PTi

Falcon Access Control System

Installation and Operation Manual
Rev 11/94

**NOTICE TO INSTALLERS AND SYSTEM OWNERS/OPERATORS:** Reliable equipment operation is dependent upon noise free uninterrupted sources of power. The PTI Falcon battery back-up feature is provided primarily to preserve the integrity of the memory data base and operation of the PTI Falcon system. This will not guarantee operation of the gate motor or door actuator for emergency ingress/egress in the event of a power loss or equipment failure. It is the sole responsibility of the purchaser to provide for and facilitate manual non-electrical emergency means of exit in the event of a power failure. Contact your local dealer/installer for options and availability.

From the President...

Dear Customer,

Thank you for choosing PTI quality and reliability for your access control needs. The PTI Falcon has been specifically designed for your needs and will provide you with years of reliable service.

Before beginning your venture into this new technological approach to customer service, please take a few moments to familiarize yourself and your staff with the contents of this manual. It will soon become quite simple for you to understand the simple operation of the Falcon system as well as the options available to you.

If you have purchased the basic Falcon package, I am pleased to tell you that all PTI options are available to you as your needs as well as your customers needs change and grow. PTI offers a full range of options including, Personal Computer Interface for operating in conjunction with Management Software, Door Alarms for each individual unit, VGA quality custom designed graphics specifically written to exemplify your facility, Keypad Intercoms as well as PTI's exclusive CodeXpress Card Access Option.

Most importantly is your choice of company. PTI is a licensed engineering firm with a Registered Professional Engineer in due charge of its operation. This is an invaluable tool to you and your installer as you move into the world of Access Control Electronics.

Once again I thank you for your choice and welcome you and your staff to our family of customers.

Lance Comstock
President

Table of Contents

Introduction

The PTI Falcon is a multi-point access control system capable of hosting up to thirty two remote keypads or door alarm controllers. Multiple building sections are supported with multiple units per section. In addition, units may be subdivided with a subsection designation. Each unit may be classified into one of eight different access zones, which allows specified entry hours and entry points. Access zone hours may be specified separately for each day of the week and holidays. Up to thirty two preprogrammed holiday dates are also supported. Any individual unit code may be locked out with a few simple keystrokes. All access activity is logged on a standard computer style printer using standard paper. When used with the optional door alarm system, all door activity is also logged. The PTI Falcon also has built-in rechargeable batteries which allow the programming unit to remain completely operational during a power failure. The simple menu driven programming is easily mastered using the thirty two character alphanumeric display. The PTI Falcon cassette tape backup system is unique in the industry, allowing you to retain a non-volatile copy of your customer data on a standard audio cassette tape with a standard cassette recorder. This simple concept allows total elimination of accidentally erased memories.

The PTI Falcon contains an optional RS232C serial interface which allows the unit to be completely programmed and controlled by a Personal Computer. The PTI Falcon is capable of interfacing to most major Self Storage managemnt software packages. PTI Remote Management software allows total control of the PTI Falcon system by telephone from any remote location.

The PTI Falcon also supports a complete individual door alarm system. Unlike many competative systems, the built in battery backup allows the PTI Falcon to provide reliable alarm operation even hours after a complete power failure.

The PTI remote keypad contains a backlit silicone rubber booted keypad which is highly weather resistant and a backlit wide temperature liquid crystal display capable of displaying thirty two characters of alphanumeric data. The keypad unit can be used in total darkness with no exterior lighting required. The unique display allows the customer to be given instructions on how to use the keypad as well as a reason for denial in the case of customer lockout. Keypad options include a built-in intercom speaker, a built-in security camera, and a built-in card reader which allows the customer to gain access by using one of his own magnetic stripe credit cards.

Both the programming console and the exterior keypads feature rugged aluminum construction with a baked enamel finish. All exterior units contain stainless steel inserts and screws, resulting in an industrial rather than commercial grade product.

Getting Started

Following the checklist below will help you in incorporating the Falcon system into your business operation. Once the installation has been completed your are then able to begin programming the Falcon with the customer data either through the Falcon Base Unit keypad or through the use of your Software Management program. If you have purchased a Software Package for your facility, it is still highly recommended that you learn the process of programming at the Falcon Base Unit in the event your Personal Computer is not available to make important changes or transactions. Please note that in the event of a complete power failure, this checklist will be a valuable tool in re-starting the system. Keep it handy!

[ ] Take a few moments and read the manual so that you will be relatively familiar with the Falcon system. It may not be completely clear at first but that is O.K., you will learn easily as you go.

[ ] Complete the questionnaire in the Troubleshooting Section (Page 46).

[ ] Collect your customer files with the customers building section, unit number and access code available (Door Alarm Users will also need to know which Control Unit {Multiplexer} each user is assigned to as well as which door). If some customers have extended entry hour privileges, have that available also.

[ ] Insure that the RS485 cable, printer cable and 120V power cable are plugged into the Falcon Base Unit.

[ ] Users operating a Management Software Package insure that the RS232C Cable is plugged into the appropriate connector on the Falcon Base Unit as well as the serial port of your PC.

[ ] Power up your Remote Keypad Units, CodeXpress Card Readers, and Door Alarm Multiplexers.

[ ] Turn on your Falcon Base Unit. Users operating Management Software may continue from this point in accordance with your Software manufacturers specifications.

[ ] Set the Time and Date.

[ ] Set the Access Zone Hours.

[ ] Designate Holidays.

[ ] Begin entering your customers.

Equipment Overview

The Base Unit

The Base Unit serves as the main programming console for the PTI Falcon access control system. Figure One illustrates the front view of the PTI Falcon Base Unit.

At the top of the unit there is a two line by sixteen character liquid crystal display. When the display is not being used for programming, it will display the current date and time.

The center of the unit contains a keypad in a standard telephone arrangement. Often during programming, you will be asked a "Yes or No" question. When responding, the "*" key indicates "No" and the "#" key indicates "Yes". If you make a mistake when entering numeric data, the "*" key can also be used to backup or rubout one character at a time. When the correct data has been keyed in, the "#" key serves as the <Enter> key to save the data in memory.

2x16 Character Display

No/Rubout Key (*)
Yes/Enter Key (#)
Cassette Plug

PTI FALCON BASE UNIT
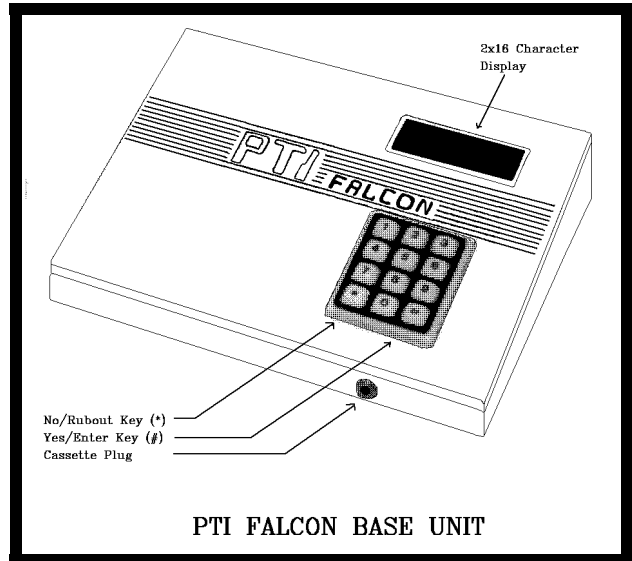
Figure One

The front of the Base Unit contains a 3.5mm standard audio cassette jack, which is used by the cassette tape memory backup system. This one plug is used for both recording and playing a tape with the Base Unit.

Figure Two illustrates the rear view of the PTI Falcon Base Unit.

Remotes   Serial   Printer   Fuse   Power

BASE UNIT – REAR VIEW
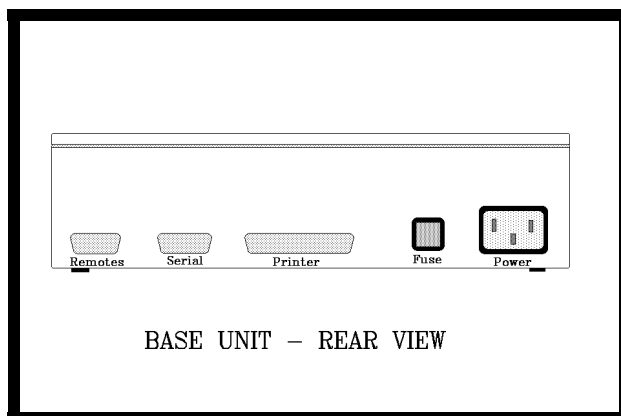
Figure Two

The left most connector (RS485) is a nine pin D-subminiature female connector and connects to the remote keypads and other remote devices. If door alarms are in use, the alarm relay contacts are also present on this connector. Falcon models with a red power switch will need this cable connected for battery back-up operation.

The center connector is a nine pin D-subminiature male connector and contains the RS232C serial port if the optional interface is

purchased.

The long right hand connector is a twenty five pin female which connects the standard parallel printer to the PTI Falcon.

Next to the connectors are the fuse holder and power line connector. The fuse may be released by inserting a small screwdriver into the notch in the top of the fuse holder and pressing down on the plastic release clip. **WARNING: TO PREVENT ELECTRIC SHOCK, NEVER REMOVE OR INSERT THE FUSE WITHOUT FIRST UNPLUGGING THE PTI FALCON BASE UNIT FROM THE POWER OUTLET!** The power line connector contains an integral RF line filter to reduce radio frequency interference with other electronic devices. **WARNING: ALWAYS UNPLUG THE POWER CORD FROM THE WALL OUTLET FIRST, BEFORE UNPLUGGING THE CORD FROM THE BACK OF THE PTI FALCON. ALWAYS PLUG THE POWER CORD INTO THE BACK OF THE PTI FALCON BEFORE PLUGGING THE OTHER END INTO A WALL OUTLET.**

The Remote Keypad

A PTI Falcon access control system may contain multiple remote keypads such as the one illustrated in Figure Three. The number of remote keypads will depend on the number of entry points to the facility through which you desire to control access.

The Remote Keypad unit contains a silicon rubber booted keypad in a typical telephone style arrangement. The keypad contains four small light emitting diodes (LED's) behind the rubber boot which serve to light the keypad for night use. These lights are continuously on, although they are not bright enough to be seen in daylight.

Figure Three

6

The Remote Keypad unit also contains a thirty two character liquid crystal display (LCD) arranged as two lines with sixteen characters per line. The display is fully alphanumeric which allows complete text to be displayed rather than just numbers. The LCD also contains a light em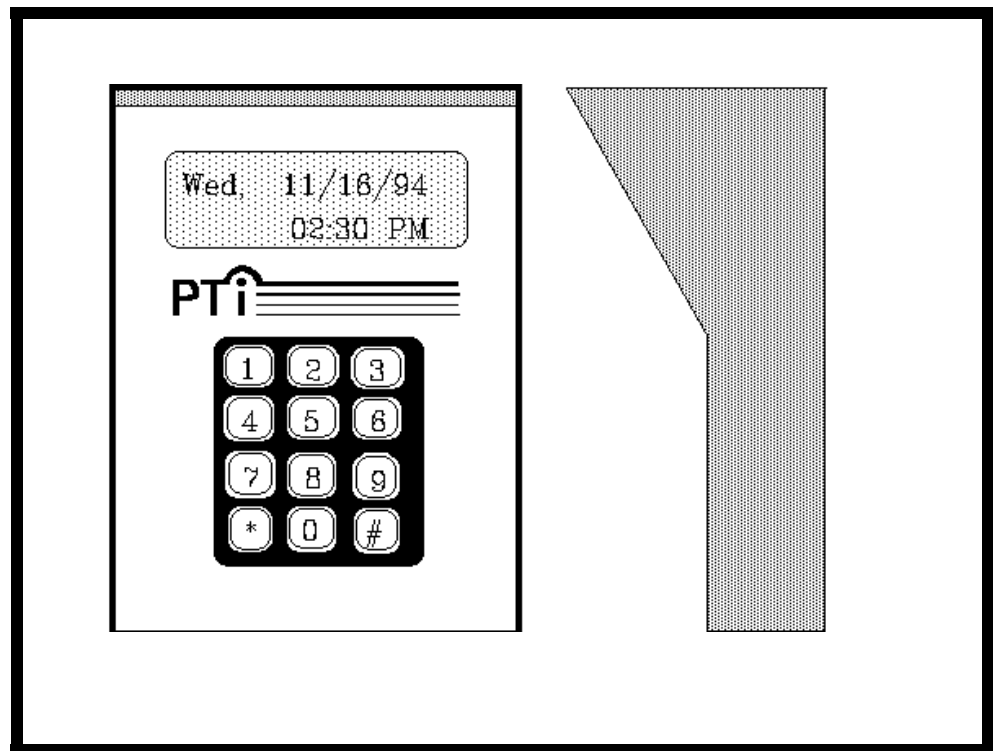itting diode panel (LED panel) behind it for night time viewing. This light only comes on when the "*" key is first pressed on the keypad to begin a transaction.

CodeXpress Card Reader Access

PTI CodeXpress card reader access control allows the operator to provide card access for the user without carrying the responsibility of purchasing, renting and recouping cards for the facility. PTI carries a pre-programmed magnetic stripe card for those facilities who would like to keep a stock of pre-programmed cards for their customers. PTI recommends asking the customer to select a card within their possession which has a magnetic stripe to be used as their access control card for your property. Assure the customer that the disclosure of the account number on the card is not at risk because the system software mathematically changes the account number into a ten digit code usable with the Falcon. Most cards with a magnetic stripe will work, including many frequent flyer cards, bank cards, video cards, credit cards etc. The card must obey the American Bankers Association (ABA Track 2) standard. The ten digit code corresponding to the card must be entered into the Falcon as the customer's access code.

In order to determine the ten digit code for a particular card, insert the card which chosen for access into the card reader. The display will indicate "Sorry, Access Denied" and the Falcon will print a 10 digit code which represents the solution to the mathematical computation done to the account number on the card. Take the number from the printout and enter it as the access code for the desired unit. *It should be noted that the customer can also use the keypad for access if they use the 10 digit code solution from their card. Property managers should decide if they would like to reserve this option for special customers only, or provide the 10 digit code to all customers using CodeXpress.* These steps should only take a few moments. Your new customer will now be able to us the CodeXpress system freely within the specified hours you have programmed for them.

Connecting Cables

The PTI Falcon requires several connecting cables for proper operation. Figure Four illustrates the power cord for the PTI Falcon. When installation is complete and you are ready to turn on the system, the female end of the power cord will plug into the power outlet on the back of the PTI Falcon and the male end will plug into a 120 VAC 60Hz outlet. **WARNING: TO AVOID SHOCK HAZARD, NEVER PLUG THE MALE END OF THE POWER CORD INTO A WALL OUTLET WITH THE FEMALE END EXPOSED!**
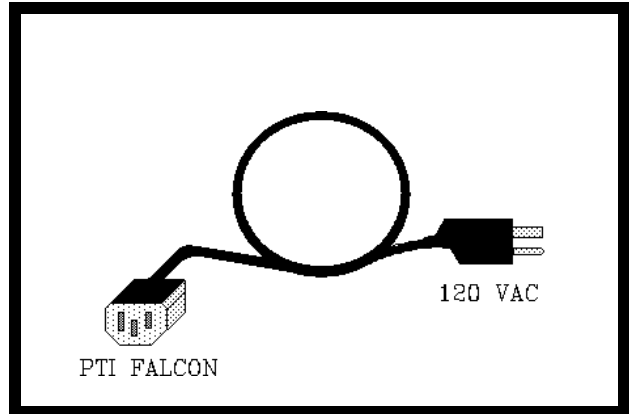
Figure Four
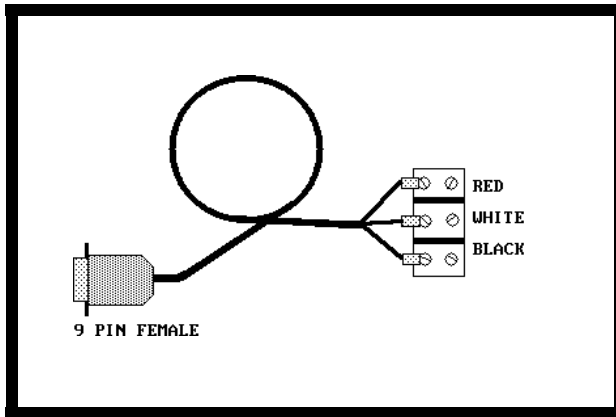
All of the remote keypads and other devices communicate with the PTI Falcon through the remote patch cord. This cord consists of a 9 pin male connector which plugs into the corner connector on the PTI Falcon. A three position terminal block is on the other end. It is on this terminal block that the field wiring from the remote devices will terminate. Systems with PTI door alarms will have a second three position terminal block on the end of this cable which provides the relay contacts to trigger the alarm siren.

Figure Five

If you have purchased a printer for the PTI Falcon, it will come with a standard computer style printer cable. The printer cable has a twenty five pin to 36 pin male connector on each end. The 25 pin end plugs into the printer connector on the back of the base unit, and the other end plugs into the printer.

8

If you have purchased the optional computer interface for the PTI Falcon, you will have a computer interface cable similar to the one pictured in Figure Seven. The PTI Falcon end of the cable will have a nine pin female connector and will plug into the nine pin serial port connector on the back of the PTI Falcon base unit. The other end of the cable will have either a nine pin female connector or a twenty five pin female connector, depending on which was ordered. This end will plug into the serial port on your computer or modem.
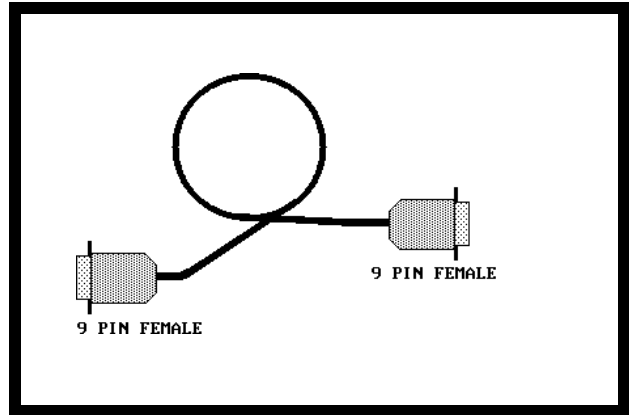
Figure Six

Accessories

Figure Seven illustrates the PTI gooseneck stand. This stand is designed to mate with the PTI remote keypad when it is used in a drive up application. The keypad mounting plate contains a center wiring hole which allows the wire to be fed up through the stand from underground conduit and three mounting holes which match the keypad backplate mounting holes. The mounting holes are tapped for an 8-32 machine screw.

The bottom plate of the gooseneck stand contains a center conduit hole and four mounting holes arranged on four inch centers. There is a cover plate which slides down over the bottom plate after mounting to hide the mounting plate bolts.

It is highly recommended that the gooseneck stand be electrically grounded to minimize the impact of lightning and static atmospheric charge on the keypad. It is also recommended that the installer seal the conduit hole inside the gooseneck stand to prevent moisture and humidity from entering through the back of the Remote Keypad Unit.

Figure Seven

9
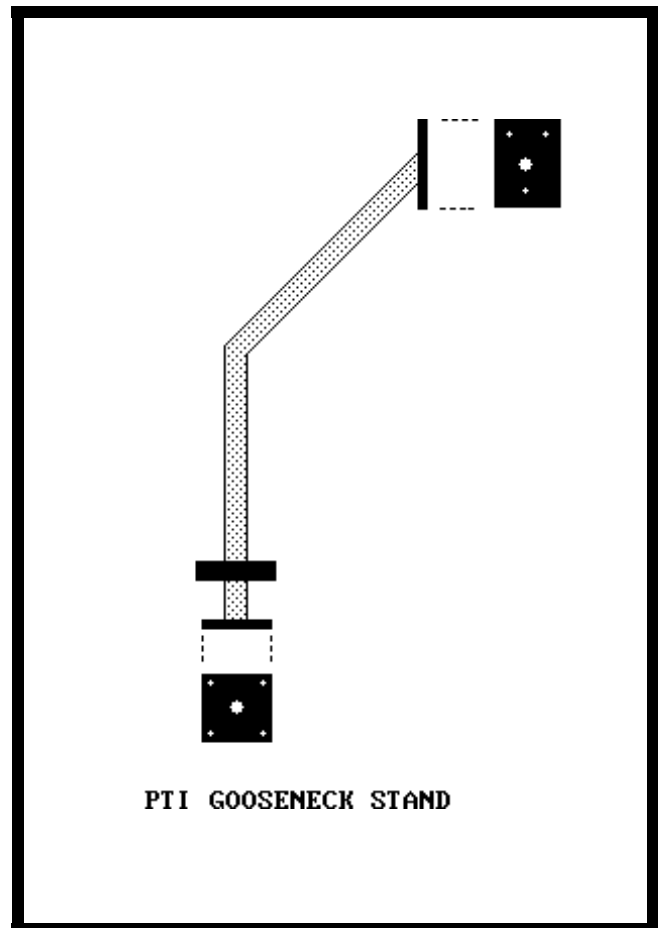
Individual Door Alarms

The PTI Falcon supports the use of PTI individual door alarms. PTI door alarms require the use of door alarm multiplexer (mux) boxes, such as the one pictured in Figure Eight. A mux box contains a master circuit board capable of multiplexing up to 96 doors. Mux boxes are available to the nearest multiple of sixteen doors up to 96.

Each building on the property must have its own multiplexer box or boxes. Multiplexer boxes are connected to the PTI Falcon base unit through the same three wire RS485 interface as the remote keypads.

Each alarmed door must have a magnetic door switch mounted on the door. The Mux box will connect to one wire from each switch in addition to a common wire which connects to all switches. Fifty conductor telephone cable is often used for the individual door wiring. If one multi-conductor cable is used for one mux board, one wire would be used for each door and two conductors for the common wire in order to increase the effective wire size for the common wire. In addition to the door wiring and communication wiring, each master mux board requires 12V

Figure Eight

power in order for the board to operate. A single 12V power supply with battery backup is often used to power all of the multiplexer boxes from a central point. This allows all of the field wiring to be low voltage. Each mux box contains a tamper switch to detect break-ins to the mux box itself. Optional 9V battery connections allow for local battery operation of each box.
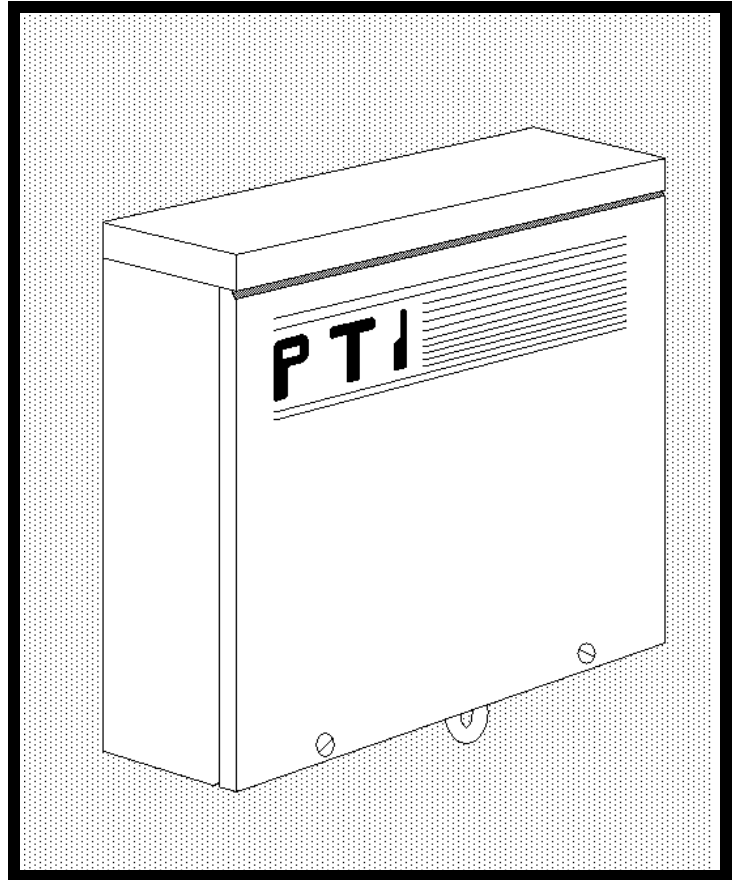
PTI Security Graphics

PTI Security graphics provides a full color image of your facility with rental units color coded according to current status. The image will scan horizontally, vertically, and diagonally as required so that all areas of the property are regularly displayed on the color monitor. In addition to the moving image, the last three access events will be displayed across the lower part of the monitor screen with color coded text. These text lines are a duplicate of the text which is logged on the printer.

There are six primary colors for rental units and three for event text as listed in the adjacent table. The **Door Open** and **Door Alarm** colors will not function unless the rental unit is wired with PTI individual door alarms.

Individual control of the image movement is allowed if the Graphics Switch Panel is connected. When the **Auto/Manual** switch is in the manual position, the image may be moved using the **Up, Down, Left** or **Right** push buttons. The image will remain still when no button is pushed. This allows the use of the image as a property map to direct a customer to his unit.

Security graphics is usually featured in a prominent position in the rental office, where it is clearly visible to both management and propective tenants. The color display is often wall mounted behind an acrylic security panel which contains the custom name and logo for the self storage.

Unit Colors

Vacant Unit	Gray
Rented Unit	Green
On-Site Unit	Blue
Locked Out	Pink
Door Open	Yellow
Door Alarm	Red

Text Colors

Normal events	White
Unusual Events	Yellow
Critical Alarms	Red
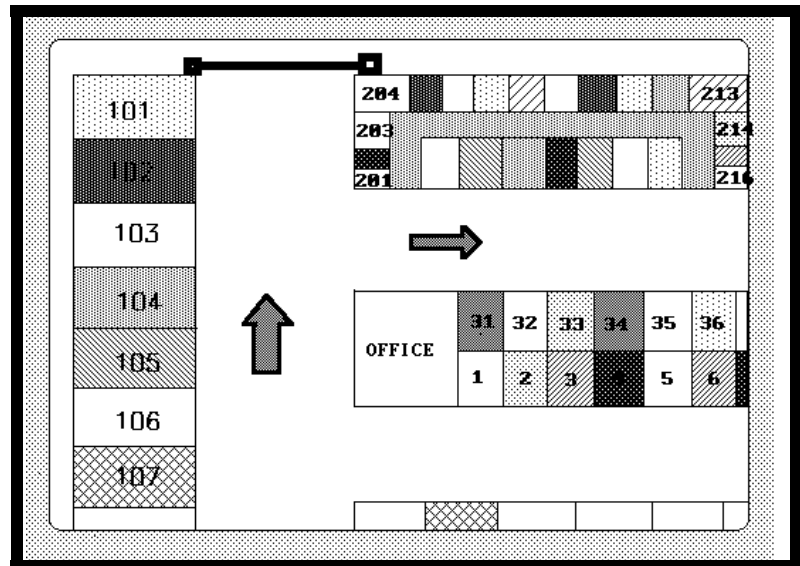
Figure Nine

Remote Management Software

PTI Remote Management Software is a IBM PC compatable software package which allows the control of a PTI Falcon system by a remote PC. The PC may be a direct connection in the same room as the Falcon, or may be miles away with the connection established with telephone Modems on an ordinary dial up telephone line. The Remote Management Software not only allows the PTI Falcon to be programmed from a remote location, it also allows the remote location to retrieve the access record for the property from the PTI Falcon and print it (or save it on disk) at the remote office. It is even possible to open the gate remotely.

It is ideal for those facilities which cannot support a full time manager, especially when used in combination with PTI individual door alarms. Please read your **PTI Remote Management Software** manual for additional details.
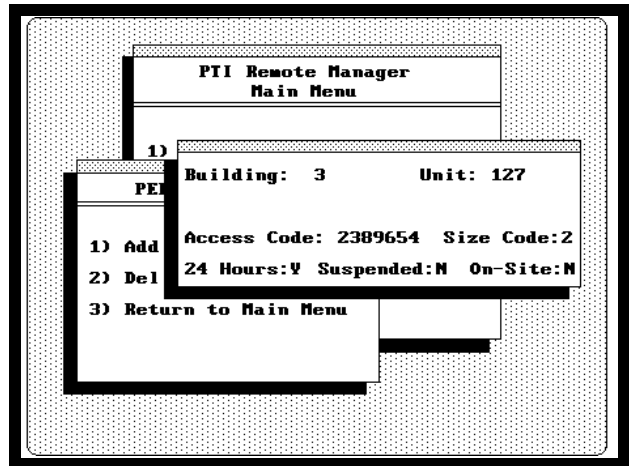
Figure Ten

Installation

Remote Keypad Installation

Open the Remote keypad by removing the four stainless steel button head machine screws on the sides of the keypad case. The front and back half will now separate. Mount the back plate to the desired keypad location using the three keyed holes.

Figure Eleven is a diagram of the circuit board found in the front half of the Remote keypad. The items of interest to the installer are as follows:

(1) Depluggable terminal strip TS1 with six terminals at the bottom left of the circuit board.

(2) Depluggable terminal strip TS2 with six terminals at the bottom right of the circuit board.

(3) Power line fuse on the bottom left side of the board.

(4) Relay contact fuse on the bottom right side of the board.

(5) Red rotary switch near the bottom center of the board.

(6) Eight position DIP switch under the red rotary switch.
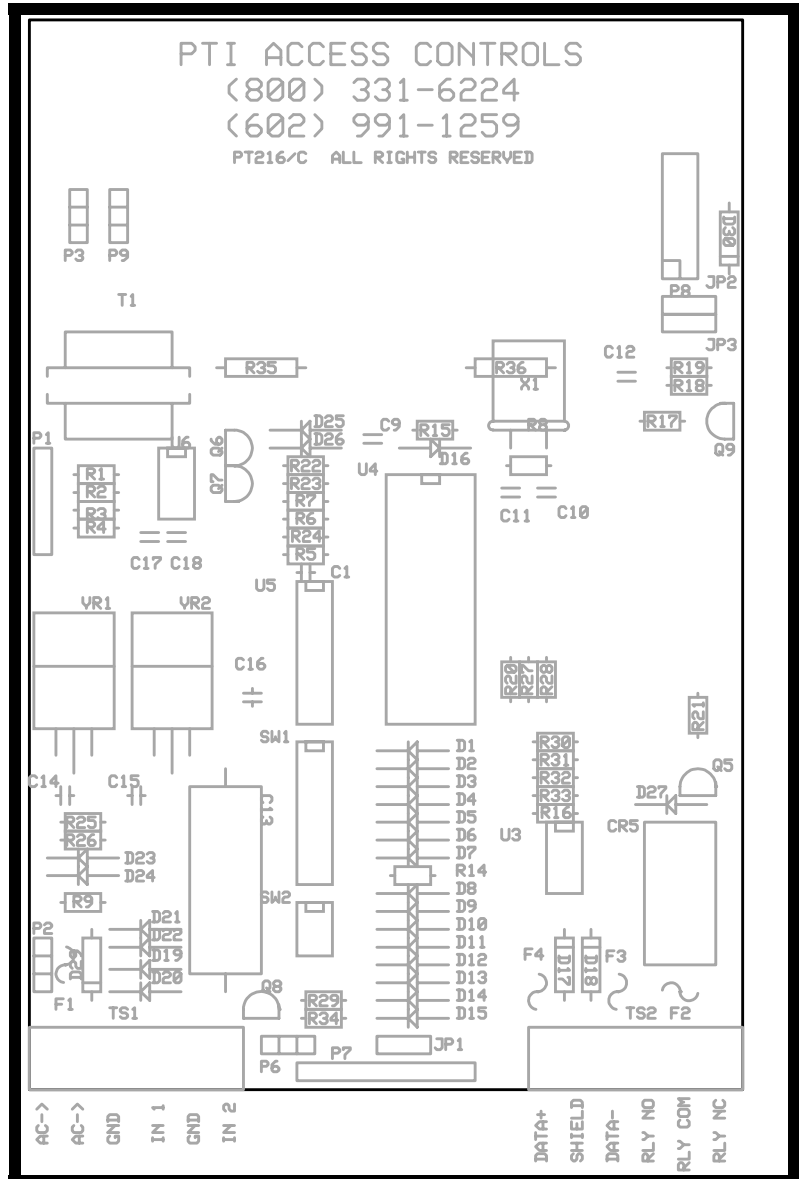
Figure Eleven

It is necessary to wire the following items to the remote keypad for proper operation:

(1)   Low voltage power and safety ground.

(2)   RS485 communication wires from the base unit.

(3)   Relay contact wires from the keypad relay to the entrance device.

Installation of wiring should proceed as follows:

(1)   Install the RS485 communication cable from the keypad to the base unit in the office. A 22 AWG shielded twisted pair with 22 AWG ground wire is best for this purpose. Terminate the wires as follows:

> TS2, pin 1 - Red Wire - to red terminal of remote patch cable
> TS2, pin 2 - ground - to white terminal of remote patch cable
> TS2, pin 3 - Black Wire - to black terminal of remote patch cable

(2)   Install the relay contact wires to the entrance operator; both normally open and normally closed relay contacts are available on the following terminals:

> TS2, pin 4 - Normally open relay contact
> TS2, pin 5 - Relay common contact
> TS2, pin 6 - Normally closed relay contact

Most electric gate operators require a normally open contact (pins 4 & 5). Some electric door strikes require a normally closed contact (pins 5 & 6). **WARNING: WIRING THE RELAY TO THE OPERATING DEVICE WILL INTRODUCE THE OPERATING DEVICE CONTROL VOLTAGE INTO THE REMOTE KEYPAD CABINET. THE INSTALLER MUST VERIFY THAT THIS DOES NOT CONSTITUTE A HIGH VOLTAGE! THE PTI KEYPAD IS NOT DESIGNED FOR THE PRESENCE OF HIGH VOLTAGE WITHIN THE KEYPAD CASE.**

(3)   Install low voltage power wiring into the keypad from the low voltage power transformer into TS1 as follows:

> TS1, pin 1 - 12 VAC
> TS1, pin 2 - 12 VAC
> TS1, pin 3 - ground

The PTI remote keypad will operate on voltages from 12V to 24V AC or DC, however, 12VAC is recommended for best operation. If you purchased a complete PTI Falcon system, a 12VAC transformer is supplied with the system.

(4)   The PTI remote keypad has an optional input circuit for reading auxiliary switches. The

auxiliary input is used to monitor an alarm switch input, which is typically used to detect forced opening of the gate or door controlled by the keypad. The auxiliary input can also be used to lock out the keypad from accepting codes based on a contact closure from an auxiliary device. This input is sometimes wired to a vehicle loop detector, which forces the customer to be in a vehicle before the keypad will allow access. If auxiliary contacts are used they should be dry contacts wired as follows:

        TS1, pin 4 - not used
        TS1, pin 5 - auxiliary contact common
        TS1, pin 6 - auxiliary contact two

Keypad Switches

The keypad switches must be properly set. The PTI Falcon system considers odd numbered keypads to be *entrance* keypads and even numbered keypads to be *exit* keypads. The first entrance keypad should be unit number one, the second unit number three, etc. Your exit keypads will then be units number two, four, etc. The unit number for each keypad is set with the red rotary switch. For unit numbers higher than nine, DIP switch number five should be turned on which adds ten to the rotary switch number. DIP switch number six may be used to add twenty to the rotary switch setting. It is possible to set the keypad number to any value from zero to thirty nine. Be aware that the PTI Falcon system reserves remote address zero for its own use, and a keypad set to be unit zero will not communicate with the base unit.

Finally, you must set the position of the eight DIP switches as needed for proper keypad operation. The switch functions are summarized in the following table:

Switch 1:	**OFF = echo code on display;**	**ON = no echo**
Switch 2:	**OFF = disable alarm input;**	**ON = enable**
Switch 3:	**OFF = disable loop input;**	**ON = enable**
Switch 4:	**OFF = 9600 baud (Watch Man/Box) (Falcon)**	**ON = 1200 baud**
Switch 5:	**OFF = add zero to unit number;**	**ON = add ten**
Switch 6:	**OFF = add zero to unit number;**	**ON = add twenty**
Switch 7:	**OFF = not used;**	**ON = not used**
Switch 8:	**OFF = high comm line impedance; ON = low**	

When DIP switch one is turned on, an "X" will appear on the keypad display as each digit of the access code is entered, rather than the actual digit. This may be set to your individual preference.

The PTI *Falcon* uses either a 1200 or 9600 baud communication rate, therefore **DIP switch four**

should be set to match the base unit setting!

Switch eight when ON, places a communication line terminating resistor across the RS485 data leads. This switch should be turned ON if the keypad is the last keypad on the RS485 communication wire, otherwise set it OFF.

Figure Twelve illustrates a Typical Wiring Scheme for a two keypad gate access system.
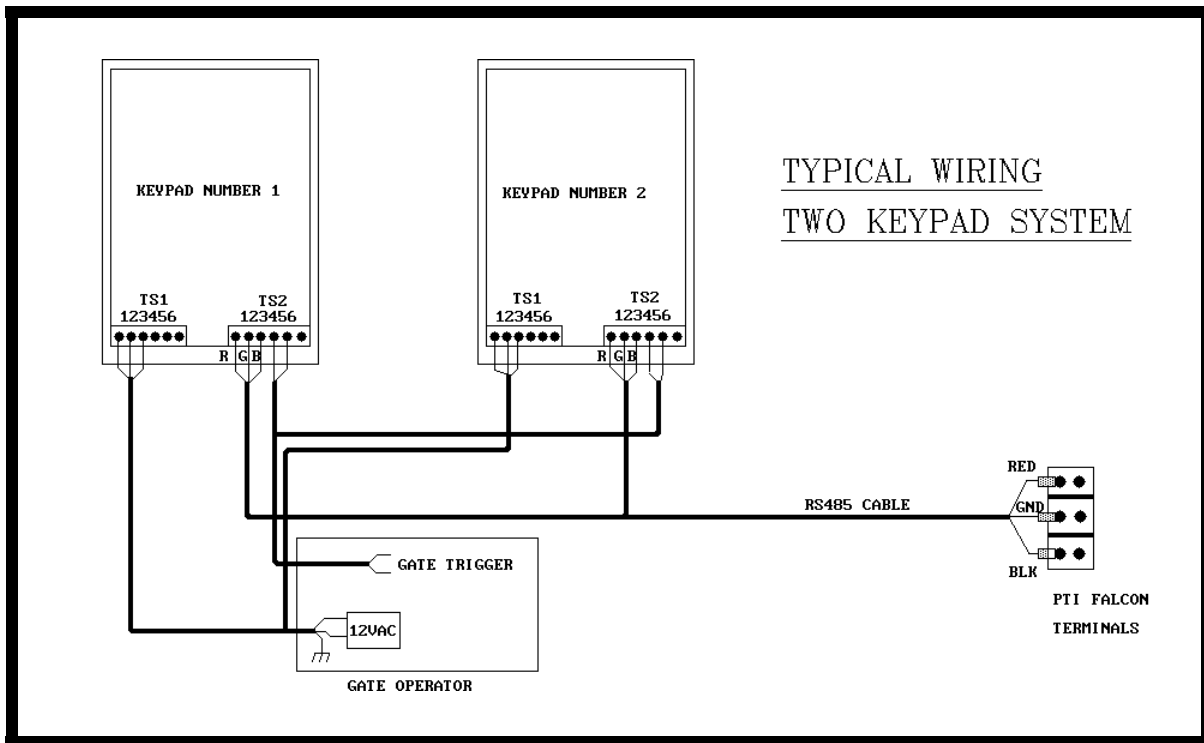
Figure Twelve

In this case, the twelve volt supply transformer for the keypad power has been located in the gate operator. In some installations, it may be more advantageous to locate this transformer in the office with the base unit.

With the RS485 communication scheme, a keypad can typically be located as far as four thousand feet from the base unit. As the wire length increases, a shielded twisted pair cable with ground wire becomes a necessity for proper operation.

Testing the Keypad

(1) Test the liquid crystal display by applying power to the keypad. A default date and time of manufacturing should appear should appear on the display after power is applied. The PTI Falcon base unit transmits the correct date and time (the date and time shown on the base unit display) to the remote keypads once a minute, so within 60 seconds the base unit will cause the date and time display to change to the time which is programmed into the Falcon. Verify that the display backlight is working by pressing the "*" key on the keypad. The light should come on when the "*" key is pressed and the display will say "Please Enter Access Code". If no keys are depressed for ten seconds, the date and time will return to the display and the backlight will shut off. The light is difficult to see in daylight, so you may have to cover the display to be certain that it is working.

(2) Test the keypad operation by pressing the "*" key. When the display says "Please Enter Access Code", press the digits "0-1-2-3-4-5-6-7-8-9". You should see each digit appear on the display as it is pressed (you will see an "X" for each digit if DIP switch #1 is set ON). Then press the "#" key to transmit the code to the base unit. The display will say "Please Wait" after the "#" key is pressed. If your keypad is communicating with the PTI Falcon base unit, the "Please Wait" message may quickly be replaced by a response from the base unit such as "Sorry-Access Denied".

(3) Check proper operation of the keypad backlights by cupping your hands tightly over the keypad and peering through your palms. This should block out enough ambient light for you to see the green lights illuminated behind the keypad.

(4) Test the keypad rotary switch setting by pressing the "*" key. When the display says "Please Enter Access Code", press the "#" key before pressing any other key. The display will show "Unit Number = XX" where "XX" is the keypad number. The display will return to the date and time after ten seconds.

(5) Test for communications with the base unit by turning on the base unit and entering the correct date and time into the base unit. The date and time at the Falcon should be sent to the keypad and appear in the display after it is changed in the base unit. This verifies communications from the base unit to the keypad. Test communications from the keypad to the base unit by entering an access code into the keypad and pressing the "#" key. If the keypad display responds with anything other than "Please Wait" before returning to the date and time, the keypad has successfully communicated with the base unit.

Individual Door Alarm Installation

(1) Find an appropriate location for the installation of each multiplexer box required for the door alarm system. Each building must have its own mux box. Buildings with a large number of doors to alarm may have more than one mux box. Remember that although the mux boxes may look identical on the outside, some boxes may be configured to handle more doors than other boxes, so take care to match the correct box to each building. Although the box enclosures are rainproof and the boxes may be mounted outdoors, use indoor mounting if available. Above the entrance door to a building with hallway access makes an ideal location.

(2) Mount each mux box by removing the door and circuit board and sinking screws or bolts through the four box mounting holes into the wall. Take care not to damage the circuit board during the mounting process. If you must drill to mount the box, do not allow any metal fragments to become lodged on the circuit board.
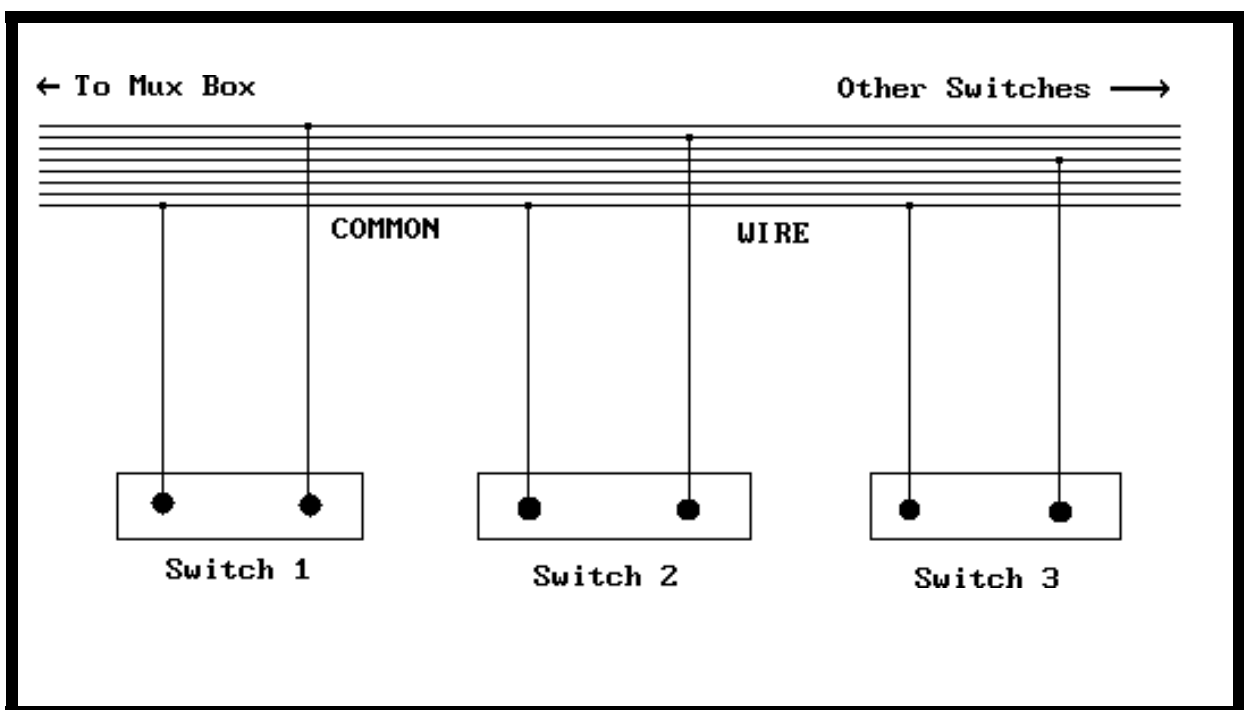
Figure Thirteen

(3) Install the door to door wiring cable and door switches. Splice the door switch wires into the main cable as indicated in Figure Thirteen. Choose a different color wire for one side of each switch. Choose one wire as the common wire to the other side of all the switches on the cable.

There are several possible cable routing schemes. You may decide to route one door to door cable from the mux box, or several depending on the number of conductors in the cable used and the box location within the building. Remember that the maximum number of switches on one cable is equal to the number of conductors in the cable minus one. Telephone cable is

18

commonly available in twenty four conductor or fifty conductor. One size will generally work better than the other depending on the number of doors and the mux box location.

Mount the magnet on the door and the switch parallel to the magnet approximately one inch away when the door is closed. Roll up style doors often require the use of a mounting bracket for the switch as shown if Figure Fourteen. The magnet may be either bolted to the door using the two mounting holes or glued using a panel adhesive.
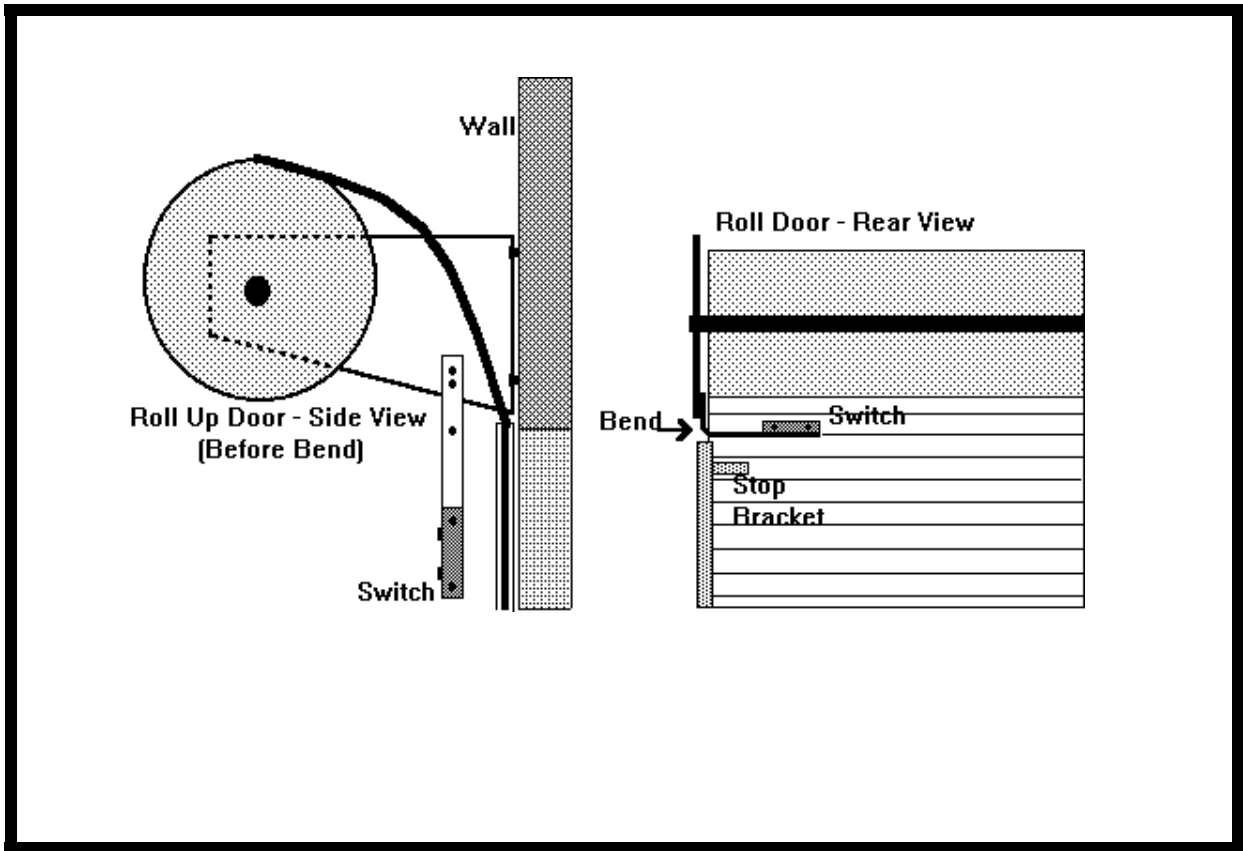
Figure Fourteen

(4)   Terminate the wires from the door to door wiring cable on the mux board connectors. Figure Fifteen illustrates the board layout. There must be one separate wire from each door switch and a common wire from all door switches. Terminate the separate wires on the twenty position terminal strips, beginning with position #1 on the top left. There are sixteen door channels per connector row followed by four common wire connections per row. The common wire or wires may be terminated on any of the last four-positions of any row.

Mux Box Switches

There are eight DIP switches on the mux board. The top five switches allow you to set the Mux box address using a binary code. The boxes may be numbered in any order as long as each box has a unique unit number that is not the same as any other mux box or keypad. It is typical to begin numbering the mux boxes at one higher than the last remote keypad number. For example, if there are two gate access keypads numbered one and two, then the mux boxes will be numbered three, four, five, etc. Using the top five DIP switches allows the mux box address to be set to any number from zero to thirty one. The Mux box address is displayed in the four digit display in the top right corner of the board.
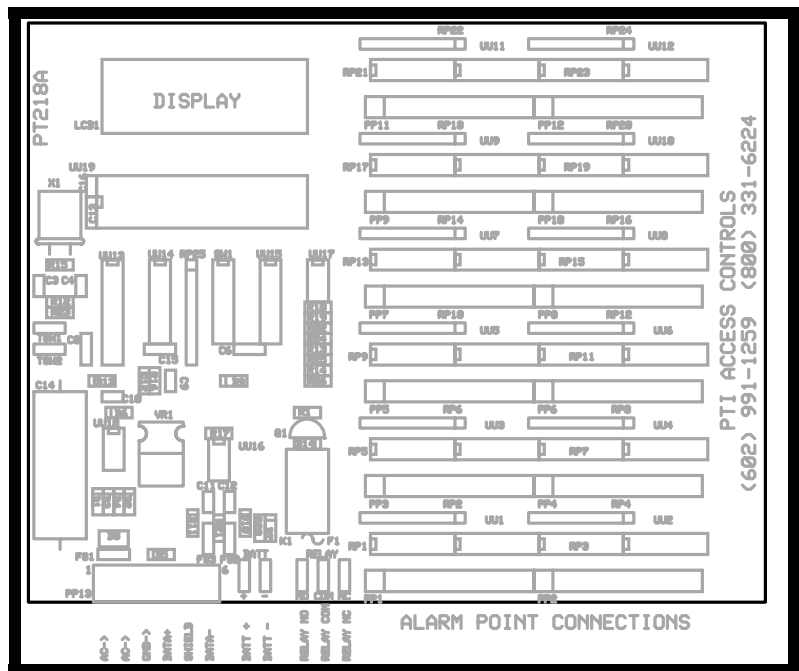
DIP switch Six is used to select 9600 or 1200 baud as the Mux board communication rate.

Figure Fifteen

Switch 1:	OFF = adds zero to address:	ON = adds one
Switch 2:	OFF = adds zero to address:	ON = adds two
Switch 3:	OFF = adds zero to address:	ON = adds four
Switch 4:	OFF = adds zero to address:	ON = adds eight
Switch 5:	OFF = adds zero to address:	ON = adds sixteen
Switch 6:	OFF = 9600 Baud communication:	ON = 1200 baud
Switch 7:	OFF = auxiliary relay disabled:	ON = relay enabled
Switch 8:	OFF = tamper switch enabled:	ON = disabled

DIP switch Seven is used to enable the Mux board optional auxiliary relay. When present, the relay will trip when an alarm has occurred, which allows auxiliary remote sirens to be triggered from the nearest Mux box.

DIP switch Eight is hooked in parallel with the tamper switch connections. When DIP switch Eight is on, the tamper switch is shunted. Set the DIP switches as summarized in the following table:

For example, Address twenty may be selected by placing switches three and five **ON**

20

and switches one, two, and four **OFF**. The result is then **4 + 16 = 20.**

Install the communication and power wiring to the mux boxes. Communications and 12 VAC power may be run through the same cable if a cable with two individually shielded twisted pairs is used. 22 AWG is sufficient wire gauge for most applications. Figure Sixteen illustrates a typical hookup
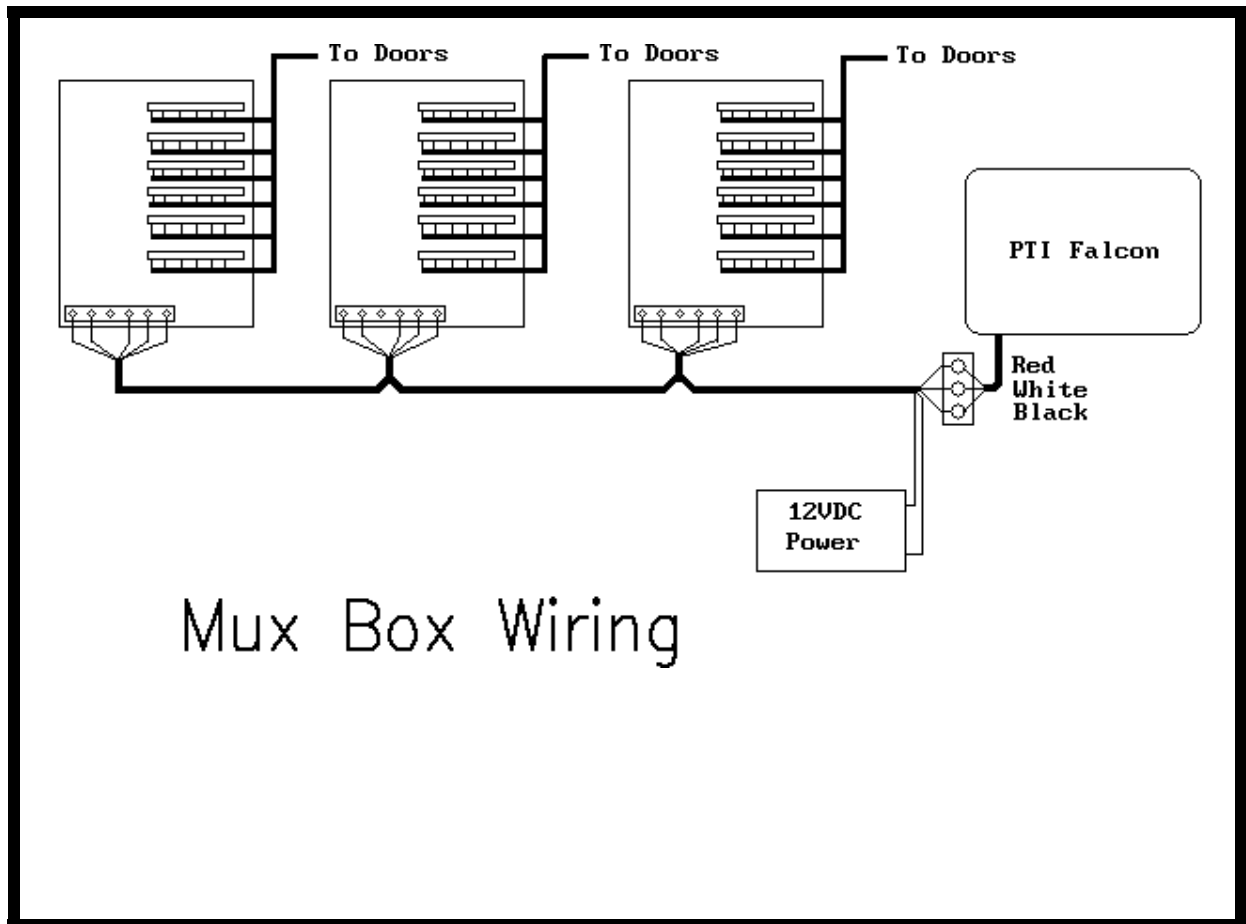
Figure Sixteen

for power and communication wiring.

Testing the Alarm Wiring

The PTI Mux board contains a four digit Liquid Crystal Display (LCD) in the upper left corner of the circuit board. There are three different diagnostics displayed on a continuous basis:

> (1) The display will present the time of day in the format HH:MM. The time is transmitted to the Mux board from the PTI Falcon base unit once a minute. The time will default to 12:00 at power up. If the time display changes to match the base unit within one

minute, communications has been established with the PTI Falcon base unit.

(2)   The display will present the address of the Mux box in the format Un:XX, where XX is the two digit unit address set with DIP switches 1-5 in the range 00-31.

(3)   The display will present the number of the last switch channel to Open or Close in the format O-XX or C-XX, where XX is the two digit channel number in the range 00-96. Channel 00 is the door tamper switch and channels 01-96 are normal alarm switches.

Testing Mux Box Communications

To test communications with the alarm multiplexer box, your PTI Falcon base unit must be installed and operational, and your communication wiring to the alarm mux box must be in place. Test communications as follows:

(1)   Check that all wiring is in place, all switches properly set, and all cables plugged in to the back of the PTI Falcon base unit. Apply power to the alarm mux boxes.

(2)   Load the printer with paper according to the instructions in the printer manual and apply power to the printer.

(3)   Apply power to the PTI Falcon base unit. After several seconds, the PTI Falcon will print on the printer "Comm On - Remote XX" along with the date and time as shown on the base unit display, where "XX" is the remote number for which communications has been logged on. One line will be printed on the printer for each remote device. If communications is lost to a remote device after being logged on, the message "Comm Off - Remote XX" along with the date and time will be logged on the printer.

Base Unit Installation

Follow the following steps for installation of the PTI Falcon base unit:

(1) Locate the base unit at a readily accessible position where there is power available. Plug the AC power cord into the back of the base unit. **Do not plug the power cord into a wall outlet yet.**

(2) Locate the printer at a readily accessible position where there is power available. Install the printer cable between the base unit and the printer by plugging the connector in at each end. Tighten the cable retaining screws using a small screwdriver. Install the printer ribbon and paper according to the instructions in the printer manual **before plugging the printer power cord into a wall outlet.**

(3) Make certain that the communications wiring from the remote keypads and door alarm multiplexers has been properly terminated on the remote patch cord and that the wires are in the correct order on the patch cord terminal block.

(4) If you have ordered the optional computer interface for the PTI Falcon, install the computer interface cable between the base unit and your personal computer.

(5) Plug the base unit power cord into a properly grounded outlet. **WARNING: SHOCK HAZARD! NEVER OPERATE THE PTI FALCON BASE UNIT FROM AN UNGROUNDED OUTLET OR USE A THREE TO TWO WIRE CONVERSION ADAPTER WITH THE PTI FALCON!** If your office is not equipped with safety grounded outlets, consult a licensed electrician to have a properly grounded outlet installed.

(6) Turn on the AC power switch on the rear of the base unit. The default date and time should appear on the display. Then install the remote patch cord in the connector on the rear of the base unit and tighten the retaining screws. This will not only complete the connection to the remote devices, but will allow the internal batteries to begin to charge. The batteries may require forty eight hours of initial operation of the base unit before being fully charged.

(7) Apply power to all remote keypads and door alarm boxes and begin testing.

Typical wiring for the PTI Security Graphics system is shown in Figure Seventeen. The small graphics adapter board allows the graphics controller to be hooked up to the PTI Falcon in the same manner as a remote keypad. Since data is transmitted from the PTI Falcon base unit to the Graphics controller only (not from the Graphics controller to the Falcon), no **Remote Unit Address** is required by the Graphics controller. Therefore, the PTI Falcon will not log "Communications On"
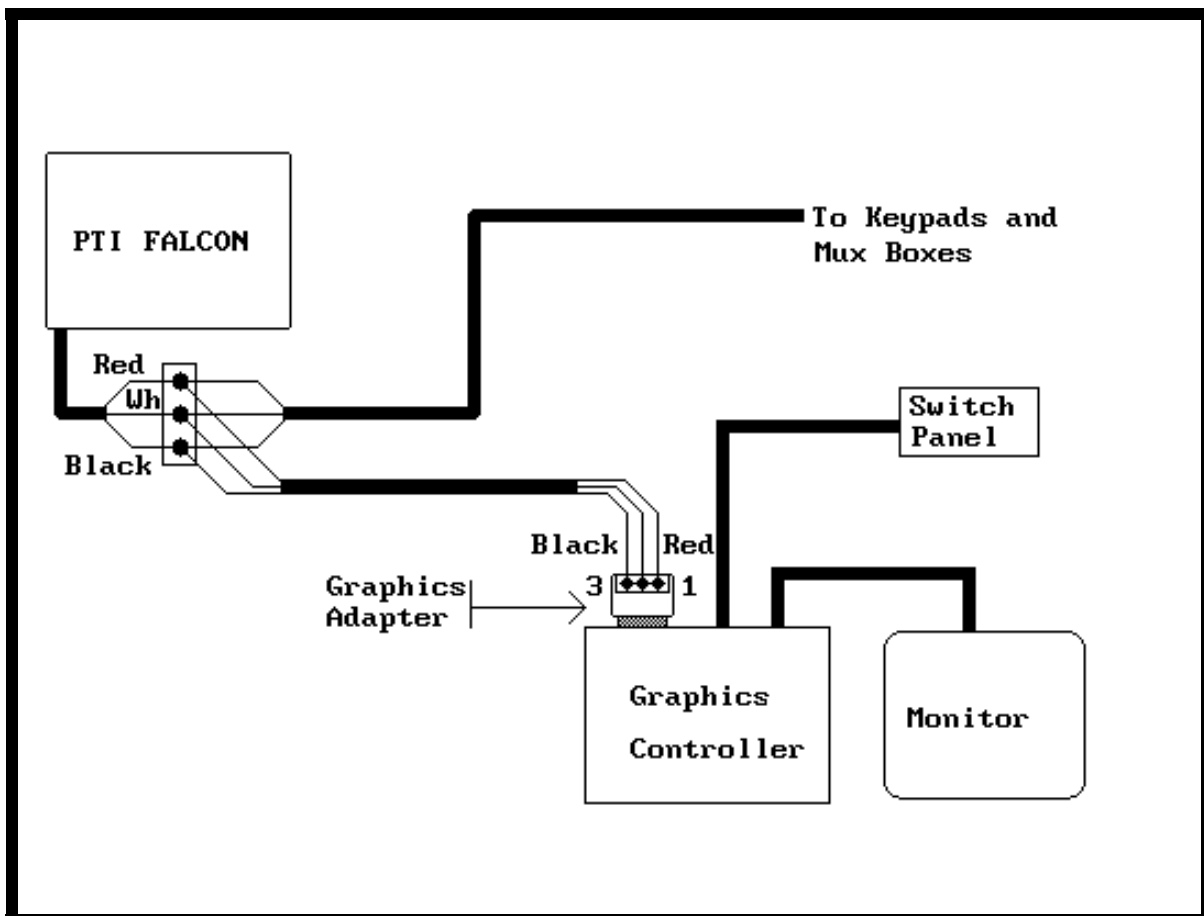
Figure Seventeen

or "Communications Off" for a Graphics Controller as it does with Remote Keypads and Door Alarm Mux boxes. If access events are logged across the bottom of the graphics screen as they occur, the system is communicating properly with the Graphics controller.

The installer should note that the Graphics Adapter is plugged into the serial port of the computer, the Switch panel is plugged into the printer port, and the VGA monitor is plugged into the VGA port.

Programming

General Information

The PTI Falcon uses a menu driven programming system which is easily mastered. Individual programming commands are accessed by *function number*. There are a total of fifteen function numbers listed on the programming guide sticker on the front of the base unit. A copy of the programming guide sticker is given here for reference. To access a programming function, proceed as follows:

Press "*".
Enter the Number
Press "#".

BASIC KEYPAD INSTRUCTIONS
PRESS * KEY, FUNCTION NUMBER, # KEY
OR PRESS * THEN # FOR HELP

1 - SET TIME/DATE
2 - SET TIME ZONE
3 - SET HOLIDAYS
4 - VACATE A UNIT
5 - RENT A UNIT
6 - DELETE A UNIT
7 - SET MASTER CODE
8 - PRINT REPORTS
9 - SAVE ON TAPE
10 - LOAD FROM TAPE
11 - OPEN ENTRANCE
12 - CLEAR ALARMS
13 - ALARM CONTROL
14 - CONTROL OPTIONS
15 - ADJUST CONTRAST
16 - UPDATE GRAPHICS

(The display will read "Function? ")

(The PTI Falcon will begin the selected Function)

PTI Access Controls · Scottsdale, AZ
(800) 331-6224 (602) 991-1259

If the programming guide sticker is unavailable, it is possible to scroll through the available function numbers on the PTI Falcon display. This is accomplished as follows:

Press "*".   (The display will read "Function? ")
Press "#".   (The display will move to Function #1)

If you wish to select a Function other than Number One:

Press "*".   (The display will move to Function #2)

Continue to press "*" until the desired Function Number is displayed, then:

Press "#".   (The display will begin the selected Function)

If you scroll through all function numbers without making a selection, the display will read "Setup Done?". To scroll through the functions again, press "*" for NO, or if you are finished, press "#" for YES.

Programming a New Installation

In order to program a new installation, you must perform the following steps:

(1) Set the correct time and date (Function #1)

(2) Program at least one time zone (Function #2)

(3) Add new units as required (Function #5)

Optional programming steps that may be necessary after completing the above steps are as follows:

(1) Set holidays that are to be recognized (Function #3)

(2) Suspend access for any overdue customers (Function #5)

Programming details for each function number are given in the sections of the manual that follow.

Function #1 - Set Time/Date is used to enter the correct time and date into the PTI Falcon. The date is entered in Month-Day-Year format (American version) or Day-Month-Year format (European/Australian version), with two digits required for each. Even though no punctuation marks (slashes) are entered from the keypad, the PTI Falcon will provided them on the display. For example, to set the date to January 9, 1991, you must enter **01/09/91**. Note that years from 85-99 refer to 1985-1999, and years from 00-84 refer to 2000-2084.

In the example at the right, the bold face type has been entered to change the date from the initial setting of 01/01/87 to 01/09/91. Press "#" to set the new date.

```
Enter   01/01/87
Date:   01/09/91
```

After entering the correct date, you may enter the correct time. The time is entered in Hour-Minute format, with two digits required for each. Even though no punctuation marks (colon) are entered from the keypad, the PTI Falcon will provide them on the display.

For example, to set the time to 3:00 PM, you must enter **03:00** from the keypad. The display will then alternately blink between 03:00 **AM** and 03:00 **PM**. Press the "#" key when **PM** is displayed to select 3:00 PM. The example at the right indicates the screen appearance when entering the time.

```
Enter   12:00 AM
Time:   03:00 PM
```

At times, you may wish to change only the time without affecting the date, or only the date without affecting the time. This is possible by pressing the "#" key as the first key entered when you are asked to enter a new date or time. If the "#" key is pressed first, the entry will be skipped (and thus remain at its present value) and the PTI Falcon will proceed to the next entry.

Whenever the date or time is changed, the PTI Falcon will recalculate the proper day of the week. The PTI Falcon display will indicate the day of the week, the correct date, and the correct time on the display when no other function is being performed. An example of the display appearance is shown at the right.

```
Wed.      01/01/91
          03:00 PM
```

```
┌─────────────────────────┐
│                         │
│   Function #2 -         │
│   Set Time Zone?        │
│                         │
└─────────────────────────┘
```

Function #2 - Set Time Zone is used to set the normal access hours that you wish to allow for your customers. Business hours are specified with both an **Open Time** and a **Close Time**. Open and Close times may be specified separately for each day of the week and Holidays. The time zones are numbered from one to eight.

After selecting Function #2, the display will appear as indicated. Select the time zone number by entering a digit in the range 1 - 8 and press #.

```
┌─────────────────────────┐
│ Time Zone # =           │
│                         │
│                         │
└─────────────────────────┘
```

Each time is entered a format similar to that used for setting the time with Function Number One. For example:

On Mondays, allow normal access from 8:00 AM to 5:00 PM.

```
┌─────────────────────────┐   ┌─────────────────────────┐
│ Monday      12:00 AM    │   │ Monday      12:00 AM    │
│ Open:   08:00 AM        │   │ Close:  05:00 PM        │
└─────────────────────────┘   └─────────────────────────┘
```

The times for Tuesday through Sunday are entered in a similar fashion, followed by the desired times for Holidays. If you wish to completely lockout entry for a particular day, set both the Open time and Close time to 12:00 AM.

As in Function One, select between AM and PM by pushing the "#" key when the desired setting appears on the screen. Normally, the Open time for a given day occurs before the Close time. If you specify a Close time which is earlier in the day than the Open time, the PTI Falcon will allow normal access all hours of the day except the time between the Close time and the Open time.

In this example, the PTI Falcon will allow access at all hours on Saturday except 8:00 AM to 11:00 AM.

```
┌─────────────────────────┐   ┌─────────────────────────┐
│ Saturday    12:00 AM    │   │ Saturday    12:00 AM    │
│ Open:  11:00 AM         │   │ Close:  08:00 AM        │
└─────────────────────────┘   └─────────────────────────┘
```

After specifying the allowed access hours for each day of the week, the PTI Falcon will request the authorized keypads that customers in this zone will be

```
┌─────────────────────────┐   ┌─────────────────────────┐
│ Keypads  00000000       │   │ Keypads  00000000       │
│ (1 - 8):  11010000      │   │ (9 -16):  00000000      │
└─────────────────────────┘   └─────────────────────────┘
```

allowed to use. The keypads will be split into two groups for data entry purposes. Keypads One

through Eight will be in the first group, and keypads Nine through Sixteen will be in the second group. Within each group enter a string of eight digits left to right. Enter a "1" if the customer is allowed to use the keypad or a "0" if they are not allowed to use the keypad. In the example shown, access to keypads One, Two and Four is allowed. The PTI Falcon allows this specification for the first sixteen keypads only. The customer will automatically be allowed to use keypads which are numbered higher than sixteen.

```
┌─────────────────────────────────┐
│                                 │
│       Function #3 -             │
│       Set Holidays?             │
│                                 │
└─────────────────────────────────┘
```

Function #3 - Set Holidays allows up to thirty two holidays to be specified in advance by date. On these days, the PTI Falcon will use the holiday access hours rather than the normal weekday, Saturday, or Sunday access hours. Each holiday is assigned a consecutive holiday number in the range of one to thirty two. The holidays do not have to be assigned in any particular order.

For example, to set holiday number three to be July 4, 1991, enter **3** for the holiday number as shown.

```
┌─────────────────────────────────┐
│                                 │
│   Holiday # = 3                 │
│                                 │
│                                 │
└─────────────────────────────────┘
```

Then, enter **07/04/91** for the holiday date as indicated. On July 4, 1991 the programmed holiday hours will be observed by the PTI Falcon.

```
┌─────────────────────────────────┐
│   Holiday          00/00/00     │
│   Date:            07/04/91     │
│                                 │
└─────────────────────────────────┘
```

If you need to change a holiday, follow the same procedure and simply enter a new date for the holiday. The PTI Falcon display will always indicate the present setting for the holiday date on the top line of the display. Holidays which have never been programmed will appear as **00/00/00**. It is not necessary to remove a holiday which has already passed, because the date will never occur again anyway. If you wish to cancel a holiday that has not yet occurred, you may reset the holiday date to 00/00/00 or to any date which has already passed. Remember that the two digit year for any date in the PTI Falcon refers to the twentieth century if the year is eighty five or higher, and the twenty first century for years zero through eighty four.

```
┌─────────────────────────────┐
│                             │
│   Function #4 -             │
│   Vacate a Unit?            │
│                             │
└─────────────────────────────┘
```

Function #4 - Vacate a Unit is used to vacate a previously rented unit. A user of the PTI Falcon is identified by the combination of his Section number and his Unit number. Subdivided units may have a final letter as part of the Unit number. Unit numbers in general are up to four digits followed by an optional letter. For example, a PTI Falcon report may indicate a unit number as A-0024C. This indicates that the unit is in Section "A", number 24C.

Enter the Section Number or Letter of the unit to be vacated. Lettered section numbers are entered by pressing the key with the correct letter several times until the correct letter appears on the display, and then followed by the # key.

```
┌─────────────────────────────┐
│ Section                     │
│ Number: B                   │
│                             │
└─────────────────────────────┘
```

Enter the correct unit number. This can be up to four digits plus an optional letter as shown. The first four keys pressed will be taken as numeric data and the fifth character will be taken as lettered, so a number such as **23C** must be entered as **0023C.**

```
┌─────────────────────────────┐
│ Unit                        │
│ Number:   0350F             │
│                             │
└─────────────────────────────┘
```

The PTI Falcon will allow you to enter the Mux box number for the unit at this time. If the Mux box number has previously been entered, press # to skip this entry. The Mux box number should be set to zero if door alarms are not in use.

```
┌─────────────────────────────┐
│ Alarm Mux: 03               │
│   New = 05                  │
│                             │
└─────────────────────────────┘
```

The Mux box channel number for the door may also be entered if desired. If the channel number has previously been entered, press # to skip this entry. This number should be set to zero if door alarms are not in use.

```
┌─────────────────────────────┐
│ Channel: 0021               │
│   New = 37                  │
│                             │
└─────────────────────────────┘
```

If you wish to vacate more units, press # for Yes. Otherwise, press *for No.

```
┌─────────────────────────────┐
│ Do More?                    │
│                             │
│                             │
└─────────────────────────────┘
```

Function #5 - Rent a Unit allows you to add a new unit into the PTI Falcon memory or modify an existing unit. Units may also be placed on temporary lockout if desired. If PTI door alarms are in use, you will also specify the physical manner in which the alarm switch from the unit is wired. Proceed as follows:

Enter the Section Number for the unit that you wish to assign. The Section number can be either a single numeric digit or a single letter.

```
Section
Number:  C
```

Enter the Section Number or Letter of the unit to be vacated. Lettered section numbers are entered by pressing the key with the correct letter several times until the correct letter appears on the display, and then followed by the # key.

```
Unit
Number:  0021H
```

Enter the Access Code for the unit. Access codes may be up to ten digits in length. Leading zeros will be ignored. This is the number that the user must enter at the remote access keypads to gain entry.

```
Code: 0000000000
New = 12345678
```

Enter the expiration date for the passcode. If you do not wish for the code to automatically expire, the date may be left at **00/00/00**.

```
Exp  00/00/00
Date: 07/01/95
```

Enter the Access/Time zone number for this unit. This will select what hours that this customer will be able to access the facility. The PTI Falcon supports up to eight Access/Time zones, as set with Function #2.

```
Zone: 01
New = 03
```

If you have door alarms, The PTI Falcon will allow you to enter the Mux box number for the unit at this time. If the Mux box number has previously been entered, press **#** to skip this entry. The Mux box number should be set to zero if door alarms are not in use.

```
Alarm Mux: 03
  New = 05
```

The Mux box channel number for the door may also be entered if desired. If the channel number has previously been entered, press **#** to skip this entry. This number should be set to zero if door alarms are not in use.

```
Channel: 0021
  New = 37
```

You must next specify if the security alarm for this unit should be turned On or Off. The present setting is displayed as indicated. Change the setting by pressing the ***** key. Press the **#** key when the correct setting is on the screen. If door alarms are not in use, skip this screen by pressing **#**.

```
 Unit Alarm
  < On >
```

Finally you must specify if the unit should be locked out from normal access permission. Press the ***** key to change the lockout setting as desired and then press **#** when the setting is correct.

```
 Unit Lockout
  <Off>
```

After specifying all data for a unit, the screen will indicate "**Do More?**". If you wish to immediately enter data for another unit, press "#" for YES and you will go back to the first step above, otherwise press "*" for NO.

Duplicate Access Codes

Under most circumstances, the access code for a single unit will be unique and assigned only to one unit. You may at times, however, have customers that rent multiple units and do not wish to remember a separate access code for each unit. This is of little consequence since you can always assign an access code to only his first unit, unless a door alarm system is in operation. In this case, the PTI Falcon must be able to recognize all units that belong to a single customer so that when he enters the property, the alarms on all of his units can be disarmed.

This is accomplished by allowing the same access code to be assigned to multiple units. To do this, enter data for the first unit normally, and then enter data for the second unit. Upon entering the same access code for the second unit, a warning message will be displayed as illustrated to tell you that you are duplicating

```
Warning-Used By:
Sc/Unit A-0002C
```

an access code. The screen will indicate the building and unit number that already use the code. After displaying the warning for a few seconds, the screen will change and ask you if you wish to

```
Save Anyway?
```

save the code anyway. Press "#" for YES to assign the duplicate code to a second unit, or press "*" for NO if you do not wish to assign the duplicate code. If you press "*", you will return to the access code entry screen so that you may assign the unit a different access code.

The above procedure may be repeated as many times as necessary to assign the same access code to all units which are assigned to a single individual.

Duplicate Mux/Channels

Under most circumstances, the door alarm Mux/Channel number assigned to a particular unit is unique. If you have, however, a common alarm sensor such as an RV parking area motion sensor photo beam, it is necessary to assign this one alarm sensor to multiple rental units. When this is done, the beam will be disarmed whenever any tenant in the area is on the property and will be armed only when all tenants from the area have left the property. When the Mux/Channel is assigned to the second and subsequent units, a duplication warning will appear as indicated.

```
Warning-Used By:
Sc/Unit B-0003A
```

If the duplication is not an error, Press # to save the Mux/Channel setting. Otherwise press * to return and select a different Mux/Channel number.

```
Save Anyway?
```

The above procedure may be repeated as many times as necessary to assign the same Mux/Channel number to all units which are assigned the same alarm sensor.

Function #6 - Delete a Unit is used to permanently remove from memory a unit which does not physically exist. This can be because a unit has been previously entered in error, or that facility remodeling has genuinely removed a unit. **This command should not be used to vacate a unit. It is primarily intended to allow the correction of data entry errors and as such should rarely be needed.**

Enter the Section Number of the unit that you wish to delete.

```
Section
Number:  D
```

Enter the Unit number of the unit that you wish to delete.

```
Unit
Number:  0150B
```

If the unit is found and successfully deleted, the screen will verify the deletion as indicated.

```
Sc/Unit: A-0005C
  -Deleted-
```

Otherwise you will be informed that the unit was not found and cannot be deleted.

```
Sc/Unit: A-0005C
  -Not Found-
```

The screen will then say **"Do More?"**. If there are other units you wish to delete press **#** for **YES**. If not, press ***** for **NO**.

```
┌─────────────────────────────┐
│                             │
│   Function #7 -             │
│   Set Master Code?          │
│                             │
└─────────────────────────────┘
```

Function #7 - Set Master Code is used to enter a master code into the PTI Falcon base unit memory. The master code will not open any entrance and must be unique, it cannot be assigned to a customer as it will not allow access. When the master code is entered into a remote keypad, the keypad display will enter the contrast adjustment procedure. Contrast adjustment then proceeds in a fashion similar to that in Function #13 for the base unit display.

After selecting Function #7, the display will appear as indicated. Enter the master code of your choice and press "#". The PTI Falcon will save the master code in memory and return to the date and time display. The master code may be up to ten digits in length like any other access code. Verify operation of the master

```
┌────────────────────┐
│                    │
│  Enter Master      │
│  Code: 87654321    │
│                    │
└────────────────────┘
```

code by entering the code at a remote keypad. The remote keypad display will go into the contrast adjustment procedure.

Entry of the master code at a remote keypad will be logged on the printer as part of the access log, but the entrance cannot be opened with the master code.

```
┌─────────────────────────────┐
│                             │
│   Function #8 -             │
│   Print Report?             │
│                             │
└─────────────────────────────┘
```

Function #8 - Print Reports is used to generate reports on the printer with the PTI Falcon. The report types are:

1: All - a report of all customers and their access codes; twenty four hour codes are marked with a "*"; units that are on-site are marked with an "S"; units with suspended access are labeled "On Hold". Systems with PTI door alarms will also print the door control unit number and door terminal number for each unit.

2: Hold - a report similar to type 1 except only units with suspended access are printed.

3: Vacant - a report of all units for which no access code has been assigned.

4: Open - a report similar to type 1 except only units with open doors are printed; this report is available only on units with PTI door alarms.

5: Stop - selecting this report type stops a report already in progress from further printing.

After selecting Function #8, the screen will appear as indicated. Select the report type by pressing a single digit 1 through 5. If you select 1,2,3, or 4 the PTI Falcon will begin printing the selected report and the PTI Falcon display will return to displaying the date and time. After a report is in progress, selecting number 5

```
┌─────────────────────────────┐
│                             │
│   All.Hold.Vacant.          │
│   Open.Stop (1-5)?          │
│                             │
└─────────────────────────────┘
```

will cause the PTI Falcon to cease sending characters to the printer and return to displaying the date and time. Even though the PTI Falcon has stopped sending data to the printer, the printer will continue to print until all data previously sent has been printed. This may make it initially appear as if the report was not canceled, but if you wait a few seconds the printer should stop.

Note that the PTI Falcon allows you to perform other Functions with the keypad while a report is being printed. If you perform a Function that changes the customer data while a report is being printed, the new change may or may not appear in the printed report.

Function #9 - Save on Tape allows you to record the contents of the system memory on a standard audio cassette recorder for memory backup purposes. This unique feature allows you to separate your customer data from the machine as well as make multiple backup copies for enhanced reliability. Backup tapes can be made even after the AC power has failed while operating from internal battery power. Backup tapes should be made on a regular basis, anytime that significant changes have been made to the customer data in the machine.

Prior to selecting Function #9, plug the audio patch cord into the jack on the front of the PTI Falcon. Plug the other end into the **microphone** jack of the tape recorder. After selecting Function #9, the display will instruct you to "**Start Tape, Hit #**". Push the **record** button and then press the "#" key.

Start Tape.
Hit #

The display will then indicate "**** Saving ****". This display will stay on for about ten seconds and then will begin to blink on and off. When the tape is almost complete, the display will stop blinking and will be on constantly again for a few seconds. The display will then return to the current date and time.

** Saving **

When the date and time has returned to the display, the tape is complete and you may stop the recorder, rewind the tape, and remove it for safe keeping. Before storing the tape, it is suggested that you verify the tape contents by loading the tape back to the PTI Falcon using Function #10. The PTI Falcon verifies the integrity of each section of the tape before loading it, so you cannot alter the contents of memory if your tape did not properly record.

You may wish to listen to the sound of a good tape out loud and become accustomed to the sound. This will help you to identify any future problems with tape quality.

Function #10 - Load from Tape allows you to load the data from a previously saved backup tape into the PTI Falcon memory. This will restore the memory to the exact condition it was in when the tape was made. Any changes made to the memory after the backup tape was made will not be restored and must be made again by hand.

Before beginning Function #10, plug the audio patch cord into the jack on the front of the PTI Falcon. Plug the other end of the cord into the **Earphone** jack of the tape recorder. Insert the backup tape and make certain that it is fully rewound. Make certain that the volume control is set from mid to three quarter range. After selecting Function #10, the display will read "**Start Tape, Hit #**". Press the "#" key and then push the **Play** button on the tape recorder.

Start Tape.
Hit #

The display will now read "**** Loading ****". This will remain on constantly for about ten seconds and then will begin to blink on and off as the tape data is loaded into memory. Near the end of the recording, the display will come on constantly for a few seconds and then will indicate "**Load Done**" and return to the date and time. The tape is now fully loaded, so stop the recorder, rewind the tape, and return it to safe keeping.

** Loading **

If the "**** Loading ****" display does not begin to blink on and off as described, your tape is not being read. This can happen if the tape is not fully rewound before playing or if you start playing the tape too long before pushing the "#" key and miss the first part of the tape. The PTI Falcon must synchronize itself to the tape at the very beginning of the tape or it cannot read any of the tape.

If while reading a tape, The PTI Falcon encounters an area of the tape it cannot read, it will display "**Tape Read Error**" for a few seconds and then return to the date and time. This can be caused by a defective tape or a tape that gets wrinkled. Low batteries in the recorder can also cause tape read errors, even when a tape is perfectly good.

Tape Read Error

```
┌──────────────────────────────┐
│  Function #11 -               │
│  Open Entrance                │
└──────────────────────────────┘
```

Function #11 - Open Entrance can be used to manually open your gate or entrance from the keypad on the PTI Falcon base unit. Each PTI Falcon remote keypad contains a relay which the installer has wired to the entrance motor or lock. This Function allows you to manually trigger the relay in any remote device in order to open the entrance to which the remote device is wired. If you have PTI door alarms in use, you also have a relay installed in the PTI Falcon base unit. This relay is typically used to trigger your alarm siren.

After selecting Function #11, the display will ask you for the number of the remote device that you wish to trigger. Enter the number and press "#". The remote relay will be triggered and the PTI Falcon will return to the date and time display.

```
┌──────────────────────────────┐
│  Trigger Remote               │
│  Number: 0                    │
└──────────────────────────────┘
```

Your installer should tell you the remote number which will trigger each entrance or exit device that you have on the property. Remote number "0" refers to the relay within the PTI Falcon base unit. This relay triggers your alarm siren in the event of a break in. Triggering Remote #0 with Function #11 is useful for testing the siren. The siren may be silenced again with Function #12 - Clear Alarms.

If you trigger a relay other than Remote #0, you must specify if you want to hold the entrance open. If you press **#** to hold the entrance open, the remote relay will be triggered and will not release until you trigger it again with Function #11 and press ***** to not hold open.

```
┌──────────────────────────────┐
│  Hold Open (Y/N)?             │
│                               │
└──────────────────────────────┘
```

Use of Function #11 to trigger a relay is logged on the printer and becomes a part of the access log for the property.

```
┌─────────────────────────────┐
│                             │
│     Function #12 -          │
│     Clear Alarms            │
│                             │
└─────────────────────────────┘
```

Function #12 - Clear Alarms is functional only on systems with PTI door alarms. Whenever a unit enters the alarm condition, the alarm is logged on the printer and the siren relay is triggered. Further alarms for the unit are then disabled until this function is executed to clear the alarm condition. This prevents a single unit from setting off the alarm multiple times without intervention by the manager to investigate the alarm. Function #12 clears all units on the property from the alarm condition, so if multiple units have alarmed, it is only necessary to execute Function #12 one time. **Note that if you forget to execute Function #12 after an alarm, the units that alarmed will be left in the off condition and will not print door activity until Function #12 is executed.**

After selecting Function #12, the display will indicate "**Clearing Alarms...**" for several seconds while the PTI Falcon searches for all units in the alarm condition and clears them. The display will then return to the date and time.

```
┌─────────────────────────┐
│                         │
│   Clearing              │
│   Alarms...             │
│                         │
└─────────────────────────┘
```

Function #12 is also used for shutting of the alarm siren prior to its programmed alarm time.

```
┌─────────────────────────┐
│                         │
│     Function #13 -       │
│     Alarm Control?       │
│                         │
└─────────────────────────┘
```

Function #13 - Alarm control is used to set and control a number of features in the PTI individual door alarm system.

The entire alarm system may be turned **On** or **Off**. Press ***** to toggle the setting from **On** to **Off**. When the setting appears as desired on the screen, press **#** to accept.

```
┌─────────────────┐
│  Alarm System    │
│     <On>         │
└─────────────────┘
```

Alarms for vacant units may be turned **On** or **Off**. Press ***** to toggle the setting from **On** to **Off**. When the setting appears as desired on the screen, press **#** to accept.

```
┌─────────────────┐
│  Vacant Alarms   │
│     <On>         │
└─────────────────┘
```

Remote Communication Alarms may be set **On** or **Off**. If Remote Communication Alarms are **On**, any failure in communication between the Falcon base unit and a remote Alarm Mux box will cause the alarm siren to sound.

```
┌─────────────────┐
│  Rem Comm Alarms │
│     <On>         │
└─────────────────┘
```

Tamper switch alarms may also be turned **On** or **Off**. Tamper alarms will normally be **On** and will only be turned **Off** when you need to open an alarm mux box for maintenance.

```
┌─────────────────┐
│  Tamper Alarms   │
│     <On>         │
└─────────────────┘
```

Unknown Channels may be turned **On** or **Off**. If a mux box reports an alarm switch opening or closing on a channel that has not been assigned to a section/unit number, it is considered an "Unknown Channel". If you do not wish Unknown Channels to become a part of the site event log, they may be turned **Off**.

```
┌─────────────────┐
│ Unknown Channels │
│     <On>         │
└─────────────────┘
```

Auxiliary sirens may be turned **On** or **Off**. Auxiliary sirens are those that are triggered from relays in the Mux boxes rather than from the relay in the PTI Falcon base unit.

```
┌─────────────────┐
│  Auxiliary Sirens│
│     <On>         │
└─────────────────┘
```

42

You may specify the length of time that the siren should sound during normal business hours in tenths of a second. A setting of **600** is equal to sixty seconds or one minute. The siren will automatically shut down after sounding for this length of time. Note that normal business hours are considered to be those specified in Time zone number One.

```
Day Siren = 00600
New Value = 3000
```

You may also specify the length of time that the siren should sound after normal business hours in tenths of a second. A setting of **3000** is equal to three hundred seconds or five minutes.

```
Nite Siren = 03000
New Value = 4000
```

The automatic rearm time is specified in minutes. If automatic alarm rearming is not desired, set the rearm time to zero. When the rearm time is non-zero, an alarm door will automatically rearm the specified number of minutes after the door is closed. Automatic rearming is useful if the site does not allow the use of an exit keypad to rearm the unit alarm as the tenant leaves, or as a fail safe for tenants who tailgate out of the property. The rearm time must be set reasonably long to prevent doors from rearming when the tenant has momentarily shut the door and then opened it again.

```
Rearm Time = 000
New Value = 30
```

You will then be asked if you wish to save the present setup. If you press **#** for **YES**, the present alarm control options will be saved in the PTI Falcon memory. The Falcon will then be able to automatically return to the desired settings even after power failures.

```
Save Setup?
<No>   <Yes>
```

```
┌─────────────────────────┐
│   Function #14 -         │
│   Control Options?       │
└─────────────────────────┘
```

Function #14 - Control Options is used to set various control features of the PTI Falcon system. They are as follows:

The relay time is specified in eighths of a second. It controls how long a remote relay is triggered when a valid access code is entered in the entry keypad. A setting of **16** is equal to two seconds, which is adequate for most gate operators.

```
┌─────────────────────────┐
│  Relay Time = 016        │
│  New Value = 40          │
└─────────────────────────┘
```

This value should be set to the maximum number of remote devices that are connected to the PTI Falcon. This includes both keypads and door alarm Mux boxes. Setting this number properly saves the PTI Falcon from wasting time attempting to communicate with remote devices that are not present.

```
┌─────────────────────────┐
│  Max Remotes = 15        │
│  New Value  = 2          │
└─────────────────────────┘
```

The baud rate for the RS232C port on the rear of the PTI Falcon base unit may be set to either **12** (1200), **24** (2400), or **96** (9600) baud. The RS232C port is used by the PTI Falcon to communicate with a host computer. The baud rate must be set to match that of the host computer for communication to be possible.

```
┌─────────────────────────┐
│  RS232 Baud = 96         │
│  New Value  = 24         │
└─────────────────────────┘
```

The baud rate for the RS485 port on the rear of the PTI Falcon base unit may be set to either **12** (1200) or **96** (9600) baud. The RS485 port is used to communicate with all remote keypads and Mux boxes, and should be set to match the baud rate of the keypads and Mux boxes. A setting of **12** (1200) will be the most reliable, but may prove too slow in larger systems.

```
┌─────────────────────────┐
│  RS485 Baud = 12         │
│  New Value = 96          │
└─────────────────────────┘
```

You will then be asked if you wish to save the present setup. If you press **#** for **YES**, the present control options will be saved in the PTI Falcon memory. The Falcon will then be able to automatically return to the desired settings even after power failures.

```
┌─────────────────────────┐
│   Save Setup?            │
│  <No>   <Yes>            │
└─────────────────────────┘
```

```
┌──────────────────────────────┐
│                              │
│   Function #15 -             │
│   Adjust Contrast?           │
│                              │
└──────────────────────────────┘
```

Function #15 - Adjust Contrast allows you to adjust the contrast of the Liquid Crystal Display (LCD) on the PTI Falcon base unit. You can either darken or lighten the display contrast.

After selecting Function #15, the PTI Falcon display will appear as illustrated. Each press of the "1" key will darken the contrast by one step; each press of the "3" key will lighten the contrast by one step. Set the contrast to your personal taste and then press the **#** key on the keyboard.

```
┌────────────────────┐
│ <1> =darker        │
│ <3> =lighter       │
│                    │
└────────────────────┘
```

You will then be asked if you wish to save the present setup. If you press **#** for **YES**, the present contrast setting will be saved in the PTI Falcon memory. The Falcon will then be able to automatically return to the desired contrast even after power failures.

```
┌────────────────────┐
│  Save Setup?       │
│ <No>   <Yes>       │
│                    │
└────────────────────┘
```

A similar adjustment is available for the displays on the remote keypads; see Function #7 for details.

Function #16 - Update Graphics is used only by customers with PTI security graphics. It is useful when the graphics control computer has been shut off and then restarted. Update Graphics will cause the PTI Falcon base unit to update the correct colors for every rental unit on the graphics image.

The PTI Falcon will indicate on the screen that the update is taking place for a few seconds. The update process will continue to occur even after the indication screen has disappeared and may in fact take several minutes to complete on a large property.

Updating Graphics...

Troubleshooting

Consult with your installer and fill in the items below to assist you in the future if you should have questions or problems.

Installation Company_____

Contact_____

Address_____

Phone ( )_____Pager ( )_____

Mobile( )_____

My Gate motor power is supplied from breaker panel

located_____
_____

My Falcon Base unit power is supplied from breaker panel located_____

_____
_____

My   Remote   Keypads   are   powered
from_____

My Management Software Package is manufactured by:_____

Entrance Keypad is/are Remote Number(s) (1) (3) (5) (7)

Exit keypad is/are Remote Number(s)   (2) (4) (6) (8)

(For Door Alarm Users) Multiplexer Boxes is/are as follows:

Building _____ has _____ units alarmed and operating through Multiplexer number:

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)

Building _____ has _____ units alarmed and operating through Multiplexer number:

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)

Building _____ has _____ units alarmed and operating through Multiplexer number:

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)

Building _____ has _____ units alarmed and operating through Multiplexer number:

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)

Building _____ has _____ units alarmed and operating through Multiplexer number:

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)

Building _____ has _____ units alarmed and operating through Multiplexer number:

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)

Building _____ has _____ units alarmed and operating through Multiplexer number:

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)

Building _____ has _____ units alarmed and operating through Multiplexer number:

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)

Building _____ has _____ units alarmed and operating through Multiplexer number:

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)

Building _____ has _____ units alarmed and operating through Multiplexer number:

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)

Building _____ has _____ units alarmed and operating through Multiplexer number:

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)

Building _____ has _____ units alarmed and operating through Multiplexer number:

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)

Building _____ has _____ units alarmed and operating through Multiplexer number:

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)

In cases where the PTI Falcon system seems to be malfunctioning, it is important to be able to isolate the problem before contacting your local installation company or PTI. This will help keep the repair cost as low as possible for you. The following examples of malfunctions will help you in isolating malfunctioning components of the system.

Normally you should not have to shut down the Falcon unless the malfunction appears to be within the Falcon. In either case it is highly recommended that a source of memory back-up be obtained (Audio Cassette or computer disk back-up through you management software package) prior to conducting any troubleshooting procedures.

Important- With the exception of cold booting the system hardware, Do not conduct any troubleshooting procedures within the system without first removing all sources of power. The Falcon induces small amounts of voltage into the Remote Keypads in addition to the 12 volt power supply. Failure to follow these recommendations can result in personal injury and damage to system.

Scenario 1- Codes entered into the Remote Keypad Units will not open gate, display reads "Please Wait".

-This means the keypad is not communicating with the Falcon. The best solution for any electronic malfunction such as this is to reset the keypad. To reset the keypad, disconnect the power from the keypad and the communication by disconnecting the RS485 cable from the back of the Falcon Base Unit and shutting off the breaker for the power source to the keypads. Once both power sources are disconnected, reconnect the RS485 Cable to the back of the Falcon and turn the breaker on for the Remote Keypad Unit power. Within 60 seconds of restoring power the current date and time should transmit from the Falcon base unit to the keypad(s) and access codes should open the gate with an "Access Granted" message appearing on the display. If this does not clear up the problem, the Remote Keypad Unit may need servicing by the PTI repair office. Call you local dealer or PTI at this point.

-Scenario 2- Codes entered into the Remote Keypad Units will not open gate, display reads "Access Granted".

-This malfunction could be in the Remote keypad unit or in the Gate Motor circuitry. If all of the Remote Keypad Units give an "Access Granted" message with an authorized code but the gate will not open, it is likely that there is a malfunction occurring in the Gate Motor. If this occurs with only one keypad, the relay inside the Remote Keypad Unit may be defective. This is most assuredly determined by connecting a ohmmeter to pins 4 & 5 (for normally open circuits) or pins 5 & 6 (for normally closed circuits). Upon entering an authorized code into the keypad, the meter should deflect in the opposite direction indicating continuity in the relay. A layman's method of this is to

simply listen closely to the keypad for 2 quiet clicks upon entering the code which is representative of the relay cycling.

-Scenario 3- Codes entered into the Remote Keypad Unit will not open gate, display reads "Access Denied".

-This indicates that the code is not recognized by the Falcon. Often times the user has forgotten the correct sequence of numbers. The Falcon will print the incorrect code for your use.

-Scenario 4- Codes entered into the Remote Keypad Unit will not open gate, display reads "Access Suspended".

-This indicates that the user assigned to this code has been locked out from the property (Function 5).

-Scenario 5- Codes entered into the Remote Keypad Unit will not open gate, display reads "Sorry, Area Closed".

-This indicates that the user is not a 24 hour user and attempted to enter the property during the closed hours of the property for his time zone which are set in Function 2. The business hours can be easily programmed incorrectly if the programmer does not enter the hours of operation in terms of AM for opening and PM for closing.

-Scenario 6- Falcon is printing "Comm Off" and "Comm On" repeatedly for one or more remotes.

-This is an indication that one or more of the remotes (keypads or door alarm multiplexers) have suffered possible damage to the communication circuitry, or the system is reacting to an outside interference such as radio frequencies, mercury vapor light interference, or power line radiation for example. In such a case, reset the system in accordance with scenario 1. If the condition continues, disconnect one remote unit from the system at a time to eliminate the possibility of one malfunctioning unit causing all units to appear faulty.

-Scenario 7- Printer will not print.

-Check all cables for tightness.
-Ensure that the printer is not jammed with paper.
-Ensure the printer is on-line/ready.
-Ensure printer is receiving power.
-Disconnect printer cable from printer, shut power off/on and reconnect cable.
-Attempt printing a report from the Falcon (Function 8)
-If all other attempts fail, shut off printer and Falcon. Turn Falcon and printer back   on, re-program Falcon or load back-up from memory source. Re-attempt report   printing again.

-Scenario 8- The Falcon will not receive information downloaded from my Property Management software package.

-This is an indication of an interface malfunction between the Falcon Base Unit and the PC.
-Ensure that the serial interface cable is securely connected at both ends.
-If using telephone modems, there is a possibility that one of them is malfunctioning.
-Ensuring there is a current back-up available, shut off Falcon and PC and restart both in accordance with the operation installation instructions.
-Under Function #14 on the Falcon Base Unit, ensure that the RS232 baud rate is set in accordance with the Software specifications and modem specifications. Note, if the baud rate is not set properly the PC will not communicate with the Falcon.

Notes

Index

Specifications

Base Unit Specifications

Voltage: 115/230 VAC 50/60 Hz   Current: 500/250 ma
Battery: 9 VDC Nicad Pack   Fuse: 1 amp

Remote Connector: Serial Connector:
   Pin 1: RS485 Data Positive   Pin 1: RS232 Carrier Detect
   Pin 2: Data Ground   Pin 2: RS232 Receive Data
   Pin 3: RS485 Data Negative   Pin 3: RS232 Transmit Data
   Pin 4: Not Used   Pin 4: RS232 DataTerminal Ready
   Pin 5: Not Used   Pin 5: RS232 ground
   Pin 6: Alarm Relay Normally Open   Pin 6: Not used
   Pin 7: Alarm Relay Common   Pin 7: RS232 Request to Send
   Pin 8: Alarm Relay Normally Closed   Pin 8: RS232 Clear to Send

Remote Keypad Specifications

Voltage: 12 - 24 V, AC or DC   Current: 300 ma
Relay Contacts: 1 amp, 24V   Power Fuse: Solid State
                            Relay Fuse: Solid State

Term Strip 1:   Term Strip 2:
   Pin 1: 12 VAC Power   Pin 1: RS485 Data Positive
   Pin 2: 12 VAC Power   Pin 2: RS485 Ground
   Pin 3: Case Ground   Pin 3: RS485 Data Negative
   Pin 4: Aux Input #1   Pin 4: Relay Normally Open
   Pin 5: Logic Ground   Pin 5: Relay Common
   Pin 6: Aux Input #2   Pin 6: Relay Normally Closed

Alarm Mux Specifications

Voltage: 12 - 24 V, AC or DC   Current: 300 ma
Battery: 9 VDC   Fuse: Solid State

Term Strip 1:   Term Strip 2:
   Pin 1: 12 VAC Power   Pin 1: RS485 Data Positive
   Pin 2: 12 VAC Power   Pin 2: RS485 Ground
   Pin 3: Case ground   Pin 3: RS485 Data Negative

Warranty

PTI Falcon Access Control System

Preferred Technology Inc. (PTI) warrants equipment manufactured by PTI to the original purchaser against defects in materials and workmanship, under normal use and service, for a period of one year from the date of shipment, provided recommended installation and maintenance procedures are followed, **and provided that the warranty registration card is promptly completed and returned to Preferred Technology Inc.**

In case of failure due to defective material or workmanship during the warranty period, components found to be defective upon examination by PTI in its sole discretion, will be repaired or replaced with new or factory rebuilt components at the option of PTI. Replacement parts are warranted only for the remaining portion of the original warranty period. Equipment requiring warranty work shall be returned freight prepaid to PTI. PTI will pay freight to return the repaired or replaced items covered by this warranty to the customer.

This warranty does not extend to normal maintenance, which the customer is expected to provide. Further, this warranty does not extend to equipment or component systems manufactured by others and sold by PTI. In such cases, the original manufacturer's warranty shall apply.

This warranty is in lieu of and excludes all other warranties, expressed or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. This warranty shall not extend to damage due to improper installation, maintenance, or use, connection to improper power sources, or to damage caused by fire, flood, lightning, power surge, or other acts of nature. In no event shall Preferred Technology Inc. be liable for any incidental or consequential damages due to any defect or failure of the equipment.

<div align="center">

PREFERRED TECHNOLOGY INC.
8271 East Gelding Dr. Scottsdale, AZ 85260
(800) 331-6224 (602) 991-1259

</div>