SILENT KNIGHT

FIRE SYSTEMS

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Model 5104
Fire Communicator

Installation Manual

Part Number 150535
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SILENT KNIGHT

FIRE SYSTEMS™

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Revised 2/95

1 INTRODUCTION

The Silent Knight Model 5104 is a low-cost fire communicator that meets the requirements for UL 864 and NFPA 71. Features of the 5104 are described below.

1.1 FEATURES

- Four fully supervised Fire zones, including 1 style D (class A) and 3 style A (class B) zones.
- Current limited loop power output for the style A (class B) zone inputs.
- Detection of ground faults.
- Built-in audible trouble or pulsing supervisory buzzer with a loudness of 80 decibels (dB) at 30 cm. (Supervisory buzzer feature requires dialer revision 9335B, expected availability 2/93.)
- $\boxed{\text{RESET/TROUBLE SILENCE}}$ switch that performs the following functions:

    1) silences audible trouble and supervisory annunciations. (Supervisory silence feature requires dialer revision 9335B, expected availability 2/93.)

    2) resets smoke detector power.

    3) resets accessory power.

- Supervision of $\boxed{\text{RESET/TROUBLE SILENCE}}$ switch. Causes a trouble signal if switch is held longer than 20 seconds.
- 12-V_{DC}, 6.5-AH rechargeable battery. Provides at least 24 hours of standby power to the basic 5104 unit.
- Accessory power output that supplies power to (a maximum of) 3 Model 5230 Remote Annunciators, or to the relay output, with a maximum current draw of 750 mA. Provides +13.8 V_{DC} nominal voltage with AC applied and battery voltage when on battery standby.
- Loss of AC and low battery reporting.
- Separate precision battery charging circuit that maximizes battery life.
- All power sources are current limited.
- Compatibility with the SIA (Security Industry Association) reporting format and 6 other standard reporting formats. **If you want the 9000 to print PROGRAMMING PASS or PROGRAMMING FAIL after downloading, the 9000 must have the Model 9307 software package, revision 900501 or later (see section 19.2.4).**
- Programmable relay output that provides additional annunciation for either alarm or dialer-failed condition (cannot be activated for supervisory conditions).
- Three LEDs on front of cabinet, indicating the presence of AC power (green), and trouble-silenced or flashing supervisory-silenced (yellow) and dialer-failed (yellow) conditions. (The supervisory-silenced feature will be available with dialer revision 9335B, expected availability 2/93.)
- Five LED indicators inside cabinet indicate short circuits and trouble conditions.
- Full-function, computer-controlled up- and downloading of options and system status information (optional).
- Easy, English-language programming using Model 5230 Remote Annunciator.
- Two-number dialing with same or different account codes and reporting formats. Alarms, troubles and status can be programmed to report to either or both numbers.
- Programmable rotary-only or rotary/Touch-Tone[R] dialing.
- Built-in dual phone line-seizure circuits.
- Dual phone line monitor circuits.
- Ring Detect feature on line 1 for downloading data to panel from a remote computer site.
- Transient voltage protection of all inputs, including AC, phone lines and accessory zones.
- Automatic daily test (programmable from Model 5230 annunciator or remote site, via downloading option).
- LCD annunciation of all alarm and trouble conditions at 5230 Remote Annunciator.
- EEPROM (nonvolatile) storage of all programmable option data, which eliminates the need to reprogram the panel if power is lost.
- Built-in watchdog circuit that monitors the operation of the 5104 and resets the system if it fails.
- Capability of being used as a stand-alone system or to communicate the status of a large fire control system that does not have a digital communicator (slave dialer).
- Follows UL alarm priority requirements (fire=highest, sprinkler=second highest, trouble=third highest, all others=lowest). (This feature requires dialer revision 9335B, expected availability 2/93.)

1.2 AUXILIARY DEVICES

- Model 5230 Remote Annunciator (optional). Used for system control, programming and troubleshooting.
- Model 7860 modular cable with spade lugs for connection to Telco RJ31X plug.
- Model 7181 Universal Zone Converter (optional).

1.3 RECEIVERS

The UL fire listed receivers that can be used with the 5104 and the formats that can be used with each receiver are listed below. The formats are described in Section 16.

    Silent Knight Model 9000 (all formats described in Section 16)
    Osborn & Hoffman Quickalert (all formats described in Section 16)
    Ademco 685 (all tone burst formats, 3/1 1400 Hz)
    FBI CP220 (3/1 and 4+2 formats)
    Radionics D6500 (BFSK 1400/2300 Hz formats)

1.4 ELECTRICAL SPECIFICATIONS

PRIMARY AC: 120 Vrms at 60 Hz, 330 mA rms
TOTAL DC LOAD: 1.3 A
ACCESSORY POWER: 9.6 V to 13.8 V max., 750 mA
SMOKE POWER: 9.5 V to 13.8 V max., 750 mA
BATTERY CHARGING VOLTAGE: 13.50 V to 13.80 V
TELEPHONE MINIMUM INPUT SENSITIVITY:
    -40 dBm from 1000 to 2500 Hz; Dial tone frequency must
    between 120 Hz to 600 Hz for at least one second.
RING DETECT MIN. SENSITIVITY: 50 Vrms at 20 Hz
GOOD PHONE LINE VOLTAGE: 2.75 VDC with .005 mA source
MIN. LOW BATTERY DETECT: 10.2 VDC
MIN. LOW AC DETECT: 102 Vrms at 60 Hz, full load
MAX. SWITCHED LOAD CURRENT: 750 mA at 12 V

MAX. STYLE D (CLASS A) TROUBLE DETECT: 0.94 V
MIN. STYLE D (CLASS A) ALARM DETECT: 0.34 V
MIN. STYLE A (CLASS B) TROUBLE DETECT: 1.0 V
MAX. STYLE A (CLASS B) ALARM DETECT: 4.7 V
MAX. WATCHDOG RESPONSE TIME: 50 seconds
AUXILIARY BELL: 9.7 to 13.8 V, 750 mA max.
MAX. LEAKAGE VOLTAGE BETWEEN EARTH AND SYSTEM
GROUND WITH GROUND FAULT DETECTION DISABLED: 0.5 V
    (when measured with a meter with no more than 10 K ohm
    resistance)

1.5 ABOUT THIS MANUAL

Since the last major revision of this manual, the NFPA has changed the naming conventions for the types of zones used with the 5104. This manual still refers to the old naming conventions. The latest naming conventions will be used in the next major revision of this manual. See Section 21 for more information.

2 BUILT-IN FEATURES

2.1 PHONE LINE MONITORS

The 5104 has built-in dual phone line monitor circuits. These circuits detect any fault in the phone lines by monitoring their voltages. They feature a delay of 40-90 seconds before a line fault is reported as a trouble. When a fault is detected for longer than this period, the audible trouble signal will sound, the appropriate line fault indicator LED will turn on and the trouble will be reported to the central station.

NOTE: To comply with industry standards, the Model 5104 is equipped with line seizure. This means that any time the system's dialer needs to communicate with the central station, it will not be possible to use any telephones that are on the same line(s) as the fire system. Normally, this condition will last approximately one minute but under adverse telephone circuit conditions could last for as long as 15 minutes.

2.2 WATCHDOG CIRCUIT

If the 5104 stops running, the watchdog circuit automatically detects the problem and attempts to resume normal operation by resetting the system. Each time the watchdog circuit resets the system, it also sounds a trouble signal.

2.3 POWER LOSS REPORTING

The 5104 monitors both AC and battery power. The AC report delay time can be programmed for 6 to 12 hours. An AC power-loss condition will cause the audible signal to sound, the green LED to flash and, after the programmed delay time, will cause the 5104 to report the trouble to the central station.

If the Slave Dialer option has not been selected (see Section 4.10.2) the battery is tested every minute, even when AC power is present and is continually being charged. A low battery condition will sound the audible trouble signal and cause the 5104 to report the trouble to the central station.

2.4 RELAY OUTPUT

The relay can be programmed to activate auxiliary bells during an alarm or dialer-failed condition. This relay cannot be activated for any supervisory condition. The relay contact is rated at 12 V_{DC}, at 750 mA. (See section 5.1 for current-draw limitations.)

The annunciators must ordinarily be provided by the user. For information on how to connect an external bell to the relay contacts, see section 12.1.

2.4.1 DIALER-FAILED CONDITION

Once the relay has been activated for a dialer-failed condition, the polarity-sensitive annunciation will not automatically deactivate until the dialer-failed condition has been restored. To silence this annunciation before the dialer-failed condition is restored, push the [RESET/TROUBLE SILENCE] switch on the right side of the cabinet, or press the [SILENCE] key on the 5230 annunciator, followed by code 0 or 1. (The codes are described in section 17, steps 35 and 36.)

2.4.2 ALARM CONDITION

After an alarm condition has been restored and reported to the central station, the polarity-sensitive annunciation will continue to sound until it is silenced. To silence this annunciation, push the [RESET/TROUBLE SILENCE] switch on the right side of the cabinet, or press [SILENCE] on the 5230, followed by code 0 or 1.

2.5 RING DETECT CIRCUIT

If the installing company calls the 5104 to up- or download data to or from a remote computer, the built-in ring-detect circuit detects the ring and, after the programmed number of rings (see section 17, step 5), seizes the line and allows the data to be transmitted.

3 PRECONNECTION REQUIREMENTS

3.1 TELEPHONE REQUIREMENTS

1. If requested by the telephone company, the following information must be provided before connecting this device to the phone lines:

    A. Manufacturer: Silent Knight Security Systems
    B. Model Number: 5104
    C. FCC Registration Number: AC698R-17462-AL-E
    D. Type of jack (to be installed by the telephone company): RJ31X

2. This device may not be directly connected to coin telephone or party line services.

3. This device cannot be adjusted or repaired in the field. In case of trouble with the device, notify the installing company or return the device to the manufacturer:

    Silent Knight
    7550 Meridian Circle
    Maple Grove, MN 55369-4927
    612-493-6455
    800-328-0103

4. If the Model 5104 causes harm to the telephone network, the telephone company will notify the user in advance that temporary discontinuance of service may be required. If advance notice is not practical, the telephone company will notify the customer as soon as possible. You as the user have the right to file a complaint with the Federal Communications Commission if you believe it is necessary.

5. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice to allow you to make the necessary modifications to maintain uninterrupted service.

3.2 FCC REQUIREMENTS

WARNING: **This equipment generates and uses radio frequency energy. If not installed and used in strict accordance with this manual, it may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference. If this occurs, the user will be required, at his or her own expense, to take whatever measures may be required to correct the interference.**

3.3 UL REQUIREMENTS

The 5104 is UL listed as a Control Unit for use in Central Station Fire-Protective Signaling Systems (UL 864, NFPA 72). All UL installations must comply with the requirements described below.

1. The 120 VAC wiring to the 5104 cabinet must be enclosed in conduit.

2. Total standby current must not exceed 175 mA.

3. All electrical connections must comply with the ratings shown in section 4.9.

NOTE: UL Canada installations must secure the cabinet with a tamper switch.

4 PANEL DESCRIPTION

CAUTION: Read these instructions carefully before applying power to the 5104.

4.1 AC POWER TRANSFORMER

A transformer is used to supply 16.5 VAC (40 VA) to power the system under normal conditions and to supply charging current to the backup battery. The primary winding must be connected directly to 120 VAC, 60 Hz power source (unswitched). Connect the secondary to the 5104 by plugging the cable into connector P1 on the circuit board.

NOTE: A professional electrician may be required to connect the pigtail wires on the primary winding to the 120 VAC source.

4.2 BATTERY CABLES

The red (+) and black (-) battery cables are used to connect a 12 VDC battery (Model 6712) to the system. The battery provides backup power to the system during AC power interruptions.

CAUTION: Observe proper polarity when connecting the 5104 battery cables. If polarity is reversed, a resettable overcurrent protection device mounted on the 5104 circuit board will automatically remove battery power to the board; the red F3 LED will turn on; and the polarity reversal will be reported to the central station.

NOTE: The Model 6712 12 VDC 6.5 AH rechargeable battery will provide at least 24 hours of standby operation to the basic 5104 system.

4.3 INDICATOR LIGHTS

Three LEDs (one green and two yellow) appear in the window of the 5104 cabinet. Five additional LEDs are on the circuit board inside the cabinet. Their functions are described below.

4.3.1 POWER LIGHT

The green POWER light is normally on and will remain on unless the panel loses AC or the RESET/TROUBLE SILENCE key is being pressed.

4.3.2 AUDIBLE SUPERVISORY/TROUBLE SILENCED LED

This yellow LED is normally off and remains off unless a trouble or supervisory condition has been silenced.

For a SUPERVISORY SILENCED condition, the LED flashes two seconds on, two seconds off. When the supervisory condition is removed and the dialer communication is complete, it will turn off. The supervisory silenced display has priority over trouble-silenced.

For a TROUBLE SILENCED condition, the LED remains on until all troubles have been resolved.

4.3.3 DIALER FAILED INDICATOR

The yellow DIALER FAILED LED is normally off. It turns on after the communicator has failed to make contact with the central station receiver within the programmed number of attempts (see section 17, steps 22 and 26). It stays on until all messages have been sent to the central station.

4.3.4 LINE FAULT INDICATORS

The red L1 and L2 LEDs (inside the cabinet) indicate faulty conditions on telephone lines 1 and 2.

4.3.5 OVERCURRENT PROTECTION DEVICE INDICATORS

The red F1, F2 and F3 LEDs are inside the cabinet. When F1 is ON, the overcurrent protection device in the **style A (formerly class B) loop power** circuit is open. When F2 is ON, the overcurrent protection device in the **accessory power** circuit is open.

If F1 or F2 comes on, disconnect power immediately. Check all devices, making sure the amount of current drawn does not exceed the ratings listed in section 5.1. After all improper conditions have been fixed, test the system by reconnecting the power.

When F3 is on, it indicates one or more of the following conditions:

1. The battery cables are connected in the wrong polarity.
2. The battery cables are shorted.
3. Battery voltage is 12.5 V_{DC} or less.

Be sure the F1, F2 and F3 LEDs are all OFF before continuing to install or operate the system.

4.4 RESET/TROUBLE SILENCE/SPRINKLER SUPERVISORY SILENCE SWITCH

This switch, which appears on the right side of the cabinet, has three functions.

1. It silences audible alarm, trouble, or supervisory signals. A trouble or supervisory annunciation will be silenced immediately when you press the [RESET/TROUBLE SILENCE] switch. **An alarm annunciation cannot be silenced until the alarm condition has been restored and all messages have been reported to the central station.**

2. The Loop Power Reset function removes power from terminals 6, 9 and 11, which resets the smoke detectors when power has been removed for longer than 1 second.

3. The Accessory Power Reset function removes power from terminal 24. To reset smoke detectors and accessory power, you must **hold the switch down for one second** or longer.

NOTE: *To avoid causing a trouble condition on all zones, do NOT hold the switch down for more than 20 seconds.*

4.5 EEPROM (ELECTRICALLY ERASABLE PROGRAMMABLE READ-ONLY MEMORY)

The EEPROM is used to store specific options such as telephone numbers, reporting format, and account numbers. These options must be programmed into the EEPROM by using the Model 5230 Remote Annunciator or Model 5541 Downloading Software, version 3.1 (or later). Refer to sections 17 and 19 for information on reprogramming the options.

4.6 CABLE CONNECTOR P1

The secondary winding of the AC transformer plugs into connector P1 (see section 4.1).

4.7 CABLE CONNECTOR P2

Connector P2 may be used for **temporary** connection of a Model 5230 Remote Annunciator, for programming or troubleshooting purposes. To use connector P2, you must order the quick-connect program cable (P/N 130294). Contact Silent Knight Sales Department at 1-800-446-6444.

WARNING: **Do NOT use connector P2 for permanent installation. If the annunciator is to be permanently installed, it MUST be wired to the 5104 terminals 23-26 (see section 8.2).**

4.8 JUMPER BLOCK JB1

JB1 is on the rev. D (and later) printed circuit board of the Model 5104. This jumper block controls whether or not the 5104 detects faults between earth and system ground. For **most applications**, earth ground monitoring must be **enabled.** If you are using the 5104 as a slave fire communicator, and the main system has ground fault detection, you can disable the 5104's earth ground monitoring (see section 4.10.2). Figure **4.9A** shows how to set JB1 to enable and disable it.

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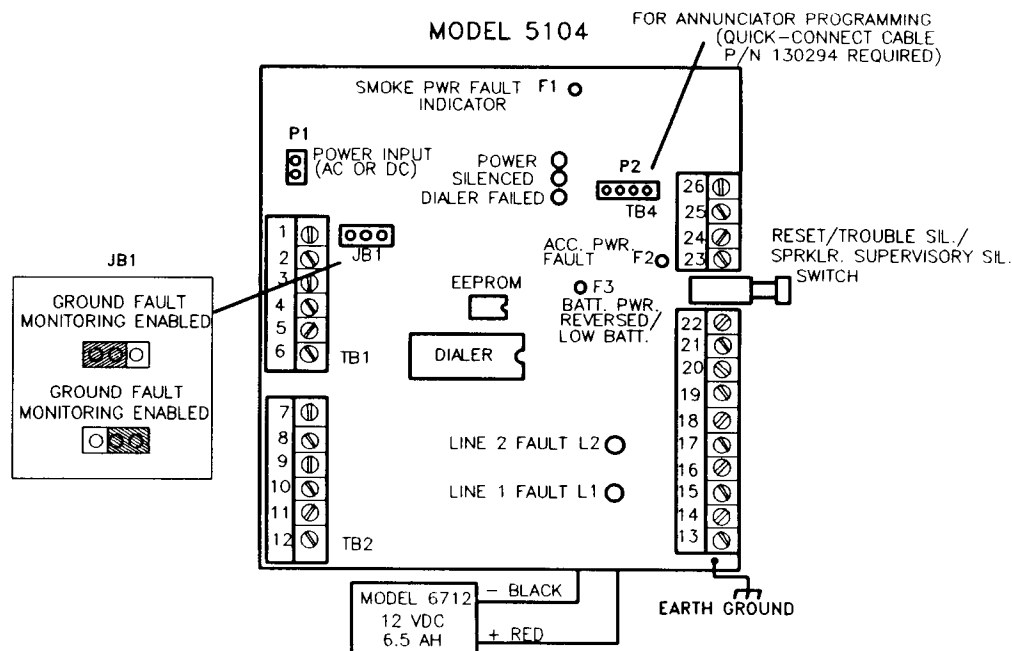## 4.9 BOARD LAYOUT AND TERMINAL STRIP DESCRIPTION

FIGURE 4.9A: 5104 CIRCUIT BOARD

TABLE 4.9A: TERMINAL STRIP DESCRIPTION

#	TERMINAL DESCRIPTION	NOMINAL V_{DC} OUTPUT ("SYSTEM NORMAL" CONDITION)
1	ZONE 1 (STYLE D/CLASS A) LOOP A OUTPUT (POWER LIMITED)	1.7 V_{DC}
2	ZONE 1, LOOP B OUTPUT (POWER LIMITED)	3.3 V_{DC}
3	ZONE 1, LOOP B INPUT	3.3 V_{DC}
4	ZONE 1, LOOP A INPUT	1.7 V_{DC}
5	ZONE 2 (STYLE A/CLASS B) INPUT	2.4 V_{DC}
6	ZONE 2 POWER (POWER LIMITED)*1 *2	13.75 V_{DC}
7	GROUND	0 V_{DC}
8	ZONE 3 (STYLE A/CLASS B) INPUT	2.4 V_{DC}
9	ZONE 3 POWER (POWER LIMITED)*1 *2	13.75 V_{DC}
10	ZONE 4 (STYLE A/CLASS B) INPUT	2.4 V_{DC}
11	ZONE 4 POWER (POWER LIMITED)*1 *2	13.75 V_{DC}
12	GROUND	0 V_{DC}
13	TELCO RING, LINE 1	-48 V_{DC}
14	TELCO TIP, LINE 1 (GROUND)	0 V_{DC}
15	HOUSE TIP, LINE 1	0 V_{DC}
16	HOUSE RING, LINE 1	-48 V_{DC}
17	TELCO RING, LINE 2	-48 V_{DC}
18	TELCO TIP, LINE 2 (GROUND)	0 V_{DC}
19	HOUSE TIP, LINE 2	0 V_{DC}
20	HOUSE RING, LINE 2	-48 V_{DC}
21	BELL +*3 (POWER LIMITED)	2.4 V_{DC}
22	BELL -*3 (750 mA MAX.)*4	13.75 V_{DC}
23	GROUND	0 V_{DC}
24	ACCESSORY POWER*2 *4 (POWER LIMITED)	13.75 V_{DC}
25	SERIAL ANNUNCIATOR DATA OUT (SKO)*2 (POWER LIMITED)	9 V_{DC}
26	SERIAL ANNUNCIATOR DATA IN (SKI)*2	6.5 V_{DC}

*1 NOTE: The maximum number of Model ESL 445CT Smoke Detectors allowed on all three style A (class B) loops combined is 12 (4 per zone).

*2 NOTE: The total smoke detector, accessory and annunciator load must not exceed 1.3 A.

*3 NOTE: This is alarm polarity. Normal polarity is the opposite.

*4 NOTE: The sum of the current ratings of all 12-V_{DC} accessories connected to terminals 22 and 24 must not exceed 750 mA. Terminal 24 is intended for use with the Model 5230 Remote Annunciator/Touchpad only.

4.10 WIRING DIAGRAMS

NOTE 1:   For UL - Canada applications, use the wiring diagram inside the cabinet door.

NOTE 2:   Any device connected to terminal 24 must be UL Listed for Fire use, and must be rated at 12 V.

4.10.1 STANDALONE FIRE COMMUNICATOR APPLICATION

Figure 4.10.1A shows how to wire the 5104 as a standalone fire communicator system. To use the 5104 as a standalone system, you must select NO (Ⓞ) for the SLAVE DIALER option (section 17, step 40).
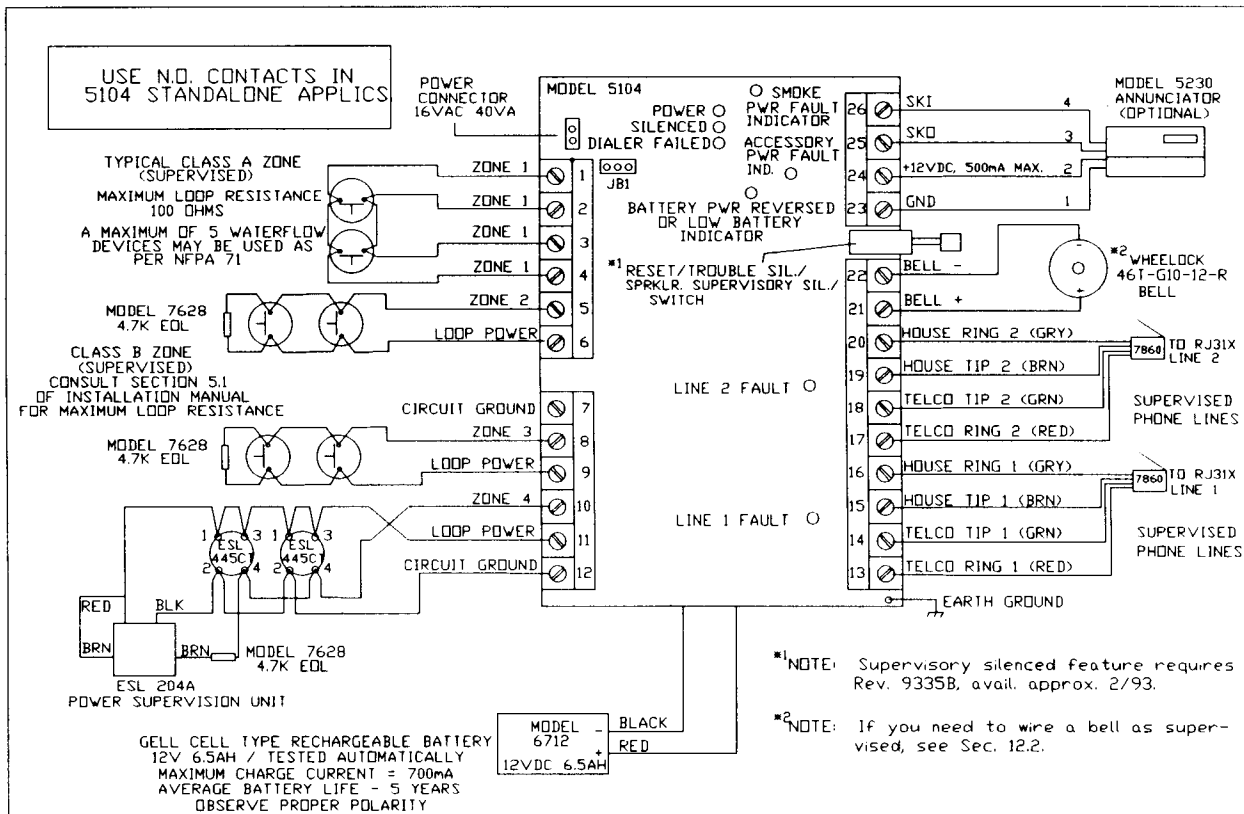

FIGURE 4.10.1A: MODEL 5104 STANDALONE APPLICATION WIRING DIAGRAM

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4.10.2 SLAVE FIRE COMMUNICATOR APPLICATION

The 5104 can be used to communicate the status of a large fire control system that does not have a digital communicator. For this application, the 5104 must be wired as shown in figure 4.10.2A.

NOTE 1: *If the main control panel tests both the battery and ground, you may wish to select YES (①) for the SLAVE DIALER option (section 17, step 40), to avoid interference between the main panel and the 5104. When YES is selected, the 5104 will NOT test the battery or the earth ground. However, it is recommended that a battery be connected. If no battery is connected and a short circuit occurs, the system might reset.*

NOTE 2: *Starting with the rev. D printed circuit board, it is possible to disable the 5104's ground fault detection by moving jumper block JB1 to the RIGHT position (over pins 2 and 3--see figure 4.9A). Do this only if the main panel has ground fault detection. Disabling the 5104's ground fault is recommended if the two systems have a common ground.*
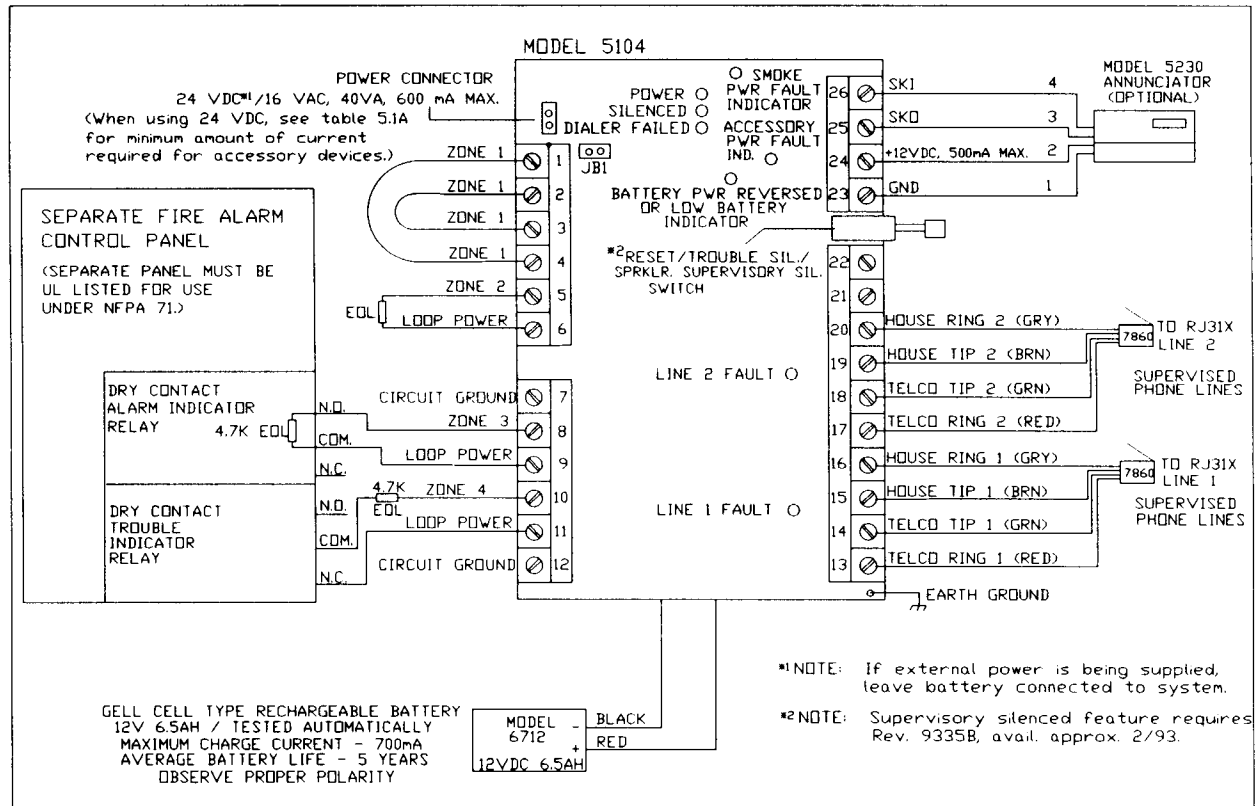

FIGURE 4.10.2A: MODEL 5104 SLAVE COMMUNICATOR APPLICATION WIRING DIAGRAM

5 INSTALLATION OVERVIEW

5.1 ACCESSORY CURRENT DRAWS

Table 5.1A lists the various accessories available for use with the 5104, and the amount of current each draws in the standby (idle) and active (alarm) states.

TABLE 5.1A: ACCESSORIES FOR THE 5104

MODEL #	STANDBY	ACTIVE (TROUBLE OR ALARM)	MAX. # OF DEVICES	MAX. LOOP RESISTANCE*1
5104	75 mA	180 mA	1	N/A
5230	60 mA	120 mA	3	14 Ω
7181 (By configuration type) 4-wire to 2-wire style D to style A style A to style D	 38 mA 38 mA 52 mA	 61 mA 176 mA 90 mA	 2	N/A (Must be installed within 3 feet from the panel.)
Bell - Wheelock 46T-G10-12-R 9 V$_{DC}$ - 15.6 V$_{DC}$	0	125 mA	If 1 used → If 2 used → If 4 used →	7 Ω 3 Ω 1.5 Ω
Horn - Wheelock Series 34T-12DC (9 V$_{DC}$ - 15.6 V$_{DC}$)	5 mA	125 mA	If 1 used → If 2 used → If 4 used →	7 Ω 3 Ω 1.5 Ω
Horn - Federal Model 450D, Series B4 (9 V$_{DC}$ - 15.6 V$_{DC}$)	5 mA	125 mA	If 1 used → If 2 used → If 4 used →	7 Ω 3 Ω 1.5 Ω*2
Supervision Unit ESL 204A	40 mA	40 mA	3 (1 per loop)	
SMOKE DETECTORS:				
ESL 445AT (6 V$_{DC}$ - 15 V$_{DC}$)	1.5 mA	60 mA	12 (4 per loop)	11 Ω*2
ESL 445CT (10 V$_{DC}$ - 30 V$_{DC}$)	0.04 mA	15 mA	12 (4 per loop)	3 Ω*2
Gentex 812 (10 V$_{DC}$ - 16 V$_{DC}$)	5 mA	60 mA	3 (1 per loop)	2 Ω*2
Detection Systems DS200HD head MB200-4W base (4-wire) (10 V$_{DC}$ - 27 V$_{DC}$)	0.08 mA	25 mA	9 (3 per loop)	2 Ω*2

*1*Maximum loop resistance can be measured by connecting an ohmmeter across the leads of a disconnected loop.
*2*Takes into account the required power supervision unit current draw of 40 mA.

Use table 5.1A to calculate the total standby and active currents for the system, then check that they are within the following limits:

To obtain 24-hour standby battery power, the total standby current drain must not exceed 175 mA.

The current drain on the accessory power output must not exceed 750 mA. Accessories that contribute to this current drain include up to three 5230 annunciators, or the devices driven by the auxiliary relay (see section 2.4), or some combination of annunciators and auxiliary relay-driven devices.
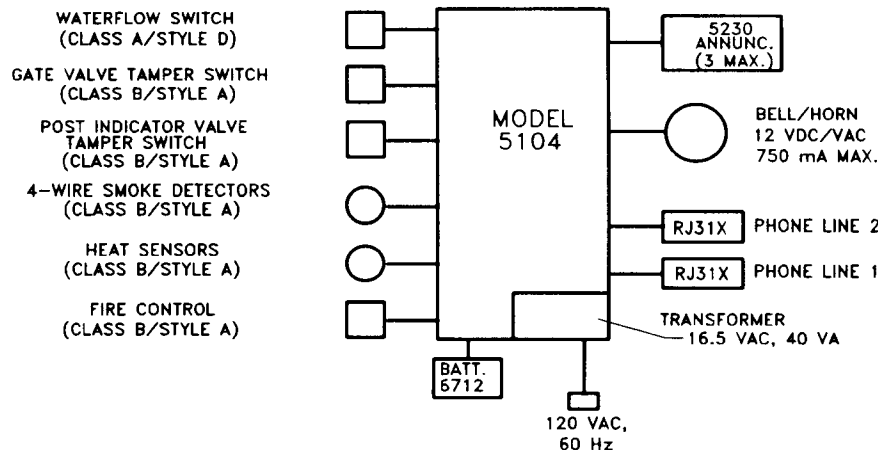
5.2 SYSTEM PLANNING

WATERFLOW SWITCH
(CLASS A/STYLE D)

GATE VALVE TAMPER SWITCH
(CLASS B/STYLE A)

POST INDICATOR VALVE
TAMPER SWITCH
(CLASS B/STYLE A)

4-WIRE SMOKE DETECTORS
(CLASS B/STYLE A)

HEAT SENSORS
(CLASS B/STYLE A)

FIRE CONTROL
(CLASS B/STYLE A)

MODEL 5104

5230 ANNUNC. (3 MAX.)

BELL/HORN
12 VDC/VAC
750 mA MAX.

RJ31X PHONE LINE 2

RJ31X PHONE LINE 1

TRANSFORMER
16.5 VAC, 40 VA

BATT. 6712

120 VAC, 60 Hz

FIGURE 5.2A: SYSTEM PLANNING BLOCK DIAGRAM

6 WIRING PRECAUTIONS

To avoid induced noise (transfer of electrical energy from one wire to another), keep input wiring isolated from high current output and power wiring. Induced noise can interfere with telephone communication, or even cause false alarms. Avoid pulling one multiconductor cable for the whole panel. Instead, separate the wiring as follows:

High current input/output: AC power and bell wiring

Low current input/output: Annunciator and zone loop wiring

Audio input/output: Telephone wiring

Wires from different groups should not be pulled through the same conduit. If you must run them together, do so for as short a distance as possible, or use shielded cable. Connect the shield to circuit ground at the panel. High and low voltages must be routed separately.

For the same reasons, wiring within the cabinet should be routed around the perimeter of the cabinet. It should not cross the printed circuit board, where it could induce noise into the sensitive microelectronics, or pick up unwanted RF noise from the high speed circuits.

High frequency noise, such as that produced by the inductive reactance of a bell, can also be reduced by running the wire through ferrite shield beads, or by wrapping it around a ferrite toroid.

NOTE: All wiring must be within the range of 12-18 American Wire Gauge (AWG).

7 MODEL 5104 INSTALLATION

7.1 SELECTING A LOCATION

When selecting a location to mount the 5104, consider the following factors:

The unit should be mounted as close to the center of the building as possible, where it will not be exposed to temperatures outside the range of 0° C - 49° C (32° F - 120° F), or humidity outside the range of 10% - 85% at 30° C (86° F) noncondensing.

7.2 MOUNTING THE 5104

Mount the 5104 so it is firmly secured to the wall surface. When mounting on concrete, especially when moisture is expected, attach a piece of $^3/_4$" plywood to the concrete surface before attaching the 5104. Mount any other desired components to the plywood.

8 5230 REMOTE ANNUNCIATOR INSTALLATION

The Model 5230 Remote Annunciator is available as an option to the Model 5104. The 5230 provides trouble and alarm information, and can be used for English-language programming.

NOTE: If a 5230 annunciator is to be permanently installed, it must be mounted on a dual gang electrical box. All wiring runs must be made using wire within the range of 12-18 AWG, with a maximum length of 1000 feet. The annunciator must be supervised.

If your installation does not include the 5230, proceed to section 9.

8.1 SETTING ID CODES

Before permanently installing the Model 5230 annunciators, you must set an identification code for each annunciator to be supervised. The ID numbers must start at 1 and progress sequentially to 3 (3 annunciators maximum). Any time an annunciator is powered up, the address of each annunciator is displayed.

On the back of each annunciator, there is a small 4-position DIP switch used to set the ID code. Table 8.1A shows how to position the switches to set specific ID codes. When using the chart, the letter **D** indicates that a switch should be in the down or OFF position, and the letter **U** indicates that the switch should be in the up or ON position.

TABLE 8.1A: ANNUNCIATOR ID CODE SETTINGS

ID #	SW 1	SW 2	SW 3	SW 4
0*	U	U	U	U
1	D	U	U	U
2	U	D	U	U
3	D	D	U	U

*NOT SUPERVISED

U = UP/ON

D = DOWN/OFF

8.2 WIRING THE 5230 ANNUNCIATOR

Table 8.2A shows how to connect the Model 5230 terminals to the 5104 terminals.

TABLE 8.2A: ANNUNCIATOR WIRING CHART

5230 TERMINALS		5104 TERMINALS	
#	DESCRIPTION	#	DESCRIPTION
1	Annunciator Ground	23	Ground
2	Annunciator Power	24	Power
3	Annunciator Input	25	Serial Annunciator Data Out
4	Annunciator Output	26	Serial Annunciator Data In

8.3 MOUNTING THE 5230 ANNUNCIATOR

To mount the annunciator, first remove the rear mounting plate. To do this, insert a #4 flat-blade screwdriver into the slots located on the bottom edge of the annunciator. Gently turn the screwdriver until the mounting plate pulls away from the frame. Once the mounting plate has been removed, you can secure it to the wall using #6 or #8 screws. The mounting plate should be oriented so that the word "TOP" is toward the top of the plate and facing you. A square hole is provided in the mounting plate to run the wiring to the annunciator.

When all of the wires have been connected to the annunciator, set the top of the annunciator over the tabs on the top of the mounting plate. Make sure the wires are not pinched between the frame and the mounting plate. Press each corner of the bottom side of the annunciator onto the mounting plate until you hear it click into place.

NOTE: You may have to gently squeeze the annunciator (top to bottom) to align it while snapping the bottom edge into place.

9 SYSTEM POWER UP

Once you have installed the 5104 and the 5230 (if applicable), test the basic system. Apply power, test the annunciator, then remove the power again. Wire each auxiliary device with the power down. After you install each one, test it by applying power again.

10 ZONE OPERATION AND WIRING

The 5104 features 4 fully supervised Fire zones, including 1 style D (formerly class A) and 3 style A (formerly class B) zones. All 4 zones have ground-fault detection and are protected against transient voltages.

To determine the correct wiring resistance, see section 5.1.

NOTE 1:   In a Normally Open device, the contacts conduct when in the alarm condition, and do not conduct when in the nonalarm condition.

NOTE 2:   When wiring the zones, use 12- to 18-gauge wire.

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10.1 STYLE D ZONE (FORMERLY CLASS A)

Zone 1 is a style D zone. It consists of a 4-wire circuit that allows an alarm to be detected after a single open or ground fault. A single open or ground fault will cause the audible trouble signal to sound, and the 5104 will report the trouble to the central station. The style D zone is appropriate for supervised sprinkler or water flow switches (maximum 5 water-flow switches per style D zone).

This zone must be wired using Normally Open contacts. Figure 10.1A shows how to wire the style D loop.

1	ZONE 1, LOOP A OUT
2	ZONE 1, LOOP B OUT
3	ZONE 1, LOOP B IN
4	ZONE 1, LOOP A IN
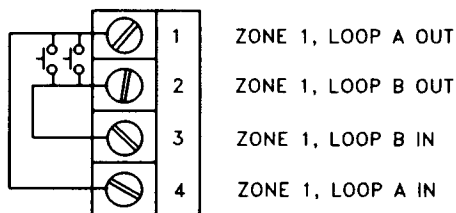
**FIGURE 10.1A: STYLE D SUPERVISED FIRE LOOP
NORMALLY OPEN SENSORS ONLY**

10.2 STYLE A (FORMERLY CLASS B) ZONES

Zones 2-4 are style A zones. Each style A zone consists of a 2-wire circuit that detects the occurrence of an open in the loop, but may not be able to detect an alarm after such an occurrence until normal operation is restored. A Model 7628 4.7-KΩ end-of-line (EOL) resistor must be installed at the end of each style A loop. Any style A zone can support a 4-wire smoke detector. Two-wire smoke detectors **cannot** be used.
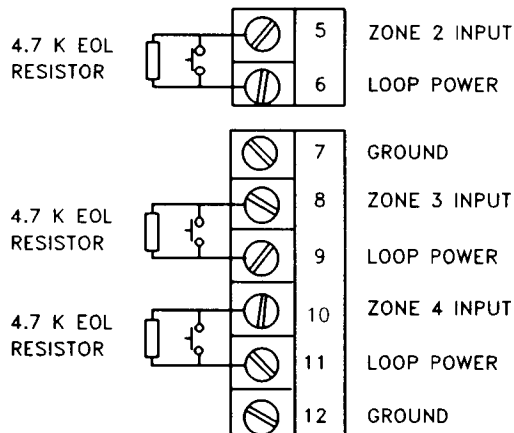
A short across the EOL resistor of the loop will cause an alarm. An open and/or short to ground is a trouble condition.

The nominal (no alarm) loop input voltage to ground is approximately 2.4 V_{DC} on each zone input.

A voltage of **less than 1.0 V_{DC}** on any input will cause a trouble condition. A voltage of **greater than 4.7 V_{DC}** on any input will cause an alarm.

A resistance of **less than 500 Ω to system ground (terminal 23)** will cause the input to be in a **trouble** condition. A resistance **greater than 10 KΩ in series with the loop** (in addition to the 4.7-KΩ EOL resistor) will cause the input to be in a **trouble** condition. These statements apply to all style A inputs.

Style A zones must be wired using Normally Open contacts. Figure 10.2A shows how to wire the style A loops.

4.7 K EOL RESISTOR

| 5 | ZONE 2 INPUT |
| 6 | LOOP POWER |

4.7 K EOL RESISTOR

7	GROUND
8	ZONE 3 INPUT
9	LOOP POWER

4.7 K EOL RESISTOR

10	ZONE 4 INPUT
11	LOOP POWER
12	GROUND

**FIGURE 10.2A: STYLE A SUPERVISED LOOPS
NORMALLY OPEN SENSORS ONLY**

Maximum Total Alarm current for all style A zones: 750 mA

Maximum Standby Current per Zone:
     Output (loop power): 50 mA
     Input: 0.5 mA

The maximum loop resistance for the device that does **NOT** draw current (e.g., a heat sensor) is 50 Ω

11 SMOKE DETECTOR WIRING

11.1 FOUR WIRE SMOKE DETECTORS

Figure 11.1A shows how to wire a UL listed ESL 449CT or ESL 445CT 4-wire smoke detector to a style A zone.

NOTES: Use only 4-wire— **not** 2-wire—smoke detectors in style A zones (unless the Model 7181 Universal Zone converter is used (see Section 11.2).

When wiring a 4-wire smoke detector to a style A zone, you must use a power supervision unit. The recommended device is ESL 204-12/24V. Refer to the wiring diagram in Section 4.10 for wiring of power supervision units. The 7628 EOL resistor and the ESL 204-12/24V must be installed at the last detector in the loop.

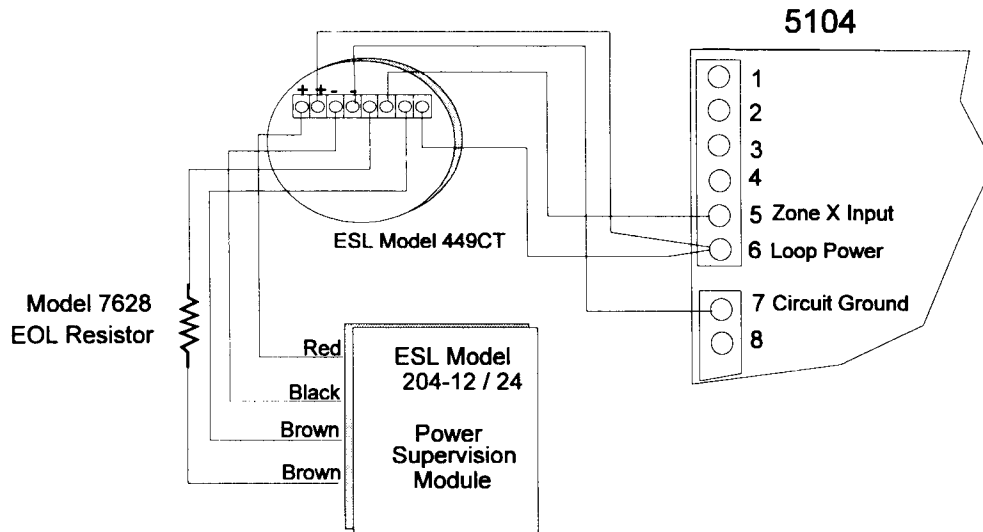Minimum gauge wire is #18 AWG. To determine the maximum loop wiring resistance, see Section 5.1.

FIGURE 11.1A: FOUR-WIRE SMOKE DETECTOR

See Section 5.1 for a list of smoke detectors that may be used with the Model 5104.

11.2 MODEL 7181 UNIVERSAL ZONE CONVERTER

The Model 7181 Universal Zone Converter allows you to connect a style A (class B) sensor to the 5104's style D (class A) zone and to connect style D sensors to the 5104's style A zones. It also allows you to connect 2-wire smoke detectors to the 5104's 4-wire zones. Figure 11.2A shows how to connect a style A sensor to a style D zone. Refer to the 7181 installation manual (P/N 150632) for additional information.
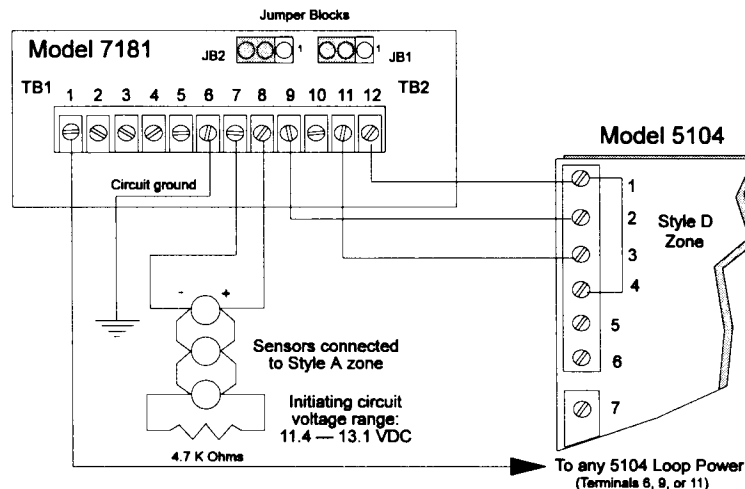

FIGURE 11.2A: CONVERTING STYLE D ZONE TO STYLE A

13

12 AUXILIARY ALARM BELL INSTALLATION

NOTE 1: If an alarm occurs and activates a bell, you can silence the bell by one of two methods:

1. Use the `RESET/TROUBLE SILENCE` switch on the panel (see Section 4.4).

2. If the Model 5230 is included in the installation, press: `SILENCE` Code 0 or Code 1 (see Section 14.2).

NOTE 2: The polarities shown in this section represent the alarm condition. In the normal standby condition, terminal polarities are reversed.

NOTE 3: Wire gauge must be within the range of 12-18 AWG, with a maximum wire length of 800 feet.

NOTE 4: When using a bell, you must select Yes for the RELAY--ALARM option (see Section 17, Step 11).

12.1 EXTERNAL DC ALARM BELL WIRING
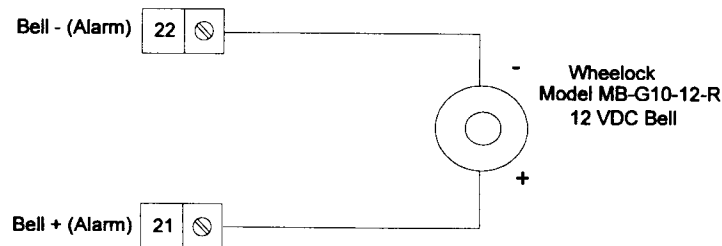
Figure 12.1A shows how to wire an external alarm bell.

FIGURE 12.1A: EXTERNAL ALARM BELL WIRING

12.2 SUPERVISED AUXILIARY BELL WIRING

When using a supervised bell, an open or short in any of the wires is reported as a trouble condition in Zone 4 (third style A/class B zone).

Figure 12.2A shows how to wire a supervised bell. Zone 4 must be used for the input. The Model 7800 Transient Suppressor must be installed. Be sure the wire that goes between the terminals 10 and 21 is connected directly to the terminals, not to the bell.

When programming, you must select Yes for the RELAY--SUPERVISE option (Section 17, Step 12). In the SIA format, Zone 4 reports as "UNDEFINED."
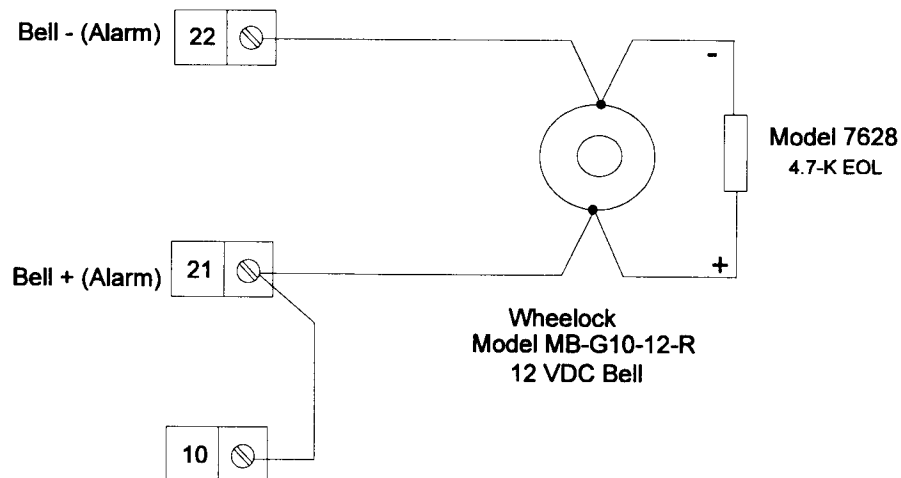

FIGURE 12.2A: SUPERVISED ALARM BELL WIRING

13 TELEPHONE LINE CONNECTION

In accordance with NFPA 71 requirements, both telephone lines must be installed.

Connect the 5104 to the phone line using the Model 7860 modular cable and an RJ31X phone jack. The telephone company will install an RJ31X jack upon request. Wire as shown in Figure 13A.
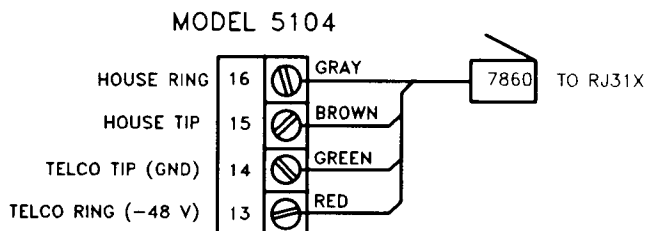
MODEL 5104

HOUSE RING	16	GRAY
HOUSE TIP	15	BROWN
TELCO TIP (GND)	14	GREEN
TELCO RING (−48 V)	13	RED

7860 TO RJ31X

FIGURE 13A: TELEPHONE LINE CONNECTION

14 MODEL 5230 ANNUNCIATOR OPERATION

The optional Model 5230 Remote Annunciator/Touchpad provides annunciation of trouble and alarm conditions, and can be used to program the system.
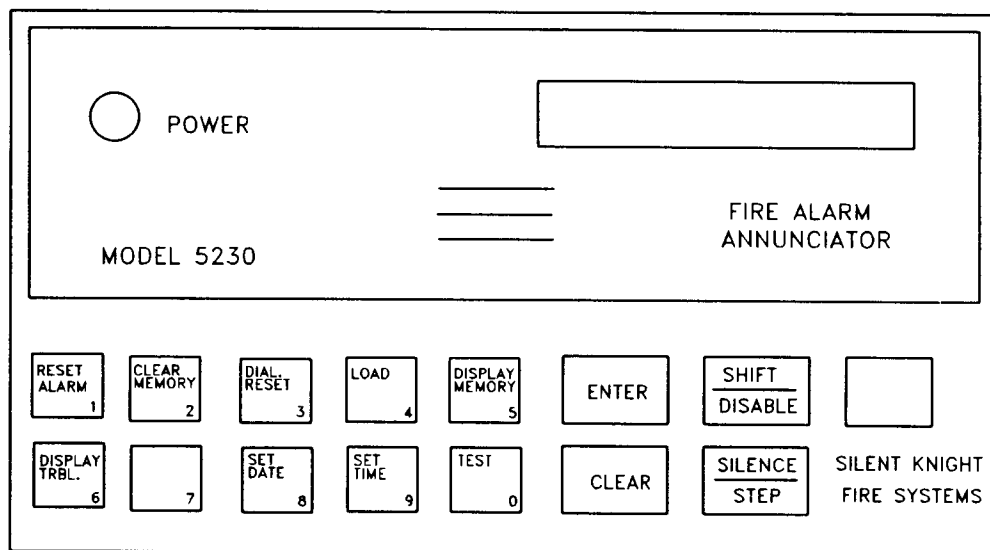
○ POWER

MODEL 5230

FIRE ALARM
ANNUNCIATOR

| RESET ALARM 1 | CLEAR MEMORY 2 | DIAL. RESET 3 | LOAD 4 | DISPLAY MEMORY 5 | ENTER | SHIFT / DISABLE | |
| DISPLAY TRBL. 6 | 7 | SET DATE 8 | SET TIME 9 | TEST 0 | CLEAR | SILENCE / STEP | SILENT KNIGHT FIRE SYSTEMS |

FIGURE 14.2A: MODEL 5230 ANNUNCIATOR

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14.1 ANNUNCIATION FEATURES

14.1.1 DISPLAY

The messages listed below are displayed on the Model 5230 LCD. If the 5104 is not reporting or being programmed, and if no functions are being entered, the LCD cycles through all messages that are applicable at the time, showing a different one every 2 seconds.

MESSAGE DISPLAYED	INDICATES
"TROUBLE ZONE #1-4"	Trouble condition in a particular zone or zones.
"ALARM ZONE #1-4"	Alarm condition in a particular zone or zones.
"TROUBLE AC"	AC power has been lost.
"TROUBLE BATTERY"	Battery power has been lost.
"TROUBLE LINE 1"	Trouble condition on line #1.
"TROUBLE LINE 2"	Trouble condition on line #2.
"TROUBLE DIALER"	Indicates a dialer failed condition.
"TROUBLE GROUND"	Ground fault.
"SILENCED"	A trouble condition exists and the annunciator has been turned off.
"SYSTEM NORMAL"	Displayed if no trouble, alarm or other condition exists.
"DATA LOST"	Displayed if event memory overflows.
"REPORTING"	A report is being transmitted to the central station.
"CALLING COMPUTER"	Data is being uploaded to or downloaded from the central station computer.
"BUS TROUBLE"	The 5230 cannot communicate with the 5104.
"TROUBLE 5230"	One or more of the 5230s annunciators is in trouble.
"BAD EEPROM"	EEPROM must be replaced. Contact Silent Knight Technical Support at 800-328-0103.

NOTE 1: When the 5230 annunciator is powered up, it will show its ID number, (1, 2 or 3) followed by the cycle of messages describing conditions that are currently in effect.

NOTE 2: While a the 5104 is communicating with the central station, the LCD will show the message *"REPORTING"* or *"CALLING COMPUTER"*, whichever is applicable.

When the transmission is completed, the annunciator memory is reset (cleared) and the annunciator ID number is displayed. Then, the LCD begins cycling through all the messages that are applicable.

NOTE 3: Pressing the ⌈RESET/TROUBLE SILENCE⌋ switch resets the 5230 (see note 1).

14.1.2 AUDIO TRANSDUCER

The audio transducer produces short beeps to annunciate keystrokes. It also emits a long, high-pitched tone to indicate a trouble condition or that an annunciator function has been entered incorrectly (see section 14.2).

14.1.3 POWER LED INDICATOR

When AC power is being supplied, the **POWER** LED glows steadily. If the **POWER** LED is flashing, it means that the AC power has been removed and the backup battery is supplying power to the 5104. If neither AC nor battery power is being supplied, the **POWER** LED is off.

14.2 MODEL 5230 KEYSWITCH FUNCTIONS

The 5230 function keys used with the Model 5104 are described below. The remaining keys are used only for entering digits. Code 0 refers to the installer's code (factory programmed as 5104). Code 1 refers to the operator's code (factory programmed as 1111). These two codes are described in section 17, steps 35 and 36. Table 14.2A summarizes the keystrokes for each function.

NOTE 1:   *Do not enter the functions described below while the system is reporting, uploading or downloading. Reporting, uploading and downloading have priority over other functions, the keystrokes you enter during this time might not be read by the 5104.*

NOTE 2:   *If you stop pressing keys before completing a function, and no key is pressed for 10 seconds, the "TRY AGAIN" message will appear.*

NOTE 3:   *The following keyswitch functions are NOT used on the Model 5104: RESET/ALARM, CLEAR MEMORY, DIAL RESET, DISPLAY MEMORY, DISPLAY TROUBLE, SET DATE, and DISABLE. (The* (SHIFT/DISABLE) *key is used only to shift.)*

(LOAD) (Digit (4)) -   Calls a computer at a different site to initiate uploading and downloading. The ENABLE--COMPUTER option must be selected (see section 17, step 6). To **call a remote computer**, press: (LOAD)(ENTER), then key in code 0.

(7) -   Must be entered when the Model 5230 is used to program the 5104 (see sections 17-19). To **go into the programming mode**, press: (7)(ENTER), then key in code 0. (Note: The system must be displaying (NORMAL) -- not reporting or up- or downloading, when you attempt to enter program mode. See section 15.2 if you need more information about the program mode.)

(SET TIME) (Digit (9)) -   To **set the time**, press (SET TIME) (ENTER), followed by code 0, then key in the time using the military format.

(TEST) (Digit (0)) -   To perform a **manual test** to make sure the dialer can report to the central station, press: (TEST)(ENTER), followed by either code 0 or code 1.

(ENTER) -   **Activates commands** or **reads programming data** into memory, after commands or data have been keyed in.

(CLEAR) -   Deletes the most recent key sequence from the annunciator's memory. Used for **correcting mistakes**.

When the (CLEAR) key is used in the programming mode, the new data disappears and is replaced by the last programmed value.

(SHIFT/DISABLE) -   Used with other keys to enter alphabetical or hexadecimal values. This key will be called the "(SHIFT)" key from now on.

NOTE: *This key CANNOT be used to disable zones.*

(SILENCE/STEP) -   Performs two functions:

1.   Silences audible trouble or alarm annunciations. To **silence a tone**, press: (SILENCE/STEP), followed by code 0 or code 1.

A trouble or supervisory annunciation will be silenced immediately, when you key in the above sequence. **An alarm annunciation cannot be silenced until the alarm condition has been restored and all messages have been reported to the central station.** (Supervisory silenced feature requires dialer revision 9335B, expected availability 2/93.)

2.   Used to **advance to different programming steps** (programming mode only). See section 19.1 for information on programming with the 5230 annunciator. In reference to programming, this key will be called the (STEP) key in this manual.

TABLE 14.2A: KEYSWITCH FUNCTIONS

FUNCTION	KEYSTROKES
Call remote computer (for uploading or downloading)	(LOAD) (ENTER), code 0
Go into programming mode	(7) (ENTER), code 0
Set Time	(SET TIME) (ENTER), code 0
Manual Test	(TEST) (ENTER), code 0

15 PREPROGRAMMED EEPROMS

The Model 5104 provides a wide variety of features that may be selected for use depending on your needs. These features are programmed into an EEPROM (Electrically Erasable Programmable Read-Only Memory) chip. For descriptions of the various options, see section 17.

The 5104 is shipped with an EEPROM that has been factory programmed. The options that have been programmed are shown in triangle brackets < > after the option names in section 17.

15.1 ENTERING PROGRAM MODE

The system must be at the NORMAL display, not reporting or up- or downloading, in order to enter program mode.

The following suggestions should help avoid the wait for the unit to make all attempts to communicate before it allows you to enter the program mode.

1.   Make sure all zones are wired according to the wiring diagram.

2.   Add EOL resistors to any unused zones.

3.   If the battery or AC are low or not present, attempt to enter the program mode within the first 60 seconds after power-up.

4.   If annunciators or phone lines are connected, enter the program mode within 40 seconds of power-up.

5.   If you have tried 1-4 and still cannot enter program mode, power down the system and use the 5521 programmer to verify option selection.

15.2 CHANGING THE OPTIONS

To customize the features to suit a particular installation, you can reprogram the options stored on the EEPROM using either the Model 5230 Remote Annunciator or the Model 5541 Downloading Software. The EEPROM is an 8-pin integrated circuit chip that can be reprogrammed up to 1000 times. For instructions on reprogramming the options, refer to sections 17 through 19.

16 REPORTING FORMATS

The Silent Knight Model 5104 can transmit information in 6 different formats. The type of format you select is determined by the type of receiver used at the central station (see section 17, steps 23 and 27).

NOTE: If the Model 9032 Line Card is used, the Model 9000 receiver printouts for the 3/1, 4+2 and FSK1 formats will be in codes, not English. For example, if alarm code 39 is transmitted in Silent Knight 4+2 format, the printout will be:

code 3 zone 9

The Radionics BFSK and SIA formats will still print in English.

Silent Knight 3/1 -	Old format, transmits a 3-digit account number and a 1-digit alarm code. Transmissions are acknowledged at 1400 Hz.
Sescoa 3/1 -	Old format, transmits a 3-digit account number and a 1-digit alarm code. Transmissions are acknowledged at 2300 Hz.
Silent Knight 4+2 -	Silent Knight tone burst format, transmits a 4-digit account number and a 2-digit alarm code.
Silent Knight FSK1 -	(Model 5521 programmer displays "FSK81".) High-speed, single-round format for use with the Model 9000 and 8510/8520 receivers. Transmits a 4-digit account number and 2-digit alarm code.
BFSK14 and BFSK23 -	High-speed, single-round, 3-digit account Radionics format. (Listed in Model 9000 Digital Alarm Receiver manual--P/N 150261--as Radionics BFSK.)
SIA8 and SIA20 -	Security Industry Association (formerly the Security Equipment Industry Association) standard.

The tables in the following subsections show the digits that are transmitted for each event reported by the 5104 dialer, and the message that is printed out by the central station's Model 9000 receiver. A separate table is shown for each format.

CAUTION: Some formats do not distinguish between certain types of reports, such as between waterflow and fire alarms, or between supervisory and trouble reports. Central station personnel must keep records of how the various zones are programmed at each account, so they can determine what condition is being reported for a particular zone.

16.1 SILENT KNIGHT 3/1 AND SESCOA 3/1 FORMATS

These formats transmit a 3-digit account number and a single-digit alarm code. These two formats greatly limit the amount of information that can be reported. To avoid confusion at the central station, standard alarm digits should be chosen. During programming, you select which alarm digits will be reported for different events.

The second column of Table 16.1A shows the programming step number in which each digit is programmed (see sections 17 and 18, steps 0-3). The third column indicates that the 9000 prints only the digit (X) that has been programmed for that event--**not** an English message.

NOTE: *When using the 3/1 formats, many of the reporting capabilities are lost because of the limited number of codes that can be sent.*

TABLE 16.1A: 9000 PRINTOUT FOR SILENT KNIGHT AND SESCOA 3/1 FORMATS

5104 DIALER CONDITION	PROGRAMMING STEP #	9000 PRINTOUT
ALARM 1-4	0	CODE X = ALARM
ALARM RESTORE 1-4	2	CODE X = RESTORE
TROUBLE 1-4	1	CODE X = TROUBLE
TROUBLE RESTORE 1-4	2	CODE X = RESTORE
AC LOST	1	CODE X = TROUBLE
AC RESTORE	2	CODE X = RESTORE
BATTERY TROUBLE	1	CODE X = TROUBLE
BATTERY RESTORE	2	CODE X = RESTORE
MANUAL TEST	3	CODE X = TEST
AUTOMATIC TEST	3	CODE X = TEST
DOWNLOADING SUCCEEDED*	3	CODE X = TEST
DOWNLOADING FAILED*	3	CODE X = TEST
TROUBLE PHONE LINE #1	1	CODE X = TROUBLE
TROUBLE PHONE LINE #2	1	CODE X = TROUBLE
ANNUNCIATOR TROUBLE 1-3	1	CODE X = TROUBLE
EARTH GROUND TROUBLE	1	CODE X = TROUBLE
DATA LOST	3	CODE X = TEST
RESTORE PHONE LINE #1	2	CODE X = RESTORE
RESTORE PHONE LINE #2	2	CODE X = RESTORE
ANNUNCIATOR RESTORE 1-3	2	CODE X = RESTORE
EARTH GROUND RESTORE	2	CODE X = RESTORE

NOTE: *A test report might indicate that the 5104 has been downloading.*

CAUTION: Do NOT use the 3/1 formats when using the uploading/downloading function. These formats do not distinguish between different types of tests (see table 16.1A).

16.2 SILENT KNIGHT FSK1 AND 4+2 FORMATS

The Silent Knight FSK1 and Silent Knight 4+2 formats transmit a 4-digit account number and a 2-digit alarm code. When an event is reported in either of these two formats, the dialer transmits the two digits shown in the second column. The 9000 can be programmed to print either the two digits or the English message shown in the third column of Table 16.2A.

TABLE 16.2A: 9000 PRINTOUT FOR SILENT KNIGHT FSK1 AND 4+2 FORMATS

5104 DIALER CONDITION	DIGITS TRANSMITTED	9000 ENGLISH LANGUAGE PRINTOUT
ALARM 1-4	01-04	ALARM 01 - ALARM 04
ALARM RESTORE 1-4	21-24	ALARM RESTORE 11-14
TROUBLE 1-4	61-64	TROUBLE 01 - TROUBLE 04
TROUBLE RESTORE 1-4	71-74	RESTORE 01 - RESTORE 04
AC LOST	60	AC TROUBLE
AC RESTORE	70	AC RESTORE
BATTERY TROUBLE	69	LOW BATTERY
BATTERY RESTORE	79	BATTERY RESTORE
MANUAL TEST	30	TEST
AUTOMATIC TEST	30	TEST
DOWNLOADING SUCCEEDED*	30	TEST
DOWNLOADING FAILED*	30	TEST
TROUBLE PHONE LINE #1	31	PHONE LINE TROUBLE 01
TROUBLE PHONE LINE #2	32	PHONE LINE TROUBLE 02
ANNUNCIATOR TROUBLE 1-3	33	EXPANSION TROUBLE
EARTH GROUND TROUBLE	33	EXPANSION TROUBLE
DATA LOST	39	DATA LOST
RESTORE PHONE LINE #1	35	PHONE LINE RESTORE 01
RESTORE PHONE LINE #2	36	PHONE LINE RESTORE 02
ANNUNCIATOR RESTORE 1-3	37	EXPANSION RESTORE
EARTH GROUND RESTORE	37	EXPANSION RESTORE

NOTE: *A test report might indicate that the 5104 has been downloading.*

CAUTION: Do NOT use the FSK1 or 4+2 formats when using the uploading/downloading function. These formats do not distinguish between different types of tests (see table 16.2A).

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16.3 RADIONICS BFSK

In this format the 5104 transmits events in English as shown Column 1 of Table 16.3A. At the central station, the 9000 receiver prints the English message shown in Column 2. In BFSK format, the 9000 does not print alarm type.

TABLE 16.3A: 9000 PRINTOUT FOR RADIONICS BFSK FORMAT

5104 DIALER CONDITION	9000 PRINTOUT	CODES SENT TO COMPUTER
ALARM 1-4	ALARM 01 - ALARM 04	A001 - A004
ALARM RESTORE 1-4	RESTORE 01 - RESTORE 04	R001 - R004
TROUBLE 1-4	TROUBLE 01 - TROUBLE 04	T001 - T004
TROUBLE RESTORE 1-4	RESTORE O1 - RESTORE 04	R001 - R004
AC LOST	TROUBLE 00	T0A
AC RESTORE	RESTORE 00	R0A
BATTERY TROUBLE	TROUBLE 09	T09
BATTERY RESTORE	RESTORE 09	R09
MANUAL TEST	RESTORE 0E	R09
AUTOMATIC TEST	RESTORE 0E	R09
DOWNLOADING SUCCEEDED	RESTORE 0F	R0F
DOWNLOADING FAILED	TROUBLE 0F	R0F
TROUBLE PHONE LINE #1	TROUBLE 0B	T0B
TROUBLE PHONE LINE #2	TROUBLE 0C	T0B
ANNUNCIATOR TROUBLE 1-3	TROUBLE 0DC	T0D
EARTH GROUND TROUBLE	TROUBLE 0D	T0D
DATA LOST	TROUBLE 0E	T09
RESTORE PHONE LINE #1	TROUBLE 0B	R0B
RESTORE PHONE LINE #2	RESTORE 0C	R0B
ANNUNCIATOR RESTORE 1-3	RESTORE 0D	R0D
EARTH GROUND RESTORE	RESTORE 0D	R0D

16.4 SIA FORMAT

Table 16.4A shows what the 5104 transmits in SIA format.

TABLE 16.4A: 9000 PRINTOUT AND CODES FOR SIA FORMAT

5104 DIALER CONDITION	9000 PRINTOUT	CODES SENT TO COMPUTER
FIRE ALARM 1-4	FIRE ALARM 1-4	FA01 - FA04
FIRE ALARM RESTORE 1-4	FIRE ALARM RESTORE 1-4	FH01 - FH04
FIRE TROUBLE 1-4	FIRE TROUBLE 1-4	FT01 - FT04
FIRE TROUBLE RESTORE 1-4	FIRE TROUBLE RESTORE 1-4	FJ01 - FJ04
AC LOST	AC TROUBLE 0	AT
AC RESTORE	AC RESTORE 0	AR
BATTERY TROUBLE	LOW BATTERY 0	YT
BATTERY RESTORE	BATTERY RESTORE 0	YR
MANUAL TEST	MANUAL TEST 0	RX
AUTOMATIC TEST	AUTO TEST 0	RP
DOWNLOADING SUCCEEDED	PROGRAMMING PASS 0	RS
DOWNLOADING FAILED	PROGRAMMING FAIL 0	RU
TROUBLE PHONE LINE #1	PHONE LINE TROUBLE 1	LT1
TROUBLE PHONE LINE #2	PHONE LINE TROUBLE 2	LT2
ANNUNCIATOR TROUBLE 1-3	EXPANSION TROUBLE 1-3	ET1-3
EARTH GROUND TROUBLE	EXPANSION TROUBLE 0	ET0
DATA LOST	DATA LOST 0	RT1
RESTORE PHONE LINE #1	PHONE LINE RESTORE 1	LR1
RESTORE PHONE LINE #2	PHONE LINE RESTORE 2	LR2
ANNUNCIATOR RESTORE 1-3	EXPANSION RESTORE 1-3	ER1-3
EARTH GROUND RESTORE	EXPANSION RESTORE 0	ER0

NOTES:

- "FIRE" is used in this table as an example. If you programmed a zone type as "SPRINKLER", the 9000 would print "SPRINKLER" instead of "FIRE".
- IF you select "BELL SUPERVISION" for Zone 4, trouble and restore reports will print as "UNDEFINED TROUBLE 4" and "UNDEFINED TROUBLE RESTORE 4".
- Model 9000 must have 9307 software (revision 900501 or later) to print "PROGRAMMING PASS/FAIL".

17 OPTIONS DESCRIPTIONS

This section explains the options that can be programmed for the Model 5104. The factory-programmed default values are shown in triangle brackets < > after the option name. These are the values that will be in effect for any options you do not reprogram (see section 15). The procedures for programming with the Model 5230 Remote Annunciator and the Model 5541 Downloading Software are explained in section 19.

NOTE: These options are listed in the order in which they appear on the 5230 annunciator. On the Model 5541 Downloading Software menus, the order and the option names vary slightly. For options with different names, the name used in the 5541 software is shown below in **square brackets** *[ ] after the 5230 option name.*

STEP 0 - CODE 3/1—ALARM [Alarm Code] <1>

Four types of event (alarm, trouble, restore or test) can be reported to the central station receiver. When this information is transmitted using 3/1 format, each event is represented by a single digit, which you program during the first four options. For each event, select a digit from 0 through 9 to identify that particular event to the receiver. The letters A through E may also be used if the receiver is capable of receiving them. (Enter (SHIFT)(1) for A, (SHIFT)(2) for B, (SHIFT)(3) for C, (SHIFT)(4) for D, (SHIFT)(5) for E.)

NOTE 1:   When using the 3/1 format, the receiver does not distinguish between 0 and A.

NOTE 2:   When the 3/1 format is being used, much of the reporting ability of the 5104 is lost because you are limited to 1 digit to report an event. For example, the report does not indicate in which zone the event occurred.

NOTE 3:   If you are not using a 3/1 format, press the (ENTER) key repeatedly until you reach the option "# OF AC HOUR".

STEP 1 - CODE 3/1—TROUBLE [Trouble Code] <8>

See step 0.

STEP 2 - CODE 3/1—RESTORE [Restore Code] <7>

See step 0.

STEP 3 - CODE 3/1—TEST [Test Code] <9>

See step 0.

STEP 4 - #OF AC HOUR [Low AC Hours] <6>

Select the number of hours that the AC power must be removed from the panel before the AC power loss is reported to the central station. If AC power is restored and lost again during this time period, the system will reset the time to 0 and start counting again. Do **NOT** select fewer than 6 or more than 12 hours. To program a number greater than 9, use (SHIFT)(1) for 10 (A), (SHIFT)(2) for 11 (B), or (SHIFT)(3) for 12 (C). (The letter in parentheses is what appears on the annunciator display when you press these keystrokes.)

STEP 5 - #OF RINGS <0—ring detect not selected>

If the downloading software (Model 5541) is to be used, this option determines the number of times the phone line will ring before the 5104 will answer the call. The allowable number of rings ranges from 2 to 14. If you select fewer than 2 rings, the 5104 will not answer. To program a number greater than 9, use (SHIFT)(1) for 10 (A), (SHIFT)(2) for 11 (B), or (SHIFT)(3) for 12 (C). (The letter in parentheses is what appears on the annunciator display when you press these keystrokes.)

NOTE: If you wish to download, you **must** *select the RING ENABLE and COMPUTER options described below.*

STEP 6 - ENABLE--COMPUTER [Computer Enable] <No>

If the downloading computer is to be used for programming and status request, you must select the ENABLE--COMPUTER option. To select Yes, press (1). To select No, press (0).

STEP 7 - DTMF LINE #1 [Phone Line #1] <No (Rotary only)>

This option determines whether line #1 will use rotary dialing alone, or will try both Touch-Tone^R and rotary dialing when attempting to send a report. Select Yes if you want the 5104 to try both ways. To select Yes, press (1). To select No, press (0).

STEP 8 - DTMF LINE #2 [Phone Line #2] <No (Rotary only)>

This option determines whether line #2 will use rotary dialing alone, or will try both Touch-Tone^R and rotary dialing when attempting to send a report.

STEP 9 - MUST REPORT #1 <No>

When the 5104 generates a report, it attempts to send the report to the priority phone number (see steps 14 through 17). If the priority phone number is not available, the system tries the other phone number. It continues to alternate between the two phone numbers until the report is sent to **one** of the phone numbers.

If phone #2 is the first phone number available, the report will go to phone #2. However, if the MUST REPORT #1 option has been selected, the system will **continue** to try to send the report to phone #1, until phone #1 is also available.

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STEP 10 - MUST REPORT #2 <No>
See step 9. If phone #1 is the first phone number available, the report will go to phone #1. However, if the MUST REPORT #2 option has been selected, the system will continue to try to send the report to phone #2 until it has either succeeded in sending a report to phone #2, or exhausted the programmed number of attempts (see steps 22 and 26), leading to a dialer-failed condition.

STEP 11 - RELAY-ALARM [Relay For - <Alarm/Dialer>] <No - Relay for Dialer>
Select Yes for this option if you want the annunciators driven by the auxiliary relay to activate during an alarm condition. Select No if you want the annunciators to activate during a dialer-failed condition.

NOTE: If REPORT SPRNK option is selected, this alarm output will not be activated when the zone input is active.

STEP 12 - RELAY-SUPERVISE [Bell Supervised] <No>
Select Yes if a supervised bell is being used on zone 4 (the third style A/class B zone—see section 12.2).

STEP 13 - # of 5230 [Supervised Annunciators] <0>
This number (0-3) specifies the number of annunciators that will be supervised. If 0 is selected, it is possible to use all 3 annunciators, but none will be supervised.

STEP 14 - SEND—ALARM #1 [Report Alarm] <Yes>
In steps 14 through 17, you select the priority phone number for sending each type of report. That is, you select the phone number to which the 5104 tries to send the report first. If you select Yes, the priority phone number will be #1; if you select No, it will #2.

If the priority phone number is not available, the 5104 will try to report to the other phone number. It continues to alternate phone numbers until it succeeds in sending the report to one of the phone numbers. If you want to be sure that the system will always report to a particular phone number (even if it reports to the other number first), see steps 9 and 10.

Alarms and their restorals are reported on zones 1-4. Select the option SEND—ALARM #1 if you want the system to try phone #1 first when reporting alarms.

STEP 15 - SEND—TROUBLE #1 [Report Trouble] <Yes>
The 5104 reports AC trouble, battery trouble, earth ground trouble, phone line #1 and #2 trouble, annunciator 1-3 trouble and zone 1-4 trouble. Select this option if you want the system to try phone #1 first when reporting troubles and trouble restorals.

STEP 16 - SEND—TEST #1 [Report Test] <Yes>
The 5104 reports manual and auto tests and downloading successes and failures to the central station. Select this option if you want the system to try phone #1 first when reporting tests.

STEP 17 - REPORT SPRNK #1 <Yes>
Select Yes if you want alarms and troubles in zone 1 to be reported as sprinkler conditions when using the SIA format (see section 16.4). Select No if you want alarms and troubles to report as fire conditions. Note that bells will sound only in fire conditions (that is, if No is selected for this option).

NOTE: The REPORT SPRNK option can be used with style D zones only.

STEP 18 - REPORT SPRNK #2 <No>
See step 17.

STEP 19 - REPORT SPRNK #3 <No>
See step 17.

STEP 20 - REPORT SPRNK #4 <No>
See step 17.

STEP 21 - ACCOUNT #1 <5104>
When programming this option, enter a 6-digit account. Use leading zeros if the format requires shorter account numbers (for example, 3/1 or 4+2). Enter leading zeros before you enter the account number, so that all six places are filled and the account number occupies the rightmost position.

STEP 22 - ATTEMPT #1 <3>
Indicate the number of times each account number will try to dial the central station before the DIALER FAILED LED turns on. The minimum number of attempts is 3; the maximum is 5. Normally the dialer will switch back and forth between account numbers after each attempt. If a different number of tries has been programmed for each number, the DIALER FAILED LED will turn on after all the attempts have been used up for the account number programmed with the lowest number of attempts. However, the dialer will continue to try to report to the remaining number until it has made the programmed number of attempts for that number.

STEP 23 - FORMAT #1 <2 (4+2 format)>

This is the reporting format to be used on phone #1. Enter the number shown in front of the appropriate format description below.

0 - SIA8 -   Security Industry Association standard. Used with Model 9000 Digital Alarm Receivers and 9004 or 9004I SIA line card.

1 - FSK81 -   Silent Knight FSK1 format used with the Model 9000 receiver. **Uses a 4-digit account number.**
(FSK1)   (Model 5521 programmer displays "FSK81".)

2 - SK4+2 -   20 pps pulsed-tone format used with the Model 9000 receiver. Uses a 4-digit account number.

3 - BFSK14 -   Format used with the Model 9000 and other receivers that can receive BFSK and send a 1400-Hz acknowledgement tone. Uses a 3-digit account number.

4 - BFSK23 -   Format used with the Model 9000 and other receivers that can receive BFSK and send a 2300-Hz acknowledgement tone. Uses a 3-digit account number.

5 - SIA20 -   Security Industry Association standard. Used with Model 9000 receivers with a 9004I SIA line card and a 9200 CPU card, Revision E.

6 - 3/1 14 -   Used with older Silent Knight, Ademco, or Sescoa receivers that send a 1400-Hz acknowledgement tone. The Model 9000 receiver also accepts this format.

7 - 3/1 23 -   Used with older Sescoa or other receivers that send a 2300-Hz acknowledgement tone. The Model 9000 receiver also accepts this format.

NOTE: The SIA formats are the preferred formats for the 5104, and are required if using the computer downloading feature.

STEP 24 - PHONE #1 <blank>

Enter a phone number up to 16 digits long. You can enter a pause, an asterisk character (*), a pound symbol (#), and a character that tells the system to look for a second dial tone. Any unassigned spaces will be automatically programmed as "F," the symbol for a blank character.

To program these special characters and functions, use the following keystrokes. (SHIFT)(1) = pause (A), (SHIFT)(2) = * (B), (SHIFT)(3) = # (C), and (SHIFT)(4) = look for second dial tone (D). The letter in parentheses is what appears on the annunciator display when you press these keys.

STEP 25 - ACCOUNT #2 <5104>

See step 21.

STEP 26 - ATTEMPT #2 <3>

The minimum number of attempts is 3; the maximum is 5. See step 22.

STEP 27 - FORMAT #2 <2>

See step 23.

STEP 28 - PHONE #2 <blank>

See step 24.

STEP 29 - ACCOUNT COMPUTER [Computer Account] <5104>

Program the account number (6 digits) you want to use when reporting to the downloading computer.

STEP 30 - PHONE # COMPUTER [Computer Phone] <blank>

Enter a phone number up to 16 digits long. You can enter a pause, an asterisk character (*), a pound symbol (#), and a character that tells the system to look for a second dial tone. Any unassigned spaces will be automatically programmed as "F," the symbol for a blank character.

To program these special characters and functions, use the following keystrokes. (SHIFT)(1) = pause (A), (SHIFT)(2) = * (B), (SHIFT)(3) = # (C), and (SHIFT)(4) = look for second dial tone (D). The letters in parentheses are what appears on the annunciator display when you press these keys.)

STEP 31 - ZONE RESPONSE #1 <1>

Select the speed at which the zone #1 will respond to alarm conditions. Table 17A shows the speed associated with each selection. The zone (loop) response time for trouble conditions is 3 to 4 seconds.

*NOTE 1: The delayed responses (speeds 1-3) are **NOT** intended to be an alarm verification feature.*

*NOTE 2: Delays may be used **ONLY** on waterflow switches, but **NOT** on waterflow switches that have their own delay.*

NOTE 3: Style A (formerly class B) zones must be programmed as "1".

*NOTE 4: Speed 0 is **not** recommended for any zone, as it may cause a false alarm to be reported.*

*NOTE 5: Do **NOT** enter any numbers other than 0-3. Doing so will cause the 5104 to default to one of these four speeds.*

TABLE 17A: ZONE RESPONSE TIMES (ALARM)

SELECTION	SPEED / ZONE RESPONSE TIME
0	0.3 to 0.4 seconds
1	3 to 4 seconds
2	15 to 20 seconds
3	30 to 40 seconds

STEP 32 - ZONE RESPONSE #2 <1>
See step 31.

STEP 33 - ZONE RESPONSE #3 <1>

See step 31.

STEP 34 - ZONE RESPONSE #4 <1>
See step 31.

ACCESS CODES

STEP 35 - CODE 0 <5104>
Enter a 4 digit code to be used by the installer. This code is required for initiating downloads (see section 14.2), for setting the time and date and for programming. It can also perform the same functions as Code 1 (see next step).

STEP 36 - CODE 1 <5104>
Enter a 4 digit code to be used by the operator. This code can be used to silence annunciations and to conduct manual tests.

STEP 37 - AUTO TEST—HOUR <01>
Enter the hour in 24-hour military format that a test report will be sent to the central station. Enter the minutes in Step 38.

For example, to program the auto test to occur at 5:15 pm, enter [1] [7] in Step 37 and [1] [5] in Step 38. Note that any events that have not been restored will be sent along with the test report. The test itself will be reported first followed by the unrestored events.

STEP 38 - AUTO TEST—MINUTE <30>
Enter the minutes for the auto test in military format. See Step 37 for more information.

NOTE: In the 5541 downloading software, Steps 37 and 38 are combined in the Test Time option. Use leading zeros for single digits.

STEP 39 - TIME
Enter the hours and minutes of the current time in 24-hour military format.

NOTES: If you are using the 5541 downloading software, use the View Status menu to set the time.

It is advisable to check the time every few minutes and reset it if necessary.

STEP 40 - SLAVE DIALER <No>
To use the 5104 as a standalone fire communicator, select [0] for No.

If you are using the 5104 to communicate the status of a large fire control system that does not have a digital communicator, you can select either [1] for Yes or [0] for No. If Yes is selected, the 5104 will not test the battery or earth ground, which may be desirable to avoid interference if the main control panel also tests the battery and earth ground.

NOTE: It is recommended that a battery be connected even if Yes is selected for this step. Without a battery, the 5104 might reset if a short circuit occurs.

STEP 41 - EXIT PROGRAMMING MODE
This step takes you out of programming mode automatically.

18 STEP PROGRAMMING FORM

The Step Programming form, which begins on the next page, is intended to help you to plan and keep a record of the options you select for an installation. Spaces are provided for you to write in selections. The form is perforated for your convenience.

MODEL 5104 STEP PROGRAMMING FORM

Step 0 - Code 3/1 -- Alarm	0 1 2 3 4 5 6 7 8 9 A B C D E
Step 1 - Code 3/1 -- Trouble	0 1 2 3 4 5 6 7 8 9 A B C D E
Step 2 - Code 3/1 -- Restore	0 1 2 3 4 5 6 7 8 9 A B C D E
Step 3 - Code 3/1 -- Test	0 1 2 3 4 5 6 7 8 9 A B C D E
Step 4 - # of AC Hour (6-12)	_____ To enter 10 or higher, use: 10 = SHIFT 1 11 = SHIFT 2 12 = SHIFT 3
Step 5 - # of Rings (2-14)	_____ To enter 10 or higher, use: 10 = SHIFT 1 11 = SHIFT 2 12 = SHIFT 3 13 = SHIFT 4 14 = SHIFT 5
Step 6 - Enable—Computer	Y N Y = 1 N = 0
STEP 7 - DTMF Line #1 (Rotary or Rotary/Touch-Tone)	Y N Y = 1 N = 0
Step 8 - DTMF Line #2	Y N Y = 1 N = 0
Step 9 - Must Report #1	Y N Y = 1 N = 0
Step 10 - Must Report #2	Y N Y = 1 N = 0
Step 11 - Relay—Alarm	Y N Y = 1 N = 0
Step 12 - Relay—Supervise	Y N Y = 1 N = 0
Step 13 - # of 5230 (0 - 3)	_____
Step 14 - Send—Alarm #1	Y N Y = 1 N = 0
Step 15 - Send—Trouble #1	Y N Y = 1 N = 0
Step 16 - Send—Test #1	Y N Y = 1 N = 0
Step 17 - Report Sprnk #1 / Supervisory Zone	Y N Y = 1 N = 0
Step 18 - Report Sprnk #2 / Supervisory Zone	Y N Y = 1 N = 0
Step 19 - Report Sprnk #3 / Supervisory Zone	Y N Y = 1 N = 0
Step 20 - Report Sprnk #4 / Supervisory Zone	Y N Y = 1 N = 0
Step 21 - Account #1	__ __ __ __ __
Step 22 - Attempt #1 (3-5)	__
Step 23 - Format #1	_____ 0 = SIA8 1 = FSK1 2 = 4+2 3 = BFSK14 4 = BFSK23 5 = SIA20 6 = 3/1 7 = 3/1 23
Step 24 - Phone #1	__ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __
Step 25 - Account #2	__ __ __ __ __
Step 26 - Attempt #2 (3-5)	__
Step 27 - Format #2	_____ 0 = SIA8 1 = FSK1 2 = 4+2 3 = BFSK14 4 = BFSK23 5 = SIA20 6 = 3/1 7 = 3/1 23
Step 28 - Phone #2	__ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __
Step 29 - Account Computer	__ __ __ __ __
Step 30 - Phone # Computer	__ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __
Step 31 - Zone Response #1 (0-3)	_____ 0 = 0.3 to 0.4 sec 1 = 3-4 sec 2 = 15-20 sec 3 = 30-40 sec
Step 32 - Zone Response #2 (0-3)	_____ 0 = 0.3 to 0.4 sec 1 = 3-4 sec 2 = 15-20 sec 3 = 30-40 sec
Step 33 - Zone Response #3 (0-3)	_____ 0 = 0.3 to 0.4 sec 1 = 3-4 sec 2 = 15-20 sec 3 = 30-40 sec
Step 34 - Zone Response #4 (0-3)	_____ 0 = 0.3 to 0.4 sec 1 = 3-4 sec 2 = 15-20 sec 3 = 30-40 sec

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MODEL 5104 STEP PROGRAMMING FORM

Step 35 - Code #0 (Installer)	— — — —
Step 36 Code #1 (Operator)	— — — —
Step 37 - Auto Test—Hour (1-24)	——
Step 38 - Auto Test—Minute (1-60)	——
Step 39 - Time	——
Step 40 - Slave Dialer	Y N Y = 1 N = 0
Step 41 - (Exit Programming Mode)	

19 PROGRAMMING

Before you begin programming your new selections, write them on the EEPROM coding form in the section 18. For descriptions of the options, see section 17.

19.1 MODEL 5230 ANNUNCIATOR

This section explains the use of the Model 5230 Remote Annunciator/Touchpad for programming the 5104. The basic operation of this annunciator is discussed in section 14.

If the 5230 annunciator will not be included in a 5104 installation, it is possible to connect an annunciator **temporarily only**, for programming purposes, using connector P2 on the 5104 circuit board.

WARNING: **Do NOT use connector P2 for permanent installation. If the annunciator is to be permanently installed, it MUST be wired to the 5104 terminal block (see section 8.2).**

NOTE 1: *All zones must be set up before power-up, that is, no zones can be in alarm or trouble.*

NOTE 2: *While the 5104 is in the programming mode, it cannot perform any other functions, such as generating alarms or reports.*

NOTE 3: *If you stop pressing keys before you finish programming a step, and no key is pressed for 4 minutes, the 5104 will EXIT the programming mode.*

NOTE 4: *If you key in a function very quickly, **wait** for the message to be displayed **before** you press the ⌈ENTER⌋ key. The 5230 must display ⌈NORMAL⌋.*

To **ENTER THE PROGRAMMING MODE**, you must be at the ⌈NORMAL⌋ display on the 5230 (the system must not be reporting or up- or downloading). Press ⌈7⌋⌈ENTER⌋, then key in code 0. (The factory-programmed value for the installer's code is 5104.) The first line of the display will show the programming option for step 0, "**CODE 3/1—ALARM**". The second line will show the most recently programmed value for that option.

To **PROGRAM AN OPTION**, key in the data you have written on the EEPROM coding form for that option. The second line will show the new value. Press ⌈ENTER⌋ and the display will advance to the next step.

To **BYPASS A STEP**, press ⌈ENTER⌋. The data in that step will not change, and the display will show the next option.

To **GO TO A SPECIFIC STEP**, press ⌈STEP⌋, then the step number, followed by ⌈ENTER⌋.

NOTE: *If you attempt to go to a step that does not exist, the entry will automatically be cleared, and the display will again request a step number.*

To select **YES** or **NO**: Press ⌈1⌋ to select Yes; press ⌈0⌋ to select No.

If you need to enter **alphabetic characters or numbers greater than 9**, press ⌈SHIFT⌋⌈1⌋ for A or 10, ⌈SHIFT⌋⌈2⌋ for B or 11, ⌈SHIFT⌋⌈3⌋ for C or 12, ⌈SHIFT⌋⌈4⌋ for D or 13, or ⌈SHIFT⌋⌈5⌋ for E or 14. (The annunciator will display the letters A through E only; it will not display 10 through 14.)

To **CORRECT AN ERROR** you made if you have **NOT** yet touched the ⌈ENTER⌋ key, press the ⌈CLEAR⌋ key. The LCD will show the previously programmed value. Key in the correct data and press ⌈ENTER⌋.

To **LEAVE THE PROGRAM MODE** at any time, press ⌈STEP⌋, then ⌈4⌋⌈1⌋. If you have just programmed the last step (step 40--SLAVE DIALER) and you press ⌈ENTER⌋, the system will automatically leave the programming mode.

19.2 MODEL 5541 DOWNLOADING SOFTWARE

The Model 5541 Downloading Software allows you to use a computer at a remote location to reprogram options at a particular installation. The instructions below give you an overview of the 5541 programming procedure. For more specific information, see the Model 5541 Operation Manual (P/N 150497).

NOTE: *5541 software version 3.1 is required for downloading.*

19.2.1 GETTING STARTED

Enter the word "PANEL" at the DOS prompt. (If you have just powered up the computer, enter the word "MODEM" first.) Then enter your user name and password when the prompts direct you to do so.

The **Panel Interface Version** menu will appear on the screen. Select Ⓒ to program the 5104.

The **5104 Panel** will appear. If you want to reprogram any of the options, select Ⓐ.

19.2.2 REPROGRAMMING THE OPTIONS

On the **Edit Account** menu, select the type of options you wish to program. When you finish programming the options on one of these menus, press (Esc) to get back to the *Edit Account* menu, then choose another set of options to program. After you have reprogrammed all the options you wish to change, press (Esc) again.

*NOTE: To set the time (section 17, step 39), exit the **Edit Account** menu, then go to the **View Status** menu and enter the time.*

Follow the screen prompts to download the new data. After you have entered the subscriber's phone number, the number will appear on the screen, followed by "**Press ESC to Terminate, Waiting for Answer....**" Several seconds will elapse before the call goes through and the screen indicates that downloading is taking place.

After downloading is completed, the panel will send a message to the central station indicating whether or not the downloading was successful. See section 16 for the message that is sent for each format.

19.2.3 PRINTING THE OPTIONS

To print the data from a particular options menu, go to the menu and press (F3).

19.2.4 VERIFYING THE SELECTIONS

To make sure the correct data has been downloaded to the subscriber's 5104, you may wish to have the 5104 send the data back so you can review it.

On the **5104 Panel** menu, select Ⓔ. Then follow the prompts to upload the data from the 5104 to your computer. To view the uploaded data, select Ⓑ on the **5104 Panel** menu. To save the uploaded data, select Ⓒ.

CAUTION: Before editing or modifying an upload, you must SAVE it.

*NOTE: After all the new data has been accepted by the 5104, the 5104 will transmit the message **PROGRAMMING PASS** in SIA format to the 9000 receiver. At this time, the central station must send a representative to the site to verify the programming changes. (If all the new data has NOT been accepted by the 5104, the 9000 will print **PROGRAMMING FAIL**.)*

*To be able to print **PROGRAMMING PASS** or **PROGRAMMING FAIL**, the 9000 must have the Model 9307 software package, revision 900501 or later. The cost for this software upgrade is $25.*

This software can be used only with the Model 9200-E CPU Card. To upgrade the software and/or the CPU card, contact Silent Knight Technical Support at 1-800-328-0103.

19.2.5 REQUESTING STATUS INFORMATION

To view the status of the 5104, press Ⓘ. This menu provides information on the status of the AC and battery power, phone line #1 and #2 trouble, zone 1-4 alarm and trouble conditions, and the current time shown at the panel. You can also program the time from this menu.

TO SET THE TIME WHILE IN THE *REQUEST STATUS* MENU:

1.   Press the ⑦ key.

2.   Enter the time in the following format: **HH:MM**

> **HH** = hours using the military format (13:00 = 1:00 PM)
> **MM** = minutes

3.   Press (← Enter).

EXAMPLE: To set the time for 11:03 AM, enter the following:

Ⓘ Ⓘ ⦂ Ⓞ Ⓖ (← Enter)

19.2.6 LEAVING THE PROGRAM

To exit the Model 5541 downloading program, press (Esc) repeatedly until you see the prompt that asks if you want to leave the program.

20 TROUBLESHOOTING GUIDE

When the system is configured properly, the voltage readings on the input and output terminals should be the same as those shown in the terminal description in Section 4.9. For more detailed voltage information, see the electrical specifications in Section 1.4.

To check voltage, set your voltmeter to the appropriate range selection. Connect the black (-) lead of the voltmeter to Terminal 7 (ground). Probe the other terminals with the red (+) lead of the meter. Be careful not to let the meter lead create a short circuit between terminals.

If the LEDs flash and the buzzer sounds while you are trying to reprogram the options, the EEPROM is defective. (If the 5230 is used, the message "BAD EEPROM" will also display in this case.) To order a new EEPROM, call Silent Knight Technical Support at 800-328-0103 or 612-493-6455.

If a 5230 annunciator is being used, check any messages displayed. These messages can help you identify additional sources of problems. (You can connect a 5230 temporarily for troubleshooting purposes.)

If the 9000 receiver prints "HELP" after downloading, the software needs to be upgraded. See Section 19.2.4.

21 INSTALLATION MANUAL REVISION HISTORY

The 2/95 revision of this manual is a minor revision containing the following changes:

- Added note about tamper switch requirement for UL Canada installations (Section 3.3).

- Added the codes the 9000 sends to an automation computer for BFSK and SIA (Section 16.3 - 16.4).

- Provided additional information about how to program sprinkler supervisory zones (Sections 17-18).

- Described changed operation of auto test (unrestored events reported with test) (Section 18, Step 30).

- This manual does not reference the latest NFPA naming conventions for zone types. (The zone type names will be updated in the near future when a major revision of this manual is completed.) The latest NFPA naming conventions for zone types are shown below:

This Manual Uses Name:	New NFPA Name:
Style A (Formerly Class B)	Class B (Style B)
Style D (Formerly Class A)	Class A (Style D)

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IMPORTANT: Silent Knight products should be tested weekly, to insure complete and proper operation and proper input and output connections.

LIMITED WARRANTY

Silent Knight warrants that the product of its manufacture shall be free from defects in materials or workmanship for one year from the date of factory invoice if such goods have been properly installed, are subject to normal proper use, and have not been modified in any manner whatsoever. Upon return of the defective product to the nearest Silent Knight dealer, Silent Knight will, at its sole discretion, either repair or replace, at no cost to the customer, such goods as may be of defective material or workmanship. Customers outside the United States are to return products to their distributor for repair.

SILENT KNIGHT SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM LOSS OF PROPERTY OR OTHER DAMAGE OR LOSSES OWING TO THE FAILURE OF SILENT KNIGHT SECURITY SYSTEMS PRODUCTS BEYOND THE COST OF REPAIR OR REPLACEMENT OF ANY DEFECTIVE PRODUCTS.

SILENT KNIGHT MAKES NO WARRANTY OF FITNESS OR MERCHANTABILITY AND NO OTHER WARRANTY, ORAL OR WRITTEN, EXPRESS OR IMPLIED, BEYOND THE ONE YEAR WARRANTY EXPRESSLY SPECIFIED HEREIN.

WARRANTY EXCHANGE

1. Silent Knight offers an exchange program for defective products with a date stamp less than 60 days old. A new product will be shipped to replace the defective unit, with credit to your account when the defective product is returned.

2. **Warranty exchange** units will be shipped to the customer via normal U.P.S., free of charge to customers who have an account with Silent Knight. Alternative shipping methods are available at the customer's expense.

3. To expedite processing for customers who do not have an account with Silent Knight, **warranty exchange** products will be shipped C.O.D. Upon receipt of the defective product, Silent Knight will issue an immediate refund.

4. Products with a date stamp over 60 days old will be repaired and returned promptly.

5. To expedite your credit or product return, be sure the RA (return authorization) number is clearly marked on the box when you ship the defective unit. To obtain the RA number, call Silent Knight Technical Support Services at 1-800-328-0103. If no RA number is shown on the box, the product will be repaired and returned promptly.

6. To avoid restocking fees or the possibility of paying the full invoice price for the product, please return the defective unit within 15 days after receiving the replacement equipment.

7. To avoid additional charges, be sure the equipment being returned is free of modifications and not missing any parts.

8. To minimize freight charges, please return the PC boards **without** the metal cabinet whenever possible.

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