SYSTEM VII.

TECHNICAL MANUAL
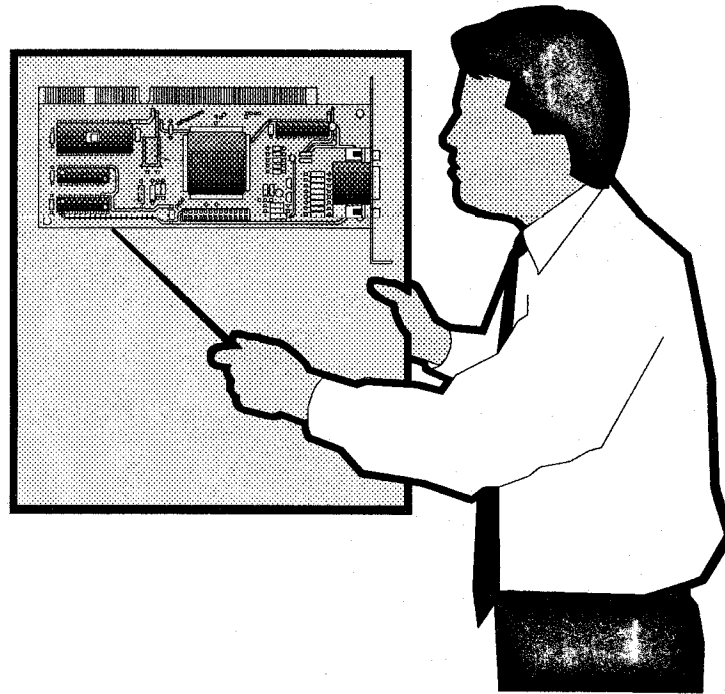
ROLLINS PROTECTIVE SERVICES

SECURITY SYSTEM

REFERENCE and
INSTALLATION Manual

	Toll Free	FAX
General & Sales	(800) 777-1415	(612) 779-4890
Order Processing	(800) 777-4841	(800) 777-4842
Credit Department	(800) 777-1415	(612) 773-4633
Technical Assistance	(800) 777-2624	(612) 779-4888
RMA-Repair or Return	(800) 777-1415 ext. 112	(800) 777-4842
RMA-Advanced Replacement	(800) 777-2624	N/A

Table of Contents

About This Manual

This manual describes how to plan, install, program, and test the system, including the following equipment:

- Central Processing Unit (CPU)
- Alphanumeric Touchpad
- Sensors
- Feature Expansion Module
- Hardwire Input Modules (HIM)
- Wireless Receiver Module
- Wireless Touchpads
- Interior/Exterior Sirens
- Energy Saver Module (ESM)

Scope

This manual describes the installation activities that an installer performs. Activities performed by an owner are covered in the *Owner's Manual*.

In some cases, such as central station programming or installation of some hardware options, this manual refers to other documents for procedures or reference information. These documents will be called out when appropriate.

Audience

This installation manual is a reference document for the installer of this equipment. ITI strongly urges reviewing the information in the first part of this manual to understand the process for installing the system before attempting installation or servicing the system. Once you understand the installation process, you can use the manual as a reference document when a question arises.

Failure to install and program the CPU and accessories as described in the manual for U.L. listed applications is a violation of the listing mark.

Change Bars

A change bar in the outside margin indicates technical changes to this manual from the previous release. An example of a change bar is in the outside margin of this paragraph.

Terms You Should Know

The following table shows terms that have a special meaning to this system.

These terms...	...in the manual
Access Code	The default primary access code preset for this system is 1234. You can change this access code to another value once you become familiar with the system.
Alphanumeric Touchpad	The Hardwired Touchpad with Alpha Display (60-248-10)
CODE	CODE represents a 4-digit access code, such as 1234. For example, press CODE + 1 means to press the keys to enter the access code, such as 1 2 3 4, then press the 1 key.
Detector	Any security device that provides a method for detecting alarms. These devices are typically hardwire contacts, smoke sensors, PIRs etc.
Keypresses	This manual shows keypress for commands on each type of controlling device.
Sensor	Sensor means a security device (detector) coupled to an RF wireless transmitter.
Sensor Number	An identifying number the CPU understands as an alarm device.
Zones	A zone is a group of detectors wired together to form a perimeter of detection.

Overview

1.1   About the System

The CPU is a state-of-the-art security system featuring Learn Mode technology. Learn Mode technology is a new development in ITI security products.This technology eliminates cumbersome individual sensor programming and incorporates preprogrammed sensors that are "learned" by the Central Processing Unit (CPU) for each particular installation.

This design allows for maximum flexibility in customer configuration since it is a wireless and a hardwire security system. This system comes standard with ITI Hardwire Data Bus, which allows for system expansion with all of ITI hardwire bus devices.

The hardwire system has six built-in hardwire zones and can be expanded in groups of eight with Hardwire Input Modules (HIMs) for a total of 32 zones. Alphanumeric Touchpads can also be added on this bus for plain English descriptions of alarm events and sensor conditions.

With the addition of the optional Wireless Receiver Module, this system can use a vast array of ITI Learn Mode wireless sensors. Remember, you can mix hardwire and wireless sensors in the same system. The total of 32 zones can be applied any way you need to meet your installation requirements.

The system uses the same family of sirens as other ITI products. Voice sirens can be installed to gain full advantage of voice alarm messages. Smaller status speakers can be installed to provide your customer with system voice status messages. Loud alarm sirens (interior and exterior) can be installed to alert the customer of alarm conditions.

Your customer's touch tone telephones become controlling devices, both from in-home and off premises. Arming, disarming, status messages, light control, energy saver control and panic alarms are all available from each telephone in your customer's home.

The system can communicate (interactively) with the ITI CS-4000 Central Station Receiver. Standard 4/2 Format is also available for applications where the CPU will report to receivers of a different vendor.

1.2   Feature Changes

The following describes the changes in 2.0 and 2.1 software from 1.0 software, and the changes to the CPU board from revision D to revision E that will determine how the software changes will affect each CPU board revision.

Table 1.1 illustrates how 2.0 and 2.1 software compare to 1.0 software and what they add to each CPU board revision.

Table 1.1. Features of 2.0 and 2.1 Software Over 1.0 Software.

Features	Board Revision		More information
	D	E or Later	
DTMF dialing		✔	Section 4.12
Separate speaker volume levels for status and alarms sounds		✔	Table 3.1
Environmental group 29	✔	✔	Table 4.6
Ability to remove the programming touchpad with upper sensor number 77	✔	✔	Table 7.2
Interrogator™ Module support	✔	✔	Table 3.2 Interrogator Module Installation Manual 46-591
House code defaults to 001 and cannot be programmed to 000	✔	✔	Table 4.2 Table 7.1
Group10 and 13 also activate no activity alarm (Upper sensor number 79)	✔	✔	Table 7.2
HOM Support	✔	✔	Table 4.6 HOM Installation 46-173
FTC's output polarity reversed	✔	✔	Section 3.9.3
*Option F21 - immediate trouble beeps when a Supervisory condition is detected (for ULC listed systems)	✔	✔	Table 7.7
*SUPSYNC setting can be set to 2 (for ULC listed systems)	✔	✔	Section 2.1.8 CS-4000 Central Station Receiver Installation amd User's Manual 46-056

* Indicates 2.1 software feature

1.3 Set-up Process Overview

This subsection shows the thought process for setting up the system and shows you where to find information on each step of the set-up process.

Planning the System

Before you install and program the system, plan how the system will operate for the owner. Section 2 contains information to help you plan the system. Using the planning information and Appendix D can help you install and program the system more efficiently, and help you make sure the system is set up with options and settings the owner may want or need.

Installing the System

After planning the installation of the system, the next step is to install system components, including mounting the system's CPU, touchpad, sirens, sensors, and system options, such as the Energy Saver Module, and connect components together, such as connecting leads for hardwired zones to the CPU.

Section 3 contains the procedures for installing the system.

Programming the System

After installing the components of the system, you will need to program all the CPU, sensor, and touchpad related information.

Section 4 contains the procedures for programming the system and Section 7 contains programming reference material.

Testing the System

After programming, you should test each installed device and feature thoroughly to verify that it works the way the owner expects.

Section 5 contains the procedures for testing the system.

Section 6 contains information on troubleshooting the system.

Training the Owner on the System

When you are done testing the system, train the owner on the system, so they know how to access the system to arm and disarm it, operate the system and use special features.

Planning the System Installation and Programming

This section describes how to prepare a plan for installing and programming this system. Planning involves gathering information for installing, programming, and testing the system. A worksheet is included with every CPU to help you gather this information in one convenient place.

Before you begin the installation, you should

- Review system requirements and installation guidelines

- Review installation requirements with Owner

- Fill out the *Quick Guide*

Take an inventory to make sure you have all equipment and information to install and program the system.

2.1   Product Requirements and Installation

When you install the system, you need to understand the system requirements, such as the temperature range in which it can operate, the types of phone systems that can work with it, and the number of hardwired and wireless zones that can be configured.

This subsection identifies system requirements and guidelines.

2.1.1 General Guidelines

The following are general system guidelines:

- Locate the CPU in a temperature-controlled environment (42°F to 95°F).

- Mount the CPU in a secure, yet easily accessible location. Suggested locations include coat closets or behind the master bedroom door.

- Verify the availability of a 110 VAC nonswitched outlet for the power transformer.

- Verify access to incoming phone line (telephone protector block).

- Run all wires for power, phone, sirens, bus devices, and hardwire zones before mounting the CPU.

- If the system is installed as a hardwire system, (no receiver module installed) upper sensor number 94 must be deleted from CPU memory.

2.1.2 Phone Compatibility

The following are phone compatibility guidelines:

- Verify that there are "true" TouchTone phones on the premises. You cannot use pulse dialing phones to operate the system.

- Phones that don't emit true DTMF (TouchTone) will not operate the system. This includes some cordless phones.

- Some true TouchTone phones require the user to press the * and/or # buttons twice before emitting a tone. Check the instructions of those phones for */# button functioning.

- If the owner uses the * or # keys for other phone system features, such as redial, call forwarding, and banking transactions, refer to "Optional Feature Numbers" (F07) in Section 7 "CPU Programming Reference". Also, refer to the Local Disable feature in the *Owner's Manual*.

2.1.3 Wireless Receiver Module Guidelines

The guidelines for the Wireless Receiver Module are

- When mounting, allow enough room for the antennas, which extend about 9" above the CPU.

- Centrally locate the CPU with respect to all wireless sensors whenever possible.

- Avoid locations with excessive metal, foil wallpaper, electrical wiring and pipes.

- Locate sensors within 100' of the CPU whenever possible. Although the system has an open field range of at least 1000' use 100' as a starting point inside a building. See Section 5.2.

2.1.4 Hardwire Zones Guidelines

The guidelines for hardwire zones are

- Use 18- to 22-gauge stranded, twisted wire.

- Don't run wires parallel to AC power or fluorescent lighting.

- Maximum loop resistance of both wire and devices should not exceed 50 ohms.

- Loop response time of all hardwire zones is 500 milliseconds (1/2 second).

- It is recommended to incorporate only one detection device per zone. This makes detecting and resolving problems less complex than when several detection devices are wired together in one zone.

2.1.5 Miscellaneous

The following are miscellaneous guidelines:

- If the installation includes Wireless Interior Sirens and/or X-10 Lamp Modules, the CPU must be powered using the optional Line Carrier Transformer, part no. 60-346-500. This transformer requires a 4-conductor cable to be run from it, to the CPU.

- If the installation includes an Energy Saver Module, the CPU requires the Feature Expansion Module be installed.

- The Energy Saver Module should be located next to or as close as possible to the premise thermostat. Always mount the Energy Saver Module on an inside wall.

2.1.6 Power Supply

The CPU provides 500 mA at 6.8 VDC for powering external devices such as the Feature Expansion Module, Alphanumeric Touchpads, hardwired detectors, HIMs, HOMs, and sirens.

2.1.7 Specifications

- Dimensions: 2"d x 13"w x 10"h (+ 9" antennas)

- Operating Temperature range: 42° to 95° F

- Microprocessor-based circuit board.

- E^2 Prom memory

- Maximum 32 zones, either hardwired, wireless or combination thereof.

- Loop response time of hardwire zones: 500 milliseconds (1/2 second)

- Quartz crystal single conversion superheterodyne receiver:

    40 kHz bandwidth

    dual antennas

    1000' plus, open air range (actual range determined during testing in Section 5.2)

- Wireless sensors:

    58-bit data packet

- Sensor battery life:

    Lithium battery – 5 to 8 years

    Alkaline battery – 12 to 18 months

- Digital communicator:

    ITI (Bell 103) or standard 4/2 formats.

- Power Input Requirements:

    Standard 9 VAC 15 VA transformer.

    Optional Line Carrier Transformer 8 to 13 VDC (load dependant) that includes built-in line carrier circuitry for Wireless Interior Siren and/or X-10 Light Modules.
    Note: Transformers Not Included. Use only one transformer.

- Rechargeable standby battery:

    6 volt 3.2 amp hour

    24-hour typical standby time

- Auxiliary power available:

    500 mA at 6.8 VDC Output (refer to Section 2.1.8 for U.L. listed constraints)

- Output relay contact rating (for exterior siren):

    30 VDC at 1 Amp.

2.1.8 Special Installation Requirements (U.L.)

Some installations may require certain configurations dictated by city codes, state codes, or insurance requirements. The following information indicates those components that are approved or meet the criteria for the respective listings.

U.L. Listed Minimum System Configurations

This subsection shows the minimum system configurations listed by Underwriters Laboratories, including the following:

U.L. U.S.A.

Following are the minimum system configurations listed by U.L.:

- Basic System

    60-435 Central Processing Unit

    60-248-CTP Hi-Tech Hardwire Touchpad w/Alphanumeric Display

    13-046 Hardwire or 60-353 Wireless Siren

    60-515 (22-035) or 60-346-500 Line Carrier Transformer

- Household Fire Alarm

    Basic system above and including

RF	Hardwire *
60-506 Smoke Sensor.	13-077 Hardwire Smoke Detector (ESL 445AT)
60-485 RF Receiver Kit	60-391 Power Supervision Module
	49-365 End-of-line resistor assembly (EOLR)
Note: For 24-hour back-up, external power is limited to 0 mA continuous.	**Note:** For 24-hour back-up, external power is limited to 50 mA continuous.

- Household Burglar Alarm

    Basic system above and including

    60-362 Door/Window sensor.

    60-485 RF Receiver Kit

- Miscellaneous Signaling

    All above systems can use the 60-348 Handheld Wireless Touchpad as a signaling device, if 60-485 RF Receiver Kit is installed.

CSA Certified Authorities

60-503 Line carrier class II transformer

Note: When hardwire initiating is used for fire alarm devices, only the 60-515 (22-035) transformer shall be used.

ULC

- Household Fire Alarm

    60-506 Smoke Sensor.

- Option F21 - ON

- SUPSYNC - 2

Note: Option F21 is supported in software version 2.1 and later and can be programmed only from the CS-4000. Refer to Section 7 "CPU Programming Reference" for more information. SUPSYNC can be set to 2 only with software version 2.1 and later and can be programmed only from the CS-4000.

2.2   Filling Out the Quick Guide

While reviewing the installation requirements with the owner, you should fill out the *Quick Guide* included with every CPU. You can use this to list information about the system that you need during installation and programming, such as the number, locations and types of sensors used in the system, and whether the system needs to use certain options and settings.

Having this planning information available during programming will help you enter the appropriate information when the system prompts for it and will ensure that certain values and options are set.

Appendix D represents an exact duplicate of the *Quick Guide* that accompanies each CPU.

Installing the System

This section describes how to install the system.

3.1   Overview

This installation process consists of several installation procedures to mount and connect some of the system components. Not all hardware options are shown here. Refer to the Hardware Devices section of this manual for specific information on optional hardware.

1. Plan the system (Section 2).

2. Take inventory of parts and information (Section 2).

3. Understand CPU board components and wire connections.

4. Install the CPU:

   • Mount the CPU

   • Install CPU options:

     - Wireless receiver and antennas

     - Speaker Kit

5. Install the Alphanumeric Touchpad.

6. Install sirens.

7. Connect the system to phone line.

8. Install CPU hardware options

   • Feature Expansion Module

   • Energy Saver Module

   • X-10 Lamp Module (lighting control)

   • Fail-to-Communicate (FTC) output

9. Connect hardwired zones, if used, to the CPU.

10. Install Hardwired Input Modules (HIMs), if used.

11. Install sensors.

12. Connect the transformer to the CPU.

13. Check all connections.

14. Apply power to the CPU.

Before you install the system, you should do the following:

• Plan the system, using the information in Section 2 and Appendix D.

• Take inventory of parts and information you need to complete the installation. Make sure you have the work order, floor plan, planning worksheets, and installation sheets for individual components ready.

3.2 CPU Board and Wiring Connections

Much of the installation process involves installing components on the CPU or making wiring connections between the CPU and system components. Understanding the CPU board, its components, and wiring is essential to performing the rest of the installation steps. This subsection provides the following:

- A diagram of the CPU board and main components (Figure 3-1), followed by descriptions of components in Table 3.1.

- A wiring diagram showing connections (Figure 3-2)

Study the CPU board and wiring diagrams before performing installation procedures.
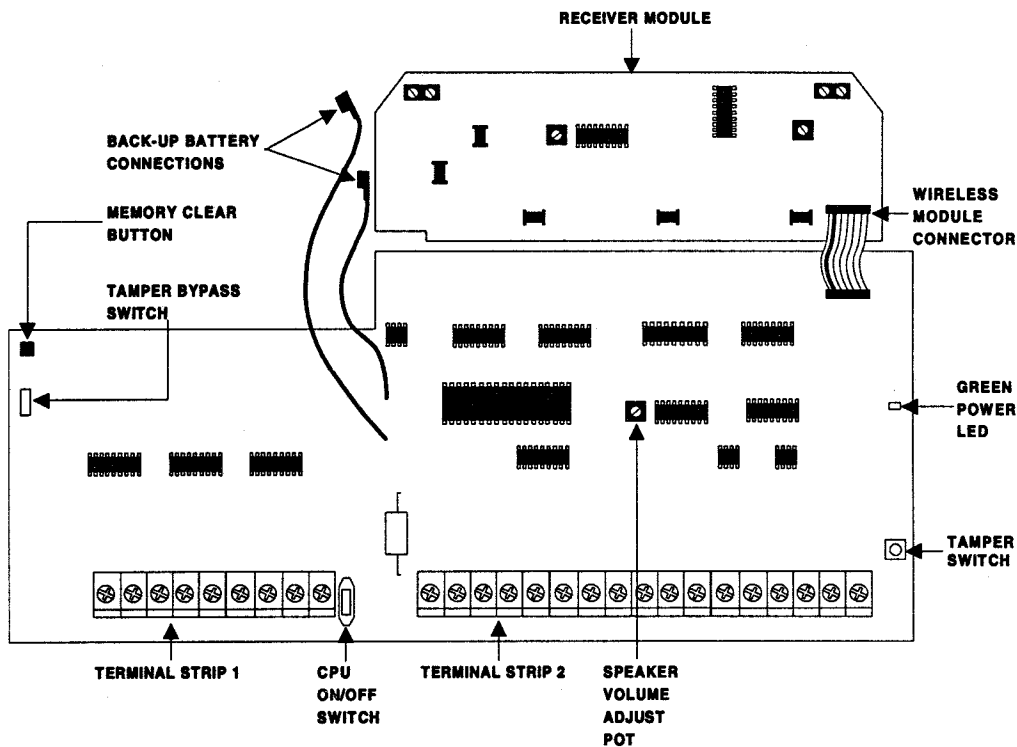
Figure 3.1. CPU Board Components

Figure 3.2 is a wiring diagram showing all connections required to install the system. The wiring diagram shows

- Components required to power, control, operate, and emit sounds from the system. You can think of these components as the basic system, which you will install most of the time.

- Additional components and accessories that can be used with the system, such as sirens, and the Energy Saver Module, are shown in the reference section of this manual.

This wiring diagram is also include in the *Quick Guide*. It might help to post a copy of the wiring diagram next to the CPU while performing installation procedures and connecting wires to the CPU terminals.

Table 3.1. CPU Board Components

Component	Description
Receiver Module and Connector	The modular receiver board is optional. This receiver board and antennas are the link needed when using wireless sensors and wireless touchpads. If you purchased the hardwire CPU, the receiver can be added at a later date to expand that system for wireless detection and operation. The connector for the receiver comes with the module. **Note:** If this system is being installed as a hardwire system only (no receiver module installed), upper sensor number 94 must be turned off in CPU memory.
Memory Clear Button	Clears all programmed information from the CPU. Use this button to clear any existing memory from the CPU before you begin programming. To clear all programmed information from the CPU, press the Memory Clear button down for 2 seconds with power ON. **Warning:** Do not press this button unless you want to clear memory.
Tamper Bypass Switch	Controls whether the CPU goes into "program mode" or alarm when the CPU cover is removed. **Normal:** with the system in level 1, removing the cover will set the CPU in program mode. With the system in level 2 or 3, removing the cover will cause a Tamper Alarm condition **Bypass:** Allows the system to operate normally if the cover is off. **Warning:** When replacing the CPU cover, DO NOT leave the switch in the BYPASS mode. This will leave your customer without any CPU tamper protection
CPU ON/OFF Switch	Off - CPU is OFF. CPU memory is retained indefinitely in EEPROM. (Battery charge circuit remains activated when transformer is plugged in, phone line will remain released.) On - CPU is operational.
Terminal Strip 1	Provides connections for up to 6 hardwired zones.
Terminal Strip 2	Provides connections for the following devices: • Power Transformer (DC or AC) • Hardwire Bus Devices • Interior Siren • Exterior Siren • Phone Line • Fail-To-Communicate output • Voice Speaker • 6.8 Volt DC powered devices
Speaker Volume Adjust Pot	Controls the output on terminal 16 which effects the volume of the voice for status to the speaker kit and Feature Expansion Module speaker. **Alarm sounds are at full volume.** Clockwise - Decreases CPU speaker volume. Counterclockwise - Increases CPU speaker volume. **Note:** On CPU board revision D, the voice level on alarm corresponds to where the speaker volume adjustment pot is set.
Green LED	Indicates the condition of the CPU. The LED can have the following states: **ON**-Normal (AC power good) **Flashing**- AC Power failure: CPU is operating on backup battery **OFF**- Major power failure (AC and back-up battery voltage absent)

Table 3.2. Terminal Descriptions

CPU Terminal	Name	What It's Used For
1	Zone 1	Hardwire zone 1
2	GND	Common for zones 1 and 2
3	Zone 2	Hardwire zone 2
4	Zone 3	Hardwire zone 3
5	GND	Common for zones 3 and 4
6	Zone 4	Hardwire zone 4
7	Zone 5	Hardwire zone 5
8	GND	Common for zones 5 and 6
9	Zone 6	Hardwire zone 6 loop
10	+DC In	Positive voltage input from the optional Line Carrier Transformer
11	GND	CPU Ground connection common to many devices
12	CCS	Line carrier signal for Wireless Interior Siren and X-10 Lamp modules
13	AC	AC indicator for Line Carrier Transformer, or Primary connection for standard AC transformer
14	AC	Second connection point for standard AC transformer
15	DC OUT	Supply voltage for hardwire bus or other devices, 6.8 volts DC (fused)
16	VOICE	Voice output (amplified) for connecting 8 ohm speaker for voice alarm and status messages.
17	Int Siren	1st connection point for interior sirens, 2nd point is DC OUT terminal 15
18	Bus Out	Data Bus Out connection for hardwire bus devices
19	Bus In	Data Bus In connection for hardwire bus devices
20	FTC	Connection for Fail-To-Communicate sensor (see FTC installation). This terminal also provides an output that can be used as a trip input for the Interrogator module.
21	EXT SIREN	One side of dry relay output (no voltage). Normally open closed on alarm.
22	EXT SIREN	Other side of dry relay output (no voltage). Normally open closed on alarm.
23	GREEN	Incoming phone line TIP connection (T)
24	BROWN	House Phone outgoing TIP connection (T1)
25	GRAY	House Phone outgoing RING connection (R1)
26	RED	Incoming phone line RING connection (R)

Figure 3.2. System Wiring (Sheet 1 of 2)

3-5

Figure 3.2. System Wiring (Sheet 2 of 2)

LINE CARRIER TRANSFORMER (OPTIONAL)
PART NO. 60-346-500
IN CANADA 60-503-235

NOTE A:
THE LINE CARRIER TRANSFORMER PROVIDES THE CPU WITH AN ELECTRICAL GROUND FROM THE INSTALLATION SITE. AN ADDITIONAL GROUND IS NOT NECESSARY.

AC 4
CCS 3
GND 2
+DC 1

CAUTION!
USE ONLY ONE TRANSFORMER.

STANDARD AC TRANSFORMER
PART NO. 60-515
IN CANADA 60-516

NOTE B:
THE STANDARD TRANSFORMER DOES NOT PROVIDE THE PANEL WITH AN ELECTRICAL GROUND. FOR THE PANEL'S SURGE SUPPRESSION TO WORK PROPERLY, IT MUST BE GROUNDED.

TERMINAL STRIP 1

1	2	3	4	5	6	7	8	9
ZONE1	GND	ZONE2	ZONE3	GND	ZONE4	ZONE5	GND	ZONE6

TERMINAL STRIP 2

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
+DC IN	GND	CCS	AC	AC	DC OUT	VOICE	INT SIREN	BUS OUT	BUS IN	FAIL	EXT	SIREN	GREEN	BROWN	GRAY	RED

4.7k ohm
NORMALLY CLOSED DEVICE

NORMALLY OPEN DEVICE

4.7k ohm
NORMALLY OPEN DEVICE

4.7k ohm

ALPHANUMERIC HARDWIRE TOUCHPAD
ITI# 60-248-10-CTP

NOT USED
RED
GREEN
WHITE
BLACK
YELLOW
YELLOW

TO PROTECTION LOOP

PHONE PROTECTOR BLOCK
INCOMING TELEPHONE LINE (FROM UTILITY POLE)

RING   TIP

GROUNDING
SEE NOTES A AND B

NOTE:.
ITI PREFERS A TRUE ELECTRICAL GROUND. A WATER PIPE GROUND IS ALSO ACCEPTABLE IF IT IS AN UNINTERRUPTED METAL PIPE.

HOUSE PHONE JACK

T1 FROM BROWN TERMINAL ON RJ-31X CA-38A

R1 FROM GRAY TERMINAL ON RJ-31X CA-38A

RED   GREEN   RED

RJ-31X CA-38A

BROWN
GREEN
RED
GRAY

3.3   Installing the CPU

This subsection describes how to install the CPU, including:

- Mounting the CPU
- Installing CPU options
  - Wireless Receiver and Antennas
  - Speaker Kit
  - Feature Expansion Module

Before performing these installation procedures, review the CPU components and wiring diagrams earlier in this section.

3.4   Installing CPU Options

This subsection contains procedures for installing the following CPU options:

- Wireless receiver and antennas
- Speaker kit
- Feature Expansion Module

3.4.1 Mounting the CPU

CAUTION: Make sure you are free of static electricity whenever you work on the CPU with the cover removed. To discharge any static, first touch the metal CPU chassis, then stay in contact with the chassis when touching the circuit board. Using an approved grounding strap is recommended.

To mount the CPU, use the following procedure:

1.   Remove the CPU cover:

   A. Loosen the three cover screws on the CPU chassis bottom (see Figure 3.3).

   B.   Swing the CPU cover out and up to remove from catches on chassis top.

2.   Remove any wiring knockouts needed. BE CAREFUL NOT TO DAMAGE THE CIRCUIT BOARD.

3.   Loosen the battery retaining screw at the top of the chassis and remove the CPU backup battery.

4.   Place the CPU chassis against the wall. Mark the locations of the two mounting holes and two keyhole mounting holes. Make sure chassis is level. If you are installing the wireless receiver and antennas, keep in mind that the CPU antennas extend about 9" above the chassis.

5.   If mounting to studs, use at least #8 x 1 1/4-inch long screws.

6.   If mounting between studs, use appropriate anchors and screws. Partially insert screws into anchors at keyhole locations, then hang the CPU chassis on them.

7.   Check for level mounting, insert the two lower screws, then tighten all screws.

8.   Replace the backup battery and gently tighten the battery retaining screw.

Cover Catches

Keyhole
Mounting
Hole

Keyhole
Mounting
Hole

Keyhole
Mounting
Hole

Mounting
Hole

Mounting
Hole

Wiring Knock Outs

Cover Screws
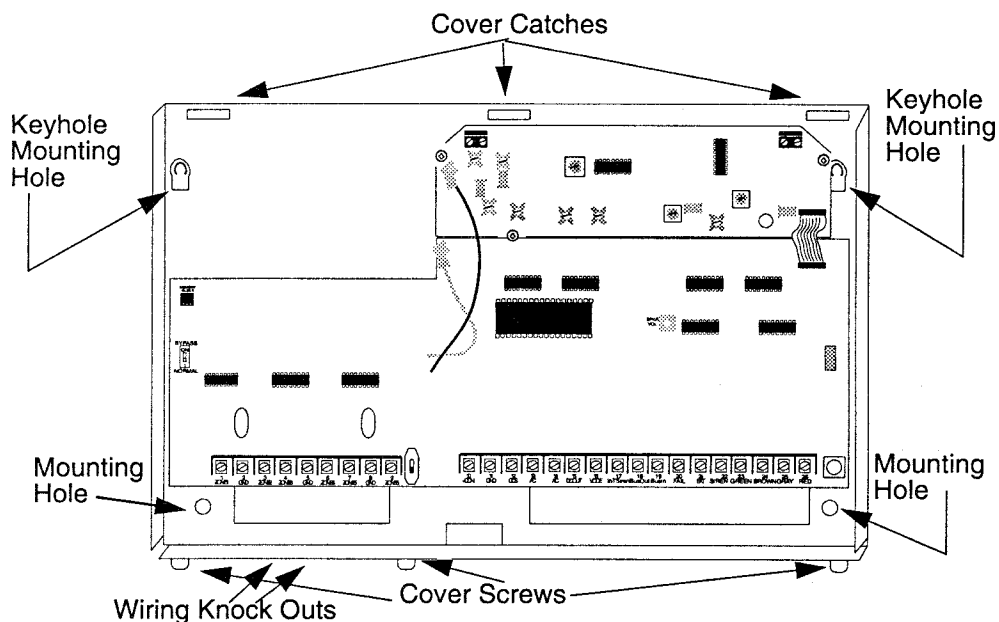
Figure 3.3. Mounting the CPU

3.5 Installing CPU Options

This subsection contains procedures for installing the following CPU options:

- Wireless receiver and antennas (60-485)
- Speaker kit (80-094)
- Feature Expansion Module (60-436)
- Hardwire Touchpad with Alphanumeric Display (60-248-10)

3.5.1 Wireless Receiver and Antennas (60-485)

To install the wireless receiver and antennas, use the following procedure:

Note: Be sure the CPU Power switch is OFF.

1. The receiver module kit includes two 6-32 x 1/4" screws used for the top of the receiver board.

2. Loosen the top two screws on the CPU board so the receiver module will mount snugly to the CPU board.

3. Slide the receiver module down onto the CPU screws.

4. Keeping the receiver module in place, install the (2) 6-32 x 1/4" screws, at the locations shown in the diagram. Tighten these screws but DO NOT OVER-TIGHTEN.

5. Tighten the two CPU screws but DO NOT OVER-TIGHTEN.

6. Connect the ribbon cable from the receive module to the CPU board. Be careful to properly align and seat this connector.

7. Insert the two antennas through the INSIDE holes provided in the top of the CPU chassis and into the INSIDE terminal block screws. Tighten the terminal block screws. The antennas should be vertical and clear of metal wires, coat hangers, pipes, duct work, etc. Care should be taken not to bend the antennas.

8. For Rev. D CPU boards ensure that the Antenna Jumper is in the position shown below. The jumper should be installed on the left two pins.

Note: Rev. E and later CPU boards do not have an antenna jumper.
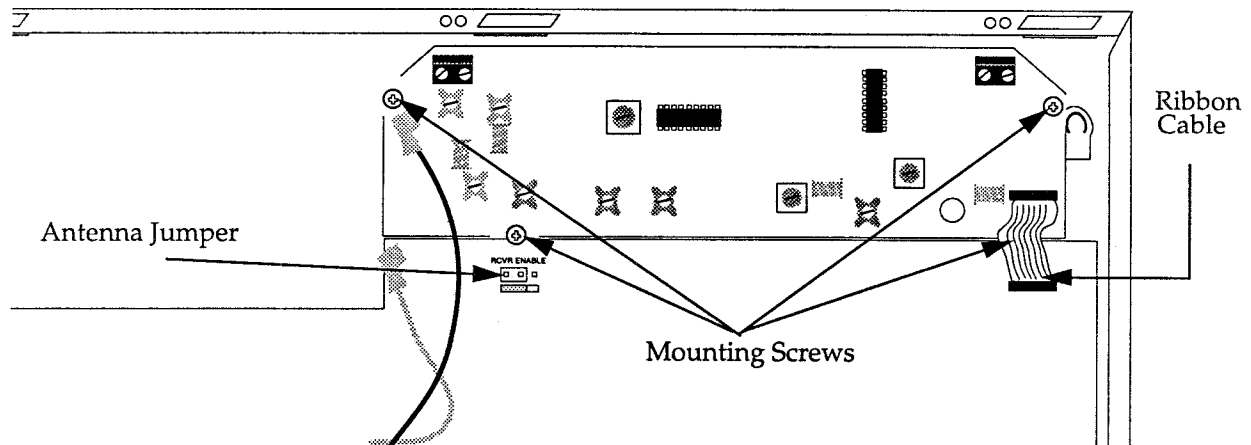
Figure 3.4. Wireless Receiver and Antenna Installation

3.5.2 Speaker Kit (80-094)

To install the speaker kit, use the following procedure:

1. The kit includes one speaker and two plastic standoffs. Identify the holes in the CPU board for the plastic standoffs as shown in Figure 3.5.
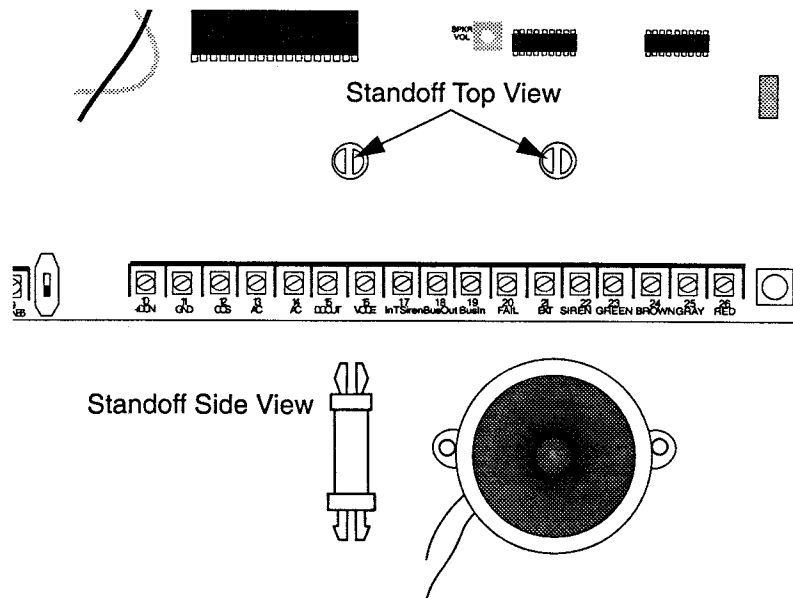
Figure 3.5. Speaker Kit Installation

2. Disconnect power from CPU by unplugging transformer and disconnecting backup battery.

3. Carefully press one end of the speaker standoff into each of the holes in the CPU board. Be extremely careful not to press too hard. The standoffs fit tight but will seat. Wiggle the standoff as you press.

4. Install the speaker on the standoff tops with the same procedure as above, be careful not to press too hard or the ears on the speaker holder might break.

5. Connect the speaker wires (polarity not important) to terminals 16 and 11.

3.6   Installing the Alphanumeric Touchpad

This subsection shows how to install the Alphanumeric Touchpad (60-248-10) that is used to program and operate the system. Installing the Alphanumeric Touchpad consists of the following procedures:

- Mounting the Alphanumeric Touchpad (either on a wall surface or gang box)

- Connecting the Alphanumeric Touchpad to the CPU

- Optionally, connecting a detector device to the hardwire loop provided on the touchpad's Wiring Harness

Recommendation

If the system uses multiple Alphanumeric Touchpads, prewire all touchpads, but fully connect only one touchpad to the CPU for programming purposes. Later, connect the additional touchpads, assign different unit numbers to each touchpad, and program the touchpads, as documented in "Programming Multiple Alphanumeric Touchpads" Section 4.1.3 or *Alphanumeric Touchpad Installation Manual* (46-506).

3.6.1 Mounting the Alphanumeric Touchpad

You can mount the Alphanumeric Touchpad either directly on a flat wall surface or gang box.

Wall Mounting

Use the following procedure to mount the touchpad on the wall:

1. Separate the Back Plate from the display by pressing the Release Tab and pulling it down.

2. Place the Back Plate at the desired location on the wall and use a pencil to mark the wall mount holes.

3. Insert anchors suitable for #6 screws at the marked locations.

4. Position the Back Plate so the wall mount holes line up with the anchors in the wall.

5. Secure the Back Plate to the wall using #6 x 1/2" or #6 x 3/4" screws. Do not use screws larger than #6 or the display will not seat properly onto the Back Plate.

6. Cut a hole in the wall for wiring along the inner right edge of the Mounting Plate. String the cable for connections to the CPU through this hole.

Gang Box Mounting

To mount the Alphanumeric Touchpad on a gang box, use the following procedure:

1. Separate the Back Plate from the display by pressing the Release Tab and pulling it down.

2. Place the Back Plate (Figure 3.6) on the gang box so the four inner slots on the Back Plate line up with the four outer holes of the gang box.

3. Secure the Back Plate to the gang box using #6 x 1/2″ or #6 x 3/4″ panhead screws.
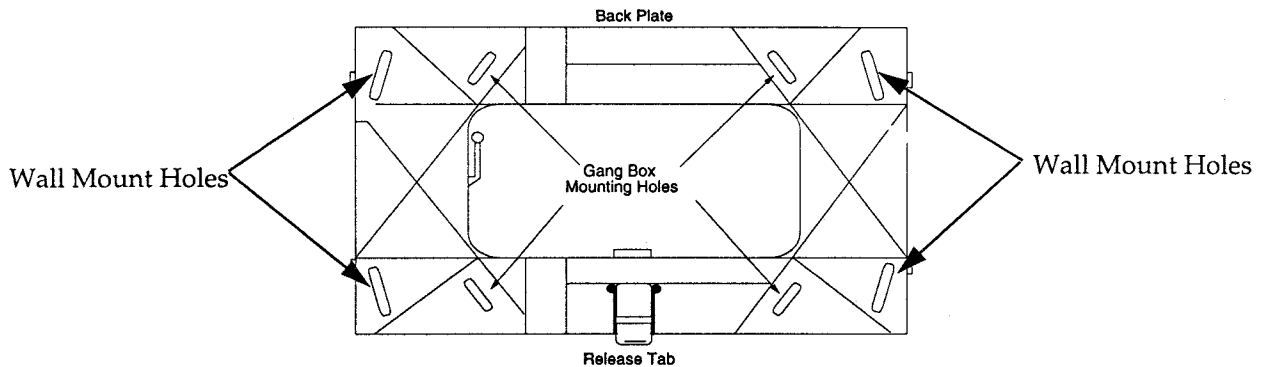
Figure 3.6. Alphanumeric Touchpad Wall Mount Installation

Note: Do not use screws larger than #6 or the Touchpad will not seat properly onto the Back Plate. Do not over tighten screws or the Back Plate may bind and not allow the Touchpad to mount properly.

3.6.2 Connecting the Alpha Touchpad to the CPU

To connect the Alpha Touchpad to the CPU, use the following procedure:

1. Run a 4-conductor cable from the touchpad to the CPU for the touchpad power and bus connections. The maximum wiring distance is 100 feet (see Table 3.3).

2. Run a 2-conductor cable from the touchpad to any hardwired detection device on the premises to utilize the loop input (yellow wires) on the touchpad wiring harness.

3. Attach the cable wires to the wiring harness as shown in Figure 3.7. and Table 3.3.

Table 3.3. Wiring Harness Connections

Attach This Wire:	To This CPU Terminal:
Red	15 (DC Out)
Green	19 (Bus In)
White	18 (Bus Out)
Black	11 (GND)

Table 3.3. Wiring Harness Connections

Attach This Wire:	To This CPU Terminal:
Yellow	If used, connect to 2-conductor cable from desired hardwired detector. This connection should be made now as a convenience to the installer (Supplementary use only).

4. Insert the Wiring Harness onto the pins on the rear of the Alpha Touchpad. Make sure the yellow wires are positioned on the two bottom pins.

5. Leave the jumper on the two top pins.

6. Attach the Alphanumeric Touchpad to the mounted Back Plate by lining up the wide portion of its four tab slots with the four tabs on the Mounting Plate. Once aligned, slide the display downward until you hear the Release Tab click into place.
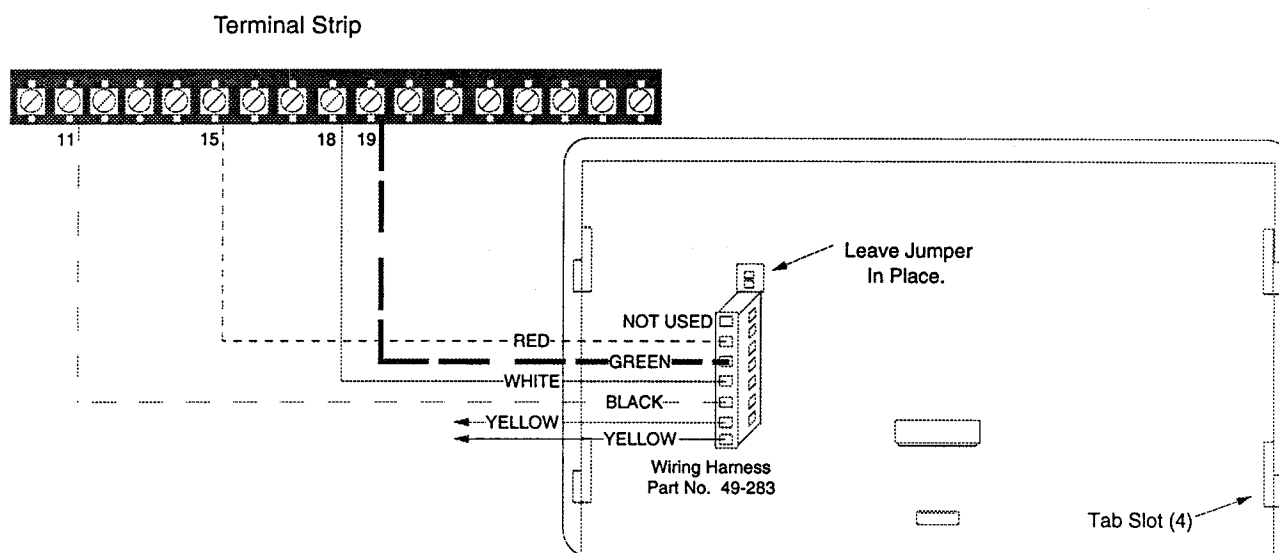
Figure 3.7. Wiring the Alphanumeric Touchpad

3.6.3 Connecting a Detection Device to the Touchpad's Hardwire Loop (Optional)

The two yellow wires on the Alpha Touchpad Wiring Harness provide a hardwire loop that you can use as a hardwire zone in the system. This circuit is supplementary and is not intended for use as a primary initiating circuit because the loop is not end-of-line supervised.

This loop provides a hardwire zone that you can use as you would the other six hardwired zones provided on the CPU. For example, you can wire the loop to a door contact for a door next to the Alpha Touchpad.

To use the Alpha Touchpad's Hardwire Loop, use the following procedure:

1. Determine the normal, non-alarm state for the detection device connected to the Hardwire Loop: is it normally open or normally closed?

2. Connect the detection device to the two yellow wires.

3. Program the Alpha Touchpad to indicate the normal, non-alarm state of the detection device: Normally Open or Normally Closed. To do this, use the LOOP IS: NC/NO touchpad configuration value (see "Programming Touchpad Configuration Information" in Section 4.4). During programming (Section 4), use the LOOP IS touchpad configuration prompt to indicate the normal state of the detection device on the Hardwire Loop. The default is NC (Normally Closed).

3.7　Installing Sirens

This subsection describes how to install and connect the following sirens:

- Hardwire Interior Siren and Piezo (60-278)*

- Hardwire Interior Siren Dual Speaker (60-528)*

- Hardwire Interior Speaker and Piezo (60-252)*

- Hardwire Interior Siren Dual Speaker (60-528)*

- Hardwire Exterior Siren (13-046)

- Wireless Interior Siren (60-353-235)

* Not investigated by U.L.

3.7.1 Hardwire Interior Siren and Piezo (60-278)*

The Hardwire Interior Siren and Piezo is a combination unit producing both low-volume status sounds and high-volume siren sounds. The unit includes double piezos and a single piezo. The double piezos activate for fire and burglary alarms only. The single piezo activates for both status and alarm sounds.

Each Hardwire Interior Siren and Piezo draws 75 mA of current in alarm; the combined piezo devices deliver an 85 dB siren in high-level alarm.

Before you install the siren, note the following:

- Locate this siren in areas where the status and siren sounds need to be heard.

- The number of sirens that can be installed depends on the amount of current available for devices powered by the CPU. The total current available for all devices powered by the CPU is 500 mA. See power requirements in Section 2.

- The CPU should be OFF when connecting the siren and piezo wires.

- If the system uses more than one Hardwire Interior Siren and Piezo unit, make connections to the piezos in parallel, with polarity observed, to maintain the siren volume.

To install the Hardwire Interior Siren and Piezo:

1. Run cable from the CPU to the siren location. Use 22-gauge or larger 4-conductor stranded wire (see Figure 3.8).

2. Remove the front cover of the siren by removing the two bottom screws. Remove the four screws that secure the piezo assembly, and pull the piezo assembly off the base.

3. Feed the cable through the circular cutout in the back of the base.

4. Mount the base to the wall with the proper anchors or screws using the two mounting holes provided.

5. Secure the piezo assembly to the base.

6. Connect the two wires from the double piezo board to the two left screws.

7. Connect the wires from the single piezo to the two right screws.

8. On the CPU, install a jumper from terminal 15 (DC Out) to terminal 21, Ext Siren. This is done because there is a dry contact between terminals 21 and 22; using a jumper between terminal 15 and 21 provides 6.8 VDC to the siren relay.

9. Using four wires, connect from the terminals on the Hardwire Interior Siren to the CPU as (observe polarity) as shown in Table 3.4.

Table 3.4. Hardwire Interior Siren Connections

Connect this Hardwire Interior Siren terminal:	To this CPU terminal:
Left red terminal (double piezo connection)	22, Ext Siren
Left black terminal (double piezo connection)	11, GND
Right red terminal (single piezo connection)	15, DC Out
Right black terminal (single piezo connection)	17, Int Siren

Note: Make sure a jumper wire is connected between terminals 15 and 21.

Observe Polarity
To CPU Term 17, INT Siren
To CPU Term 15, DC Out
To CPU Term 11, Ground
To CPU Term 22, Ext Siren
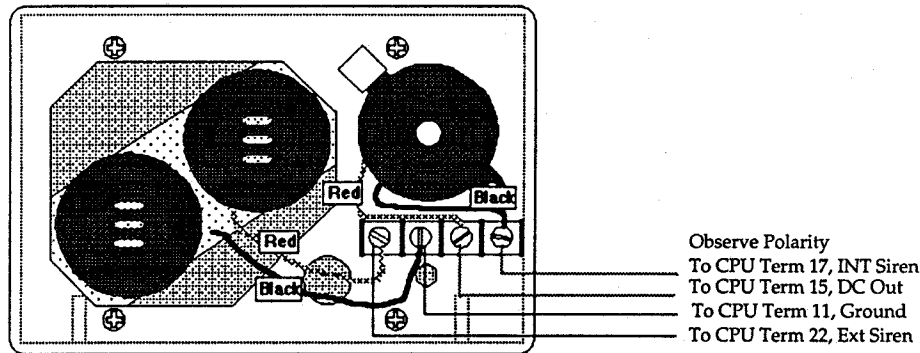
Figure 3.8. Connecting the Siren

3.7.2 Hardwire Interior Speaker and Piezo (60-252)*

The Hardwire Interior Speaker and Piezo is a combination unit producing both low-volume status sounds and high-volume siren sounds with voice alarm messages. The unit includes a speaker and a single piezo. The interior voice speaker annunciates all voice messages and alarms. The single piezo activates for both status and alarm sounds.

Before you install the siren, note the following:

• Locate this speaker in interior areas where the system status and siren sounds need to be heard. This speaker annunciates all voice messages and alarms.

• The number of sirens that can be installed depends on the amount of current available for devices powered by the CPU. The total current available for all devices powered by the CPU is 500 mA. See power requirements in Section 2.

* Not investigated by U.L.

- The CPU should be OFF when connecting the speaker and piezo wires.
- If the system uses more than one Hardwire Interior Speaker and Piezo unit, make connections to the speakers in series. Don't connect speakers in parallel. Make connections to piezos in parallel.

To install the Hardwire Interior Speaker and Piezo (60-252), use the following procedure:

1. Run cable from the CPU to the speaker location. Use 22-gauge or larger 4-conductor stranded wire (see Figure 3.9).

2. Remove the front cover of the speaker by removing the two bottom screws. Remove the four screws that secure the piezo assembly, and pull the piezo assembly off the base.

3. Feed the cable through the circular cut-out in the back of the base.

4. Mount the base to the wall with the proper anchors or screws using the two mounting holes provided.

5. Secure the piezo assembly to the base.

6. Connect the two wires from the speaker to the two left screws.

7. Connect the wires from the single piezo to the two right screws.

8. Using four wires, connect from the terminals on the Hardwire Interior Speaker to the CPU as in Table 3.5 (observe polarity).

Table 3.5. Hardwire Interior Speaker Connections

Connect this Hardwire Interior Speaker terminal:	To this CPU terminal:
Left terminal (black wire)	16, VOICE or terminal 1 on Feature Expansion Module.
Left terminal (black wire)	11, GND or terminal 2 on Feature Expansion Module.
Right terminal (single piezo red wire)	15, DC Out
Right terminal (single piezo black wire)	17, Int Siren
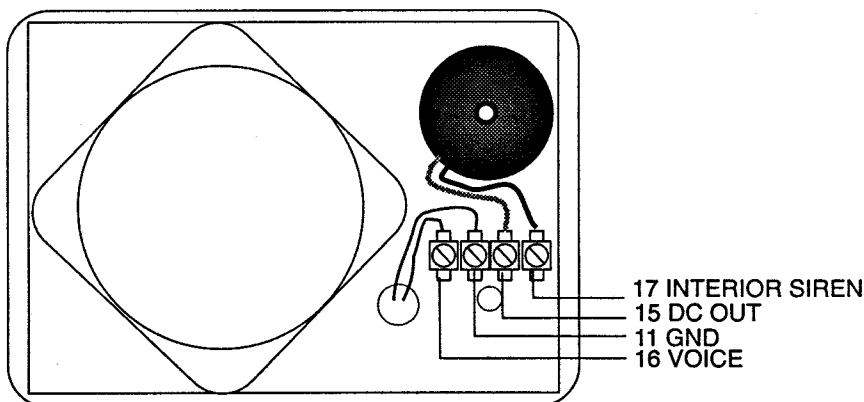
Figure 3.9. Installing the Hardwire Interior Speaker and Piezo

3.7.3 Hardwire Exterior Siren (13-046)

The Hardwire Exterior Siren produces high-level alarm sounds and is designed for large indoor or outdoor areas. It draws only 100 mA of current and has a weatherproof housing.

Before you install the siren, note the following:

- Mount the Exterior Siren where its alarm sounds can be heard but an intruder cannot easily locate it. Attics and vents are ideal locations.

- Use 2-conductor, 22-gauge or greater stranded wire to connect the siren to the CPU.

- During the system operation, the exterior siren output is delayed 15 seconds when Optional Feature F02, Exterior Siren Delay, is set ON (the default). See "Central Station Programming Information" in Section 8 for details on feature F02.

To install the Hardwire Exterior Siren (13-046), use the following procedure:

1. Remove the two bolts and washers that secure the mounting bracket to the siren housing.

2. Place the mounting bracket at the desired location and mark the mounting holes.

3. Secure the mounting bracket to the surface using appropriate anchors and screws.

4. Attach the siren housing to the mounting bracket with washers and bolts.

5. Aim the siren in the desired direction and securely tighten the bolts.

6. Connect the siren wires (see Figure 3.10).

7. On the CPU, install a jumper between terminal 15 (DC Out) and terminal 21 (Ext Siren). There is a dry contact between terminals 21 and 22; the jumper provides 6.8 VDC to the siren on alarm.

8. Connect the Hardwire Exterior Siren to the CPU terminals, as follows:

Warning:
Be sure you fully understand the wiring connections for the Hardwire Exterior Siren. Failure to follow instructions may permanently damage the CPU circuit board or your siren. Do not store any excess siren wires behind the CPU circuit board.

Table 3.6. Exterior Siren Terminal Connections

Connect this lead from the Hardwire Exterior Siren:	To this CPU terminal:
Black lead	11, GND
Red lead	22, External Siren
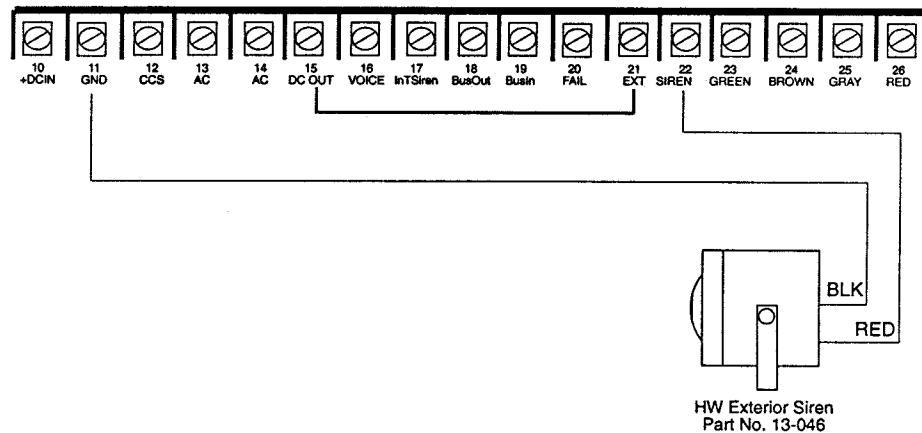
Figure 3.10. Wiring a Hardwire External Siren

3.7.4 Hardwire Interior Siren Dual Speaker (60-528)

This product consists of two speakers: one large and one small in a plastic enclosure. The dual speaker is designed to be used with a system installations where voice feedback is requested or required. When installed, the user will receive voice feedback for any command entered as well as on alarms.

- Locate this speaker in interior areas where the system status and siren sounds need to be heard. This speaker annunciates all voice messages and alarms.

- The CPU should be OFF when connecting the siren and piezo wires.

- Any additional speaker connected across terminals one and two of the FEM must be connected in series.

- This product should be used with systems that use the Feature Expansion Module (FEM) only.

To install the Hardwire Interior Siren Dual Speaker:

1. Using 22-gauge or greater 4-conductor stranded wire, run cable from the Central Processing Unit (CPU) to the dual speaker location.

2. Remove the two cover screws from the bottom of the dual-speaker enclosure.

3. Gently remove the cover by rotating the bottom edge up and off the cover tabs.
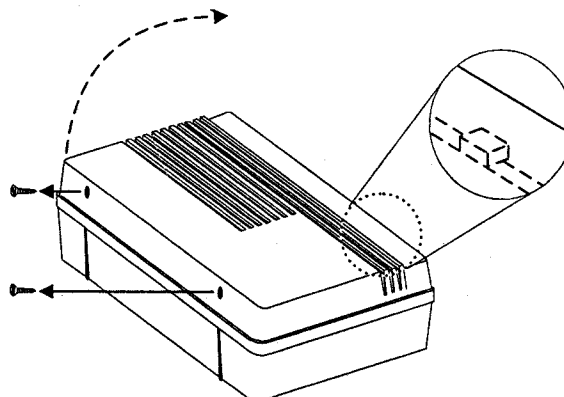
Figure 3.11. Removing the Cover

4. Remove the three speaker plate screws.
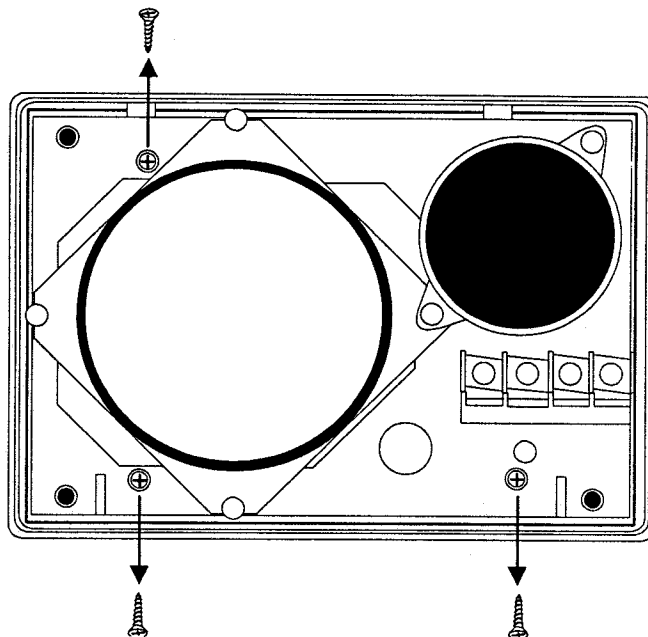
Figure 3.12. Removing Speaker Plate Screws

5. Lift off speaker plate off of the back box and set it aside.

6. Hold the back box to the mounting location; when level, mark the screw locations through the mounting screw keyholes.
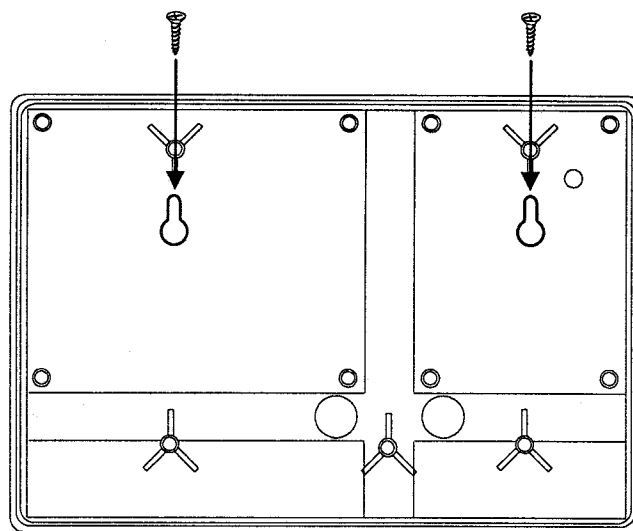
Figure 3.13. Mounting the Back Box

7. Screw in the two mounting screws (provided) at the marked locations, and use the plastic anchors provided, if necessary.

8. Feed the cable through one of the cable holes in the back box.

Note: Channels and knockouts are provided on the back of the back box for cable runs along the wall surfaces.
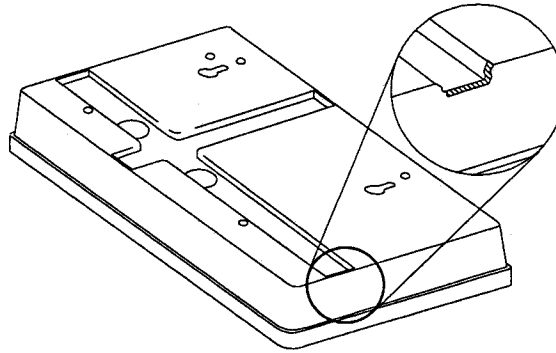
Figure 3.14. Channels and Knockouts

9. Align the back box mounting screw key holes with the two mounting screws and slide down.

10. Level the back box, and tighten the mounting screws.

11. Feed the cable through the large hole on the speaker plate.

12. Replace the three speaker screws.

13. Strip back the 4-conductor cable and the individual wires.

14. Connect the larger speaker to the first two terminals and the smaller speaker to the last two terminals.

Note: When the larger speaker is connected to terminals one and two of the FEM, it activates for fire and burglary alarms only. The smaller speaker activates for both status and alarms.

15. Connect the 4-conductor as shown.

To Terminal 11 GND
To Terminal 16 Voice
To Terminal 1 of Feature Expansion Module
To Terminal 2 of Feature Expansion Module
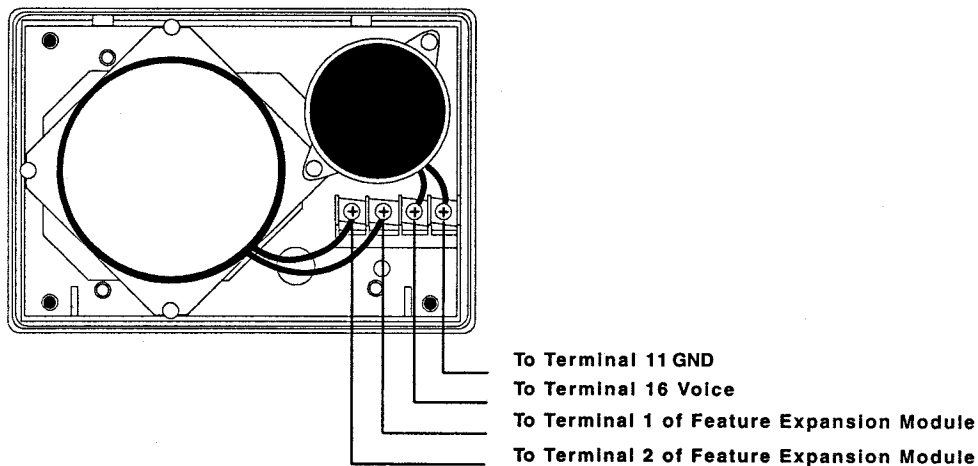
Figure 3.15. Terminal Connections to CPU

3.7.5 Wireless Interior Siren (60-353-235)

The Wireless Interior Siren (WIS) is used as a siren/annunciator in areas where the CPU's siren and status sounds need to be heard. Using the Wireless Interior Siren, you can install any number of sirens without having to do any wiring to the CPU. The Wireless Interior Siren is plugged into a live, non-switched, 110-volt AC wall outlet. The WIS receives CPU signals from the optional Line Carrier Power Transformer over the AC power line. It also contains backup battery to supply power during an AC power failure (9-volt alkaline or optional rechargeable NiCad). The backup battery supplies at least 4 hours of standby power and provides 85 dB minimum sound level output for at least 4 minutes. If the backup battery is low, the WIS beeps every 60 seconds until the battery is replaced. The WIS has screw terminals which can only be used to connect a Hardwire Exterior Siren, ITI #13-046.

Before installing the Wireless Interior Siren, consider the following:

*   Make sure the CPU uses the Line Carrier Transformer instead of the standard AC transformer. The Wireless Interior Siren requires the Line Carrier Transformer.

*   The Wireless Interior Siren gets programmed with the house code that is programmed into the CPU using the house code value. To program the house code, see "Programming CPU Configuration Information" in Section 4. If the house code is ever changed, the new code must be loaded into the Wireless Interior Siren (see "Changing the House Code in the Wireless Interior Siren," later in this section).

*   If you use the two screw terminals to connect a Hardware Exterior Siren (see Figure 3.11), use only ITI model 13-046 siren. These terminals provide 6 volts DC and 100 mA maximum current and activate only the POLICE and FIRE alarm sounds.

*   If you encounter interference and phasing problems with the Wireless Interior Siren. See "Handling Interference and Phasing Problems" in this subsection for details.

Note: U.L. applications require either Duracell Model MN 1604 or Eveready Model 522 Alkaline batteries.
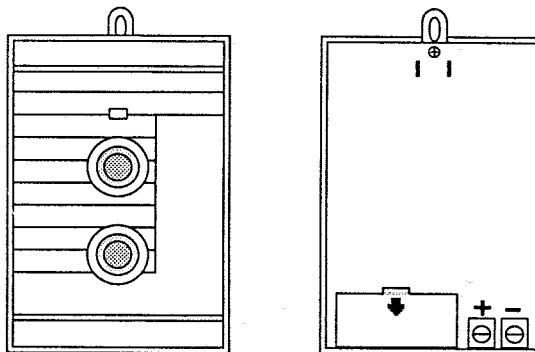
Figure 3.16. Installing a Wireless Internal Siren

Installing the Wireless Interior Siren consists of the following procedures:

*   Setting Dip switches on the Wireless Interior Siren
*   Installing the Wireless Interior Siren
*   Connecting another siren to the Wireless Interior Siren
*   Handling interference and phasing problems

Setting Dip Switches on the Wireless Interior Siren

The Wireless Interior Siren has three Dip switches located in the battery compartment, which allow you to modify the operation of the WIS to fit the needs of the installation.
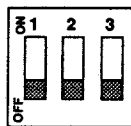
Set the Dip switches as needed. Table 3.7 describes each DIP switch and what each switch setting means.

Table 3.7. Dip Switch Setting

Switch	What It Does
SWITCH 1	OFF - Turn off if you are using an alkaline 9 volt battery. ON - Turn on if you are using the optional NiCad battery. This puts a 1 mA trickle charge on the battery connector (alkaline only for a U.L. listed system).
SWITCH 2	OFF - Allows all alarm and Status beeps to sound from the WIS. ON - Allows only High Level Alarm (Police and Fire) sounds from the WIS.
SWITCH 3	OFF - A connected external siren will activate immediately with the WIS. ON - A connected external siren will be delayed for 15 seconds before activating.

Note: The Wireless Interior Siren delay operates independently of the Exterior Siren Delay (set by optional feature number F02 at the central station). To avoid any confusion, however, if F02 is ON and a siren is wired to the terminals on the back of Wireless Interior Siren, set SWITCH 3 to ON.

To install a Wireless Interior Siren (60-353), use the following procedure:

1. Plug the WIS into a non-switched outlet.

2. Secure the WIS to the outlet with the center outlet screw so it cannot be accidentally unplugged.

3. This step must be done with a powered up and programmed CPU. You will need to program a house code into the CPU. This information is covered in the programming section. On the Alpha Touchpad, press STATUS. The CPU's house code is automatically entered into the WIS. Communication from the CPU to the WIS is verified by the LED on the front of the Wireless Interior Siren. The LED flashes every time it receives a signal from the CPU.

Changing the House Code in the Wireless Interior Siren

If you ever change the house code (001-225) programmed into the CPU, you need to make sure this new house code is programmed into the Wireless Interior Sirens. To change the house code on the Wireless Interior Siren, use the following procedure:

1. Unplug the Wireless Interior Siren.

2. Disconnect the battery.

3. Wait at least 30 seconds, then reconnect the battery.

4. Plug the Wireless Interior Siren back into the outlet.

5. Program the new house code value set on the CPU into the Wireless Interior Siren by pressing the STATUS button on the Alpha Touchpad.

CAUTION: Never open the Wireless Interior Siren while it is plugged into a live circuit. Serious injury or death could result from electric shock.

Connecting Another Siren to the Wireless Interior Siren

The Wireless Interior Siren has two screw terminals on the back of the unit which you can use to connect an exterior siren (6 VDC 100 mA maximum). Only the POLICE and FIRE alarm sounds are activated from these two screw terminals. Refer to the WIS installation sheet for more information.

Interference and Phasing

In some installations, a Wireless Interior Siren may experience interference and phasing problems. Table 3.8 identifies these situations and suggests actions to resolve the problems.

Table 3.8. Interference and Phasing

Problem	Corrective Action
Signal Blocking -- Occasionally, applications (especially TVs) can act as a filter and block signals being sent to a Wireless Interior Siren.	Use a different circuit than the TV or be sure the Wireless Interior Siren is on the near side of the circuit in relation to the CPU and the TV is beyond the Wireless Interior Siren.
Phasing Problems -- AC power coming into an installation site is usually broken into two separate 110 volt lines which are referred to as phases. Each of these lines serve different areas. Sometimes when a CPU is plugged into one phase and a Wireless Interior Siren into another, signals will not get through properly.	Move the Wireless Interior Siren to an outlet in phase with the CPU transformer, or move the transformer to an outlet in phase with the WIS. If this is not possible, you may want to switch to a Hardwired Interior Siren.
Interference -- The Wireless Interior Siren uses line carrier technology for signaling. Under severe circumstances, RF interference, AC power spikes, and other noise on an AC power line may cause any line carrier device to operate erratically or intermittently.	Try installing the WIS on a different electrical circuit. If that does not help, install a Hardwire Interior Siren in place of the WIS.

3.8 Connecting the System to the Phone Line

The next installation step is to connect the system to the phone line that the CPU will use to report to the central station.

This subsection contains the following information about the phone line connection:

- Set-up procedures for connecting the system to the phone line
- Procedures for connecting this system to the phone line:
    - Reviewing the site's existing phone wiring
    - Connecting the site's phone line to the RJ-31X Jack
    - Connecting the DB-8 cord from the RJ-31X Jack to the CPU

Following are some things you should know before connecting the system to the phone line.

- What the phone line connection does
- What equipment is involved in the phone line connection (see Table 3.9)
- What wiring is involved in the phone line connection

The phone line connection involves rewiring the site's phone lines, using an additional jack and cable, so that:

- The system is directly connected to the incoming phone line and can use the line to dial out to the central station.

- The site's individual phones (in-house phones) are directly connected through the CPU to the incoming phone line. All phone signals coming into the site through the phone line pass through the CPU and back out to the phones.

- The system uses the phone line to report several conditions. For example, when the security system goes into alarm and dials out to the central station, it has full control of the outgoing phone line during any communications. Phones on site are powered by the CPU and can be used to disarm, gain status, cancel alarm, etc. For example, during an alarm, if someone takes a phone off hook, the system listens for a valid command. In some cases a voice message will greet the user to alert them to system status. Phones remain disconnected from the outgoing phone line until the system is done contacting the central station.

- The CPU constantly monitors the phone system for any commands (commands preceded by the * key) entered at phone touchpads.

Table 3.9. Phone Line Connection Equipment

Equipment	How Used in the CPU Phone Line Connection
Incoming phone line	The phone line coming into the site from the phone system (the phone-system wiring leading up to the phone protector block). This is the phone line the system uses to dial out to the central station.
Phone protector block	A block supplied by the telephone company that provides surge protection for the incoming phone line and all in-house phones and devices wired to it. During re-wiring, you change the wiring at the output of this block so that the system is wired ahead of the in-house phones.
RJ-31X/CA-38A Jack	This jack is the key to the phone line rewiring. You use this jack to rewire the phone line so that it can connect to the CPU via the DB-8 Cord (see Figure 3.17).
House phone jacks (RJ-11 or other jack type)	One or more in-house phone jacks used at each phone to connect to the incoming phone line.
CPU	Connects to DB-8 Cord, which in turn connects to the incoming phone line through the RJ-31X/CA-38A Jack. During alarms, the CPU dials out to central station and has full control of the outgoing phone line. During operation, phone signals pass through the DB-8 Cord to the CPU and pass back out through the DB-8 Cord to the in-house phones. The CPU monitors the phone system for any system commands (commands preceded by the * key) entered at phone touchpads.

Table 3.9. Phone Line Connection Equipment

Equipment	How Used in the CPU Phone Line Connection
DB-8 cord	Connects the RJ31X/CA-38A Jack to the CPU. You can disconnect the CPU from the phone line by disconnecting the DB-8 Cord from the RJ-31X/CA-38A Jack. During testing, you can disconnect the CPU to test whether the phones work both with and without the CPU connected.
Wiring Involved	Study the wiring diagram earlier in this section to identify the wiring involved in the CPU phone system connection. The wiring ensures that the primary connection for the site's phone connections is between the phone line and the CPU, and that connections between the phone line and the in-house phones are secondary, and can be disabled.

To help you keep track of the wiring in the phone line connection, you can think of the connections as having two main groups of wires (see Table 3.10).

Table 3.10. Wiring Connections

These Wires:	Are Used For:
Red and green	Connections **incoming to the CPU**. These wires are used for communications between the CPU and the incoming phone line. These color codes for the wiring are used throughout the phone system connection (from the phone protector block to the CPU).
Gray and brown	Connections **outgoing from the CPU** to the in-house phone system. While these wires are gray and brown at the CPU terminals, they might be different colors elsewhere in the connection, such as the phone seizure cable or individual in-house phones, depending on the color coding used on cables and phone wiring. Though the color may vary, the potential remains the same throughout the connection.

3.8.1 Wire the System Ahead of All In-House Phones

Since this connection to the phone line allows the system to have full outgoing phone line seizure, wire the CPU ahead of all in-house phones.

Connecting the system to the phone line consists of the following procedures:

* Reviewing the site's existing phone wiring

* Connecting the site's phone line to the RJ-31X/CA-38A Jack

* Connecting the phone line to the CPU

3.8.2 Reviewing Site's Existing Phone Wiring

Because you will modify the site's phone wiring, review the existing wiring. This review helps determine how much rewiring you have to do to disconnect the individual phones from the incoming phone line and wire them so that the system has primary control over the outgoing phone line. To review the site's existing phone wiring, do the following:

1. Determine where the phone protector block is (such as outside, in the basement, or in a utility closet). Phone companies may vary where they put the phone protector block.

2. Determine how the site's phones are connected to the phone protector block. For example, check whether multiple phones are all parallel-connected at the phone protector block.

3. Check the polarity on the TIP and RING terminals on the phone protector block. Some phone systems are polarity-sensitive. When you rewire the phone lines for use with the system, you need to be aware of this polarity. Determine which terminal is negative (RING), and which is positive (TIP).

3.8.3 Connecting the Phone Line to the RJ-31X/CA-38A Jack

To connect the phone line to the RJ-31X/CA-38A Jack, use the following procedure:

1. Mount the RJ-31X/CA-38A Jack close to the CPU (the DB-8 Cord connecting RJ-31X/CA-38A Jack and CPU is about 8 feet long) (see Figure 3.17).

2. Run a cable from the phone protector block to the RJ-31X/CA-38A Jack. Use 22-gauge 4-conductor phone-grade cable. Do not make any connections yet. This is the security phone cable.

3. At the phone protector block, identify which terminals are used for the phone connections. You will connect new wires to these terminals later.

4. Disconnect all wiring for the in-house phones from these terminals.

5. Connect the green and red wires from the cable you ran in step 2 to the TIP and RING terminals on the phone protector block from which you disconnected in-house phone wiring in Step 4.
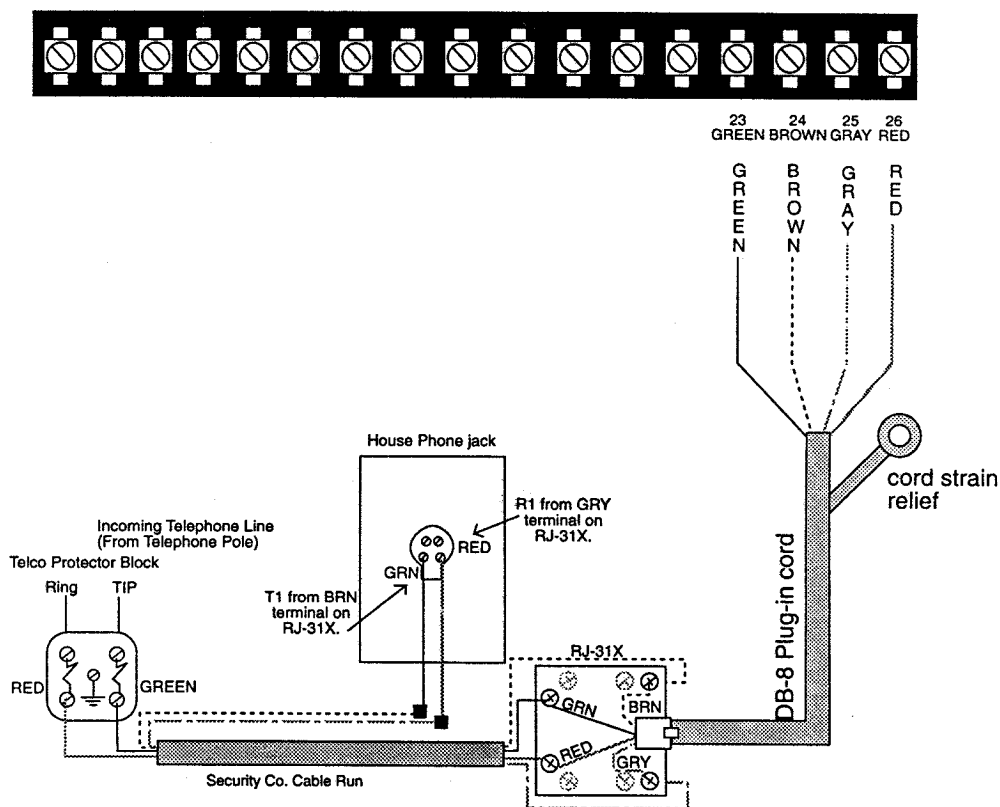
Figure 3.17. Connecting Phone Line to the RJ-31X/CA-38A Jack

Note: Make sure you know the polarity used on these terminals (see previous procedure) before connecting wires to the terminals.

Normally, the protector block uses the following polarity and wires at each terminal:

Terminal	Wire Used:
TIP+	(Positive)Green
RING-	(Negative)Red

If the protector block reverses the polarity at these terminals, wire the terminals accordingly. To help you keep track of the polarity for TIP and RING throughout the connection, ITI recommends using green and red wires on the security phone cable to connect to the protector block. Attach the green wire to the TIP (positive) terminal. Attach the red wire to the negative (RING) terminal.

6. At the RJ-31X/CA-38A end of the security phone cable, connect the pair of wires used for TIP and RING to the RJ-31X/CA-38A Jack. Keep in mind which color wire is being used for TIP and which for RING throughout the connection. Make the following connections:

Connect this wire:	To This RJ-31X/CA-38A terminal:
TIP	GREEN
RING	RED

7. Connect the remaining pair of wires from the security phone cable to the brown and gray terminals of the RJ-31X/CA-38A Jack. This connection wires the in-house phone system to the RJ-31X/CA-38A Jack.

8. Connect the in-house phones to the remaining two unconnected wires on the phone-protector block end of the security phone cable.

Note: All in-house phones at this splice are connected in parallel.

9. Check whether phones in the site work. If any phones don't have a dial tone, check your wiring and correct as needed.

If a telephone is not working properly, the problem may be that polarity for the phone's wiring reversed from the rest of the connection's wiring. Check the polarity, reverse wiring for that telephone, and check the phones again.

3.8.4 Connecting the Phone Line to the CPU

Now that the phone line is connected to the RJ-31X/CA-38A Jack, use the following procedure to connect the phone line to the CPU:

1. Connect the DB-8 Cord from the RJ-31X/CA-38A Jack to the CPU. Make the following connections from the DB-8 Cord to the CPU terminals:

   • DB-8 Cord green to terminal 23 (T)

   • DB-8 Cord brown to terminal 24 (T1)

   • DB-8 Cord gray to terminal 25 (R1)

   • DB-8 Cord red to terminal 26 (R)

2. Secure the DB-8 cord strain relief to the CPU chassis using the screw in the lower right corner of the CPU board.

3. Plug the DB-8 Cord into the RJ-31X/CA-38A Jack.

3.8.5 Testing the Phone Connection

When the phone wiring is completed, check the phone line connections to make sure the wiring is correct.

Make sure the phone connection can work with and without the CPU connected. Determine whether each phone in the phone connection has a dial tone with and without the DB-8 cord plugged into the RJ-31X/CA-38A.

3.9 Installing Hardware Options

This subsection shows how to install the following hardware options:

- Feature Expansion Module and Energy Saver Module
- X-10 Lamp Module
- Fail-to-Communicate (FTC) transmitter

3.9.1 Installing the Feature Expansion Module (60-436) and Energy Saver Module (60-438)

The Feature Expansion Module:

- Has a maximum current draw of 300 mA from the CPU's total available output current of 500 mA.
- Piggybacks directly to CPU, only one module per CPU.
- Allows for the connection of an Energy Saver Module for setback temperature use.
- Has a 12 VAC siren driver with speaker output. An 8 ohm minimum load is required, ITI Part # 60-252 or 13-060 are suggested. **If two Speakers are used, connect them in series (no connection in a U.L. listed system).**
- Has a built in self-test. When the CPU is powered up with the Feature Expansion Module installed, the self-test status can be checked by the LED on the Feature Expansion Module. If the LED is "OFF", the Feature Expansion Module self-test checked out okay. If "ON" call ITI Technical Services.
- Has a + 6.8 VDC switched output for devices requiring that power be removed to reset the device, typically a smoke detector such as ITI Part # 13-077.

Note: Only one Feature Expansion Module can be used per CPU.

The switched output's maximum current draw is 100 mA. and should be calculated in with the CPU's total available output current of 500 mA. The output switches off for 3 seconds at siren timeout or when the CPU is disarmed, following a high level alarm.

Installation

The Feature Expansion Module mounts "piggyback" style on the CPU. Make sure CPU power is off before installing the module. There are two standoffs and two small metal guides attached to the cabinet chassis. The guides and standoffs align with two plated screw holes and notches in Feature Expansion Module circuit board. The following procedures will assist you in the Feature Expansion Module's installation.

1. Make sure CPU power is off by turning off CPU switch, unplugging the power transformer, and disconnecting the backup battery (see Figure 3.18).

2. Align notches on Feature Expansion Module circuit board with small metal guides on CPU chassis and then align plated holes on circuit board with standoffs.

3. Place mounting screws through plated holes into standoffs, and secure the circuit board to the CPU. Take care when tightening these screws as damage to the circuit board could result.

4. Connect the following five terminals from Feature Expansion Module to terminal strip 2 of CPU. Hint: an 8-inch section of a 5- or 6-conductor cable, stripped back 2" on each end, can be used as a connecting bridge between the respective terminals.

Feature Expansion Module	CPU
6	11 CPU Ground
7	15 CPU DC Out
8	16 CPU Voice
9	18 CPU Bus Out
10	19 CPU Bus In
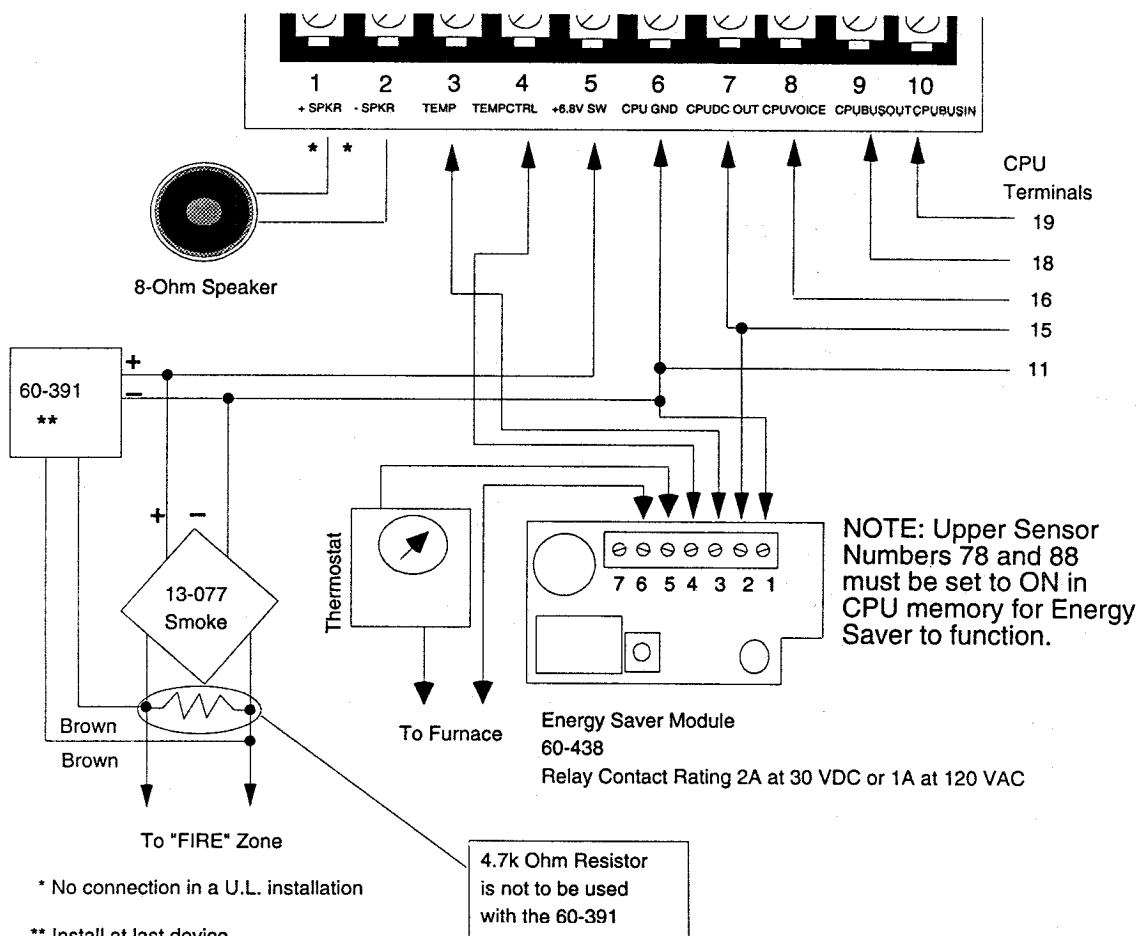
Figure 3.18. Feature Expansion Module Wiring Diagram

Programming and Adjustments

Unit number

Any device wired to terminals 18 (Bus Out) and 19 (Bus In) on terminal strip 2 of a CPU has a unit number assigned to it. Each device wired on terminals 18 and 19 must have a separate unit number, duplicating unit numbers will prevent all bus devices from operating. Refer Figure 3.19 to properly set your unit number for the Feature Expansion Module.
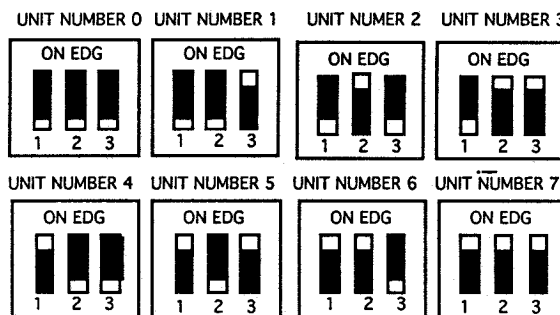
Figure 3.19. Setting the Unit Number for the Feature Expansion Module

Energy Saver Terminal Connections

ESM	Feature Expansion Module
1 ground	6 CPU Ground
2 + Vdc In	7 CPU DC Out
3 temp	3 Temp
4 temp control	4 Temp Control
5 Relay	Thermostat in series with furnace
6 Relay	furnace

Note: For best results , always mount the Energy Saver Module (as shown in Figure 3.20) with the relay at the upper right corner.

Temperature Calibration

The Energy Saver Module has an on board potentiometer that calibrates the temperature sensor to match the house thermostat. With the Feature Expansion Module and Energy Saver installed and the CPU on, perform a long status and the current temperature measured by the Energy Saver Module will be announced. If this temperature is too low or too high, adjust the potentiometer on the Energy Saver to match the thermostat temperature. Each adjustment of the potentiometer will require that a long status be performed to hear the current temperature sensed by energy saver.

Note: Allow 20 seconds between adjusting the pot and performing a long status. The temperature is sampled and sent from the bus module to the CPU every 10.4 seconds, waiting 20 seconds will allow the temperature to stabilize for a more accurate setting.
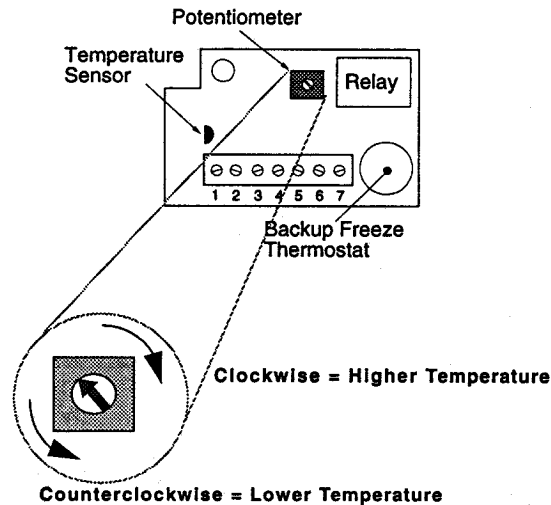
Figure 3.20. Energy Saver Potentiometer adjustment

Setting the High- and Low-Temperature Settings

The following procedures are to be performed after the system is completely wired and after it is powered up.

To set the low-temperature limit

1. Press ✳ + CODE + # + 3 on any system TouchTone phone

   or CODE + STATUS + 3 on any Alpha Touchpad

2. Immediately enter your desired two digit setting

3. Press COMMAND (for Alpha Touchpad **only**)

To set the high-temperature limit

1. Press ✳ + CODE + # + 4 on any system TouchTone phone

   or CODE + STATUS + 4 on any Alpha Touchpad

2. Immediately enter your desired two digit setting

3. Press COMMAND (for Alpha Touchpad **only**)

Note: The high- and low-temperature settings should set to a minimum of 14° apart from each other. Refer to the *Owner's Manual* for more information.

3.9.2 Installing X10 Lamp Modules (Light Control)

The X-10 Lamp Module is a plug-in device used to turn premise lights on during entry delay or alarm conditions. The optional Line Carrier Transformer must be used and a house code must be programmed for the Lamp Module to function. Any number of lamp modules can be installed and no wiring to the CPU is required. The Lamp Module is plugged into a non-switched 110 VAC wall outlet and then a lamp is plugged into the module. The lamp switch should be turned ON. During entry delay or alarm conditions, the lamp module receives a signal from the CPU via the Line Carrier Transformer and the light turns ON. Light control is for supplementary use only in a U.L. listed system.

- The transformer connected to the CPU must be a Line Carrier Transformer, ITI# 60-346-500

- The module must not be plugged into switched outlets.

- House code of the CPU and Lamp Modules must match. See Chart below to set house code on Lamp Modules.

House Code Setting

The vertical A-P column represents the HOUSE dial on the Lamp Module. The numbers to the right of each letter indicate the 16 CPU house codes available for that setting. For example, if the CPU house code is set to 146, the HOUSE dial on the Lamp Module should be set to C (see Table 3.11).

The UNIT dial on the Lamp Module is not used and can be left at position 1.

Table 3.11. X-10 Unit Number Setting

A		16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
B	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
C	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
D	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
E	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
F	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
G	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
H	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
I	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
J	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
K	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
L	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
M	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
N	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
O	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
P	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

No physical wiring is required to use the X-10 Lamp Modules. Feature is "installed" by 1) plugging in module to outlet; 2) plugging lamps into X-10 Lamp Modules; 3) setting dial on the X-10 module; and 4) programming to ensure the house code on the X-10 Lamp Module and in the CPU match.

3.9.3 Fail-To-Communicate (FTC) Output Buddy Transmitter

The Fail-To-Communicate output can be used to trip an Interrogator Alarm Verification Module, or it can trip an SX-V Door/Window sensor or Learn Mode D/W Sensor to signal a near by ITI system in the event of a communication failure (see Figure 3.21).

Note: Remember when installing FTC Transmitter, the FTC output activates after three unsuccessful communication attempts by the CPU with phone line voltage detected. If no phone line voltage is detected on initial phone attempt, the FTC output activates immediately.

SX-V   Learn Mode
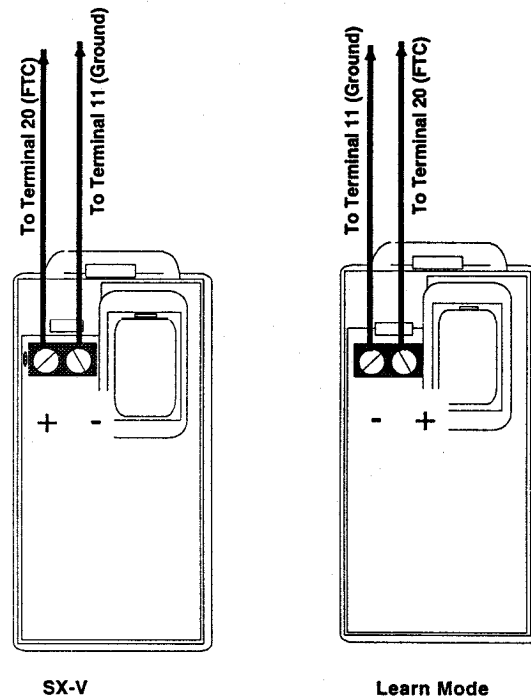
Figure 3.21. Connecting the Buddy Transmitter

Notes:

SX-V

The SX-V Transmitter must be programmed Normally Open (sensor type 0) for CPU software 2.0, or Normally Closed (sensor type 1) for CPU software 1.0. Refer to *SX-V System Installation Manual* for sensor programming.

Learn Mode

The Learn Mode transmitter must be learned into the prospective CPU while in the alarm state. This can be done before the transmitter is connected to the CPU, by shorting (2.0 software) the two external contact terminals, or leaving the terminals open (1.0 software) and then tripping the tamper switch. Program the sensor into an appropriate sensor group such as group 02. Since this is not a true "Buddy System," it is the monitoring station's responsibility to dispatch to the correct location.

3.9.4 Connecting Hardwired Zones to the CPU

You only need to perform this procedure if the system uses any of the six built-in hardwired zones. This step involves connecting wire leads from hardwired detection devices to the screw terminals for zones on the CPU panel.

Zones are configured during programming (see "CPU Programming Reference," Section 7).

On the CPU, connect hardwire circuits to CPU terminal strip #1 as indicated in Figure 3.22.

Notice in Figure 3.22 how two zones share a ground (GND). Each zone requires a 4.7k ohm end-of line resistor at the end of its circuit (supplied).
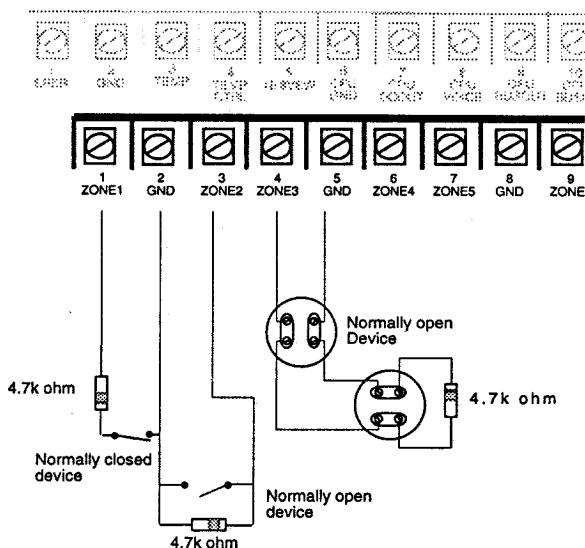
Figure 3.22. Connecting the Hardwire Zones

Note: Always install end-of-line resistors after the last device in a series circuit (Normally Closed or N/C) or across the terminals of the last device in a parallel circuit (Normally Open or N/O). Resistors installed at the terminal strip cannot properly monitor the circuit for an open or short condition.

3.10 Installing Hardwired Detectors

Installing hardwired devices involves mounting the detectors for which leads have previously been hardwired to the CPU. Follow manufacturers' instructions for installing hardwire detectors.

3.11 Installing Wireless Sensors

This section covers procedures for installing sensors. Because many different sensors can be used with the system, this section refers you to the appropriate installation instructions for details on installing each sensor type.

The following instruction sheets accompanying each sensor.

Table 3.12. Sensors and Related Installation Document Number

To install:		See Document #:
60-352	ESL Smoke Sensor	46-543
60-356*	DS923 PIR	46-544
60-362	Door/Window Sensor	46-327
60-409*	Recessed Mount Sensor	46-545
60-452	Pendant Panic Sensor	46-546
60-457	HandHeld Panic Dual Buttons	46-437
60-458	HandHeld Panic Single Button	46-437
60-459*	Sound Sensor	46-459
60-460* †	Rate-of-Rise Sensor	46-547
60-461*	Shock Sensor	46-438
60-462*	Glass Guard Sensor	46-548
60-472*	Sentrol PIR	46-396
60-499*	Slim Line D/W Sensor	46-549
60-504*	Freeze Sensor	46-550
60-506	System Smoke Sensor	46-515

* Not investigated by U.L.

† Not listed by California State Fire Marshall.

3.12 Connecting the Transformer to the CPU

Next, you need to connect the transformer to the CPU. You can connect the CPU to one of two transformer types.

Note: Transformers are not supplied with the CPU.

- Standard AC Transformer (Part No. 60-515, in Canada 60-516).

- Line Carrier Transformer (Part No. 60-346-500, in Canada 60-503-235). The Line Carrier Transformer is needed if you are installing the WIS or X-10 Lamp Modules.

Warnings:

- Do not connect both transformer types to the CPU. That is, if you use the line carrier transformer, you can connect that transformer only, not both the standard AC transformer and Line Carrier Transformer.

- Do not connect to an AC receptacle controlled by a switch.

- Do not store any excess wire behind the circuit board.

- Do not power other equipment from the CPU's transformer.

3.12.1 Connecting the Standard AC Transformer

To connect the standard AC Transformer to the CPU use the following procedure:

1. Be sure the CPU power switch is OFF and the back-up battery is disconnected.

2. Use two wires to make connections. On the CPU, connect one wire to CPU terminal 13 (AC) and connect the other wire to CPU terminal 14 (AC).

3. Connect the wires to the two terminals on the standard AC Transformer.

4. Connect the CPU board mounting screw to electrical ground at the installation sight (if the installation sight has a true electrical ground). Cold water pipe grounding can be used if it is an uninterrupted metal pipe (see Figure 3.2 for CPU board mounting screw location).
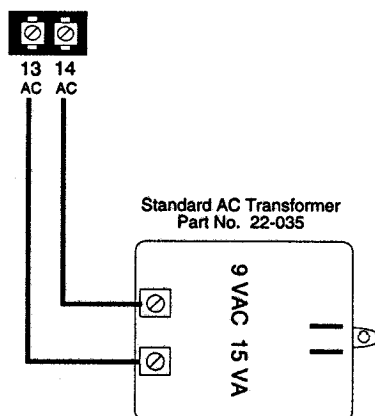
Figure 3.23. Standard AC Transformer Connections

Note: For wire runs of up to 50 feet, use minimum 22-gauge wire. For runs of 50 feet and longer, use minimum 18-gauge wire.

3.12.2 Connecting the Line Carrier Transformer

To connect the optional Line Carrier Transformer to the CPU use the following procedure:

1. Be sure the CPU Power Switch is OFF and the backup battery is disconnected.

2. Using a 4-wire conductor make the following connections between the Line Carrier Transformer and the CPU in Table 3.13.

Note: If the installation site has a true ground, the panel will be grounded to the site through the grounding lug on the Line Carrier Transformer.

Table 3.13. Line Carrier Transformer Wiring Connections

Connect this transformer terminal:	To this CPU terminal:
1 +DC	10 (DC+)
2 GND	11 (GND)
3 CCS	12 (LINE CARRIER)
4 AC	13 (AC INDICATOR)
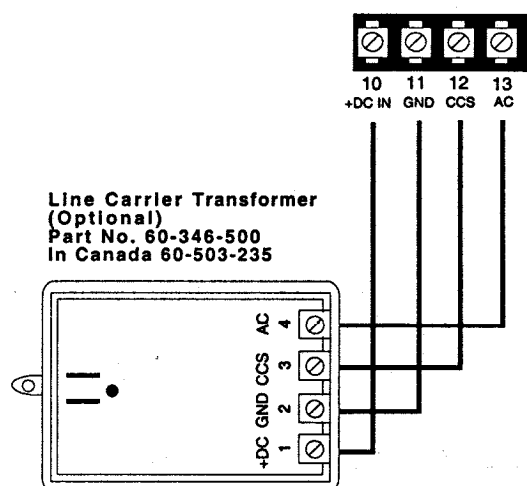
Figure 3.24. Line Carrier Transformer Connections

Note: For wire runs of up to 50 feet, use minimum 22-gauge wire. For runs of 50 feet and longer, use minimum 18-gauge wire.

3.13 Checking Connections

At this point, check all connections you made while installing and connecting components. Make sure that all connections are tight and all sensors and devices are mounted properly. While you can't yet fully test the system, checking connections now can help avoid any installation-related problems, such as incorrect wiring, that might otherwise show up during programming and testing.

3.14 Applying Power to the CPU

To apply power to the CPU, use the following procedure:

1. Make sure the CPU power switch is set to OFF.

2. Connect the backup battery connections (red and black flying leads) to the back-up battery. Observe polarity.

Note: The charge of the CPU backup battery will depend on how long the battery has been stored. A low battery condition may take up to 24 hours to clear while the CPU charges the backup battery.

3. Plug the transformer into a non-switched AC outlet. Secure the transformer with the center screw provided. This will prevent the transformer from becoming accidentally unplugged.

CAUTION: Do not power up the CPU until all connections are complete and you are ready to program the CPU (see Section 4).

Programming the System

This section describes how to program information about how the system will work, such as how many sensors the system contains and how the sensors work. It covers the following topics:

* An overview of programming activities

* Things to do and understand before you start programming

* Preparing the CPU for programming and entering program mode

* Programming CPU-related information

    - CPU configuration information

    - Upper sensor numbers (77 - 96)

* Programming touchpad-related information

    - Touchpad configuration information

    - Wireless touchpads

* Programming sensor-related information

    - Learning sensors into CPU memory

    - Programming sensor text

    - Deleting sensors

* Exiting program mode

* Programming options on the CS-4000 central station

4.1   Programming Activities Overview

Programming the system involves several areas and tasks. This overview describes which components are used in programming and the sequence of programming activities you perform.

4.1.1 Alphanumeric Touchpad

The Alphanumeric Touchpad is the main programming device for the CPU. This touchpad is used to enter values into CPU memory, such as sensors and system-specific configuration information. During programming, the Alphanumeric Touchpad prompts you for information in a certain order. You can cycle through this order of prompts to get to the desired programming area. For example, you can cycle past the prompts for sensor text to enter the system configuration information, and later return to programming sensor text. In "Understanding How to Program Using the Alphanumeric Touchpad," later in this section, there is a flow chart showing the order of the prompts, and the area of programming

related to these prompts. Once you know this order of prompts, you will be able to move forward and backward in the prompt sequence to locate the programming item you need. This section also shows you how to use the Alphanumeric Touchpad keys for programming.

4.1.2 Central Station (CS-4000)

Some features can only be programmed by the CS-4000. For example, if the system will have multiple user access codes for arming and disarming the system, you can only program the multiple user access codes at the central station.

4.1.3 Multiple Alphanumeric Touchpads and Unit ID Numbers

If the system you are installing and programming will include more than one Alphanumeric Touchpad for normal operation do the following:

- Do the programming with only one of the Alphanumeric Touchpads connected to the CPU. That is, mount all the touchpads, string wires between the touchpads and the CPU, and connect the wires to the CPU terminals, as documented in "Installing the Alphanumeric Touchpad" in Section 3.6. However, leave the wiring harness disconnected from the pins on the rear of all Alphanumeric Touchpads except the one you will use for programming. Once you have completed all programming for that Alphanumeric Touchpad, you can fully connect the other Alphanumeric Touchpads to the CPU and download the programming from that touchpad to the other Alphanumeric Touchpads. "Programming Multiple Alphanumeric Touchpads," later in this section, shows you how to program multiple Alphanumeric Touchpads.

- Program each Alphanumeric Touchpad (and all other hardware devices connected to the CPU Hardwire Bus) with a different unit number. This helps prevent conflicts among unit numbers for devices connected to the Hardwire Bus. To program the unit number, see "Programming Touchpad Configuration Information" later in this section.

4.2   Programming Process

The following explains the programming process.

1. Preparing for Programming
   Understand Alphanumeric Touchpad programming
   Prepare CPU for programming and enter program mode

2. CPU-related programming
   Program CPU Configuration information
   Program upper sensor numbers

3. Touchpad-related programming
   Program touchpad configuration information
   Program wireless touchpads
   Program multiple Alphanumeric Touchpads

4. Sensor-related programming
    Learning sensors
    Programming sensor text
    Deleting sensor text
    Deleting sensors

5. Exit program mode on CPU

6. Central station programming

Section 7 "CPU Programming Reference," provides details on programming done in this section. Information on how programming affects the operation of the system and how options and settings work can be found there.

You may also need to refer to other manuals during programming, for example:

- The installation instruction sheets for each sensor include programming details for that sensor.

- Some system options can only be set at the CS-4000. You may need to check the CS-4000 manual for information on entering commands.

Before you start programming, you should do the following:

- Make sure you have identified information you will need during programming, such as sensor and group information (see planning information in Section 2).

- Fill out the Appendix D.

- Install equipment (see Section 3).

- Have related manuals and installation instructions on hand, including installation instruction sheets for hardware devices that require programming.

4.3   Understanding How to Program Using the Alphanumeric Touchpad

Most of the programming is done using the Alphanumeric Touchpad. This subsection shows you how to use the Alphanumeric Touchpad to program information, including:

• How to use the touchpad keys for programming

• The order in which the touchpad cycles through programming information

• How having multiple Alphanumeric Touchpads in a system affects programming

Review this information before starting to program using the Alphanumeric Touchpad. Programming with the Alphanumeric Touchpad is straightforward and easy to accomplish. However, there are several items to be aware of when programming the CPU. These will be covered below:

4.3.1 Blank Values

When you enter program mode in the system, the Alphanumeric Touchpad does not "read" program memory in the CPU. It only allows you access to change information or toggle values. The touchpad does not display what the current programmed information

is in the CPU. The only way to get a listing of programmed memory is to have the central station operator use the CS-4000 to view program memory. You will have to keep accurate records of all information programmed into the CPU. If you have doubt about the contents of a programmed value, REPROGRAM IT. Do not make the assumption that the information is correct.

Default values for certain programming items are listed in the programming reference section of this document. There are two ways to reset the default values for these programming items. The first is to perform a memory clear on the CPU. Keep in mind this will completely erase all programmed information. The second is to reprogram the default value as the default value from the reference section.

4.3.2 Toggle Values

Some programming values are toggled between states that are displayed on the Alphanumeric Touchpad. These values show in the display what the current setting is. If a value is ON, pressing the appropriate key will toggle it OFF. If OFF, then ON. Some values have several different resident values that are selected by scrolling through the list and selecting the value with a keypress. Each type of value set will be described in a chart containing that value.

4.3.3 How Alphanumeric Touchpad Keys Are Used for Programming

When you use the Alphanumeric Touchpad to program, the system is in program mode, which means the touchpad keys have special meanings and functions for programming only. Figure 4.1 shows what keys are used during programming. Table 4.1 describes the programming keys.
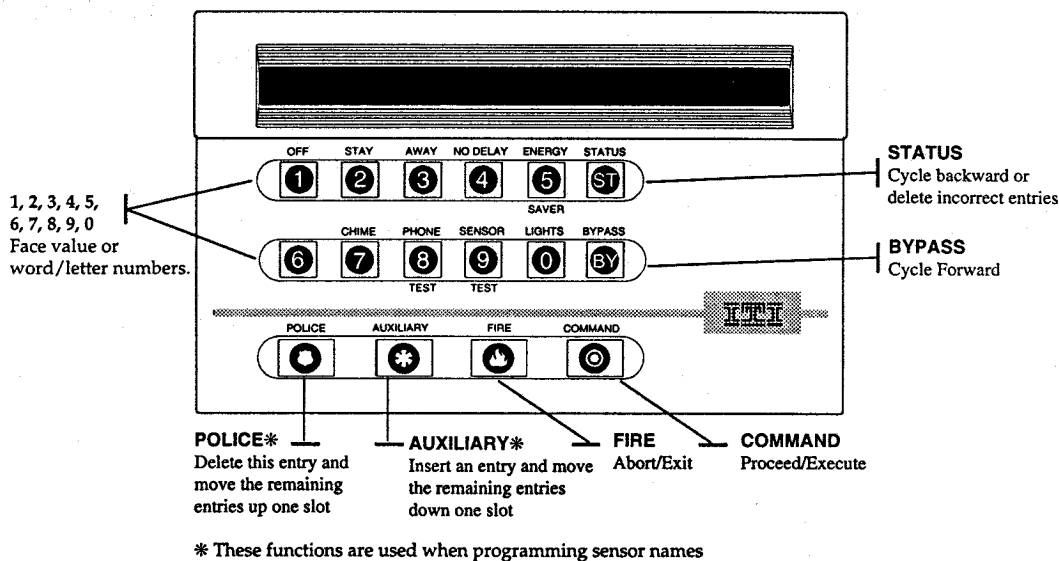
Figure 4.1. Key Functions for Programming

Table 4.1. Programming Keys

Numeric keys	Used to enter values such as time, sensor numbers, etc.
STATUS	• Cycle backward to previous programming function • Deletes an incorrect entry when entering information
BYPASS	Cycle forward to next programming function
POLICE	In sensor name programming, deletes entry and moves the remaining entries up one slot. Also is used to program a pause in CS phone number.
AUXILIARY	In sensor name programming, inserts entries and moves the remaining entries down one slot.
FIRE	Cancel programming command.
COMMAND	• Proceed or execute or confirm entry. • Toggle between values, such as Yes/No, ON/OFF.

4.3.4 Program Flow Used in the Alphanumeric Touchpad

Figure 4.2 shows the order in which the Alphanumeric Touchpad displays programming information. The programming software is like a menu of choices displayed in a set cycle. To move forward and backward through these choices, use the STATUS and BYPASS keys. Review this figure to understand how the system asks you for programming information, and the main system areas covered in programming. Programming instructions later in this section show you how to program each main area. Each programming procedure tells you to press STATUS or BYPASS until the programming function you need to use is displayed.

Examine the flow chart to familiarize yourself with the sequence in which the programming procedures appear. The direction of the arrows represents pressing the Bypass button. To view procedures in reverse, press the Status button.
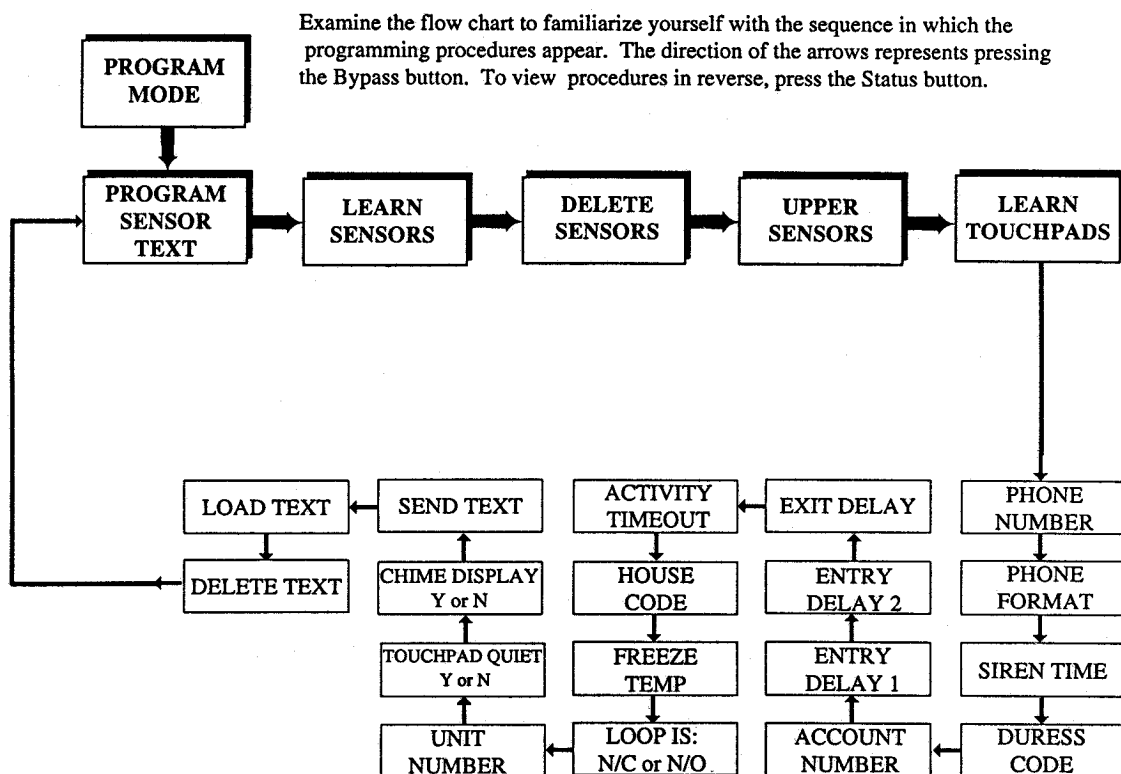
Figure 4.2. Programming Flow Chart

4.3.5 Entering Program Mode

For a new installation it is recommended to clear the CPU Memory with the following procedure.

Note: Keep the CPU cover off until you are done with programming.

Procedure

1. Set the Tamper Bypass Switch to NORMAL.

2. Check the power supply. Make sure the power transformer is plugged into a 24-hour unswitched AC outlet and is connected to the CPU.

3. Check the backup battery. Make sure the backup battery is connected.

4. Turn the CPU power switch to ON. The green LED at the middle right side of the CPU should be ON. The Alphanumeric Touchpad should display a self-test sequence, consisting of two tests:

*   The display scrolls all letters of the alphabet from right to left.

*   The display shows the message KEY TEST. You can use the key test to verify each key's operation and ensure that the key you press is also the key displayed on the touchpad's display. Performing the key test is recommended for first-time installation and power-up. Press every key on the touchpad and check what the display shows for each key. For example, if you press the FIRE key, the display should show KEY TEST - FIRE. If you do not press a key within 5 seconds of the last key press, or don't perform the key test, the display shows PROGRAM MODE. This message indicates that the self-tests have completed and the CPU is ready for programming.

Note: If the CPU and Alphanumeric Touchpads don't power-up, immediately turn the CPU power switch OFF and proceed to Section 6 "Troubleshooting."

5. Clear CPU memory. Before programming, clear any existing programming out of CPU memory. To clear CPU memory, press the MEMORY CLEAR button on the CPU for about two seconds. The touchpad display will blank out for 2 or 3 seconds and return to PROGRAM MODE. The premise telephones will announce MEMORY GOOD-BYE. You can now use the Alphanumeric Touchpad to program the system. Throughout your programming, the Alphanumeric Touchpad's piezo and the CPU's speaker (if installed) will beep six times every 60 seconds as a reminder that the CPU is in program mode.

4.4 Programming CPU Configuration Information

This section describes how to program values that control how the CPU performs. It includes the following procedures:

*   Programming CPU configuration information

*   Programming Upper Sensor Numbers

CPU configuration information is system- or site-specific values used to run the system, such as:

- The phone number used to dial out to the central station

- The reporting format used for transmitting reports to the central station

- Time-out values, such as the time the CPU allows a user to enter or exit an armed system without causing an alarm

On the Alphanumeric Touchpad, these CPU configuration values are programmed through the following functions:

- Phone Number

- Phone Format

- Siren Time-out

- Duress Code

- Account Number

- Entry Delay 1

- Entry Delay 2

- Exit Delay

- Activity Time-out

- House Code

- Freeze Temp

Before you program the CPU configuration information, determine values for each prompt and list them on the *Quick Guide*.

If you need to review the detailed descriptions for any CPU configuration value, see "CPU-Related Configuration Information" in Section 7.1.

CPU Configuration Values

Table 4.2 lists the configuration values for the CPU-related programming information shown earlier in this section. For detailed information on each value, refer to the "CPU Programming Reference" Section 7.

Table 4.2. Configuration Values

For This Prompt:	Description:	Enter this value:	Default
Phone Number	The phone number for the central station receiver.	Can be from 2 to 18 digits long (enter no digits and press the command button to clear the phone number).	None
Phone Format	The reporting format used for transmitting reports to the central station.	Press BYPASS or STATUS to choose from three phone formats: • ITI • 4/2 1900Hz/1400Hz • 4/2 1800Hz/2300Hz	ITI
Siren Timeout	The length of time the sirens will sound.	1 through 15 minutes	4 minutes
Duress Code	Last two digits of the duress code that sends a silent alarm to the Central Station (first two digits are the same as the first two digits of the primary access code).	Any two digits other than the last two digits of the access code. Upper Sensor number 86 is automatically enabled when a Duress is programmed.	N/A
Account Number	Five-digit ID number for identifying a CPU at the central station. 4 digit number transmitted in 4/2 format.	Any five digits	00-000
Entry Delay 1 *	Standard entry delay allowing user to enter premises and disarm the system without causing an alarm.	The delay can range from 8 through 88 seconds, and should be a multiple of 8. Otherwise, it is rounded down to the nearest multiple of 8.	32 seconds
Entry Delay 2*	Extended entry delay allowing user extra time to enter premises and disarm system. Can be used, for example, for a sensor controlling entry through a garage door.	The delay can range from 1 through 8 minutes.	4 minutes
Exit Delay**	Standard delay allowing user to leave premises after arming the system.	The delay can range from 8 through 88 seconds, and should be a multiple of 8. Otherwise, it is rounded down to the nearest multiple of 8.	32 seconds
Activity Timeout	Auxiliary alarm if the CPU has not detected any interactions with the homeowner within a specified time period.	Can be from 1 through 24 hours.	24 hours
House Code	Identifies the CPU with certain line carrier optional devices	001-255	001
Freeze Temp	Sets the low temperature for a freeze alarm	40°F to 90°F	42°F

* Shall not exceed 45 seconds in a U.L. approved installation.

** Shall not exceed 60 seconds in a U.L. approved installation

Program each value listed above with the command sequences shown below.

DISPLAY READS	PRESS	DISPLAY READS	ENTER	PRESS	DISPLAY READS	PRESS	PRESS
PHONE NUMBER	◉	_ _ _ _ _ _ _ _	2-18 Digit	◉	OK	⏻	🆑 To Continue
PHONE FORMAT	◉	SET ITI FMT	BY or ST for 4/2 1400 or 2300	◉	SET ITI OK	⏻	🆑 To Continue
SIREN TIME OUT	◉	SET SIREN _ _ MIN	01-15	◉	SET SIREN OK	⏻	🆑 To Continue
DURESS CODE	◉	SET DURESS _	Any 2 Digits	◉	SET DURESS OK	⏻	🆑 To Continue
ACCOUNT NUMBER	◉	SET NUMBER	Any 5 Digits	◉	SET NUMBER OK	⏻	🆑 To Continue
ENTRY DELAY 1	◉	SET ENTRY _ _ SEC	08-88	◉	SET ENTRY OK	⏻	🆑 To Continue
ENTRY DELAY 2	◉	SET ENTRY _ _ MIN	1-8	◉	SET EXIT DONE	⏻	🆑 To Continue
EXIT DELAY	◉	SET EXIT _ _ SEC	08-88	◉	SET EXIT OK	⏻	🆑 To Continue
ACTIVITY TIMEOUT	◉	SET TIMEOUT _ _ H	01-24	◉	SET TIMEOUT OK	⏻	🆑 To Continue
HOUSE CODE*	◉	SET CODE	001-255	◉	SET CODE OK	⏻	🆑 To Continue

* The House Code should only be set if X-10 modules or Wireless Interior Sirens are installed.

FREEZE TEMP	◉	SET TEMP	40-90 (°F)	◉	SET TEMP OK	⏻	🆑 To Continue

4.5   Programming Upper Sensor Numbers

Upper sensor numbers are numbers, ranging from 77 through 96, that represent Alarms, Reports and Tests resident in the CPU's memory. These upper sensor numbers affect what alarms and reports are sent to the central station, and how they affect system operation.

The names of the upper sensor numbers are pre-programmed and cannot be changed. On the Alphanumeric Touchpad, the name for each upper sensor number automatically displays with the number. For example, when sensor number 77 is displayed, the display scrolls through the following text: Sn77 - TOUCHPAD TAMPER.

Upper sensor numbers can be set to either ON or OFF, and have default values (see Table 4.3).

Table 4.3. Upper Sensor Default Values

A default of...	Means the sensor is...	Sensors with this default
ON	Already active.	80-83, 86, 91-92, and 94-96
OFF	Inactive until you turn it on.	77-79, 84, 85, 87, 88, 89, 90, 93

You can turn any upper sensor number on or off according to the system owner's installation requirements. However, it is recommended that you keep any upper sensor numbers that default to ON set to ON.

Programming upper sensor numbers involves toggling settings for each sensor number as needed, which in turn enables or disables the upper sensor numbers.

While planning the system installation (Section 2), you should have determined whether any upper sensor numbers must be modified from their default settings to accommodate the owner's system. For example, if the system uses the Energy Saver Module, you need to toggle the setting for upper sensor number 88 (Energy Saver) from OFF to ON. Appendix D has a section for determining upper sensor number settings. Section 7 has detailed descriptions of how the upper sensor numbers operate and the default settings for each upper sensor number. Review these descriptions if you still need to determine whether the system needs any upper sensor numbers changed from their default settings.

To learn more about each upper sensor number, see "Upper Sensor Number Programming Information" in Section 8.

To program upper sensor numbers, use the following procedure:

1. On the Alphanumeric Touchpad, press BYPASS or STATUS until the display shows UPPER SENSORS.

2. Press COMMAND to enter the upper sensor numbers programming function. The display shows the current setting for the first upper sensor number, 77: Sn77 OFF - TOUCHPAD TAMPER

3. Either toggle the setting for the upper sensor number or confirm the current setting and move on to another upper sensor number (see Table 4.4). The upper sensor number settings depend on the installation's requirements. Use the filled-out *Quick Guide* to determine whether you need to change any upper sensor numbers from their defaults.

Table 4.4. Toggling Upper Sensor Default Numbers

To:	Do this:
Toggle the setting for the upper sensor number	Press COMMAND. The sensor number blinks, and the state of the upper sensor changes from the current setting. If it was previously OFF, the setting would toggle to ON. If it was previously ON, the setting would toggle to OFF. For example, pressing COMMAND when the display reads Sn77 OFF - TOUCHPAD TAMPER would toggle the setting for upper sensor 77 from OFF to ON, and the display reads: Sn77 ON - TOUCHPAD TAMPER.
Confirm the current setting for the upper sensor number and move to the next upper sensor number	Press BYPASS. or STATUS

4. Continue setting the values for the upper sensor numbers as needed for the installation, using information from the *Quick Guide.*

To move forward and backward through the upper sensor numbers, press BYPASS and STATUS.

To confirm or toggle the setting for each upper sensor number, follow step 3.

4.6   Programming Touchpad-Related Information

This subsection provides information and procedures for programming touchpad-related information. It includes the following information:

*   Programming touchpad configuration information

*   Programming wireless touchpads

*   Programming multiple hardwired Alphanumeric Touchpads

Touchpad-related configuration information is system- or site-specific values that determine how this Alphanumeric Touchpad (the one being used for programming) operates, such as

*   The touchpad's unit number

*   Whether, when the Chime feature is on, the touchpad displays the sensor number for a protected door or window when the door or window is opened and the chime sounds.

On the Alphanumeric Touchpad, these touchpad configuration values are programmed through the following functions:

*   Loop Is

*   Unit Number

*   Touchpad Quiet

*   Chime Display

4.6.1 How to Program Touchpad Configuration Information

Use the following procedure to program the touchpad configuration information.

1. Cycle through programming menu until LOOP IS is displayed.

2. Enter Touchpad Configuration Information, as shown in Table 4.5.

Table 4.5. Touchpad Configuration

For this prompt:	Enter this value:	Default
Loop Is	The parameter selects the normal state of the Hardwire Loop used on the Alphanumeric Touchpad (Normally Open or Normally Closed). Normally Open =NO, Normally Closed=NC Use this setting if you have a detection device connected to the two yellow wires on the Alphanumeric Touchpad's wiring harness. For more information on using the hardwire loop, see "Connecting a Detection Device to the Touchpad's Hardwire Loop" in Section 3.6.3.	NC (Normally Closed)
Unit Number	The unit number for the Alphanumeric Touchpad (ranging from 0 through 7). Each device connected to the Hardwire Bus must have a unique unit number. The *Quick Guide* has a section for identifying all Hardwire Bus connected devices, and assigning unit numbers to each device. If you add other Alphanumeric Touchpads to the system, you must set different unit numbers for each additional Alphanumeric Touchpad. EACH HARDWIRE BUS DEVICE MUST HAVE A DIFFERENT UNIT NUMBER.	7
Touchpad Quiet	This value disables the internal status beeps emitted by the touchpad. Unless that Alpha Touchpad is being used, then status beeps occur regardless.	OFF
Chime Display	Determines whether the touchpad displays sensor number information when the Chime feature is on. When Chime Display is on and the Chime feature is on, the touchpad displays the sensor number for a protected door or window when the door or window is opened and the chime (beep) sounds. The open sensor will continue to display as long as the sensor is open. When Chime Display is off and the Chime feature is on, only the chime sounds. The touchpad does not indicate which sensor was tripped.	ON

4.7   Programming Wireless Touchpads

This subsection describes how to program a wireless touchpad into CPU memory using the LEARN TOUCHPADS function. You can program up to four wireless touchpads.

Note: If the system uses multiple wireless touchpads, gather all the touchpads and program them all at the same time. This is because pressing LEARN TOUCHPADS and then COMMAND erases all existing programming for wireless touchpads. This recommendation applies to both first-time programming and reprogramming. For example, if you add a third wireless touchpad to a system that already has two, gather all three touchpads, and reprogram the CPU for all three touchpads.

To program a wireless touchpad, use the following procedure:

1. On the Alphanumeric Touchpad, press BYPASS or STATUS until the display shows LEARN TOUCHPADS.

2. Press COMMAND. The display shows PRESS TP 01 BYP. This prompt tells you to press the BYPASS key on the wireless touchpad. It calls this wireless touchpad 01. If there are multiple wireless touchpads, you will press the BYPASS keys on those touchpads too.

3. On the wireless touchpad press BYPASS. This causes the CPU to learn the wireless touchpad into its memory.

   The Alphanumeric Touchpad display shows PRESS TP 02 BYP. This indicates that the CPU has programmed information for the first wireless sensor and is ready to learn another wireless touchpad.

4. If you are programming more than one wireless touchpad, continue pressing the BYPASS key on each wireless touchpad as prompted on the Alphanumeric Touchpad display. You can program up to four wireless touchpads.

5. When you are done programming wireless touchpads, press FIRE on the Alphanumeric Touchpad. LEARN TOUCHPADS is displayed again.

Note: Remember, pressing COMMAND again will erase what you just programmed.

4.8 Programming Sensor-Related Information

This subsection describes programming sensor information into CPU. It includes the following procedures and information:

- Learning sensors (assigning sensor numbers to groups, tripping sensors to establish sensor IDs in CPU memory)

- Programming sensor text (the name for the sensor)

- Deleting sensor text

- Deleting sensors

4.8.1 Learning Sensors

"Learning" sensors involves setting up the CPU to "listen" for sensors that are tripped by the installer depending on the group they will be assigned to. When a sensor is learned into CPU memory:

- The sensor is assigned to a particular group, a preset value in the CPU that defines characteristics of a sensor, such as whether it is used to detect fire or entry, the type of alarm sound, and whether the sensor sends a report to the central station.

- The sensor's ID is initialized in CPU memory by manually tripping the sensor. This sensor tripping causes the CPU to acknowledge the sensor and initialize values for it in CPU memory. Tripping the sensor programs the sensor's ID code in the CPU memory.

Learning sensors applies only to the sensor numbers 01 through 32. That is, the CPU does not have to "learn" the upper sensor numbers 77 through 96; they are always programmed into CPU memory.

Groups are defined as operational characteristics the CPU uses for each learned sensor in an installation. The CPU when learning a sensor number's ID, needs a set of instructions to follow when that sensor trips in the future. The 29 group types in the system are intended to do just that. Table 4.6 describes the function of each group. A detailed summary chart of unique characteristics for each group is in the Programming Reference Section of this manual. Refer to Section 2.1.8 for U.L. listed system requirements.

Table 4.6. Sensor Group

Group Number	Description	Application
00	Sensors in this group cause an Instant Police siren to sound, with no Restore signal is required. These sensors are active in levels 1, 2, and 3 and are supervised. A report is sent to the Central Station upon alarm.	24-hour audible fixed panic buttons.
01	Sensors in this group sound an Instant Police siren with no Restore signal. These sensors are active in levels 1, 2, and 3 and are unsupervised. They send a report to the Central Station upon alarm.	24-hour audible portable panic buttons.
02	Sensors in this group initiate an Instant Silent alarm and the panel does not require a Restore signal from the sensor. Sensors in this group are active in levels 1, 2, and 3 and are supervised. They send a report to the Central Station upon alarm.	24-hour silent fixed panic buttons.
03	Sensors in this group initiate an Instant Silent alarm and the panel does not require a Restore signal from the sensor. Sensors in this group are active in levels 1, 2, and 3 and are unsupervised. They send a report to the Central Station upon alarm.	24-hour silent portable panic buttons.
04	Sensors in this group initiate an instant low-level auxiliary alarm and the CPU does not require a Restore signal. These sensors are active in levels 1, 2, and 3 and are supervised. They send a report to the Central Station upon alarm.	24-hour auxiliary sensors such as a portable panic button, hold-up button, etc.
05	Sensors in this group initiate an instant low-level auxiliary alarm and the CPU does not require a Restore signal. These sensors are active in levels 1, 2, and 3 and are supervised. They send a report to the Central Station upon alarm, and shut OFF once the panel receives a kissoff from the Central Station.	24-hour auxiliary sensors and siren shut-off confirms CS communication.
06	Sensors in this group initiate an Instant low-level auxiliary alarm and the CPU does not require a Restore signal. These sensors are active in levels 1, 2, and 3 and are unsupervised. They send a report to the Central Station upon alarm.	24-hour portable auxiliary alert buttons.

Table 4.6. Sensor Group

Group Number	Description	Application
07	Sensors in this group initiate an Instant low-level auxiliary alarm and the CPU does not require a Restore signal. These sensors are active in levels 1, 2, and 3 and are unsupervised. They send a report to the Central Station upon alarm, and shut OFF once the panel receives a kissoff from the Central Station.	24-hour portable auxiliary alert buttons and siren shut-off confirms CS communication.
08	Sensors in this group initiate an Instant Police siren and the CPU requires a Restore signal from these sensors before rearming can occur. These sensors are active in levels 1, 2, and 3 and are supervised. They send a report to the Central Station upon alarm.	Special belongings such as gun cabinets, wall safes, silver drawers, etc.
09	Sensors in this group initiate a Police siren after the standard delay expires. The CPU requires a Restore signal from these sensors before rearming can occur. These sensors are active in levels 1, 2, and 3 and are supervised. They send a report to the Central Station upon alarm.	Same as group 8, but activation initiates a delay.
10	Sensors in this group initiate a Police siren after the standard delay expires. The CPU requires a Restore signal from these sensors before rearming can occur. These sensors are active in levels 2 and 3 and are supervised. They emit a Chime when the panel is set to level 1 and the Chime feature is ON. They send a report to the Central Station upon alarm.	Entry, Exit doors.
11✷	Sensors in this group initiate a Police siren after the extended delay expires. The CPU requires a Restore signal from these sensors before rearming can occur. These sensors are active in levels 2 and 3 and are supervised. They emit a Chime when the panel is set to level 1 and the Chime feature is ON. They send a report to the Central Station upon alarm.	Garage doors, etc., that need an extended delay time.
12✷	Sensors in this group initiate a Police siren after the twice extended delay expires. The CPU requires a Restore signal from these sensors before rearming can occur. These sensors are active in levels 2 and 3 and are supervised. They emit a Chime when the panel is set to level 1 and the Chime feature is ON. They send a report to the Central Station upon alarm.	Driveway gates, etc., that need a twice extended delay time.
13	Sensors in this group initiate an Instant Police siren and require a Restore signal from the sensor before rearming can occur. These sensors are active in levels 2 and 3 and are supervised. They emit a Chime when the panel is set to level 1 and the Chime feature is ON. They send a report to the Central Station upon alarm.	Exterior doors, windows.

✷ Not for use in a U.L. approved installation

Table 4.6. Sensor Group

Group Number	Description	Application
14	Sensors in this group initiate an Instant Police siren if tripped first, otherwise they serve as a Follower to a delayed sensor. They require a Restore signal from the sensor before rearming can occur. They are active in levels 2 and 3 and are supervised and they send a report to the Central Station upon alarm.	Interior doors.
15	Sensors in this group initiate an Instant Police siren if tripped first, otherwise they serve as a Follower to a delayed sensor. They do not require a Restore signal and are active in levels 2 and 3. They are supervised and send a report to the Central Station upon alarm.	Interior PIR motion sensors.
16	Sensors in this group initiate an Instant Police siren if tripped first, otherwise they serve as a Follower to a delayed sensor. They require a Restore signal from the sensor before rearming can occur and are active in level 3 only. These sensors are supervised and send a report to the Central Station upon alarm.	Interior doors.
17	Sensors in this group initiate an Instant Police siren if tripped first, otherwise they serve as a Follower to a delayed sensor. They do not require a Restore signal, and are active in level 3 only. These sensors are supervised and send a report to the Central Station upon alarm.	Interior PIR motion sensors.
18	Sensors in this group initiate an Instant Police siren if two (or more) are tripped within 4 minutes of each other, otherwise they serve as a Follower to a delayed sensor. The panel does not require a Restore signal, and sensors are active in level 3 only. Sensors in this group are supervised and send a report to the Central Station upon alarm. NOTE: Group 18 will function like group 17 if Feature 15 is ON.	Interior PIR motion sensors used to prevent false alarms.
19	Sensors in this group initiate a Police siren after a standard delay is initiated and the panel requires a Restore signal from the sensor before rearming can occur. These sensors are active in level 3 only, are supervised, and they send a report to the Central Station upon alarm.	Interior doors that initiate a delay before they go into alarm.
20	Sensors in this group initiate a Police siren after a standard delay and the panel does not require a Restore signal from the sensor. These sensors are active in level 3 only, are supervised, and they send a report to the Central Station upon alarm.	PIR motion sensors that initiate a delay before they go into alarm.
21	Sensors in this group initiate an Instant Police siren when tripped and the panel requires a Restore signal from the sensor before rearming can occur. Sensors in this group are active in levels 1, 2, and 3 and are supervised. They do not send a report to the Central Station upon alarm.	A 24-hour local alarm zone that protects anything that opens and closes.

Table 4.6. Sensor Group

Group Number	Description	Application
22	Sensors in this group initiate a Police Siren after a standard delay and the panel requires a Restore signal from the sensor before rearming can occur. Sensors in this group are active in levels 1, 2, and 3 and are supervised. They do not send a report to the Central Station upon alarm.	Same as group 21 above, plus activation initiates a delay before going into alarm.
23	Sensors in this group initiate an Instant low-level Auxiliary alarm. The panel requires a Restore signal from the sensor and the arming level must be changed to shut OFF the panel's speaker and exterior siren(s). Sensors in this group are active in levels 1, 2, and 3 and are supervised. They do not send a report to the Central Station upon alarm.	A 24-hour local alarm zone that protects anything which opens or closes.
24	Sensors in this group initiate an Instant low-level Auxiliary alarm which shuts OFF upon receiving a Restore signal from the sensor. Sensors in this group are active in levels 1, 2, and 3 and are supervised. They do not send a report to the Central Station upon alarm.	A 24-hour local alarm as above except restoring the sensor stops the alarm.
25	Sensors in this group Instantly initiate two long beeps which serve as a local annunciation. Sensors in this group are active in levels 1, 2 and 3 and are supervised. They do not send a report to the Central Station.	To notify the user that a door, etc. has been opened.
26	Sensors in this group initiate an Instant Fire alarm and the panel requires a Restore signal from the sensor before rearming can occur. You **cannot** bypass this sensor. Sensors in this group are active in levels 1, 2, and 3 and are supervised. They send a report to the Central Station upon alarm.	24-hour fire sensors.
27	Sensors in this group initiate an Instant Silent alarm and the panel requires a Restore signal from the sensor before rearming can occur. Sensors in this group are active in levels 1, 2, and 3 and are supervised. They do not send a report to the Central Station upon alarm.	Activating an output module line for light control and other custom requirements. Used with the HOM.
28	Sensors in this group initiate an Instant Silent alarm and the panel does not require a Restore signal. Sensors in this group are active in levels 1, 2, and 3 and are supervised. They do not send a report to the Central Station upon alarm. Same as group 27 above, except the sensor is momentary.	Used for momentary non-restore devices. Used with the HOM.
29	Sensors in this group initiate an instant low-level auxiliary alarm and the CPU requires a Restore signal. These sensors are active in levels 1, 2, and 3 and are supervised. They send a report to the Central Station upon alarm.	24-hour environmental sensors.

4.8.2 How CPU Prompts for Information When Learning Sensors

This subsection describes how the CPU asks you for information when it is learning sensors. You will find this information helpful when you are first using the LEARN SENSORS function.

4.8.3 Sensors Learned on a Group-By-Group Basis

Sensor learning works on a group-by-group basis. That is, the CPU first prompts you to specify the group to which you want to assign sensors, then for the sensors to be learned into CPU memory for that group.

Because the sensor learning prompts are on a group-by-group basis, it may help to learn all sensors for a particular group at once, rather than learning all sensors sequentially. That is, suppose a site has 20 sensors to be assigned to several groups. If you learn all 20 sensors sequentially, you may have to repeat the LEARN SENSORS procedure several times, possibly backing out to the LEARN SENSORS prompt for each sensor.

4.8.4 How CPU Assigns Numbers to Sensors

The CPU uses an ascending numbering sequence when learning sensor numbers. That is, the CPU prompts for and assigns numbers to sensors in a certain order. For each group to which you assign and learn sensors, the CPU prompts for the lowest unprogrammed sensor number, and increases from there, unless you tell the CPU you want it to learn a different sensor number (the procedure for learning sensors shows how to skip to another sensor number or group). The CPU does not check whether the sensor numbers it assigns are the same sensor numbers you want to use for the sensors (for example, the numbers you've assigned to the sensors during planning or the number labels you've attached to the sensors). The CPU only knows it is learning a sensor to which it is assigning a particular sensor number.

The CPU's sensor numbering could become a problem if you accidentally trip a sensor out of sequence while the CPU is learning sensors. That accidentally tripped sensor is programmed into CPU memory, even if it is in the wrong group or assigned the wrong number. For example, suppose you are learning three sensors, to which you've attached labels 01, 02, and 03. If you accidentally trip the sensor labeled 03 while the CPU is waiting for you to trip what it considers "sensor 02," the accidentally tripped sensor gets learned into the CPU as 02.

If a sensor is accidentally tripped or assigned to the wrong group, you can delete the programming for that sensor (see "Deleting Sensors" later in this section) and begin again.

4.8.5 Plan and Record Sensor and Group Information

Learning sensors will proceed more efficiently if you write down all sensor and group information on a worksheet, such as the one included in the *Quick Guide*. If you have this information planned and written down, you won't have to back out of the LEARN SENSORS function to determine or check values, such as the group number for a sensor, or the sensor-numbering scheme used for the system.

Before you learn sensors into CPU memory, do the following:

- Plan the system, using the information in Section 2 and the *Quick Guide*.

- Identify all sensors to be used in the system. Use the *Quick Guide* to keep track of all sensor information including:

  - How many sensors the system will have

  - The types of each sensor (such as smoke, motion detector, intrusion)

  - The number you want to assign to each sensor

  - The group to which you will assign each sensor - review the group chart to determine the appropriate group for each sensor. If you need more detailed information on groups, see Section 7 "CPU Programming Reference."

  The name or text for each sensor (programming sensor text is documented in a separate procedure.

- Install all sensors, as documented in Section 3 and the individual installation sheets for each sensor.

4.8.6 Learning Sensors into Memory

To learn sensors into CPU memory, use the following procedure:

1. With the CPU in program mode, at the Alphanumeric Touchpad, press BYPASS or STATUS until the display shows LEARN SENSORS.

2. Press COMMAND. The display shows LEARN GROUP _ _.

3. Fill in the blanks in the LEARN GROUP _ _ prompt with the two-digit group number to which you will assign sensors. See your filled-out sensor programming section of the *Quick Guide* for this information. Press COMMAND. The group number flashes for a few seconds, then the display shows LEARN Snxx, where xx is the sensor number. This prompt tells you the CPU is ready to learn that sensor number into its memory, and assign the sensor to the group you selected.

Note: If any sensors in the range of 01 through 32 are already learned, the display shows the lowest sensor number not already learned into CPU memory. For example, if sensors 01 and 02 were already learned, the display would show LEARN Sn03.

4. Specify the sensor number you want the CPU to learn. Either confirm that you want the CPU to learn the displayed (flashing) number, or choose another number to learn (refer to Table 4.7).

Table 4.7. Choosing Sensor Number to Program

To:	Do This:
Confirm that you want the CPU to learn the displayed (flashing) number	Press COMMAND.
Choose another sensor number to learn	a. Enter the desired sensor number. b. Press COMMAND.

5. The display shows TRIP Snxx, where xx is the sensor number to trip, for example, TRIP Sn01. This prompt tells you to trip the sensor. Tripping the sensor causes the CPU to learn the sensor's factory programmed ID code (refer to Table 4.8).

Table 4.8. How to Learn Sensors

If the Sensor is...	Do This to Trip the Sensor:
Wireless	Remove the sensor cover. This trips the tamper switch built-in to the sensor. Some sensors do not have a tamper switch and need to be activated. Refer to the individual installation sheet for each device you are programming. **Note:** When using an external contact with a Door/Window Sensor to properly learn it into CPU memory the contact must be in the alarm state while tripping the tamper.
Hardwired	The method of tripping the detector may vary by device.

When the CPU has learned the sensor, the touchpad display shows SENSOR xx OK, then SENSOR yy, that is, the next highest sensor number it is ready to learn. The display shows TRIPyy.

For example, if you just learned the sensor 01 in response to the prompt TRIP Sn01, the CPU displays TRIP Sn02.

Note: The process of learning and tripping sensors proceeds fairly rapidly. If you have to trip several sensors in a row, and you accidentally trip the wrong sensor during learning, you can delete that sensor and relearn the sensor. For the procedure for deleting a sensor, see "Deleting Sensors," later in this section.

6. Continue learning all sensors to be included in the currently selected group by repeating Step 5. The CPU prompts for sensors in ascending order. If you want to skip a few sensors, you must press FIRE to exit out to LEARN SENSORS, specify the group number again, and enter the sensor number to learn.

7. When you are done learning all sensors for the currently selected group, press FIRE. The display shows LEARN SENSORS. You can now learn sensors for another group or exit the LEARN SENSORS function.

Table 4.9. Changing Groups and Exiting Learn Sensors

To:	Do This:
Learn sensors for another group	Repeat steps 2 through 7.
Exit LEARN SENSORS function	Press BYPASS or STATUS to go to another function.

4.9   Programming Sensor Text

After sensors have been learned into CPU memory, you can give the sensors names. This is done by using the PROGRAM SENSOR TEXT function. This subsection describes how to program sensor text. It includes the following topics:

- An overview of what programming sensor text involves

- A table showing the words and characters you can use in sensor text, and the two-digit entries you enter for each word or character when programming sensor text

- Things to remember when programming sensor text

- A procedure for programming sensor text

Sensor text is a word or group of words that you can use to describe sensors programmed into the CPU. This sensor text is stored and displayed on the Alphanumeric Touchpad only. You can use sensor text to help you and the owner identify the sensors used in the system. For example, you can program the sensor text FRONT DOOR for sensor number 01. When information about sensor 01 is displayed on the Alphanumeric Touchpad, the text FRONT DOOR is displayed with the sensor number.

Programming sensor text is completely optional. That is, the system can operate on the basis of the sensors learned into the CPU; it does not need the sensor text to operate. However, for the owner's convenience and to help you in servicing the system, ITI recommends using sensor text for each sensor.

The system includes a library for programming sensor text. This library consists of the following:

- Preset words that are commonly used to describe areas and objects protected in a security system, such as DOOR, WINDOW, and BEDROOM. You can use combinations of these preset words, for example, to describe where the sensor is used, as in FRONT DOOR. Or what it protects, as in MEDICAL CABINET. Each preset word corresponds to a two-digit number in the range of 40 through 99. During sensor text programming, you enter the two-digit number for the word instead of the word itself. For example, to use the word DOOR for a sensor's text, you enter the number 53. The table on the next page shows the preset words you can program in sensor text, and the two-digit entry for each word.

- Individual alphanumeric and special characters that you can use to create customized words, or words that are not already in the preset words. This set of characters include A through Z, 0 through 9, special characters used for punctuation (space, apostrophe, and dash), and a null value. For example, you might want to program sensor text that includes a proper name or a special location. Each alphanumeric or punctuation character corresponds to a two-digit number in the range of 00 through 39. During sensor text programming, you enter all the two-digit numbers required to create custom words for the sensor text. The sensor text table shows the alphanumeric and special characters you can program in sensor text, and the two-digit number for each character.

Sensor text can consist of:

- All preset words (for example, BEDROOM WINDOW)

- All customized words created using individual alphanumeric characters (for example, GREENHOUSE)

- A combination of preset and customized words (for example, BOYS' BEDROOM WINDOW)

Each sensor name contains ten "locations" for programming its name, designated by letters A through J. These locations are place holders for the two-digit numbers corresponding to a preset word or individual alphanumeric/special character. When you program sensor text, you enter a two-digit character, corresponding to a preset word or individual

character, that is stored in each sensor text location. For example, to program the sensor text FRONT DOOR, you can use the preset words FRONT and DOOR. These words take up two "locations" for the sensor, A and B. To enter FRONT DOOR, you enter two-digit entries: 62 for FRONT, and 53 for DOOR.

4.9.1 Sensor Text Library

Table 4.10 shows the preset words, alphanumeric characters, and special characters in the sensor text library, and the two-digit number that corresponds to each entry. Enter the two-digit number when programming. During programming, you can either directly enter the two-digit entry for a word or character, or press BYPASS and STATUS to cycle through all of these character/word/number combinations, and choose the appropriate word or character for the location.

Table 4.10. Sensor Text

Character/Word	Number	Character/Word	Number
Null	00	T	20
A	01	U	21
B	02	V	22
C	03	W	23
D	04	X	24
E	05	Y	25
F	06	Z	26
G	07	Space (blank)	27
H	08	Apostrophe (')	28
I	09	Dash (-)	29
J	10	0	30
K	11	1	31
L	12	2	32
M	13	3	33
N	14	4	34
0	15	5	35
P	16	6	36
Q	17	7	37
R	18	8	38
S	19	9	39

Character/Word	Number		Character/Word	Number
Area	40		Library	70
Attic	41		Living	71
Basement	42		Main	72
Bathroom	43		Master	73
Bedroom	44		Mat	74
Bottom	45		Medical	75
Breezeway	46		Motion	76
Cabinet	47		North	77
Carpet	48		Office	78
Closet	49		Panic	79
Den	50		Patio	80
Desk	51		Police	81
Dining	52		Pool	82
Door	53		Porch	83
Drawer	54		Rear	84
East	55		Room	85
Entry	56		Safe	86
Family	57		Screen	87
Fire	58		Second	88
First	59		Sensor	89
Floor	60		Shock	90
Freeze	61		Side	91
Front	62		Sliding	92
Gallery	63		Smoke	93
Garage	64		Sound	94
Hall	65		South	95
Heat	66		Stairs	96
Kitchen	67		Top	97
Laundry	68		West	98
Level	69		Window	99

Keep the following in mind when programming sensor text:

- All locations (A through J) have a default of 00 (null). Whenever you want to delete a character or word from a sensor's name, enter 00 or press the POLICE button.

- When programming individual characters to create customized words (using entries 01 through 39), add spaces (entry 27) where necessary, including:

  - Between customized words. For example, you need to program a space between the customized words FENCE GATE.

  - After a customized word that is followed by a preset word. For example, you need to program a space between the customized word BOYS' and the preset word BED-ROOM.

Spaces are not automatically inserted at these places. Each programmed space uses one location (A through J).

- When programming preset words (numbers 40 through 99), spaces are automatically inserted after each word. You do not have to program these spaces, and they do not take up any extra locations (A through J).

- When creating customized words, you especially need to be aware of the 10-location limit for sensor text. Where possible, abbreviate and generalize. For example, suppose a sensor protects a window in a bedroom two brothers share. If you tried using each boy's name in the text, you would probably run out of locations. Instead, you can name the sensor BOYS' BEDROOM WINDOW. This sensor text is a combination of customized and preset words, and uses locations A through H, as follows:

  - BOYS' is a customized word, programmed in locations A through E.

  - Because BOYS' is a customized word, a space must be programmed in location F

  - The preset word BEDROOM is programmed in location G

  - The preset word WINDOW is programmed in location H

- You can program sensor text more efficiently if you write down the sensor text for each sensor and the two-digit entries for each word or character on the Alphanumeric Touchpad Worksheet.

4.9.2 Sensor Programming Text

To program sensor text use the following procedure:

Notes:

- This procedure assumes the sensors for which you are programming sensor text have already been learned into CPU memory. For details on learning sensors, see "Learning Sensors" earlier in this section.

- You can only program sensor text for sensors 01 through 32. You cannot program sensor text for the upper sensor numbers (77 through 96). Upper sensor numbers have preset text associated with them that cannot be changed through PROGRAM SENSOR TEXT.

    1. Press BYPASS or STATUS until the Alphanumeric Touchpad display shows PROG SENSOR TEXT.

2. Press COMMAND. The display shows Snxx Gryy; that is, the first sensor number programmed into the CPU and its group assignment. For example, if assigned sensor number 01 was assigned to group 10 when learning sensors, the display shows Sn01 Gr10. (If any sensor text has been programmed for the sensor, the text follows the sensor and group number, for example, Sn02 Gr14 - LIVING ROOM.) If no sensors have been learned into CPU memory yet, the display shows the lowest number of the programmable sensors (01 through 32) like this: Sn01 - DISABLED.

3. Either choose the currently displayed sensor number, or chose another sensor number for which you want to program sensor text (see Table 4.11).

Table 4.11. Choosing Sensor Number for Text

To:	Do This:
Choose the currently displayed sensor number	Press COMMAND.
Choose another sensor number	Either: • Enter the desired sensor number and press COMMAND. • Press STATUS or BYPASS to cycle through all programmed sensors. At the end of the cycle, Sn__ is displayed, allowing you to enter the desired sensor number. After choosing or entering the number of the desired sensor number, press COMMAND.

After choosing a sensor number and pressing COMMAND, the display shows A 00. This prompt shows you what is currently programmed in the first sensor text "location," A, and shows the current value for that location. If no text is already programmed for the sensor, the value for the location is 00. If any sensor text is already programmed for that sensor, A xx text is displayed, where xx is the two-digit number corresponding to the text.

4. Enter a two-digit number corresponding to the sensor text for the first "location," A. You can use a preset word from the text library or create customized words by building the word from the numerical entries corresponding to each letter in the word. The sensor text can also be a combination of preset and customized words. Use the Word/Entry chart in this subsection and the filled-out *Quick Guide* to determine which two-digit entries you have to enter for each word or character.

To enter the sensor text for location A you can either:

• Press the keys for the two-digit entry for the word or character, then press COMMAND

OR

• Press STATUS or BYPASS to cycle through the words and characters in the sensor text library until the desired word or character is displayed, then press COMMAND.

For example, to use the preset word FRONT for location A, press 62, then COMMAND. The display shows A 62-FRONT

After pressing COMMAND, the display shows the current value for the next sensor text location (B), for example, B 00.

5. Continue entering two-digit numbers corresponding to sensor text for each location. For example, to use the preset word DOOR for location B, press 53.

6. When you are done entering sensor text for the sensor, press FIRE. The display scrolls the sensor number and the sensor text you have programmed, for example, Sn01 DISABLED - FRONT DOOR. Remember the text is disabled because sensor 01 has not been learned by the CPU.

7. To program sensor text for another sensor, repeat steps 3 through 6.

8. When you are done programming sensor text for all sensors, press FIRE until the display shows PROG SENSOR TEXT.

4.9.3 Deleting Sensor Text

You can delete all sensor text for sensor numbers ranging from 01 through 32 previously programmed into an Alphanumeric Touchpad using the DELETE TEXT function. Some examples of when you might want to delete sensor text include:

• When working with an Alphanumeric Touchpad that had been used previously for demonstration purposes. You can clear any of the example sensor text programmed into the touchpad.

• If you run into problems while programming sensor text and want to start over again.

• When a site has multiple Alphanumeric Touchpads and you copy sensor text from one touchpad onto other touchpads, as described in "Programming Multiple Alphanumeric Touchpads," earlier in this section. ITI recommends using DELETE TEXT to clear any existing text from all touchpads to which sensor text will be sent.

Before using DELETE TEXT, make sure you really want to delete all sensor text for sensors 01 through 32. You cannot delete text for a particular sensor. If all you want to do is change the sensor text for a particular sensor, simply write over the existing text, using the PROGRAM SENSOR TEXT function (see "Programming Sensor Text" earlier in this section).

To delete sensor text, use the following procedure.

1. On the Alphanumeric Touchpad, press BYPASS or STATUS until the display shows DELETE TEXT.

2. Press COMMAND. The display shows DELETE TEXT RDY.

3. Press POLICE. All sensor text for sensors 01 through 32 is deleted. After a few seconds, the display shows DELETE TEXT DONE.

4.10 Deleting Sensors

You can delete sensors already programmed into CPU memory. For example, while learning sensors, if you accidentally trip a sensor and program it into CPU memory, you can delete the programming for that sensor. To delete sensors, use the DELETE SENSORS function. DELETE SENSORS does the following:

• Removes all programming for a sensor from the CPU memory.

- Deletes the sensor text associated with that sensor from the Alphanumeric Touchpad.

In contrast, the DELETE TEXT function removes only the sensor text for all sensors 01 through 32 from that Alphanumeric Touchpad's memory, the sensor number is retained in the CPU's memory. To delete sensor text, see "Deleting Sensor Text" earlier in this section. You can only delete sensors 01 through 32. You cannot delete upper sensor numbers (77 through 96).

To delete one or more sensors in the range of 01 through 32, use the following procedure:

1. On the Alphanumeric Touchpad, press BYPASS or STATUS until the display shows DELETE SENSORS.

2. Press COMMAND.

    The display shows the first sensor in the range of 01 through 32 that is currently programmed into CPU memory, for example DEL Sn01.

3. Either delete the currently displayed sensor, or choose and delete another sensor (see Table 4.12).

Table 4.12. Deleting Sensors

To:	Do This:
Delete currently displayed sensor	Press COMMAND. The sensor number flashes, then the display shows DEL Snxx OK.
Choose another sensor to delete	A. Press STATUS or BYPASS to cycle through all programmed sensors until the sensor you want to delete is displayed. B. Press COMMAND. The sensor is deleted and the display shows DEL Snxx OK, for example, DEL SN01 OK. OR A. Enter the sensor number you want to delete. B. Press COMMAND. The display shows DEL Snxx OK.

4.11 Send Text to Multiple Alphanumeric Touchpads

This section describes how to program more than one Alphanumeric Touchpad to work in the system. It contains the following information:

- Overview

- Things to do before you begin programming multiple Alphanumeric Touchpads

- Procedures for programming multiple Alphanumeric Touchpads:

    - Connecting the other touchpads

    - Setting a unique unit number on each touchpad

    - Clearing any sensor text already programmed into the other touchpads

    - Copying text from the touchpad used for programming onto other touchpads

Note: For all of the following programming operations, the CPU must be in the PRO-GRAM MODE.

If a system uses multiple Alphanumeric Touchpads, this manual recommends that you connect and use only one of the touchpads for most programming. Later, when you are done with programming for one touchpad, you can connect the other Alphanumeric Touchpads and program them so they can also be used to operate the system.

You can copy the sensor text programmed onto one touchpad to other touchpads, using the SEND TEXT and LOAD TEXT programming functions.

- SEND TEXT is used on the already programmed touchpad from which you will send text to the other touchpads.

- LOAD TEXT is used on all unprogrammed touchpads to receive the text sent from the already-programmed touchpad.

SEND TEXT and LOAD TEXT involve only the programmed sensor text; that is, the text displayed for sensors 01 through 32. It does not send other touchpad programming, such as the touchpad configuration values (Loop Is Nc/No, Unit Number, Touchpad Quiet, and Chime Display). You must program those configuration values at each touchpad.

If you change sensor text at any one of the touchpads, you need to load the changed text to the other touchpads in the system, so they all function the same.

Note: It is possible to have different sensor text in different Alphanumeric Touchpads. This can be done by loading the sensor text to only the desired touchpads.

4.11.1 Assigning Unit Numbers to Alphanumeric Touchpads

Because Alphanumeric Touchpads are connected to the Hardwire Bus, they must each have a unique unit number. On Alphanumeric Touchpads, the unit number is programmed using the unit number touchpad configuration value (see "Programming Touchpad Configuration Information," earlier in this section). Make sure all other Alphanumeric Touchpads and Hardwire Bus-connected devices have a unique unit number. The *Quick Guide* has a section for identifying all Hardwire Bus connected devices and their unit numbers.

4.11.2 Programming Additional Touchpads

The process of programming additional Alphanumeric Touchpads with information you already programmed on another touchpad consists of the following procedures:

- Connecting the other touchpads to the CPU power and box terminals

- Programming touchpad configuration values for each touchpad (most importantly, setting a unique unit number for each touchpad)

- Clearing any existing sensor text from the other touchpads

- Copying programming from the Alphanumeric Touchpad used for programming onto the other Alphanumeric Touchpads

4.11.3 Connecting Other Touchpads to CPU

The installation procedure for the Alphanumeric Touchpad in Section 3 recommends mounting and wiring all Alphanumeric Touchpads, and leaving all but one of the touchpads disconnected by unplugging the wiring harness off each touchpad.

To connect the Alphanumeric Touchpads to the CPU, use the following procedure:

1. Plug the wiring harness into the back of the Touchpad. Insert the wiring harness onto the pins on the rear of the Alphanumeric Touchpad. Make sure the Yellow wires are positioned on the two bottom pins.

3. Leave the jumper on the two top pins.

4. Attach the Alphanumeric Touchpad to the mounted back plate by lining up the wide portion of its four tab slots with the four tabs on the mounting plate. Once aligned, slide the display downward until you hear the release tab click into place.

4.11.4 Programming Touchpad Configuration Information for Each Touchpad

At each additional touchpad, you need to program the touchpad configuration values (Loop Is Nc/No, Unit Number, Touchpad Quiet, and Chime Display).

To program these values, follow the procedure in "Programming Touchpad Configuration Information," earlier in this section. The most important value to set is the unit number. Make sure you assign a different unit number to each touchpad.

4.11.5 Copying Text onto Other Touchpads

To copy text from an already-programmed Alphanumeric Touchpad onto other touchpads, use the following procedure:

1. On the touchpad from which you are sending text, press BYPASS or STATUS until the display shows SEND TEXT.

2. Press COMMAND. The display shows SEND, then SEND RDY.

3. On all touchpads to receive text, press BYPASS or STATUS until the display shows LOAD TEXT.

4. Press COMMAND. The displays should show LOAD, then LOAD SN.

5. On the touchpad from which you are sending text, press COMMAND. The display cycles through all sensors, beginning at 01 and ending at 32.

6. On all touchpads that are receiving text, the displays cycles through all sensors beginning at 01 and ending at 32. At this point, all programmed sensor text is being loaded into the other touchpads.

7. When all sensor text is sent to the other Alphanumeric Touchpads, Table 4.13 shows what should be displayed on each touchpad.

Table 4.13. Touchpad Displays for Send Text Procedure

Touchpad	Display
The touchpad from which you sent text	SEND DONE
All touchpads that received text	000 ERRS

If any touchpads that received text indicate errors (that is, any value other than 000 ERRS), repeat steps 1 through 5 of this procedure. If any touchpad displays still indicate errors after repeating steps 1 through 5, contact ITI Technical Services.

4.12 Programming DTMF Dialing from an On-Premise Phone

The CPU defaults to pulse dialing. If DTMF dialing is preferred, use the following steps to change the default setting.

1. Set the CPU to program mode (if the CPU is not already in program mode).

2. Press the STATUS or BYPASS button on the Alpha Touchpad.

3. Pick up an on-premise phone and press * 0 2 2, the CPU will respond by saying "ON" indicating that DTMF dialing is on. (Repeating * 0 2 2 toggles DTMF dialing On and Off.)

Note: DTMF dialing is available with CPU Rev. levels E and later, with CPU software 2.0 and later.

4.13 Exiting Program Mode

There two ways to exit the programming mode. If you will continue to be wiring the CPU and would like to leave the cover off the CPU, set the tamper/bypass switch to "BYPASS". This will enable the panel to be operated as if the cover was installed. The system returns to protection level 1.

With the switch in the "NORMAL" position, the CPU will return to the normal mode when the cover is installed.

4.14 Programming Options on the Central Station

Some system configuration options can only be set using the CS-4000 Central Station. This subsection describes programming these options. The *Quick Guide* and Section 7 "CPU Programming Reference" identifies these options. During planning, you should have determined whether the owner's system needs to use any of these options.

- F Features

- Phone system options:

- Phone number dialing options (PMODEs)

- Second phone line capability (Phone 2)

• Multiple access codes for different system users (MACCESS)

If the system you are installing requires any of these options to be enabled, inform the operator at the CS-4000, and tell them which options need to be set.

These options are covered in the *CS-4000 Central Station Installation and User's Manual.*

Testing the System

This section describes how to test the system to ensure that all components work, and that the system works as programmed.

5.1   Sensor Testing

This subsection provides information and procedures to test wireless sensors and hard-wired devices.

5.2   Testing Wireless Sensors

The following procedure explains how to test wireless sensors.

1. Initiate a Dealer Sensor Test, press CODE + STATUS + 9 from a touchpad, or *
    CODE # 9 from an on premise phone. The Dealer Sensor Test will help you deter-
    mine two things, first if the sensor is communicating with the CPU and secondly
    how many rounds the CPU is hearing from that sensor.

    Note: Entering CODE, STATUS, and 9 will also clear alarm history.

2. Trip the wireless sensor and listen for and count the beeps from an interior siren
    output, (WIS or a recommended siren wired across terminals 15 and 17, refer to
    CPU Wiring Diagram Figure 3.2). The beeps indicate rounds of data that are
    repeated 8 times from each sensor when tripped.

3. The number of beeps can be used to determine whether a sensor is in a good loca-
    tion or not. Intrusion and other type protection sensors, (Door/Window, Shock,
    PIR & Sound Sensors, Smoke/Heat Sensors, Portable Panics), have the following
    validation.

    > 7 to 8 beeps - Acceptable

    > 6 or fewer beeps - Poor or Unacceptable

Note: Only an acceptable response from a sensor shall be used.

4. If no beeps are heard when the sensor is tripped, use the RF Sniffer to determine if
    the wireless sensor is transmitting. For RF Sniffer operation, refer to the instruc-
    tion sheet included with the RF Sniffer.

5. To determine which sensors have not tested, press STATUS on an Alphanumeric
    Touchpad or press # on an on premise phone. CPU will announce through the
    phone, SENSOR TEST IS ON, SENSOR XX TEST, SENSOR XX TEST, etc.". "SEN-
    SOR XX TEST" indicates which sensor(s) have not been tested. On the Alphanu-
    meric Touchpad, the display will scroll through the untested sensors, for example:
    01 TEST BOYS BEDROOM WINDOW, 81 TEST POLICE PANIC, etc. If no beeps
    (refer to step 4) or less than the desirable number of beeps are heard, then check
    for the following possible problems:

Other sensor test information includes

- During both Dealer and Customer Sensor Test, the beeps indicating transmission and the voice messages can be heard on the speaker attached to terminals 16 (voice) and 11 (Gnd).

- During Dealer Sensor Test, all the "beeps" (indicating transmitter rounds) and voice messages can be heard on any speaker connected to the Feature Expansion Modules terminals 1 and 2.

- During Customer Sensor Test the CPU 's backup battery is tested.

Problem/Solution

- Sensor was not "learned" into CPU memory (refer to Section 4).

- Location problem (sensor out of range of CPU). Relocate sensor.

- Defective sensor, refer to step 4 then replace sensor.

- Null or dead spot within premise, relocate sensor.

5.3 Hardwire Devices

1. Initiate Sensor test, press CODE + 9 from a touchpad, or * CODE +9 from an on premise phone.

    Note: Entering CODE and 9 will also clear alarm history.

2. Trip a hardwired sensor and listen for a confirmation beep from an interior siren output, (WIS or a recommended siren wired across terminals 15 and 17, see Figure 3.2).

3. If no confirmation beep is heard make sure that sensor was "Learned" in the CPU memory or that the sensor was not "Learned" in the proper state, for example: Normally open versus Normally closed. Refer to Section 4 for proper programming.

5.4 Optional Hardware Device Testing

This subsection provides procedures on testing the system for optional hardwired devices, such as Alphanumeric Touchpad and a TouchTone phone, sirens, light control, the Feature Expansion Module (Voice Siren Driver, switched power output and Energy Saver functions included), and phone communications. You can also refer to the *Owner's Manual* for more information on the system. You should be familiar enough with basic system operations, (such as, arming, disarming, remote access, activating alarms), to train the owner on the system.

5.4.1 Alphanumeric Touchpad and Phone Operation

Arm and disarm the CPU several times from either the Alphanumeric touchpad(s) or from an on premise phone(s), or both depending on the specifications of the installation site.

5.4.2 Light Control and Feature Expansion Module

The following procedure demonstrates how to test the light control and the Feature Expansion Module.

1. Test the Light Control Functions by pressing COMMAND + 0 on the Alphanumeric Touchpad or * CODE + 0 from an on premise phone. Designated X-10 Lamp Module controlled lights should come on. If not, refer to Section 6 for troubleshooting.

2. Turn lights back off by pressing COMMAND + 0 on the Alphanumeric Touchpad or * CODE + 0 from an on premise phone.

3. Arm the system; controlled lights should come ON and stay ON for 5 minutes after Exit Delay time runs out.

4. Open a Delay door; the Entry Delay time will start and the controlled lights should again come ON; disarm the system (the lights will stay ON for 5 minutes after system is disarmed). The controlled lights also come ON during an alarm and stay ON until 5 minutes after the system is disarmed (Test this function with sirens as described later in this testing section).

5. To test the Energy Saver, first check the present temperature indication at CPU by pressing STATUS + STATUS on a touchpad or * CODE + # + 1 on an on premise phone.

6. Temporarily reset the low- and high-temperature settings to 5° above and below the present temperature indication from the CPU, for example: on a full status report CPU indicates that the temperature is 72°, set your low-temperature setting to 66° and your high-temperature setting to 77°.

7. Attach an AC volt meter across terminals 5 and 6 on the Energy Saver Module, HINT: use clip type leads on your meter. Clip one end of a small wire into each clip lead and wire the other end of the small wire into terminals 5 and 6, this will allow for freer hand usage.

8. With Energy Saver Module OFF, the voltage at terminals 5 and 6 on the Energy Saver Module should read 0 VAC. Turn the Energy Saver Module ON by pressing COMMAND + 5 on a touchpad or * CODE + 5 from an on premise phone. You will hear the relay on the Energy Saver Module click and the voltage at terminals 5 and 6 should go to about 24 VAC.

9. Put an ice cube in a plastic bag, and seal the bag with a rubber band or wire twist.

10. Place the plastic bag with the ice cube on the thermistor of the Energy Saver Module. Make sure that no water leaks out of the plastic bag. Hold the ice cube there for about 3 to 5 minutes or until the relay clicks and the voltage at terminals 5 and 6 drops to 0 VAC.

11. Remove ice cube and wait about 5 to 6 minutes. The relay on Energy Saver Module should click and the voltage at terminals 5 and 6 should read about 24 VAC.

5.4.3 Sirens and Communication

The following procedure demonstrates how to test the system sirens and at the same time test the communication with the central station.

1. Inform the central station that you will be testing the system for proper communication, this will avoid unwanted alarm dispatches from the central station.

2. Arm the system to either level 2 or 3.

3. Wait for Exit Delay Time to expire then trip an instant intrusion type sensor (PIR, Door or Window sensor, etc.). The CPU should go into alarm and all sirens (interior and exterior) should pulse slowly (ON - 1 second, OFF - 1 second).

4. Check the on premise phones for phone line seizure. Designated X-10 Lamp Module controlled lights should come on as well. If no phone line seizure, refer to Section 6 for phone line trouble shooting.

5. Wait about 30 seconds, then disarm the system. The CPU should seize the phone lines again to report the cancellation.

6. Repeat steps 2 through 5 as many times as you feel necessary for an adequate test of the system.

7. Call the central station and confirm that the proper alarm(s) and cancellations were received.

Troubleshooting

This section contains troubleshooting information to help you identify and solve problems you may encounter with the system and its components. Use this section with the testing information in Section 5 to test the system before turning it over to the owner.

This section is organized by components of the system, as follows:

- Control Processing Unit (CPU)
- Central station communication
- Wireless touchpads
- Alphanumeric Touchpad
- Wireless Interior Siren (WIS)
- Hardwire sirens
- Wireless sensors
- Hardwire zones
- Energy Saver Module
- X-10 Lamp Module (lighting control)

6.1   Control Panel

Problem   Unit won't power-up.
Corrective Action

- Check that power transformer is plugged in.
- Check for proper wire termination at the CPU and power transformer.
- Use a voltmeter to check the incoming voltage at the CPU terminals: Standard 2 Wire Transformer - Terminals 13 & 14 Voltage Reading = 9VAC Optional 4 Wire Transformer - Terminals 10 (+) and 11 (-) Voltage Reading = 8-13 VDC
- If the voltage reading is 0, turn CPU power switch OFF. Disconnect wires from the CPU and transformer terminals. Use an Ohmmeter to check for continuity (short) between any two conductors or an open on any conductor.
- Check that AC indicator wire is connected to terminal 13. CPU will not power up without AC indicator wire connected.

Problem   Flashing AC power LED on CPU, voice message

"AC POWER FAILURE".

Corrective Action

- Check to see if power transformer fell out of or is disconnected from outlet. Secure the transformer to the outlet with the screw provided.
- Check for correct wire connection from 4-conductor power transformer to CPU terminals.
- Check that AC indicator wire is connected to terminal 13. CPU will not power up without AC indicator wire connected.

Problem

- When set to level 2 or 3, system won't go into alarm when CPU cover is removed.

Or

- When set to level 1, system won't go into Program Review when CPU cover is removed.

Corrective Action

- Tamper Bypass Switch is set to BYPASS (ON). Set it back to NORMAL.

6.2   Phone System

Problem

- No dial tone on house phones after wiring RJ-31X Jack.
- No dial tone on house phones after plugging in DB-8 Cord.

Corrective Action

- Check for improper wiring of RJ-31X Jack. See "Connecting the System to the Phone Line" in Section 3 to check and correct wiring.
- Check for improper wiring of DB-8 Cord to CPU terminals. See "Connecting the System to the Phone Line" in Section 3.8 to check and correct wiring.
- Check for defective RJ-31X Jack. If defective, replace jack.
- Check for defective DB-8 Cord. If defective, replace cord.

Problem

- Can't dial out on phones (constant dial tone).

Corrective Action

- This indicates there are polarity-sensitive phones on the premises. Reverse the wires you connected to the brown and gray wire terminals on the RJ-31X Jack.

Problem

- CPU does not seize phone line.

Corrective Action

- RJ-31X Jack is wired between house phones. Jack must be wired between phones and incoming Telco block (phone protector block) for proper line seizure.

Problem

- CPU doesn't respond to commands from TouchTone phones.

Corrective Action

- Press the * twice before entering the desired command. Some Touch-Tone phones use the * key for redial or other features, which may require a ** entry in order for the CPU to respond.

6.3   Central Station Communication

Problem   • Central Station is not receiving any reports.

Corrective Action

• DB-8 cord not plugged into RJ-31X Jack. Plug cord into jack

• Improper wiring of RJ-31X Jack. See "Connecting the System to the Phone Line" in Section 3.8 to check and correct wiring.

• Verify the phone number of the receiver line with the central station operator. Reprogram the phone number if necessary and re-test.

• Defective RJ-31X jack. Replace jack.

• Improper wiring of DB-8 Cord to CPU terminals. See "Connecting the System to the Phone Line" in Section 3 to check and correct wiring.

• Defective DB-8 cord. Replace cord.

6.4   Wireless Touchpads

Problem   • CPU won't learn touchpads.

Corrective Action

• Check that Receiver module is installed and connected to the CPU board.

• Check that CPU antenna are installed.

• Use the RF Sniffer to verify that the touchpad is transmitting.

Problem   • CPU won't respond to touchpad commands.

Corrective Action

• Try operating touchpads from different locations within the premises to identify possible "dead spots".

• Relearn touchpads into CPU memory (no more than four).

• Check that CPU antenna are installed.

6.5   Alphanumeric Touchpad

Problem   • Touchpad won't power-up.

Corrective Action

• Improper wiring from touchpad to CPU terminals.

• Check that wire harness is plugged securely into back of touchpad.

• Check for an "open" condition on any wire.

• Check for proper voltage output on CPU terminals 11(-) and 15 (+), approximately 6.8 VDC.

• Check for a short on wire runs.

Problem   • Touchpad display reads F F F F F F F F F F F F.

Corrective Action

- Disconnect power from the touchpad for about 15 seconds, then apply power again. If problem persists, contact ITI Technical Services.

Problem
- CPU won't respond to touchpad commands.

Corrective Action

- This may indicate that two or more touchpads (or other bus device) have the same unit number. Change the unit numbers so that each device has a different number. Refer to the Touchpad installation manual to set unit numbers.

- Check if bus-in (terminal 19) or bus-out (terminal 18) wires are connected.

6.6 Wireless Interior Siren (WIS)

Problem
- No sound or LED activation from WIS.

Corrective Action

- Check that CPU transformer is plugged into outlet.

- Check that WIS is not plugged into an outlet controlled by a switch. Relocate if necessary.

- Program house code into CPU memory. Refer to the programming section to set the house code. (WIS operation requires a house code.)

- CPU has standard 2-wire transformer. Replace with optional 4-wire line carrier transformer (part no. 60-346-500).

- WIS is not on same electrical phase as CPU Line Carrier Transformer. Relocate WIS to various outlets to identify working locations.

- Move WIS to a non-appliance occupied circuit.

Problem
- Intermittent WIS operation.

Corrective Action

- Check that WIS is not plugged into an outlet controlled by a switch. Relocate if necessary.

- Move WIS to a non-appliance occupied circuit.

Problem
- WIS piezos and LED won't turn off.

Corrective Action

- Unplug unit from outlet. Disconnect battery from WIS, then short battery clip terminals. Re-connect battery to WIS and plug into outlet. Program House Code into WIS and test.

Problem
- WIS emits alarm sounds only.

Corrective Action

- Switch number 2 inside WIS is ON. Set to OFF if you want status sounds.

Problem
- WIS emits chirps every minute.

Corrective Action

- Battery is low or missing.

6.7 Hardwire Sirens

Problem • Exterior Sirens don't emit any alarm sounds.

Corrective Action

  • Check for jumper at CPU from terminal 15 to terminal 21. If there is no jumper, install one.
  • Check for siren (or siren driver) connection to CPU terminal 22.
  • Check for proper siren connections to siren driver.

Problem • Interior sirens don't emit any sounds.

Corrective Action

  • Check for proper connections from siren to CPU terminals 15 (+) and 17 (Interior Siren).

Problem • Exterior speakers don't emit any voice alarm messages.

Corrective Action

  • Check for proper connections from speakers to Feature Expansion Module terminals 1 & 2. Also check connections between terminals 16 (on CPU) and 8 (on Feature Expansion Module), DC and ground.
  • Check that the Speaker Volume is **not** turned fully clockwise.

6.8 Wireless Sensors

Problem • CPU doesn't respond to sensor activation (no Alarm, Chime or Sensor Test sounds).

Corrective Action

  • Check CPU memory for sensor number. Do this by entering the Program Sensor Text menu from the Alphanumeric Touchpad. If sensor number and name don't appear, or if sensor displays as DISABLED, the sensor is not in CPU memory. Perform the "Learning Sensors into Memory" in Section 4.8.6 procedure.

Problem • CPU responds intermittently to sensor signals.

Corrective Action

  • Check that CPU antennas are installed.
  • Change the position of the sensor 90° or 180°.
  • Move the sensor to a different location.
  • Use RF Sniffer to verify that the sensor is transmitting.

6.9 Hardwire Zones (Six Built-in Zones)

Problem • CPU doesn't respond to zone activation (no Alarm, Chime or Sensor Test sounds).

Corrective Action

- Check CPU memory for sensor number. Do this by entering the Program Sensor Text menu from the Alphanumeric Touchpad. If sensor number and name don't appear or if sensor displays as Disabled, the sensor is not in CPU memory. Perform the "Learn Sensors" procedure described in the *Alphanumeric Touchpad Installation Manual.*

Problem
- CPU indicates "trouble" on hardwire zones.

Corrective Action

- Check that 4.7K ohm resisters are properly installed on each zone.
- For N/O circuits, check for a "break" in the protection loop.
- For N/C circuits, check for a "short" in the protection loop.

6.10 Energy Saver Module

Problem
- CPU does not report temperature upon Full Status inquiry.

Corrective Action

- Check for proper wiring from Energy Saver Module to Feature Expansion Module.
- Check CPU memory to be sure upper sensor number 88 is set to ON.

Problem
- CPU doesn't accept HI/LOW temperature set-point commands.

Corrective Action

- Check for proper wiring from Energy Saver Module to Feature Expansion Module.
- Check CPU memory to be sure upper sensor number 88 is set to ON.

Problem
- Does not function.

Corrective Action

- Check where high/low temperature limits are set in conjunction with thermostat.

6.11 Lights (X-10 Powerhouse Module)

Problem
- Lights don't activate manually (CODE + 0 / COMMAND + 0) or during alarms.

Corrective Action

- Make sure lamps are plugged into X-10 Lamp Modules and X-10 Lamp Modules are plugged into outlets.
- Check that X-10 Lamp Modules are not plugged into outlets controlled by a switch. Re-locate to a non-switched outlet.
- X-10 operation requires a house code. Check if a house code has been programmed into CPU memory. If it hasn't, program house code into CPU memory. Refer to the *Alphanumeric Touchpad Installation Manual* set the house code.

- Check to be sure switch settings on X-10 Lamp Modules match CPU house code. See Appendix C for X-10 Lamp Module house code settings.

- Check if using Line Carrier Transformer.

- Check if X-10 Lamp Module is plugged into same electrical circuit as CPU.

CPU Programming Reference

This section contains reference information about how the CPU is programmed. It covers the following topics:

- CPU-related programming information
  - CPU configuration information
  - Upper sensor numbers
- Touchpad-related programming information
  - Touchpad configuration information
  - Wireless touchpads
  - Multiple hardwired touchpads
  - Copying programming onto other touchpads
- Sensor-related programming information
  - Group Programming
- Central station programming information
  - Central Station optional features
  - PMODE options

7.1   CPU-Related Programming Information

This subsection includes reference information for the following areas of CPU programming:

- CPU-related configuration information
- Upper sensor number descriptions

CPU configuration information is system- or site-specific values used to run the system, such as

- The phone number used to dial out to the central station
- The reporting format used for transmitting reports to the central station
- Time-out values, such as the time the CPU allows a user access to enter or exit an armed system without causing an alarm

On the Alphanumeric Touchpad, these CPU configuration values are programmed through the following functions:

- Phone Number
- Phone Format
- Siren Timeout

- Duress Code
- Account Number
- Entry Delay 1
- Entry Delay 2
- Exit Delay
- Activity Timeout
- House Code
- Freeze Temp

Table 7.1 describes each CPU configuration value you need, whether there is a default value, what each value is used for, and what you enter for this value, for example, whether you enter digits or a word, such as ON or OFF.

Table 7.1. CPU Configuration Values

Name	Default	What It Is	What You Enter
Phone Number	None	The phone number CPU dials to access the central station receiver. NOTE: You can program a second phone number into CPU memory, but only at a CS-4000 Central Station. (See Second Phone Number in Central Station Programming Information, later in this section)	Phone number, up to 18 digits long.
Phone Format	ITI	The communication format the CPU uses to transmit reports to the central station. There are three formats you can use: ITI interactive (the default), 4/2 1400Hz or 4/2 2300 Hz reporting formats.	Press BYPASS or STATUS to toggle between three phone formats: ITI, 4/2 1400, and 4/2 2300 Press command to enter the chosen option.
Siren Timeout	4 minutes	The period sirens sound when the user is not on site to disarm the system (4-minute minimum for U.L. listed systems).	1-15 minutes.
Duress Code	None	A special code reports a silent duress alarm to the central station. The first two digits of the duress code are the same as the primary access code. The duress code programming value allows you to set the last two digits of the duress code. IMPORTANT! • For the CPU to report the duress alarm when the duress code is used, upper sensor number 86 must remain ON (default setting). • Never confuse the access code with the duress code. duress alarms cannot be canceled.	Any 2 digits.

Table 7.1. CPU Configuration Values

Name	Default	What It Is	What You Enter
Account Number	None	An identifier for the CPU that the central station operator uses to determine which CPU is reporting. For CPU's set to the 4/2 reporting format, only the last four digits of the account number are transmitted to the central station. Note: From the Alphanumeric Touchpad, you can only enter numbers for the account number. If the central station requires alphabetical characters as part of the number, you must use a CS-4000 Central Station Receiver.	5-digit number.
Entry Delay 1 (Standard delay)	32 seconds	A standard delay setting allowing users to enter the premises and disarm the system but not create an alarm condition. Although the CPU accepts any number between 8-88, entries should be made in multiples of 8. All other entries are rounded down to the nearest multiple of 8 (45 seconds maximum for U.L. listed systems.)	8- 88 seconds.
Entry Delay 2 (Extended delay)	4 minutes	For groups 11, An extended delay setting allowing users extra time to enter the premises and disarm the system so as not to create an alarm condition. An example of when you'd want to assign sensors to groups using this extended delay is for sensors protecting entry through an overhead garage door. For sensors in group 12, the default is extended to twice the value programmed here.	1-8 minutes.
Exit Delay	32 seconds	The delay setting which allows the user to leave the premises after arming the system. The delay can be set from 8 - 88 seconds. Although the CPU will accept any number between 8 - 88, entries should be made in multiples of 8. All other entries will be rounded down to the nearest multiple of 8.	8 - 88 in seconds.
Activity Timeout	24 hours	Initiates an auxiliary alarm and a No Activity Alarm report to the Central Station if the CPU has not detected certain system activities within the programmed time period. **Example:** With the CPU in level 1 or 2, the CPU has not received any signals from an interior sensor or it hasn't detected a "phone off hook" condition within the programmed time period. The CPU will initiate a local auxiliary alarm for 5 minutes. If the alarm is not cancelled within that 5 minutes the CPU will report a No Activity Alarm to the Central Station. **NOTE: Answer machines, FAX machines, Modems can give an "off hook" condition.**	1-24 in hours.
House Code	001	Identifies the CPU with certain line carrier optional devices such as WIS's and X-10 Lamp Modules. **Note:** The house code cannot be set to 000 with 2.0 software.	001-255
Freeze Temp	42°F	This value is used with the Energy Saver Module. The Energy Saver Module has a built-in temperature sensor. When the temperature of the premises is equal to or less than the Freeze Temp setting, the CPU responds with an Auxiliary alarm sound and reports a Freeze Alarm to the central station. To use this feature, you must also set upper sensor number 78, Freeze Alarm ON (default is OFF).	Temperature ranging from 40°F - 90°F.

7.2 Upper Sensor Number Programming Information

This subsection provides details on how the upper sensor number values work.

7.2.1 What Are Upper Sensor Numbers?

Upper sensor numbers (sensors 77 through 96) are numbers that represent alarms, reports and tests resident in the CPU's memory. These upper sensor numbers affect what alarms and reports are sent to the central station, and how they affect system operation. Upper sensor numbers encompass both definitions of what alarms and reports the CPU sends to the central station, and, in some cases, definitions of actual physical devices serving as sensors. For example, upper sensor numbers 80, 81 and 82 are for actual physical sensors. To use some system options and accessories, such as the Energy Saver Module, some of these upper sensor numbers must be enabled.

7.2.2 What Upper Sensor Number Defaults Mean

Upper sensor numbers can be set to either ON or OFF, and have default values.

A default of...	Means the sensor is...	Sensors with this default
ON	Already active.	80-83, 86, 91-92, and 94-96
OFF	Inactive until you turn it on.	77-79, 84, 85, 87-90, 93

You can turn any upper sensor number on or off according to the system installation requirements. However, it is recommended that you keep any upper sensor numbers that default to ON set to ON.

Upper Sensor Number Descriptions

Table 7.2 identifies each upper sensor number, shows the default setting, and describes how the upper sensor number works with the CPU, including the reports and alarms it sends to the central station.

Table 7.2. Upper Sensor Numbers

Upper Sensor Number	Name	Default	What It Does/ When To Use It
77	Touchpad Tamper Hardware Supervisory	OFF	If the CPU hears 40 incorrect digit entries that do not equal the proper access code, the sirens go into audible alarm (police siren) and report 77 TOUCHPAD TAMPER to the central station. If a hardware bus device quits reporting, the CPU reports a 77 Supervisory and identifies the unit number of the bus device. **Note:** The CPU must be in program mode to remove a programming touchpad. After the touchpad has been removed for 15 seconds, the CPU can be returned to the normal operating mode.

Table 7.2. Upper Sensor Numbers

Upper Sensor Number	Name	Default	What It Does/ When To Use It
78	Freeze Alarm or Trouble	OFF	Used with the Energy Saver Module. This setting (if ON) determines whether a Freeze Alarm is activated when the temperature becomes equal to or less than the freeze temperature, a value for the low end of the temperature range programmed into the Energy Saver Module. The default freeze temperature is 42°. When this sensor number is ON, and the CPU does not receive any temperature data from the Energy Saver Module, the CPU reports a 78 TROUBLE alarm.
79	No Activity Alarm	OFF	If ON and the CPU doesn't hear from an interior sensor, or a sensor in groups 10 or 13, or the arming level changes, or detects a phone removed from the hook, within a set time period (no activity time period), it sets off a 79 ALARM and the auxiliary siren. If the siren isn't canceled at the end of five minutes, the CPU dials the central station and reports the alarm. The auxiliary continues to sound until the CPU receives a kissoff from the Central Station. This alarm feature is active in levels 1 and 2, and is programmable from 1 to 24 hours. **Warning:** Answering machines, Fax machines, etc. will create an off-hook condition and reset the activity alarm timer.
80	Touchpad Fire	ON	24-hour fire alarm. Audible. This sensor number enables the touchpad Fire buttons on all touchpads and telephones.
81	Touchpad Police	ON	24-hour police alarm. Audible. This sensor number enables the touchpad Police buttons on all touchpads and telephones.
82	Touchpad Auxiliary	ON	24-hour auxiliary alarm. Audible. This sensor number enables the auxiliary buttons on all touchpads and telephones.
83	Phone Test	ON	A phone test can be initiated by the system owner. After a successful test, all sirens may sound briefly at the customers home. In addition, Phone Test clears from the Alphanumeric Touchpad display and the CPU returns to level 1. If the test is conducted off premise, the CPU's protection level won't change.
84	Opening Report	OFF	If 84 is ON, whenever the CPU is disarmed, the CPU reports 84 OPENING REPORT. If reporting in ITI format, the CPU also reports the user number. Quick arm will be disabled if turned ON.
85	Closing Report	OFF	If 85 is ON, whenever the CPU is armed, the CPU reports 85 CLOSING REPORT. If reporting in ITI format, the CPU also reports the user number. Quick arm will be disabled if turned ON.

Table 7.2. Upper Sensor Numbers

Upper Sensor Number	Name	Default	What It Does/ When To Use It
86	Duress Alarm	ON	A specially programmed access code that sends a 24-hour POLICE EMERGENCY CALL silently to the Central Station. This sensor number just reports to the Central Station--it does not display on the Alphanumeric Touchpad. To use duress alarms, you must also program a duress code (see the description of the duress code CPU configuration value earlier in this section).
87	Force Armed	OFF	If 87 is ON, the CPU reports 87 FORCE ARMED whenever a sensor number is deliberately bypassed by a user (Indirect or Direct Bypass). The CPU always reports 87 AUTO FORCE ARMED whether 87 is ON or OFF if it force armed itself.
88	Energy Saver	OFF	Used with the Energy Saver Module. When 88 is turned ON, the Energy Saver Module monitors the temperature of the premises. 88 must be turned ON if you need to set low and high temperature set points for energy saving parameters. If the CPU does not receive temperature data from the Energy Saver Module, it displays 88 TROUBLE at the Alphanumeric Touchpad and reports the trouble condition to the Central Station.
89	RF Touchpad Supervisory/ Low Battery	OFF	When 89 is ON, the CPU checks for a supervisory report from each Wall Mount Wireless and Hand Held touchpads. If the CPU doesn't hear from each touchpad within twelve hours, it activates an 89 supervisory alarm. The CPU will indicate a touchpad low battery if 89 is turned ON and a touchpad has a low battery condition.
90	A/C Failure	OFF	If 90 is ON, and the AC Power at the CPU's outlet has been off for 15 minutes, the CPU reports 90 AC FAILURE to the central station. When power returns, the CPU reports 90 ALARM RESTORAL". Note: If protection level is changed before AC power is restored, the CPU won't report 90 ALARM RESTORAL. Upper sensor number 90 must be initialized for U.L. installations.
91	Low Battery	ON	This report is sent to the Central Station after the CPU's back-up battery voltage drops below 5.6 VDC. When the battery becomes low, the CPU shuts down until AC power is restored. Program memory is saved in EEPROM indefinitely. When the AC power is restored, the CPU resets to the same protection level it was at when it powered down. The CPU could also report 91 as a POWER SUPPLY FAILURE. This condition is usually due to a major power supply failure. NOTE: If the protection level is changed before battery power is restored, the CPU won't report 91 ALARM RESTORAL. Upper sensor number 91 must be initialized for U.L. installations.

Table 7.2. Upper Sensor Numbers

Upper Sensor Number	Name	Default	What It Does/ When To Use It
92	CPU Tamper	ON	The CPU is shipped with a tamper switch inside the cover. Opening the CPU cover when the system is armed to level 2 or 3 activates the tamper alarm. The CPU reports this condition to the central station as 92 ALARM TAMPER LOOP.
93	Automatic Phone Test	OFF	If 93 is ON, the CPU reports 93 AUTOMATIC PHONE TEST to the Central Station at a programmable interval (from daily to every 255 days). This interval defaults to 7 days. Upper sensor number 93 must be initialized for U.L. installations.
94	Receiver Failure	ON	The CPU reports 94 RECEIVER FAILURE if it does not hear from any transmitter for 2 hours. **Turn sensor 94 OFF if the system is hardwire only.** If RF is used, 94 must be initialized for U.L. listed systems.
95	CPU Back in Service	ON	If the CPU loses AC power, the CPU first reports the AC Failure (if 90 is ON), then Low Battery (upper sensor 91 is on). If AC power is not restored and the backup battery has failed, the CPU shuts down. When AC power is restored, the CPU reports it is Back in Service and resets to the protection level it was at when it shut down.
96	Fail to Communicate	ON	The CPU makes eight attempts (per each programmed phone number) to contact the central station. If the CPU is unsuccessful reporting to the central station after the third attempt, the CPU activates a 96 alarm. 96 will be displayed at the Alphanumeric Touchpad. The CPU continues to dial the remaining 5 attempts. A 96 alarm is also displayed if the CPU detects that no phone line voltage is present and feature F14, hourly phone test, is on (see F feature descriptions later in this section). A trouble tone sounds every 60 seconds. To silence the alarm tone, enter CODE + 1. FTC output will trigger, regardless whether upper sensor number 96 is ON or OFF. Upper sensor number 96 must be initialized for U.L. installations.

7.3 Touchpad-Related Programming Information

This section provides details on touchpad-related programming information. Touchpad-related configuration information is system- or site-specific values that determine how this Alphanumeric Touchpad (the one being used for programming) operates, such as

- The touchpad's unit number

- When the Chime feature is on, the touchpad displays the sensor number for a protected door or window when the door or window is opened.

On the Alphanumeric Touchpad, these touchpad configuration values are programmed through the following functions:

- Loop Is
- Unit Number
- Touchpad Quiet
- Chime Display

Table 7.3 describes each touchpad-related programming value you need to enter during programming, whether there is a default value, what each value is used for, and what you enter for this value, for example, whether you enter digits or toggle between ON or OFF.

Table 7.3. Touchpad Programming Values

Value	Default	What It Does	What You Can Enter
Loop Is No/Nc	Nc	Indicates the normal (non-alarm) state of the detection device connected to the hardwire loop on the Alphanumeric Touchpad wiring harness. The loop can be set for **No** and can be configured for any type of detection device. For installation details, see "Connecting a Detection Device to the Touchpad's Hardwire Loop "in Section 3.6.3.	NC = Normally closed device NO = Normally open device
Unit Number	7	Identification number for devices that must be connected to the Hardwire Bus, such as Alphanumeric Touchpad, Feature Expansion Module, HIM and HOM. Each Hardwire Bus-connected device requires a unique unit number to avoid communication conflicts between the CPU and the devices. Up to eight devices can be connected to the Hardwire Bus.	Give each device a unique unit number ranging from 0 to 7.
Touchpad Quiet	N (OFF)	Determines how the Alphanumeric Touchpad handles sounds and displays. When Touchpad Quiet is ON, the touchpad does not emit beeps for Status and Entry Delay conditions. **Note:** When commands are entered on the Alphanumeric Touchpad, Touchpad Quiet is temporarily disabled. After 15 seconds of no activity detected at the touchpad, Touchpad Quiet mode resumes. When Touchpad Quiet is OFF, the Touchpad emits beeps for Status and Entry Delay conditions and the Touchpad keys illuminate and display goes to full brightness when any Touchpad key is pressed (shall be OFF for U.L. listed systems).	Y = ON or N = OFF
Chime Display	Y (ON)	Determines whether the touchpad displays sensor number information when the Chime feature is on. When Chime Display is ON and the Chime feature is ON, the touchpad displays the sensor number for a protected door or window while the door or window is opened. When Chime Display is off and the Chime feature is on, only the chime sounds. The touchpad does not indicate which sensor was tripped. When ON, the Alphanumeric Touchpad displays the word CHIME.	Y = ON N = OFF

7.4   Group Programming Information

This section provides details on how each group functions.

A group is a fixed set of operating instructions for the CPU. Sensors are assigned to an appropriate group. The group determines what actions the CPU will take when the CPU receives a sensor transmission.

The CPU has 29 groups. These groups fall into the following group types:

- Panic
- Auxiliary
- Special
- Entry /Exit delay
- Instant Exterior
- Interior
- Delayed Interior
- Local
- Fire

7.4.1 Group Characteristics

This subsection describes the operating characteristics of each sensor group.

Table 7.4 shows common applications of security system devices, such as areas or items to be protected and types of protection or detection, the general group type you can use for the application, and the specific sensor groups included in each group type.

Table 7.4. Common Security System Applications

Application	Group Type	Group Numbers of This Type
24-hour Fixed and Portable Panic Buttons.	Panic	00 through 03
24-hour Auxiliary sensors and 24-hour portable Auxiliary Alert buttons.	Auxiliary	04 through 07
Sensors protecting items such as gun cabinets, wall safes and silver drawers.	Special	08 and 09
Door/Window sensors securing entry and exit doors.	Entry delay	10 through 12
Door/Window sensors and PIRS used for securing exterior doors and windows, interior doors, and interior intruder detection.	Instant Exterior/ Interior	13 through 18
Door/Window sensors and PIRs used for securing interior doors and areas. Delayed interior groups initiate a delay upon activation.	Delayed interior	19 and 20

Table 7.4. Common Security System Applications

Application	Group Type	Group Numbers of This Type
Sensors in these groups can secure interior/exterior doors but do not report to the Central Station.	Local	21 through 25
24-hour sensors such as Smoke, Heat and Manual Fire Pull Stations.	Fire	26
Custom applications such as activating an Output signal on a Hardwire Output Module (HOM).	Output module	27 and 28
24-hour environmental sensors such as water detector or freeze sensor.	Auxiliary	29

7.4.2 Using the Group Characteristics Table

Table 7.5 shows you what each column of the Group Characteristics (Table 7.6) contains, and how you can use this information to understand how sensors assigned to each group work.

Table 7.5. Terms for Group Characteristics Table

Table Column	What It Means
Group Type	Identifies the general group type, such as panic, auxiliary, or fire
No.	The group number. You assign this group number to a sensor when learning sensors.
Group Name	A descriptive name for the sensor group number.
Siren Type	The type of alarm sound emitted for the sensor group (Police, Auxiliary, or Silent), and whether it is emitted from interior, exterior or both types of sirens.
Delay Type	The type of delay used with sensors in the group: Instant, Follower, Standard, Extended, and Twice Extended. Instant No Delay. Instant sensors go into alarm immediately, there is no delay upon entry. Follower sensors go into alarm if they are tripped before a delay sensor. If a delay sensor is tripped first, sensors in the Follower groups will honor the delay period. Standard, Extended, Twice Extended Sensors with these delays do not go into alarm immediately, but will initiate a delay time if they are activated first. These delays are programmed through the Entry Delay 1 and Entry Delay 2 CPU configuration values. Standard Delay Programmable from 8 to 88 seconds. Extended Delay Programmable from 1 to 8 minutes. Twice Extended is twice the Extended Delay time.
CPU Needs Restore Before Rearm?	Indicates whether the CPU requires a restore signal from sensors in this group before rearming.

Table 7.5. Terms for Group Characteristics Table

Table Column	What It Means
Active in Protection Levels	Indicates the protection level in which the sensors cause an alarm or chime.
CPU Needs Supervisory Signal From Sensor?	Indicates whether the CPU needs to hear supervisory signals from sensors in the group.
Chime	Indicates whether sensors in the group will emit a chime in chime mode.
CPU Reports to Central Station On Alarm?	Indicates if sensors in the group will send a report to the central station.
Comments	Additional information.
Application/Uses	Identifies uses and applications for sensors in the group, such as locations, areas, and items best protected by sensors in a sensor group.

Table 7.6. Group Characteristics

Group Type	No.	Group Name	Siren Type	Delay Type	CPU Needs Restore before Rearm?	Active in Protection Levels	CPU Needs Supervisory Signal From Sensor	Chime	CPU Reports to Central Station on Alarm?	Comments	Application/ Uses
Panic	00	Fixed panic	Police Interior Exterior	Instant	No	1,2,3	yes	No	Yes		24-hour audible fixed panic buttons.
	01	Portable Panic	Police Interior Exterior	Instant	No	1,2,3	No	No	Yes		24-hour audible portable panic buttons.
	02	Fixed panic	Silent	Instant	No	1,2,3	Yes	No	Yes		24-hour silent fixed panic buttons.
	03	Portable Panic	Silent	Instant	No	1,2,3	No	No	Yes		24-hour silent portable panic buttons.
Auxiliary	04	Fixed Auxiliary	Aux. Interior	Instant	No	1,2,3	Yes	No	Yes		24-hour auxiliary sensors such as a portable panic button or holdup button.
	05	Fixed auxiliary	Aux Interior	Instant	No	1,2,3	Yes	No	Yes	Sirens shut off at kissoff	24-hour auxiliary sensors such as a portable panic button or holdup button.
	06	Portable Auxiliary	Aux Interior	Instant	No	1,2,3	No	No	Yes		24-hour portable auxiliary alert buttons.
	07	Portable Auxiliary	Aux Interior	Instant	No	1,2,3	No	No	Yes	Sirens shut off at kissoff	24-hour portable auxiliary alert buttons and siren shut-off confirms central station communication.
Special	08	Special Intrusion	Police Interior Exterior	Instant	Yes	1,2,3	Yes	No	Yes		Special belongings such as gun cabinets, wall safes of silverware drawers.
	09	Special Intrusion	Police Interior Exterior	Standard	Yes	1,2,3	Yes	No	Yes		Special belongs such as gun cabinets, wall safes or silverware drawers.
Entry Delay	10	Entry/Exit Delay	Police Interior Exterior	Standard	Yes	2, 3	Yes	Yes	Yes		Exit and entry doors that require the minimum delay time for entering and exiting.

Table 7.6. Group Characteristics

Group Type	No.	Group Name	Siren Type	Delay Type	CPU Needs Restore before Rearm?	Active in Protection Levels	CPU Needs Supervisory Signal From Sensor	Chime	CPU Reports to Central Station on Alarm?	Comments	Application/ Uses
Entry Delay	11	Entry/Exit Delay	Police Interior Exterior	Extended	Yes	2,3	Yes	Yes	Yes	Refer to NOTE 1	Garage doors and other doors that need an extended delay time.
Entry Delay	12	Entry/Exit Delay	Police Interior Exterior	Twice Extended	Yes	2,3	Yes	Yes	Yes	Refer to NOTE 1	Driveway gates and other entry/ exit points that need a twice-extended delay time.
Instant Exterior/ Interior	13	Instant Perimeter	Police Interior Exterior	Instant	Yes	2,3	Yes	yes	Yes	Exterior	Exterior doors. Windows.
	14	Instant Interior	Police Interior Exterior	Follower	Yes	2,3	Yes	No	Yes	Interior	Interior Doors.
	15	Instant Interior	Police Interior Exterior	Follower	No	2,3	Yes	No	Yes	Interior, Refer to NOTE 1	Interior PIR motion sensors.
	16	Instant Interior	Police Interior Exterior	Follower	Yes	3	Yes	No	Yes	Interior	Interior doors
	17	Instant Interior	Police Interior Exterior	Follower	No	3	Yes	No	Yes	Interior, Refer to NOTE 1	Interior PIR motion sensors.
Instant Exterior/ Interior (cont.)	18	Instant Interior	Police Interior Exterior	Follower	No	3	Yes	No	Yes	Interior Sounds Instant Police Siren if 2 or more sensors are tripped within 4 minutes. Otherwise, sensors are followers to delayed sensors. If central station feature 15 (Alarm Verification) is ON, group 18 works like group 17.Refer to NOTE 1	Interior PIR Motion sensors used to prevent false alarms
Delayed Interior	19	Delayed Interior	Police Interior Exterior	Standard	Yes	3	Yes	No	Yes	Refer to NOTE 1	Interior doors that initiate a delay before going into alarm

Table 7.6. Group Characteristics

Group Type	No.	Group Name	Siren Type	Delay Type	CPU Needs Restore before Rearm?	Active in Protection Levels	CPU Needs Supervisory Signal From Sensor	Chime	CPU Reports to Central Station on Alarm?	Comments	Application/ Uses
	20	Delayed Interior	Police Interior Exterior	Standard	No	3	Yes	No	Yes	Refer to NOTE 1	PIR motion sensors that initiate a delay before into alarm
Local	21	Local Instant Interior	Police Interior Exterior	Instant	Yes	1,2,3	Yes	No	No		24-hour local alarm zone protecting anything that opens and closes.
	22	Local Delayed Interior	Police Interior Exterior	Standard	Yes	1,2,3	Yes	No	No		24-hour local alarm zone protecting anything that opens and closes. Same as group 21, plus activation initiates a delay before going into alarm
	23	Local Instant Auxiliary	Aux Interior	Instant	Yes	1,2,3	Yes	No	No	Refer to NOTE 1	24-hour local alarm zone protecting anything that opens or closes
	24	Local Instant Auxiliary	Auxiliary Interior	Instant	Yes	1,2,3	Yes	No	No	Shuts off at restoral Refer to NOTE 1	A 24-hour local alarm zone protecting anything that opens or closes
	25	Local Special Chime	Interior (2 long beeps)	Instant	Yes	1,2,3	Yes	No	No	Local annunciator Refer to NOTE 1	Notify user that a door has been opened.
Fire	26	Fire	Fire Interior Exterior	Instant	Yes	1, 2, 3	Yes	No	Yes	Refer to NOTE 2	24-hour Fire sensors
Output Module	27	Hardwire Output Module (HOM)	Silent	Instant	Yes	1,2,3	Yes	No	No	Refer to NOTE 3	Activating an output nodule line for light control or other customer features.
	28	Hardwire Output Module (HOM)	Silent	Instant	No	1,2,3	Yes	No	No	Refer to NOTE 3	PIR or pressure mat
Auxiliary	29	Instant auxiliary	Auxiliary Interior	Instant	Yes	1, 2, 3	Yes	No	Yes		Freeze or water sensors.

Note 1: Not intended for primary protection circuits in U.L. listed systems, supplementary use only.
Note 2: Required for U.L. listed residential fire alarm applications.
Note 3: Not investigated by U.L.

7.5 Central Station Programming Information

This subsection provides details on programming information that can only be programmed through the CS-4000 Central Station, including the following:

- Central station optional features

- Phone dialing options (PMODEs)

- Second phone number capability (PHONE2 command)

- Multiple user access code capability (MACCESS command)

- 4/2 reporting format information

7.5.1 Central Station Optional Features

Table 7.7 describes each central station optional feature, including the number and name of each feature, its default value, what it is used for, and what the different settings mean.

Table 7.7. Optional Feature Numbers

Feature Number	Feature Name	Default	Description
F00	Remote Phone Access	ON	Controls whether users can access and control the CPU from a remote telephone. ON=YES OFF=NO, works in conjunction with feature F01. NOTE: Off-premise accessing must be done with primary access code.
F01	• RING Hang-up • RING ANSWER	ON	Determines how the CPU responds to calls from a remote telephone. ON=user can call the CPU, let ring twice, hang up, and call again after 10 seconds and no more than 40 seconds. The CPU answers the phone immediately with "SYSTEM HELLO" and 4 beeps. OFF=CPU waits until the 12th ring to answer the phone. For this feature to work, feature F00 must be ON.
F02	Exterior Siren Delay	ON	Controls whether the exterior siren output is activated immediately or delayed 15 seconds. ON= Delayed OFF= Immediate
F03	Toll Saver	ON	Controls on which phone ring the CPU answers if an alarm or trouble has occurred. ON=8 rings OFF=12 rings
F04	Low Battery Reports	ON	Controls whether low-battery conditions re-report weekly or daily from sensors. ON = WEEKLY/ OFF = DAILY
F05	Sensor Supervisory Reports	ON	Controls whether uncorrected Supervisory trouble conditions re-report to the Central Station daily or weekly. ON = WEEKLY/ OFF = DAILY

Table 7.7. Optional Feature Numbers

Feature Number	Feature Name	Default	Description
F06	Dialer Abort	ON	Controls whether the dialer aborts alarm calls canceled by the owner before dialing is completed (about 15-20 seconds). ON=YES OFF=NO
F07	Access Key Type	OFF	Controls which telephone key (* or #) accesses the CPU. Can reprogram this value if owner regularly uses * and # keys for other phone system functions, such as redial, call forwarding, and banking transactions. OFF = * ON = #
F11	Interior Siren Sounds	OFF	Controls whether Hardwire Interior Sirens make status and alarm sounds or alarm sounds only. ON=alarm sounds only OFF=alarm and status sounds
F12	Alarm Restoral Report	OFF	Controls whether the CPU reports restorals by zone. ON=YES OFF=NO
F13	Low Battery Restoral Reports	OFF	Controls whether the CPU sends a sensor battery restoral report to the central station. ON=YES OFF=NO
F14	Hourly Phone Test	OFF	Controls whether the CPU check and indicate a trouble condition and sounds trouble beeps when it detects no phone line voltage (a local indication). Checked once every hour. ON=Yes OFF=No
F15	Alarm Verification	OFF	ON: CPU dials central station when two different sensors are tripped within 4 minutes. First sensor tripped causes a Police siren to sound. OFF: Feature disabled. This feature works only with groups 10 through 20.
F16	Trouble Beeps Must be OFF for U.L. listed systems.	OFF	Controls whether the panel sounds 6 quick trouble beeps once each minute to indicate a Low Battery or Supervisory trouble condition, and whether the panel protests upon arming when these trouble conditions occur. ON: trouble beeps do not sound. Panel protests only if a sensor is open. OFF: trouble beeps sound to indicate a Low Battery/Supervisory condition. Panel protests upon arming. NOTE: This feature does not function with Fire or hardwire sensors.
F17	Sensor Tamper (24-hour sensor tamper alarm)	OFF	Controls what happens when the CPU receives a tamper signal from a sensor. ON: tamper signal generates an alarm condition in any protection level. OFF: tamper signal generates an alarm condition only when CPU is in a level in which the sensor is active.
F21	Immediate Trouble Beeps Must be ON for ULC listed systems.	OFF	Controls whether trouble beeps sound immediately when a Supervisory condition is detected. OFF = Trouble Beeps Sound Within 10 Hours ON = Immediate Trouble Beeps

7.5.2 Phone Dialing Options (Pmode Command)

You can only program these dialing options at the CS-4000 using the PMODE command. You can choose from three dialing options: PMODE 0, PMODE 3, and PMODE 5. Table 7.8 describes the dialing options.

Note: Phone dialing options and formats programmed through PMODE commands at the CS-4000 override any phone formats programmed using system touchpads.

Table 7.8. Dialing Options

Dialing Option (PMODE)	Description
PMODE 0	The CPU uses phone number one to send alarms and reports to the CS-4000. The CPU powers up in PMODE 0. The default phone reporting format is ITI, but you can also use 4/2 format.
PMODE 3	The CPU uses two phone numbers to send reports to the CS-4000 and reports sent over both phone numbers use the ITI reporting format. • The CPU dials the first number to report all alarms, openings, and closings. • The CPU dials the second number to send all reports. The second number must be programmed by the CS-4000 for PMODEs 3 and 5; otherwise, the CPU defaults to PMODE 0.
PMODE 5	The CPU uses two phone numbers to send reports to the CS-4000, as with PMODE 3, but the two numbers use different reporting formats. The first number uses 4/2 phone format; the second number uses ITI format. Note: There are two 4/2 reporting formats, with different transmit and receive frequencies: • 1800 Hz transmit, 2300 Hz receive • 1900 Hz transmit, 1400 Hz receive You can choose the 4/2 reporting format type using the Phone Format programming option on the Alphanumeric Touchpad or from a CS-4000 using the PFORMAT command.

7.5.3 Second Phone Number Capability (Phone 2 Command)

In addition to the central station phone number, you can program a second phone number for sending reports to another location. This second phone number can only be programmed from the CS-4000, using the PHONE 2 command.

Depending on the dialing option (PMODE) chosen, the CPU reports to both locations.

7.5.4 Multiple User Access Code Capability (Maccess)

If you need to program additional user access codes for the system beyond the primary and visitor access codes, you can use the CS-4000 MACCESS command. Multiple user access codes are especially desirable when upper sensor numbers 84 and 85 (opening and closing reports) are set to ON.

The maximum number of user access codes you can program in the system is 6 (access codes 0 through 5). Access codes 0 and 1 are the primary and visitor access codes and can be programmed through a touchpad connected to the CPU. Access codes 2 through 5 are additional access codes that can only be programmed at the CS-4000 using the MACCESS command.

Note: The access code #1 (visitor code) can also be programmed through the CS-4000 (MAC-CESS 1).

7.5.5 4/2 Reporting Format Information

The 4/2 reporting format (see Table 7.9) is a method of reporting from the CPU to the central station that consists of the following:

• A 4-digit account number

• A 2-digit alarm code or a 2-digit condition code.

When the system is set to 4/2 reporting, the CPU transmits the last four digits of the programmed account number to the Central Station. For example, account #11-234 reports on the CS-4000 as X1-234.

Note: In U.L. listed systems, the system shall communicate to the CS-4000 Only.

Table 7.9. 4/2 Reporting Format

Sensor No.	Alarm	Trouble	Cancel	Restore
01	01	B1	39	
02	02	B2	40	
03	03	B3	41	
04	04	B4	42	
05	05	B5	43	
06	06	B6	44	
07	07	B7	45	
08	08	B8	46	
09	09	B9	47	
10	10	C0	48	
11	11	C1	49	
12	12	C2	50	
13	13	C3	51	
14	14	C4	52	
15	15	C5	53	
16	16	C6	54	
17	17	C7	55	
18	18	C8	56	
19	19	C9	57	

Table 7.9. 4/2 Reporting Format

Sensor No.	Alarm	Trouble	Cancel	Restore
20	20	D0	58	
21	21	D1	59	
22	22	D2	60	
23	23	D3	61	
24	24	D4	62	
25	25	D5	63	
26	26	D6	64	
27	27	D7	65	
28	28	D8	66	
29	29	D9	67	
30	30	E0	68	
31	31	E1	69	
32	32	E2	70	
77	77	F6	E9	
78	78	F7	F0	FB
79	79		F1	
80	80		F2	
81	81		F3	
82	82		F4	
83	83			
84	84			
85	85			
86	86			
87	87			
88		F8		
89		F9		
90	90			FC
91	91			FD
92	92		F5	
93	93			
94	94			
95	95			

Hardware Devices

8.1 Installing Hardwire Input Modules (60-242)*

If the system requires additional hardwired zones beyond the six built-in zones provided on the main CPU panel, you can install Hardwire Input Modules (HIMs). This procedure summarizes HIM installation: mounting, connecting to CPU, and connecting leads from hardwired zones to HIM.

Note: You will need an SX-V HandHeld Programmer (60-371) to program the HIM's features.

Up to 8 Hardwire Bus Devices can be attached to a system. Do not exceed the 500 mA total power supplied by the CPU.

All programmed data is stored in E^2PROM.

The HIM has a removable terminal strip for easier wiring.

The HIM Module requires a 4-conductor wire. It is recommended that you use 20-gauge or greater stranded jacketed cable. In some long run instances, use shielded cable.

The HIM sends supervisory signals for each zone to the CPU.

The HIM's plastic case can be tamper-protected by using one of the inputs wired to a reed switch. The plastic base has a molded housing for the reed switch (1/4-inch drill mount) and the top cover will hold the magnet. Opening the cover will open the switch.

Each HIM has eight zones which can be individually programmed using the SX-V Programmer. The unit number of the device on the hardwire bus is also set with the programmer. (The LED's correspond to the loop input that is being programmed or read.)

All loops need to be terminated with a 4.7 K ohm end-of-line resistor. For Normally Open switches, the resistor must be in parallel. For Normally Closed switches, the resistor must be in series. Unused loops need not be terminated but should be "put to sleep" with the Programmer.

* Not investigated by U.L.

8.1.1 Installation

Use the following procedure to install the HIM.

1. Using 22-gauge or greater wire, connect the HIM to the CPU (See Figure 8.1). Using 22-gauge or greater wire, connect your hardwire loops to the HIM. Verify that end-of-line resistors are installed properly (Normally Open in parallel, Normally Closed in series.)

2. Be sure power is off when you plug the strip back in. Double check the wiring and be sure the terminal strip is seated properly. Restore power back to the CPU.
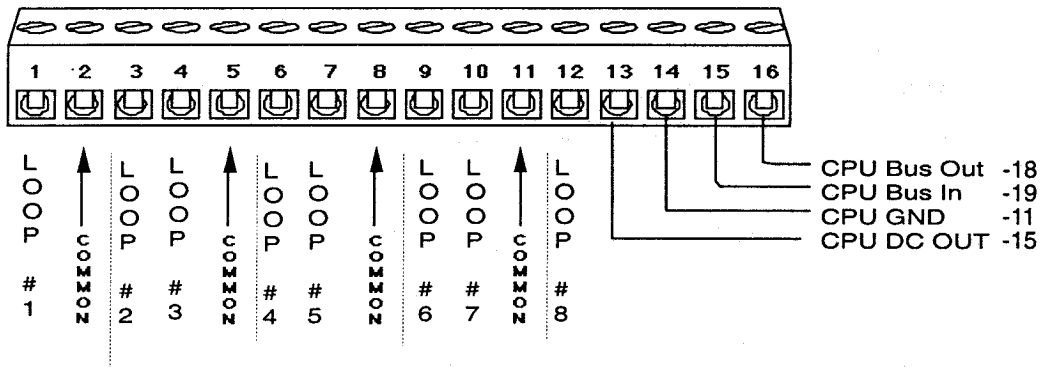
Figure 8.1. Terminal Connections

8.1.2 Programming

How to Change a Unit Number on a HIM

1. Plug the Programmer Cable into the HIM. Make sure to observe proper polarity. The open face of the programmer cable should be toward the outside.

2. Press the house code button on the programmer.

3. Enter the unit number (any unused number 0 to 7). Then press Enter.

Sensor Programming

1. With the HIM wired to the CPU and detectors connected, plug the programming cable from the SX-V Programmer into the Programming Jack. Polarity must be observed. The open face of the programmer cable should be toward the outside.

Note: If your programmer displays a decimal point following the "HELLO", the software will not work in programming the HIM. Contact ITI Technical Services for software updates.

2. Press the READ Button on the Programmer. One of the LEDs will light. This LED corresponds to the zone or loop you are programming. By pressing the READ Button you can toggle through the 8 LEDs to select the zone you wish to program.

3. Press the Sensor Number Button. You will need to enter a sensor number. This number can be anything from 00-77 (32 zones total). The CPU uses this number and the Unit number of the HIM for "learn mode" programming. You will assign a sensor number for the CPU in the LEARN SENSORS menu prompt from the Alphanumeric Touchpad.

Note: Sensor numbers 00-77 may be used, to avoid confusion use sensor numbers 01-32

4. Now press the Sensor Type Button on the Programmer. Sensor type 1 = Normally closed and Sensor type 0 = Normally open these will be the only two "types" needed to program hardwired zones. Enter the Type on the Programmer.

Note: The programming option keys operate the same as for an RF sensor except for the Supervised and Fire Panic Priority buttons. All zones are supervised and each zone will continue sending data until an acknowledge is received from the CPU.

5. Press the Enter key on the Programmer. The display will show DONE or FAIL. If FAIL is displayed repeat steps 1 through 5 making sure entries are valid.

6. Press READ to verify your programming.

7. Press READ again to step to the next zone and continue programming all devices hardwired to the HIM.

Note: Any zone that is not used should be put to sleep using the Programmer.

8. Refer to the Programming section to "learn" these sensors into the system.

Learn Mode DWS

The Learn Mode Door/Window Sensors (DWS) use ITI Learn Mode technology, simplifying sensor programming. You can trip the built-in tamper switch of the sensor by opening its cover, and the sensor transmits its ID for the CPU to learn.

The Learn Mode DWS can be installed on doors, windows, or anything that opens and closes. A Learn Mode DWS transmits signals during normal operation, and it can send a supervisory signal to the CPU. When the door is closed, a "RESTORE" signal is transmitted. These signals are sent whether the system is armed or not.

The Learn Mode Door/Window Sensor contains an RF transmitter that can transmit at least 1,000 feet in open air. The DWS contains two internal magnetic reed switches or a terminal block to connect a remote switch to. A 3.5 VDC lithium battery, which should last 5 to 8 years, powers the sensor. When the battery power is low, the sensor transmits a low battery (trouble report) to the CPU. The sensor contains a tamper feature, which cannot be disabled. It also sends a check-in signal to the CPU every 64 minutes.

The sensor has screw terminals that will accept normally open and normally closed hardwire devices. The sensor also contains two internal reed switches for convenience. The DWS has an operating temperature of 10° to 120°F.

Here are some installation guidelines:

Do

- Try to keep all sensors within 100 feet of the CPU. The 100-foot distance is recommended as a starting guideline. The DWS has an open air range of at least 1,000 feet, but the installation environment will influence this range.

- Mount sensor on door frame, magnet on door or on double doors. Mount the sensor on least used door, magnet on the other door.

- Mount sensors with screws, not double-sided tape.

Do Not

- Place sensors on a door within 5 inches of the floor to avoid damage to the sensors.

- Place sensors or magnets on any metallic surface such as metal doors or foil wallpaper. If you must, then use spacers to keep sensor and magnet away from the metal.

- Place sensors in areas with excessive metal or electrical wiring, such as furnace/utility rooms.

- Place sensors in areas where they will be exposed to moisture.

- Place sensors in locations where the temperature will exceed the sensor's operating limits of 10° to 120°F.

A.1 Installation

1. Remove the sensor cover by pressing on the end of the cover (that has an opening for wire) to release the tab on the cover from the slot on the sensor base.
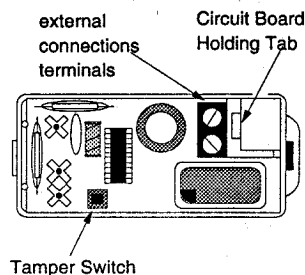

Figure A.1. D/W Components

Warning:
To prevent damage to the circuit board, you must be free of all static electricity when handling the sensors. Touch a grounded metal surface before handling the circuit board. Always handle the circuit board by the edges and never set the circuit board on any metallic surface.

2. Carefully remove the circuit board by pulling back on the tab and lifting the battery holder, or gently flex the plastic sensor base to release the circuit board. To guard against static, place circuit board in sensor cover before continuing.

3. Mount the sensor base using #6 flathead screws. Two screw holes are provided, one is enlarged to allow for sensor alignment. Two small additional holes are provided for mounting the sensor with 18-gauge wire nails (brads) and a brad driver.

Note: The sensor base has markings that indicate the position of the reed switches when the circuit board is reinstalled. Use the markings to aid in alignment. Spacers are available if the sensor is mounted on a metallic surface or height alignment is needed.

Figure A.2. Door/Window Sensor Spacers Magnet Spacer

4. Mount magnet base within 3/8" of the sensor's base, centered on the base's notch or tab. Use two #6 x 1/2" flat head screws.

Note: Be sure magnet does not interfere with door or window opening. Do not use two-sided tape to mount magnet.
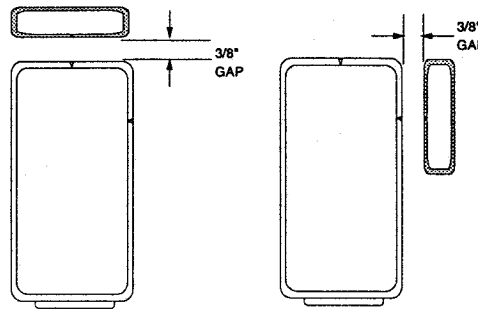
Figure A.3. Magnet Spacing

5. Reattach the circuit board to the sensor base.

Note: After determining which reed switch will be used, remove the other reed switch by clipping leads as close to the board as possible.

6. Reattach the sensor cover to the sensor base.

A.1.1 Connecting External Switches

The Learn Mode DWS can be connected to either normally open (closes on alarm) or normally closed (opens on alarm) external switches. Multiple normally closed switches are wired in series. Multiple normally open switches are wired in parallel to the same two screw terminals. For high security installations, always remove both reed switches when connecting an external switch to the terminals of a DWS.

Notes:
* The normally closed configuration can only be used in U.L. listed installations.

* Do not attempt to use the built-in reed switch and an external switch on the same DWS

A.2   Programming

The following subsections explain programming the Learn Mode DWS.

A.2.1 Programming Considerations

To program the sensor for normally open operation, set the external switch in the alarm (closed) condition and trip the sensor's tamper switch.

To program the sensor for normally closed operation, set the external switch in the alarm (open) condition and trip the sensor's tamper switch.

Do

* Make sure the switch connected to the sensor is a hermetically sealed type such as a sealed reed switch.

* Remove reed switches not being used.

* Make sure the switch supplies a minimum 250-millisecond open or closure on alarm.

* Use stranded wire, not solid core wire.

Do not

- Use the sensor's built-in reed switch if connecting a remote device to a DWS or use mechanical switches connected to a DWS.

- Attempt to connect fast pulse devices such as Window Bugs to a DWS.

- Exceed 6 feet of wire in any wire run if using untwisted wire or exceed 25 feet of 22-AWG (minimum) stranded wire in any wire run.

- Connect more than five switches or connect more than one alarm screen to a DWS. Fewer than five switches are preferred.

- Run wires parallel to electrical wires, cross them at a 90° angle. If a parallel wire run cannot be avoided, keep runs a minimum of 18" from electrical wiring.

Note: Refer to the appropriate CPU Installation Manual for specific instructions on programming this sensor.

General Guidelines for Programming the D/W sensor:

1. Set the CPU to program mode.

2. Trip the sensor's tamper switch.

3. Restore the tamper switch.

A.3 Testing

Perform a Dealer Sensor Test. Refer to the appropriate CPU installation manual for specific instructions on testing this device.

Here are general guidelines for performing a Dealer Sensor Test:

1. Using the appropriate touchpad for the CPU, enter the applicable Dealer Sensor Test code.

2. Trip the sensor.

3. Note the number of beeps indicating the number of rounds the CPU heard from the device.

System Sensor Smoke Detector

The System Sensor™ Smoke Detector is a photoelectronic type detector that contains its own alarm horn and low battery annunciator. The detector's output will trip a special Learn Mode transmitter that is built into the detector. The System Sensor Learn Mode Smoke Detector, a U.L. recognized system component, contains an RF transmitter that can transmit at least 1,000 feet in open air. It has an operating temperature range of 40° to 100°F.

The alarm horn in this smoke detector meets or exceeds current Underwriters Laboratories (U.L.) audibility requirements; however, the horn may not wake up a sound sleeper if a closed door is between the detector and the sleeper.

Two 9-volt alkaline batteries, which last at least 12 months, power the detector. Approved batteries for the detector are the Eveready #522 or the Duracell #MN1604. The detector has its own low battery annunciator that will emit a short beep every minute if the batteries are low. It also sends a low battery report (trouble) to the CPU. The detector also sends a check-in signal to the CPU every 64 minutes.

When the smoke detector is functioning normally, the indicator light flashes continuously about four times a minute. During an alarm, the detector emits a pulsing tone and the indicator light flashes rapidly.

Since each residence has different design requirements, it is not possible to give specific smoke detector location information. This smoke detector should be installed in accordance with the National Fire Protection Association (NFPA), Standard 74. Additional information on household fire warning is available at a nominal cost from: the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269. Request NFPA Standard 74.

Here are some Installation Guidelines:

Do

- Try to keep all detectors within 100 feet of the CPU. The 100-foot distance is recommended as a starting guideline. The smoke detector has an open air range of at least 1,000 feet, but the installation environment will influence this range.

- Determine the best locations for each smoke detector to optimize early detection and maintain accessible escape routes out of the building.

- Locate a smoke detector at the bottom of a basement stairwell. For stairwells on other levels, it is best to place smoke detectors at top of the stairwell.

- Mount detectors on ceilings whenever possible. Make sure that the smoke detector is no closer than 4" to any wall.

- Place the smoke detectors no more than 6" from ceiling for wall mounting.

- Locate the smoke detector in any hallway servicing bedrooms. For maximum protection, place a smoke detector inside each bedroom, especially smokers' bedrooms or rooms where electric blankets or other electrical devices are used.

Do Not

- Mount smoke detectors in rooms with sloped, peaked, or gabled ceilings whenever possible. If unavoidable, mount detectors 3 feet (0.9 meter) measured horizontally from the highest point of the ceiling. (Refer to Figure B.1.)
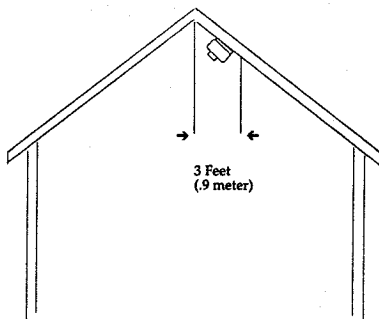

3 Feet
(.9 meter)

Figure B.1. Peak Diagram

- Mount smoke detector in or near damp or very humid areas such as bathrooms with showers.

- Install in areas with excessive metallic surfaces or electrical wiring as these may inhibit the smoke detector's signals from reaching the CPU.

- Install near fluorescent light fixtures. Noise from electrical lights may cause nuisance alarms.

- Place sensors in location where the temperature exceeds the smoke detector's operating limits of 40° to 100°F.

- Mount in very dusty or dirty areas.

- Mount near fresh air inlets or returns or excessively drafty areas.

- Mount in areas where many insects are present.

B.1 Installation

The following procedure explains the detectors installation.

1. Remove the detector's mounting bracket to screw bracket onto mounting surface. (See Figure B.2.)
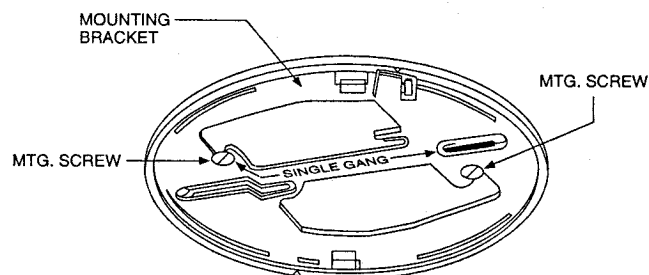

MOUNTING BRACKET

MTG. SCREW

MTG. SCREW

SINGLE GANG

Figure B.2. Mounting Bracket

2. Mount bracket directly onto wood surfaces using No. 8, 1-1/2" wood screws. If mounting onto plaster or dry wall, use appropriate anchors.

3. Insert batteries and observe proper polarity.

4. Place sensor in mounting bracket by aligning arrows on mounting bracket and smoke detector. (See Figure B.3.)
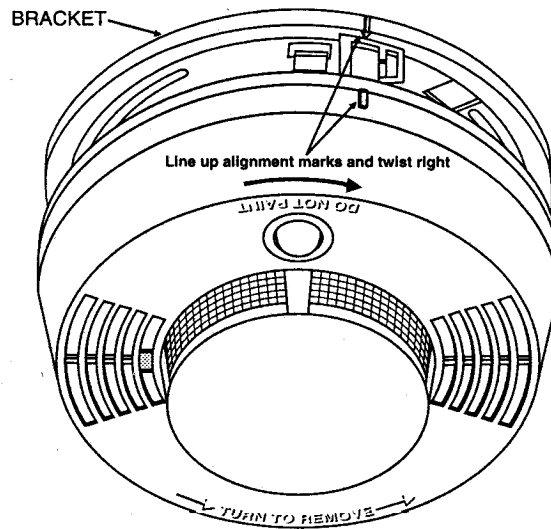

Figure B.3. Alignment Arrows

B.2 Programming

The following is General Programming Guidelines for the Smoke Sensor.

1. Set CPU to Program Mode/Learn Sensors.

2. Trip the sensor's test button. You must hold down the test button for 20 seconds, then the smoke detector's alarm will start and the detector will transmit its ID to be learned by the CPU.

Note: Refer to the appropriate CPU installation manual for specific instructions on programming this sensor.

B.3 Testing

We recommend testing the smoke detectors on a regular basis, for example, once a week, once a month, etc. Test each detector to verify that its siren and signal integrity is adequate for continued proper operation of the detectors.

1. Initialize sensor test mode on CPU, refer to specific installation manual to initialize sensor test mode.

2. Press and hold the test button on the smoke detector for 20 seconds then the smoke detector's audible output will start and the detector's indicator light will flash rapidly. The device will transmit an alarm signal to the CPU.

Note: Refer to the CPU Installation Manual for procedures on performing a Dealer Sensor Test on the entire system.

Warning:

Make sure CPU is in Sensor Test Mode before testing sensor to avoid a fire department dispatch from the central station.

Optional System Test

We suggest that you test the smoke detectors as part of the security system:

1. Notify the central station that you will be initiating a fire alarm.
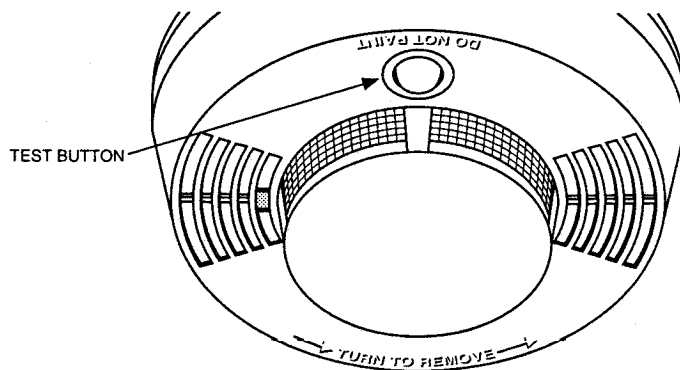
2. Disarm the security system.

Figure B.4. Test Button Location

3. Trip the alarm by pressing and holding the test button on the smoke detector. (See Figure B.4.)

4. Verify that the smoke detector caused the system to go into alarm.

5. Verify with the central station that the alarm signal was received.

B.4   Care and Maintenance

Perform the following maintenance:

*   Replace batteries once a year, or when the detector emits a low battery "beep" signal. Use only Eveready #522 or Duracell #MN1604 batteries.

*   Carefully vacuum the dust from black meshed area on top of smoke detector at least once a year.

Warning:

Before cleaning smoke detector the CPU must be placed in Sensor Test mode.

DS 924 Passive Infrared Sensor

A Passive Infrared (PIR) Sensor is designed to detect movement inside a structure. The PIR sensor detects infrared temperature changes such as the human body emits. A PIR sensor coverage area is divided into several zones, and the PIR sensor contains an RF transmitter that transmits at least 1,000 feet in open air. The sensor has an operating temperature range of 10° to 120°F.

A 3.5 VDC lithium battery, which can last 5 to 8 years, powers the sensor. The sensor sends a low battery report (trouble) to the CPU. It also sends a check-in signal to the CPU every 64 minutes.

The following are features of the DS 924:

- A masking kit to mask portions of the coverage. Refer to the DS installation instructions for details on masking portions of coverage.

- A built-in walk test feature.

- Different lenses to fit installation requirements.

- A built-in tamper switch that activates when the sensor's cover is removed, the tamper switch cannot be disabled.

- A motion lockout feature. Once the transmitter sends, the lockout feature will not allow the transmitter to send again for 3 minutes. The lockout feature can prolong the life of the lithium battery.

Do

- Try to keep all sensors within 100 feet of the CPU. The 100-foot distance is recommended as a starting guideline. The PIR has an open air range of at least 1,000 feet, but the installation environment will influence this range.

- Mount the PIR so there is a reference point (such as a wall) at the end of its detection pattern.

- Mount the sensor so that an intruder will most likely walk across the detection pattern.

- Mount the sensor 5 to 8 feet above the floor.

- Mount on an insulated outside wall facing in whenever possible.

- Mount on a surface which is rigid and free from vibration.

Do Not

- Mount in direct sunlight.

- Aim at air conditioners, heat vents, wood stoves, fireplaces, or intermittent heat source.

- Aim at solar-heated walls or uninsulated metal walls.

- Aim at moving objects (ceiling fan, or pets)

- Mount the sensor where it can be exposed to moisture.

- Place in locations where the temperature will exceed the sensor's operating limits of 10° to 120°F.

- Mount in areas with excessive metallic surfaces or electrical wiring as these areas may inhibit the sensor's signals from reaching the CPU.

- Mount in an area where the coverage may be blocked by any temporary items such as boxes or freight.

C.1   Installation

The following section shows the components (Figure C.1) of the DS 924 followed by the different forms of mounting.
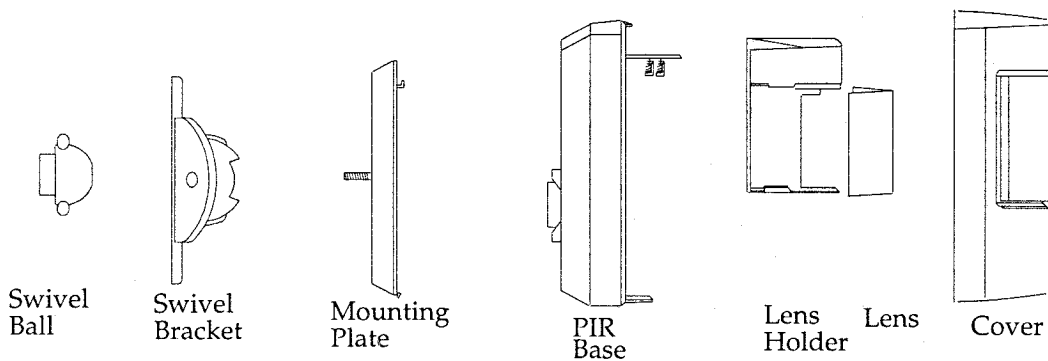

| Swivel Ball | Swivel Bracket | Mounting Plate | PIR Base | Lens Holder | Lens | Cover |

Figure C.1. PIR Components

C.1.1 Mounting without Swivel Bracket

Follow this procedure to mount the PIR without a swivel bracket.

1. Remove mounting plate (see Figure C.2) by using a small screw driver, gently prying away the plate from the PIR body.

Figure C.2. Mounting Plate Removal

2. Mount mounting plate using either corner mount knockouts or surface mount knockouts according to the installation needs. Use the # 6 x 1" wood screws provided with the PIR.

3. Replace PIR body into mounting plate and secure it to the mounting plate with #4 x 3/8" metal plate screw.

Corner mount

Flush mount

Figure C.3. Mounting Hole Locations

C.1.2 Mounting with Swivel Bracket

Follow this procedure to mount the PIR with a swivel bracket.

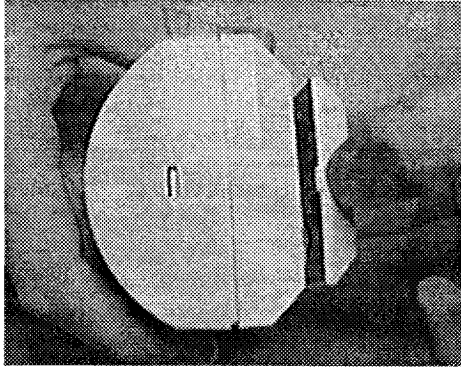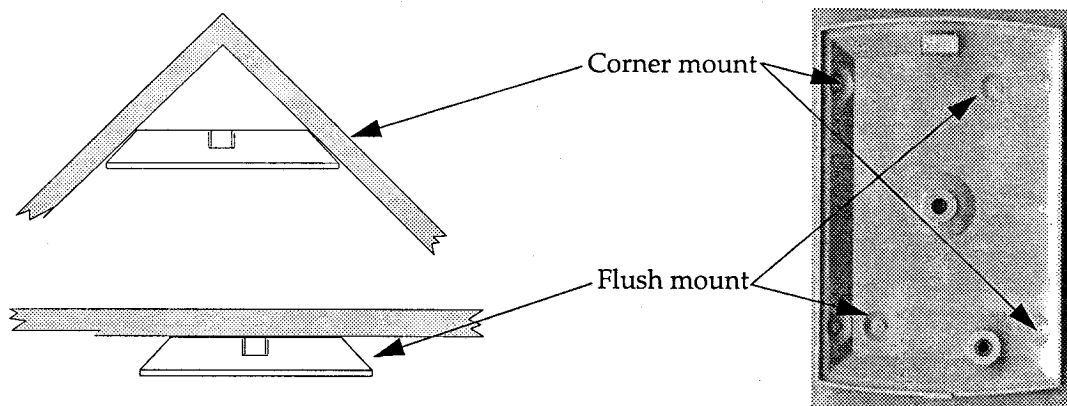1. Remove mounting plate (see Figure C.2) by using a small screw driver gently pry the plate away from the PIR body.

Table C.1. Lens Types

ITI Part No.	Lens Pattern
13-286	70-foot Barrier Lens
13-287	35-foot Broad Pet Avoidance Lens
13-288	35-foot Wide Angle Lens
13-318	35-foot Standard Barrier Lens
13-319	Double Corridor Lens
13-320	Long-Range Pet Avoidance Lens

C.3 Programming

Here are some general guidelines for programming the PIR.

1. Set the CPU to program mode.

2. Trip the sensor's tamper switch by removing the PIR cover.

3. Restore the tamper switch by replacing the PIR cover.

Note: Refer to the appropriate CPU installation manual for specific instructions for pro-gramming this device.

C.4 Testing

This section shows two ways of testing the PIR.

C.4.1 Walk Testing

The purpose of the walk test is to determine and set the best position that will it enable the PIR to be most effective.

Note: Refer to the CPU installation manual for specific testing procedures. Refer to the Detection Systems DS-924 instructions to preform a walk test.

C.4.2 RF Testing

The purpose of the RF test is to determine if the RF link between the PIR and the CPU are adequate. The following procedure describes how to perform a Dealer Sensor Test.

1. Open the cover on the PIR (see Figure C.6).
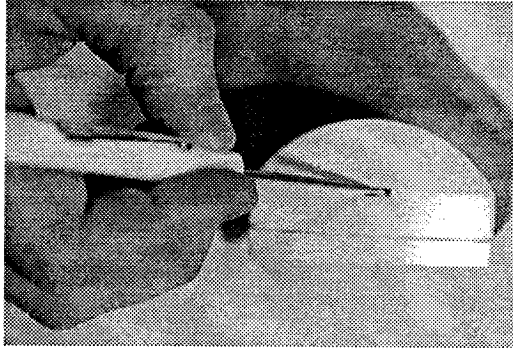
Figure C.6. Opening Cover

2. Press the Walk Test Button for approximately 3 seconds. (See Figure C.7 for test button location.)
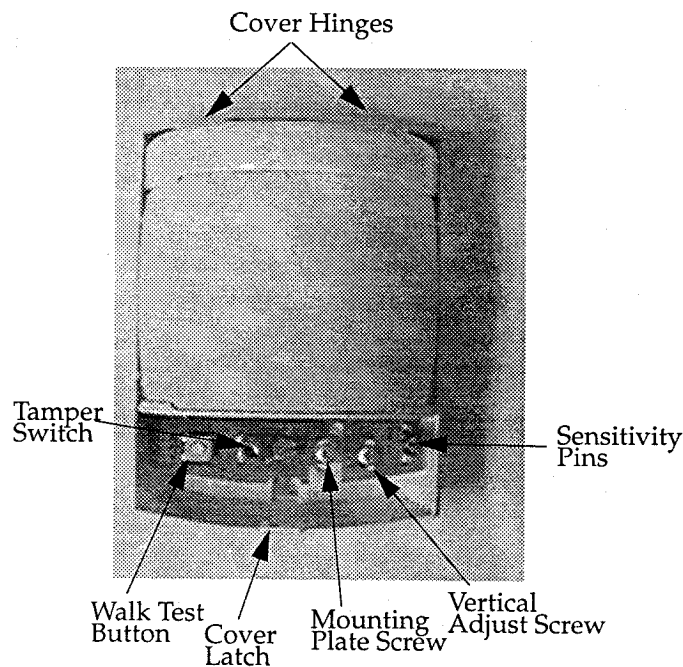
Figure C.7. Internal PIR Components

3. Replace the PIR cover.

4. Using the appropriate touchpad for the CPU, enter the applicable Dealer Sensor Test code for that CPU.

5. Move across the detection pattern until Walk Test LED turns ON, stop your motion.

6. Note the number of beeps (from the CPU) indicating how much of the RF signal (rounds) the CPU heard from the PIR.

Note: On Walk Test, you must allow 10 seconds between trips. Walk Test ends automatically once the PIR sees no motion for 90 seconds.

Quick Guide

Planning, Wiring & Programming

Customer Information

Customer Name _____Address_____

City _____ County_____State_____Zip _____

Phone Number (___) _____

CPU Configuration Information

C. S. Phone Number _____Phone Format: ITI 4/2 (1400Hz) 4/2 (2300Hz)

Siren Timeout _____ minutes Duress Code _____ Account No. _____

Entry Delay 1 (standard) _____secondsEntry Delay 2 (extended) _____ minutes

Exit Delay _____ secondsActivity Timeout _____hoursHouse Code _____

Freeze Temp (Energy Saver) _____ °F

Touchpad Configuration Information

Loop Is (Optional HTD Loop Input): N/C or N/O
Unit Number (HTD Bus I.D. Number) _____

Touchpad Quiet: Y (yes) or N (no) Chime Display: Y (yes) N (no)

Planning

❏   Confirm work order information with the customer.

❏   Discuss the system device locations with the customer.

❏   Take inventory of equipment. Add components as needed.

❏   Verify that there are TouchTone phones on the premises. Pulse dialing phones will not operate the CPU.

❏   For wireless installations, centrally locate the CPU in relation to all sensors whenever possible.

❏   Mount the CPU in a secure, yet easily accessible location. Always mount the CPU in a temperature controlled environment; 42°F to 95°F.

❏   Run all wires for power, phone, sirens, bus devices and hardwire zones before mounting the CPU.

❏   If the installation includes Wireless Interior Sirens (WIS) and/or X-10 Lamp Modules, the CPU must be powered using the optional Line Carrier Transformer, part no. 60-346-500.

❏   If the installation includes an Energy Saver Module it should be located next to or as close as possible to the premise thermostat. Always mount the Energy Saver Module on an interior wall.

Planning(cont)

System Hardware Configuration

Below, write in the quantity of each device required for the installation. Check to be sure each device required for the system includes installation instructions. Also, write in the current draw (mA) of the devices that will require power from the CPU. Current draw specifications for each device are listed below. Total current draw of all devices connected to the CPU must not exceed 500 mA.

	QTY.	PART#	PARTNAME	DOC.NO.
Wireless Sensors				
	___	60-362	Door/Window Sensor	46-327❑
	___	60-409	Recessed Door/Window Sensor*	46-545❑
	___	60-499	SlimLine Door/Window Sensor*	46-549❑
	___	60-461	Shock Sensor*	46-438❑
	___	60-356	DS923PIR*	46-544❑
	___	60-459	Sound Sensor*	46-459❑
	___	60-462	Glass Guard Sensor*	46-548❑
	___	60-452	Pendant Panic Sensor	46-546❑
	___	60-458	Single Button Panic Sensor	46-437❑
	___	60-457	Dual Button Panic Sensor	46-437❑
	___	60-506	System Smoke Sensor*	46-515❑
	___	60-460	Rate of Rise Heat Sensor*	46-547❑
	___	60-504	Freeze Sensor*	46-550❑
	___	60-511	DS924*	46-587❑

				UNIT#	POWEREACH	SUBTOTAL
Internal CPU Devices						
	___	60-436	Feature Expansion Module	46-460❑	___	300mA	_____mA
	___	60-485-95	Receiver Module	46-552❑			
	___	80-094	Speaker Kit	46-554❑			
BusDevices(8maximum)						
	___	60-438	Energy Saver Module	46-460❑		40mA	_____mA
	___	60-248	AlphanumericTouchpad(HTD)	46-506❑	___	100mA	_____mA
	___	60-245	PinpointInterfaceModule(PPM)	46-333❑	___	10mA	_____mA
	___	60-242	Hardwire Input Module (HIM)	46-226❑	___	10mA	_____mA
	___	60-243	Hardwire Output Module (HOM)	46-173❑	___	10mA	_____mA
Sirens & Speakers						
	___	60-278	Hardwire Interior Siren/Piezo	46-180❑		75mA	_____mA
	___	60-252	Hardwire Interior Speaker/Piezo	46-324❑		5mA(piezoonly)	_____mA
	___	13-046	Hardwire Exterior Siren	In Manual		100mA	_____mA
	___	60-275-235	WirelessInteriorSiren(WIS)**	In Manual			
Hardwire Detectors						
	___	13-077	Hardwire Smoke Detector	46-185❑		100mA	_____mA
	___	13-082	HardwirePIRMotionDetector			10mA	_____mA
	___	60-280	Hardwire Sound Detector	46-208❑		4mA	_____mA

_____Total mA

Miscellaneous
    ___   13-204X-10Lamp Module**   In Manual

*   Not Investigated by U.L.

**   To operate these devices requires the CPU to be powered by the optional Line Carrier Transformer, part number 60-346-500 or 60-503-235 (for Canada).

SENSOR GROUP ASSIGNMENTS

The information at the top of this page describes the characteristics of each sensor group. Use the bottom of the page to write in the sensor group assignment and location for each sensor in the system. For more information about each group refer to the Installation & Reference Manual.

GROUP #	GROUP NAME	DESCRIPTION
00	Fixed Panic	24 hour, supervised, audible police siren, no restore.
01	Portable Panic	Same as group 00 except not supervised.
02	Fixed Panic	24 hour, supervised, silent, no restore.
03	Portable Panic	Same as group 02 except not supervised.
04	Fixed Auxiliary	24 hour, supervised, audible auxiliary interior siren, no restore.
05	Fixed Auxiliary	Same as group 04 except siren shuts off after CPU completes successful report to central station.
06	Portable Auxiliary	24 hour, unsupervised, audible auxiliary interior siren, no restore.
07	Portable Auxiliary	Same as group 06 except siren shuts off after CPU completes successful report to central station.
08	Special Intrusion	24 hour, supervised, instant, audible police siren.
09	Special Intrusion	Same as group 08 except delayed (Entry Delay 1).
10	Entry/Exit Delay	Standard delay, active in levels 2 & 3, supervised, audible police siren, chime.
11	Entry/Exit Delay	Same as group 10 except Extended delay (Entry Delay 2).
12	Entry/Exit Delay	Same as group 11 except Twice the extended delay.
13	Instant Perimeter	Active in levels 2 & 3, supervised, audible police siren, chime.

GROUP #	GROUP NAME	DESCRIPTION
14	Instant Interior	Same as group 13 except will honor a delay, no chime.
15	Instant Interior	Same as group 14 except no restore.
16	Instant Interior	Active in level 3 only, supervised, audible police panic, will honor a delay.
17	Instant Interior	Same as group 16 except no restore.
18	Instant Interior	Same as group 17 except CPU must receive 2 separate group 18 sensors.
19	Delayed Interior	Active in level 3 only, supervised, audible police siren, standard delay (Entry Delay 1).
20	Delayed Interior	Same as group 19 except no restore.
21*	Local Instant Interior	24 hour, supervised, audible police siren.
22*	Local Delay Interior Local Delay Interior	Same as group 21 except initiates standard delay.
23*	Local Instant Aux.	24 hour, supervised, audible interior siren.
24*	Local Instant Aux.	Same as group 23 except siren shuts off when CPU receives restore from sensor.
25*	Local Special Chime	24 hour, supervised, initiates double length chime when sensor is activated.
26	Fire	24 hour, supervised, audible fire siren (steady tone).
27*	Custom HOM	24 hour, supervised, instant, silent.
28*	Custom HOM	Same as group 27 except no restore.

All groups require a Restore signal unless otherwise noted.

*Indicates those groups that don't report to the central station.

SENSOR#	GROUP#	SENSOR LOCATION
01	___	_____
02	___	_____
03	___	_____
04	___	_____
05	___	_____
06	___	_____
07	___	_____
08	___	_____
09	___	_____
10	___	_____
11	___	_____
12	___	_____
13	___	_____
14	___	_____
15	___	_____
16	___	_____

SENSOR#	GROUP#	SENSOR LOCATION
17	___	_____
18	___	_____
19	___	_____
20	___	_____
21	___	_____
22	___	_____
23	___	_____
24	___	_____
25	___	_____
26	___	_____
27	___	_____
28	___	_____
29	___	_____
30	___	_____
31	___	_____
32	___	_____

Upper Sensor Numbers

Using the information below, determine the state of each Upper Sensor Number based on the system's configuration. Numbers that default to ON should not be changed. For more information about Upper Sensor Numbers refer to the Installation & Reference Manual.

NUMBER	NAME	DEFAULT	SET TO:
77	Touchpad Tamper	OFF	_____
78	Freeze Alarm/Trouble	OFF	_____
79	No Activity Alarm	OFF	_____
80	Touchpad Fire	ON	_____
81	Touchpad Police	ON	_____
82	Touchpad Auxiliary	ON	_____
83	Manual Phone Test	ON	_____
84	Opening Report	OFF	_____
85	Closing Report	OFF	_____
86	Duress Alarm	ON	_____
87	Forced Armed	OFF	_____
88	Energy Saver Enable	OFF	_____
89	RF Touchpad Sup./Low Battery	OFF	_____
90	AC Failure	OFF	_____
91	Low CPU Battery	ON	_____
92	CPU Tamper	ON	_____
93	Automatic Phone Test	OFF	_____
94	Receiver Failure	ON	_____
95	CPU Back In Service	ON	_____
96	Fail To Communicate	ON	_____

Optional Feature Numbers

Using the information below, determine the state of each Optional Feature Number based on the customer's needs. Numbers that default to ON should not be changed. For more information about Optional Feature Numbers refer to the Installation & Reference Manual. NOTE: Optional Feature Numbers can only be changed from a CS-4000 Central Station Receiver.

NUMBER	NAME	DEFAULT	SET TO:
F00	Remote Phone Access	ON	_____
F01	Ring/Hang-up/Ring, Answer	ON	_____
F02	Exterior Siren Delay	ON	_____
F03	Toll Saver	ON	_____
F04	Low Battery Reports	ON	_____
F05	Supervisory Reports	ON	_____
F06	Dialer Abort	ON	_____
F07	Phone Access Key Type	OFF	_____
F11	Interior Siren Sounds	OFF	_____
F12	Alarm Restoral Reports	OFF	_____
F13	Low Battery Restoral Reports	OFF	_____
F14	Hourly Phone Test	OFF	_____
F15	Alarm Verification	OFF	_____
F16	Trouble Beeps	OFF	_____
F17	24 Hour Sensor Tamper Alarm	OFF	_____

Programming

Before you begin...

1. Check all wiring at devices and CPU for proper connections.

2. Be sure the Tamper Bypass switch is in the Normal position.

3. Be sure the CPU power switch is in the Off position.

4. Connect the CPU battery leads to the battery, observing polarity.

5. Plug the power transformer into the AC outlet.

6. Turn the CPU power switch to the On position.

7. After the touchpad completes its self test be sure the display reads PROGRAM MODE.

If the CPU and alphanumeric touchpad don't power up, immediately disconnect the power transformer. Refer to the Troubleshooting section of the Installation and Reference Manual, part no. 46-629.

CPU Configuration Programming

To program the information you filled out at the top of the front page into CPU memory, use the following procedure. The following example shows a typical sequence for programming.

Display Reads	Press	Enter Variable	Press	Display Reads	Press
PHONE NUMBER	◎	_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	◎	OK	**ST** or **BY** To Continue

The SETTING refers to the numerical or other entry for each parameter. The BYPASS entry at the end will display the next parameter to be programmed. Continue pressing BYPASS until the parameter to be programmed is displayed. The example above shows the programming sequence and corresponding display readout for the PHONE NUMBER.

Begin by pressing either the BYPASS or STATUS button on the alphanumeric touchpad until the display reads the heading you desire. Some examples are listed below.

PHONE FORMAT	Set to ITI or 4/2 reporting by pressing the STATUS or BYPASS button. Default = ITI.
SIREN TIMEOUT	Set from 01-15 (minutes). Default = 04.
DURESS CODE	Enter any two digits. Default = None.
ACCOUNT NUMBER	Enter five digits. Default = 00-000.
ENTRY DELAY 1	Set from 08-88 (seconds). Default = 32.
ENTRY DELAY 2	Set from 1-8 (minutes). Default = 4.
EXIT DELAY	Set from 08-88 (seconds). Default = 32.
ACTIVITY TIMEOUT	Set from 1-24 (hours). Default = 24.
HOUSE CODE	Set from 000-255. Default = 000.
FREEZE TEMP	Set from 40-90 (°F). Default = 42.

Touchpad Configuration Programming

To set the Unit Number, use the same programming sequence described above. To set the Loop, Touchpad Quiet and Chime Display parameters, press the BYPASS or STATUS button to display the desired parameter. Then, press the COMMAND button to set the parameter to the desired state.

LOOP IS N/O	Set touchpad hardwire loop input to N/O (normally open) or N/C (normally closed). Default = N/O.
UNIT NUMBER	Set from 0-7 for touchpad bus identification. Default = 0.
TOUCHPAD QUIET Y	Set to Y to silence touchpad sounds or N to hear sounds. Default = Y.
CHIME DISPLAY N	Set to Y (yes) to display tripped sensors when Chime feature is on. Default = N (no).

Programming (cont.)

Learn Sensors

Use the sensor Group assignments you filled out on page 3 with the Learn Sensors procedure outlined below.

1. Press **BY** or **ST** until the alphanumeric display reads LEARN SENSORS.

2. Press **◎**, display reads LEARN GROUP _ _.

3. Enter two digit group number (00-28).

4. Display reads LEARN Sn01. The 01 will flash rapidly. Press **◎** to assign sensor 01 to the group selected in step 3 or enter the desired sensor number, then press **◎**.

5. Display reads TRIP Sn01 (or other sensor number selected in step 4). Trip the tamper switch of the desired sensor.

6. Once the tamper signal is received the alphanumeric touchpad's piezo will beep two times for confirmation. The display will then read TRIP Sn02. Again if this is not the sensor number you want the CPU to learn, enter the desired number and press **◎**. Then, trip the tamper of the next sensor.

Note: To learn Smoke Sensors press and hold the test button until the alphanumeric touchpad's piezo emits two beeps.

To change the Group Number press **🔥**, then **◎** and enter the desired Group Number. Continue sensor group assignments as described above.

Delete Sensors

This procedure deletes any sensor number, 01-32 from CPU memory and also deletes the sensor name from the alphanumeric touchpad's memory.

1. Press **BY** or **ST** until the alphanumeric display reads DELETE SENSORS.

2. Press **◎**, display scrolls DEL Sn01 - FRONT DOOR.

3. Press **◎**, display reads DEL Sn01 - OK.

To continue deleting sensor numbers press **BY** or **ST** to cycle to the desired sensor number or enter the sensor number directly from the alphanumeric touchpad buttons.

Upper Sensors

Use the information at the top of page 6 to set the Upper Sensors with the procedure below.

1. Press **BY** or **ST** until the alphanumeric display reads UPPER SENSORS.

2. Press **◎**, display scrolls Sn77 OFF - TOUCHPAD TAMPER.

3. To turn 77 ON press **◎**. The alphanumeric display will scroll Sn77 ON - TOUCHPAD TAMPER and the touchpad's piezo will emit one beep as confirmation.

To continue press **BY** or **ST** to cycle to the desired number. Then **◎**, press to change the state of the displayed Upper Sensor Number.

Note: Numbers 80 - 83, 91 -92 and 94 -96 default ON. It is recommended these numbers remain ON.

Learn Touchpads (Wireless)

This procedure allows the CPU to learn the I.D. Codes of up to four wireless touchpads for use with the system.

1. Press **BY** or **ST** until the alphanumeric display reads LEARN TOUCHPADS.

2. Press **◎**, display reads PRESS TP 01 BYP.

3. Press the Bypass button on the desired wireless touchpad. The alphanumeric touchpad's piezo will emit one beep and the display will read PRESS TP 02 BYP.

Repeat step 3 to learn up to four touchpads.

IMPORTANT! If you exit the Learn Touchpads mode, then later return to it and press **◎**, you must re-learn all touchpads which were previously learned.

Once the COMMAND button is pressed, the CPU automatically clears all learned wireless touchpad I.D. Codes.