privileged*" attribute when defined at the Host CPU. This special parameter allows certain users access to the "**Mask/Unmask**" command via the User Command Screen shown in Figure 3-9 above.

To perform a "**Mask**" or "**UnMask**" command, press the Up or Down arrows until the "**Mask/Unmask**" command is displayed in the center of the screen. Press the "**Exec**" key to execute the command. When executed the initial status screen for the selected Account will display. This allows the user to select the applicable alarm zone via the Matrix display method, or the "one zone at a time" method. Remember that the Matrix method requires setting the cursor on a zone, then pressing the "**SL**" (select) key (see paragraph 3.1.3.2). No matter what method is used, the selected zone will be shown in the following screen:

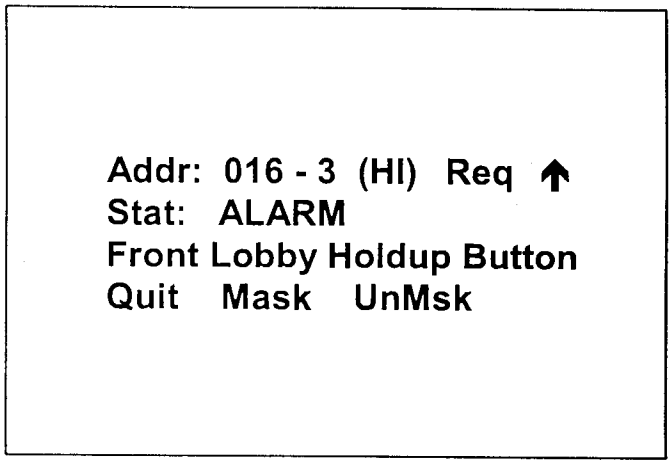


Figure 3-10. ACU-6 MASK/UNMASK COMMAND SCREEN

The "**MASK**" and "**UnMsk**" keys are used to perform the functions of Enabling or Disabling the monitoring of the alarm zone. The **Up** and **Down** arrow keys now take on a whole new feature in this mode, in that any masked zone (whether in alarm condition or not), or any zone in an active alarm condition (whether masked or not), will appear in the rotating display list that is accessed by pressing the Up and Down arrows. This makes this task much easier to manage. With the appropriate alarm point selected and displaying on the screen, press the "**Mask**" key or the "**UnMsk**" key to perform the desired operation.

3.2.1.4 The EXIT DELAY Screen

When the user arms the system, or account area, with a normal Close or Force Close command, the system will typically go into an Exit Delay mode, where the alarm points are not armed for a preset length of time to allow the user to exit the area without setting off alarms. This exit time is a configurable parameter in the RTU. While the exit timer is active and counting, the ACU-6 will display the **EXIT DELAY** screen, as shown below.

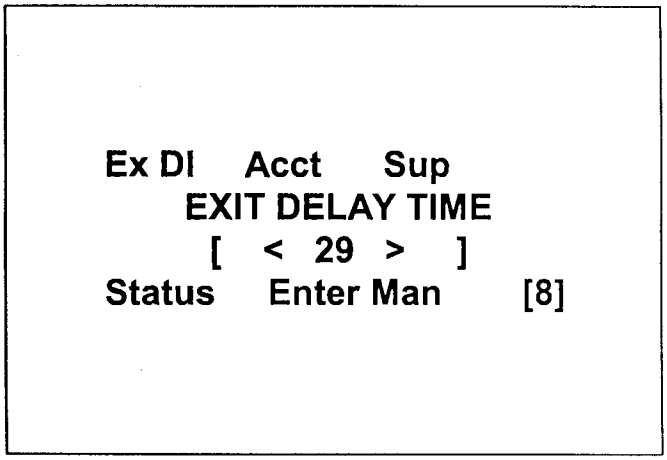


Figure 3-11. ACU-6 EXIT DELAY TIMER SCREEN

During the exit delay, the screen shows the exit timer countdown, showing the remaining time until the area secures (the account arms), and beeping as each second "ticks" off the timer value.

During this exit delay time, the user has the capability of performing other functions with the ACU-6 Arming Station. The "**ACCT**" key may be used to switch to another account during the exit, and therefore allow commands to be performed on this new account. The "**Sup**" key may be used to enter the Supervisor Configuration mode for setting or changing ACU-6 parameters. The "**Status**" key may also be used to request status displays of any valid account. And, the "**Enter Man**" function may also be used to enter a valid Man Number and Security code and perform other commands on this same Account or other Accounts. You may have realized that you forgot something in the area and need to go back in to get it. In this case, you are not required to wait for the exit time to expire. You can simply re-enter the Man Number/Code and execute an "Open" command, which will override the exit timer.

3.2.1.5 Account Open Time Feature

The SAFEnet System contains a little-used feature which allows accounts to manually or automatically control how long an account can remain open (for example, limiting vault open times to 1 hour). When the account has just been OPENED, the "**Time**" key label will switch to "**OpTm**" (open time) to display (and possibly edit) the open time. If the feature is not used, the word "Forever" is substituted for the HH:MM:SS time display. On the initial ACU-6 screen display, the OPEN TIME can be viewed by first calling up "**Time**", then selecting "**OpTm**" from the "**Time**" screen. (see Paragraph 3.1.3)

3.3 SUPERVISOR FUNCTIONS

The ACU-6 Arming Control Unit provides special configuration and operational functions which can only be accessed and performed by someone with a special "high level" access code which is different from any Man Number or PIN. These functions are typically allocated to a "Supervisor" or System Administrator or, in some cases, a System Technician. These functions are accessed by pressing the key labeled "**Sup**" which is present on a number of different screens within the ACU-6. When the "**Sup**" key is pressed from any screen display, the special supervisor access code will be requested with the prompt: "**SupMan#: . . . . .** ". The Supervisor Access Code is a 5-digit code with the factory default set in the EPROM to 00123. This can be changed via the EPROG programmer function of the Host CPU. The first 2 digits must be 00, since Man # 00 is the supervisor. Once a valid code is entered, the following screen is displayed:

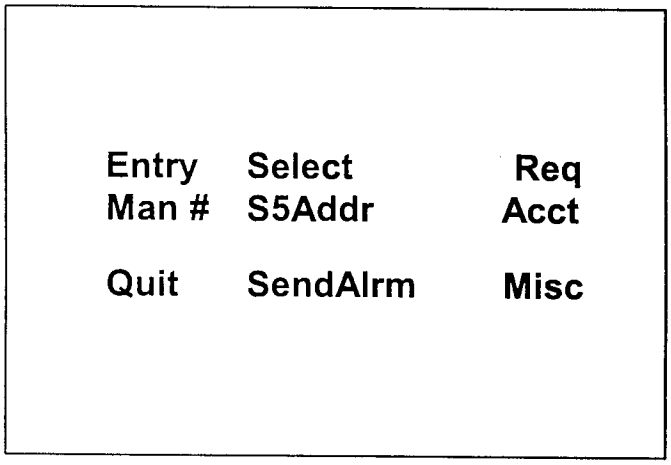


Figure 3-12. ACU-6 SUPERVISOR FUNCTION SCREEN

The Functions of the labeled keys are as follows:

Entry: Selects if **Man #** mode, **PIN #** mode, or both modes of user access code control will be used. The PIN method requires RTUs with card access control memory, and the option enabled in the software. If both Man# and PIN# mode is selected, the user be given labeled keys to press to choose which code they wish to enter for accessing the commands.

Select S5Addr: Allows the Supervisor or technician to setup and select the addresses (and therefore accounts) that this ACU-6 will control.

Req Acct: Requests the Account information to be downloaded from Host CPU when an Account assignment is made to this ACU-6.

SendAlrm: Used to send a "soft" Alarm to the Host CPU from the ACU-6. The alarm sent can be selected to be a FIRE, a HOLDUP/DURESS, a MEDIC, or a BURGLER/INTRUSION. This feature is normally used for test purposes.

MISC: The key is used to display the selections for a number of configuration features of the ACU-6 Arming Control Unit, such as:

A. Key Labeling (Vertical, Horizontal, Rotational, etc.)
B. Edit Names (allows local, manual editing of zone names)
C. CRC (verifies integrity of EPROM via CRC check and display)
D. Edit Accnt (allows local, manual editing of account names)
E. Edit Clock (allows local setting of clock/calendar)
F. Clr/Rst (allows purging and/or downloading of account, alarm zone, and control point names)

3.3.1 Account Select ("Select S5Addr")

The "**Select S5Addr**" key allows a Supervisor or authorized technician to setup and select the addresses and accounts that the ACU-6 Arming Control Unit will control. Only "free" addresses with an 'S5' ZIM (arming station ZIMs not already assigned to another ACT-5 or ACU-6) will be available for selection. The "**S5Addr**" screen is shown below:

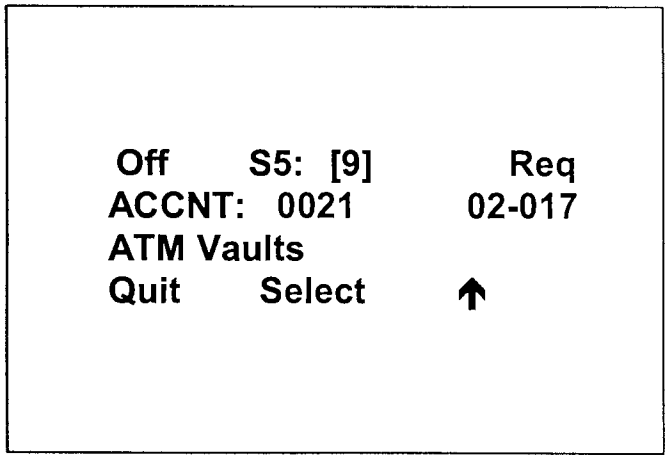


Figure 3-13. ACU-6 ACCOUNT SELECTION SCREEN

The functions of the labeled keys are as follows:

S5: [A]: Displays the arming station ZIM type and associated address.

The up and down keys scroll through the available accounts, with the ACCNT numbers, addresses, and names shown on the display.

Select: Selects the displayed 'S5' Address and Account to be assigned to, and controlled by this ACU-6, and switches the account from "Off" to now be the currently active Account. Use the arrows to scroll through each available 'S5' Address/Account to be controlled by the ACU-6, and use the "**Select**" function to assign them to this ACU-6.

3.3.2 Send Alarms

When installing, setting up and testing a new location with the ACU-6, it is often useful to create and send simulated alarms to the Host CPU central equipment via the keypad, rather than actually tripping the alarm devices. The "**SendAlrm**" function provides such a capability. When the "**SendAlrm**" key is pressed, the Send Alarm selection screen, shown in Figure 3-14, is displayed.

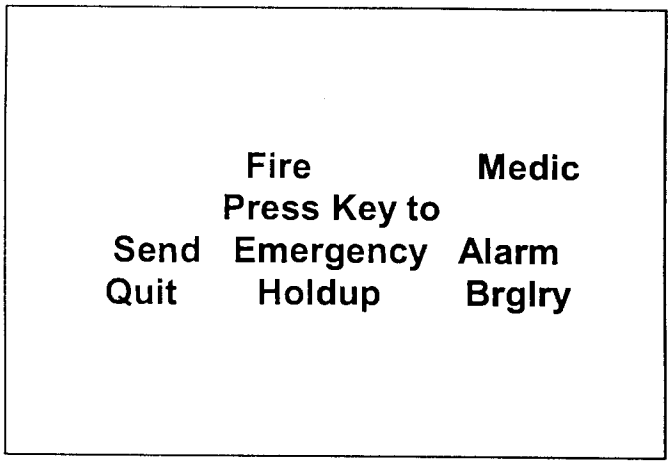


Figure 3-14. ACU-6 SEND ALARM SCREEN

The Send Alarm feature provides the capability to create and send to the Host CPU, a **FIRE** Alarm, a **HAZARD** (**Medic**) Alarm, a **HOLDUP/DURESS** Alarm, or an **INTRUSION/BURGLARY** alarm. Each alarm that is sent to the Host will be reported using the address and zone number of the first alarm zone, within the selected Account, that has the corresponding type of ZIM. If that ZIM type does not exist within that Account, the alarm cannot be sent to the Host CPU, and the following messages will typically be displayed:

Waiting for RTU Acknowledgement Send Fire Alarm in Progress	then ———	No Reply From RTU Please Contact System Supervisor

The first message is displayed while the processor is looking for that type if alarm zone (approximately 5 seconds), with the second message appearing after that and will stay on the screen for another 5-10 seconds.

If the alarm is sent successfully, the screen will immediately return to the "Send Alarm" screen as shown above with a single audible beep from the ACU-6. The operator at the HOST CPU monitoring station should then receive the alarm condition for processing and acknowledgement.

3.3.3 Misc. Configuration Command Menu Screen

The "**Misc**" key (lower right) of the Supervisor Function screen provides for a number of configuration, editing, and override capabilities to be performed by an authorized supervisor or system technician. Pressing the "**Misc**" key will display the Misc. Menu, as show below.

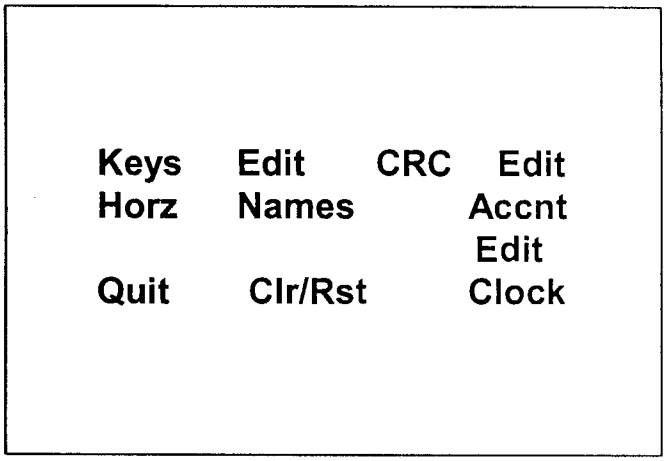


Figure 3-15. ACU-6 SUPERVISOR MISC. MENU SCREEN

The Misc. Menu allows the supervisor to perform the following tasks:

"Edit Names": Provides for the manual editing, at the ACU-6 keypad, of the alarm zone names for the selected Account. This can be used to modify the downloaded name or create new text.

"Edit Accnt": Provides for the manual editing of the Account name for the selected Account. This can be used to modify the existing name or create new text.

"Edit Clock": Provides for the manual setting of the Date and Time. Remember that the Date and Time is downloaded from the Host CPU every 15 minutes.

"Clr/Rst": Provides functions for clearing or re-downloading the Account names, Alarm Zone names and Control Point names within the ACU-6 local memory. A selection is also available to completely RESET the ACU-6.

"Keys": Provides a configuration utility to configure how the keys will be numerically labeled when entering an User Access code such as a MAN #, a PIN #, or Supervisor I.D. number. Selections are available to change the key numbering method for HORIZONTAL display, VERTICAL display, ROTATIONAL display, and ROTATIONAL + (which are numbers that shift around after each key entry)

"CRC": Provides for the calculation and generation of CRC test for various parts of the ACU-6 programs and memory. This is a Service Aid feature.

3.3.3.1 Edit Zone Names

If you desire different text names for the alarm zones than are downloaded from the Host CPU, the names may be manually entered via the "**Edit Name**" function of the "**Misc**" menu screen. After selecting the "**Edit Names**" function, the following screen is used to select the alarm zone you wish to edit. Only Line 3 of the display can be edited.

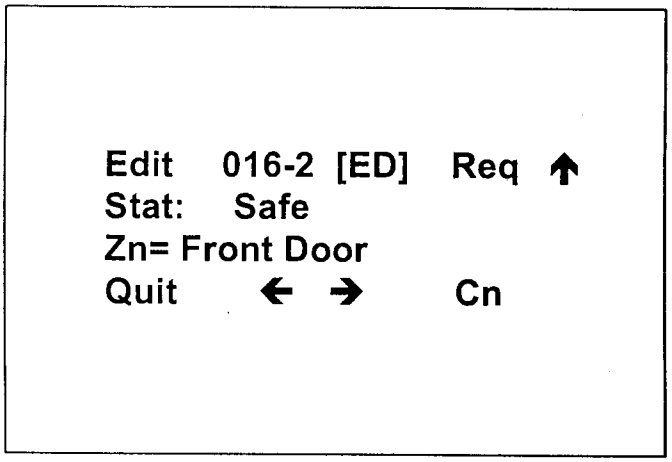


Figure 3-16. ACU-6 EDIT ZONE NAME ZONE SELECTION SCREEN

The displayed zone is identified by it's address-zone number (016-2), along with the zone type [ED] (entry/exit delay).

↑ The **Up** and **Down** arrows are used to move to the next or previous set of 8 zones (next or previous address).

← → The **Left** and **Right** arrows are used to move to the next or previous zone number (1-8) within the same address.

"**Edit**": Enters the editing function to begin editing of the zone name field (line 3) for the selected zone.

"**Req**": This key requests a download of the current zone text name from the Host CPU. Normally used if no text is displayed for the zone on the screen.

"**Cn**": Changes the name text on the screen to the text name of the correspondingly numbered control point.

Use the arrows to move between the applicable addresses and zones until the desired zone is displayed on the screen. Press the "**Edit**" key to begin editing the text.

3.3.3.1.1 Editing the Zone Name Text

Once the zone is selected, press the "**Edit**" key and the "Name EDIT" screen will appear:

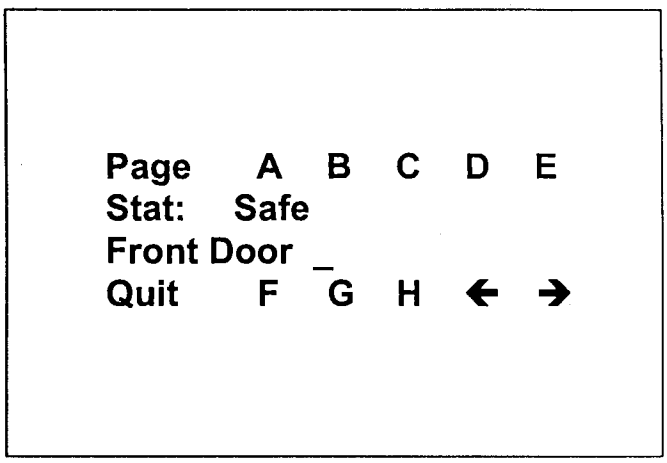


Figure 3-17. ACU-6 ZONE NAME EDITING SCREEN

The left (←) and right (→) arrow keys are used to move the cursor (underline mode) to the right or to the left. Moving the cursor left erases characters as it moves, leaving a blank space. Moving the cursor to the right skips over existing characters leaving them as they are.

The other keys around the display will be labeled with letters of the alphabet. Obviously, there are not 26 keys, so all of the letters cannot be displayed at the same time. The "**Page**" key will change the characters assigned to the character entry keys to a different set of characters. Upper and lower case, numbers, and common punctuation marks are available. Press the key corresponding to the character desired for that text position on the screen. Continue with the process, moving pages as necessary to find the required characters, until the text is as desired. When completed, press the "**Quit**" key.

To edit Control Point text names, use the same process to find the correct address and zone #, and then press the "**Cn**" key to switch the display to the Control Point text, and press "**Edit**".

3.3.3.2 Edit Account Names

If you desire a different text name for an Account, the Account name can also be edited. Editing the names of accounts is very similar to editing the alarm zone names. Press the "**Edit Accnt**" key on the supervisor "**Misc**" menu screen and the account selection screen will be displayed. The Account selection screen has only the up (↑) and down ( ) arrows to move between accounts. When the desired account is displayed on the screen, press the "**Edit**" key to begin the text edit process. The account name editing process is the same as the zone name text editor.

3.3.3.3 Change/Set Clock

To temporarily change the clock (remember, it is reset 4 times an hour by the Host CPU computer), press the "**Edit Clock**" key, which brings up the following screen:

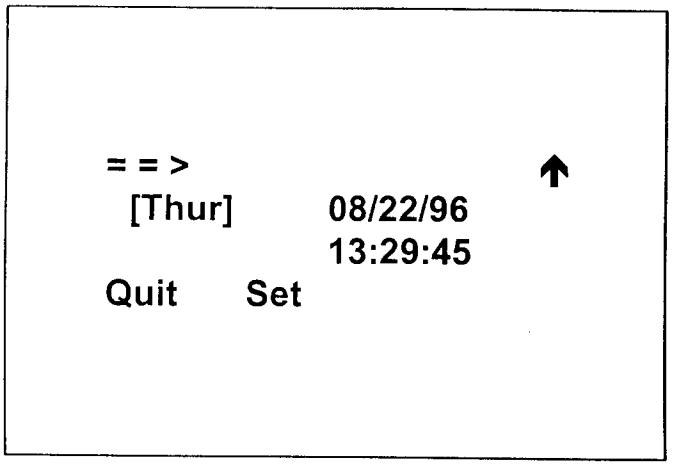


Figure 3-18. ACU-6 EDIT CLOCK SCREEN

The "==>" key is used to move the cursor to the various time and date digits. The up (↑) and down ( ) arrow keys are then used to increment or decrement the value of the selected digit. Press the "**Set**" key when the date and time are as desired.

3.3.3.4 Clear and Reset Functions

The Clear and Reset key ("**Clr/Rst**") is used for database setup maintenance, such as clearing all or part of the database memory, or re-downloading the entire database memory. Selecting the "**Clr/Rst**" key brings up the following screen:

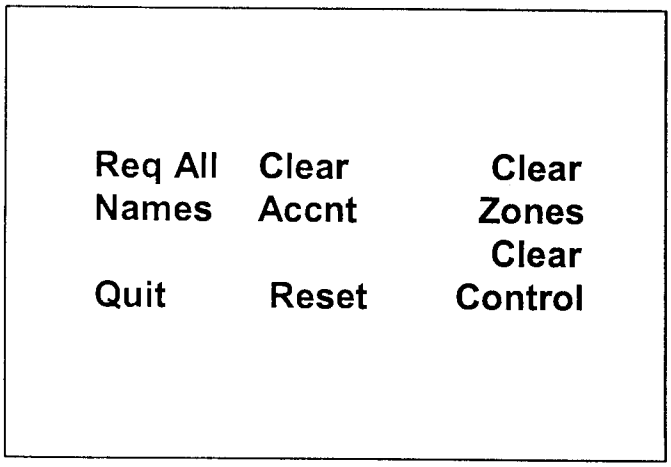


Figure 3-19. ACU-6 CLEAR/RESET NAMES SCREEN

The labeled keys function as follows:

"Req All Names": This key is used to request the Host CPU to completely re-download all of the Account names, Alarm Zone names, and Control Point names for the Addresses and Accounts assigned to the ACU-6. When this key is pressed, the screen will display the following message:

Waiting For RTU
Acknowledgement
Req. Accnt Name
Wait RTU Downloading

The 3rd line the message will change to "**Req. Zone Name xxx-x**" when the downloading of Account names is complete. While the zone names are downloading, the "**xxx-x**" will be displaying the RTU number and zone number being downloading. When the downloading of Zone names is complete, the message line will change to "**Req. Cntl Name xxx-x**" for the downloading of Control Point names, the "xxx-x" representing the applicable point numbers. When all downloading is completed, the screen will return to the ACU-6 initial menu screen.

"Clear Accnt": This key is used to erase all of the Account names presently stored in the ACU-6 database memory. Only the Account names are effected. When this key is pressed, the screen will display the following message:

--- Cleared All ---
Account Names

"Clear Zones": This key is used to erase all of the Alarm Zone names presently stored in the ACU-6 database memory. Only the Alarm Zone names are effected. When this key is pressed, the screen will display the following message:

--- Cleared All ---
Zone Names

"Clear Control": This key is used to erase all of the Control Point names presently stored in the ACU-6 database memory. Only the Control Point names are effected. When this key is pressed, the screen will display the following message:

--- Cleared All ---
Control Names

"**Reset**": Pressing this key will completely erase all of the database setup information, re-initialize the internal hardware and programs, and restart the ACU-6. This function is primarily used during initial setup in order to purge old data.

3.3.3.5 Key Labeling Setup

The "**Keys**" key of the "**Misc**" Menu screen is used to select one of four (4) different methods of labeling the number keys that are used for entering Man Numbers or PIN Numbers or ID numbers. The four labeling methods are as follows:

"**HORZ**": Horizontal Numbering - the upper row of small keys are labeled 1 thru 5 in order, and the lower row of small keys are labeled 6 thru 0 in order.

"**VERT**": Vertical Numbering - the upper row of keys are labeled with the odd numbers (1, 3, 5, 7, 9) and the lower row of keys are labeled with the even numbers (2, 4, 6, 8, 0).

"**ROT**": Rotational Numbering - a higher security option that changes the key labels to different labeling between each use. The numbers for the keys will still be labeled in numerical order, similar to the horizontal method, however the starting point will be different each time.

"**ROT+**": Rotational-PLUS - An even Higher security option that changes key labels between each keystroke entry. Again, the numbers for the keys will still be labeled in horizontal numerical order, however the numbers will shift to different positions after each keystroke.

The present method in use, or present setting, is shown on the screen display directly under the "**Keys**" label (see Figure 3-15). Each time "**Keys**" is pressed, the method shown will change to the next type. Continue pressing the "**Keys**" button until the desired labeling technique is displayed.

3.3.3.6 CRC Check

The "**CRC**" key is a service aid that is used to display the CRCs (Cyclic Redundancy Check) of various parts of the ACU-6 program and parameters in the EPROM. The result of the test is something like a checksum, where hexadecimal number values are calculated based on the data read by the test. When the "**CRC**" key is pressed, the screen will momentarily display the message:

One Moment Please
Firmware CRC Test
in Progress . . .

Followed by the result of the test:

```
ACU-6 CRC Test:
Par= BBA2  Code= 9693
CRD= 278E  Prom= F11A
Quit
```

For each ACU-6, the resultant hexadecimal number values should be the same every time the test is run, unless the Firmware EPROM has been upgraded or the internal parameter settings have been changed using the EPROG program of the Host CPU. The numbers may vary for different ACU-6 units as they may have different versions of Firmware or their parameters may be set differently.

3.4 ACCOUNT AND ZONE NAME SOURCES

The ACU-6 internal database will normally obtain the text names of Accounts, Alarm Zones, and Control Points via a download from the Host CPU. Alternatively, the ACU-6 provides a simple text editor to allow for the manual (though tedious) entry of text names. Some planning is required for the input of names into the Host CPU database that are useable as names in the ACU-6.

The ACCOUNT names (and numbers) come from the SAFEware/2 Account Editor screen. The 4-digit Account number and 20-character Account name can be downloaded from the Host CPU computer to the ACU-6 via a mouse click. A prompt will ask for account only (A), or both zone and account names (B).

The alarm zone editor in the Host CPU has both a long (60-character) and a "Queue" (14-character) name for the alarm and control zones. The shorter "Queue" names are downloaded to the ACU-6. These names can be downloaded from the CPU as well.

Depending upon whether the names are entered into the Host CPU database or the ACU-6 is installed first, CPU initiated or ACU-6 initiated downloads can be used. Sometimes, the ACU-6 and computer database are installed at the same time, allowing each account and zone's name to be checked and adjusted for best appearance.

Many of the ACU-6 screens have a "**Req**" key used to initiate the downloading of an Account or zone name upon request. This feature was included to let the user, rather than a service tech, refresh names that may have changed, been lost, or had not been entered at the time of the installation.

The ACU-6 is designed to be powered from the battery backed 'AUX' power terminals on an RTU TELCO Board. For this reason, there is no backup battery or non-volatile memory in the ACU-6. If the unit loses power for some reason, the names and active account settings are lost. Fortunately, it is very easy to either re-download names from the CPU "Account" editor, or via the Supervisor "Request All Names" key. Alternatively, the user can perform a "**Req**"(uest) on any screen with a missing name field, should the unit have lost data.