

SILENT KNIGHT
MODEL 2730/34
CONTROL/COMMUNICATOR
INSTALLATION MANUAL
REVISED APRIL 1990
PART NUMBER 150579

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1 INTRODUCTION

The Silent Knight Model 2730 is a UL Listed combination Control/Communicator which features 8 intrusion zones, a supervised fire zone and a supervised emergency input. The Model 2730 provides remote access and zone annunciation capabilities through the use of the Model 2090 Digital Key Module. The Model 2730 combines all the features of a versatile residential control panel with the features and reliability of a commercial unit. Telephone and option information is stored in two Electrically Erasable PROMs (EEPROMs), which prevent the loss of this information when all power is removed and allow reprogramming up to 1000 times. For the purposes of this installation manual, all references to the Model 2730 also apply to the Model 2734 unless otherwise noted.

2 TELEPHONE REQUIREMENTS

1. Before connecting this device to the phone lines the telephone company must be notified and provided with the following information:
 - A. Manufacturer - Silent Knight
 - B. Model Number - 2730
 - C. FCC registration number - AC698R-69183-AL-R
 - D. Type of jack (to be installed by the telephone company) - RJ31X

NOTE: The telephone company must also be notified if this device is permanently disconnected.

2. This device may not be directly connected to coin telephone or party line services.
3. Under certain circumstances, the telephone company may temporarily discontinue services and/or make changes in its facilities and services which may affect the operation of this device. However, the telephone company is required to give adequate notice in writing of such changes or interruptions.
4. This device cannot be adjusted or repaired in the field. In case of trouble with the device notify the installing company or return to:

SILENT KNIGHT SECURITY SYSTEMS
1700 Freeway Blvd. N.
Minneapolis, MN. 55430
Phone (612) 566-0510
(800) 328-0103

3 FCC REQUIREMENTS

CAUTION: This equipment generates and uses radio frequency energy. If not installed and used in strict accordance with this manual, 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, in which case the user will be required, at his or her own expense, to take whatever measures may be required to correct the interference.

4 FEATURES

- * 8 Intrusion Zones - each independently programmed for desired features such as Exit/Entrance Delay, Interior Zone, 24-hour Zone, Silent Zone, Delayed Detection, ability to be Shunted (Bypassed) and choice of Normally Open (N.O.) or Normally Closed (N.C.) contacts.
- * 1 supervised Emergency and 1 supervised Fire Zone.
- * 10 Access Codes - used to Arm/Disarm system. If Open/Close Reporting option is selected, User Code is reported to identify who Armed or Disarmed system. Access Codes are reprogrammable from Digital Key Station. Options to give different codes different levels of access.
- * Full Zone Annunciation/Control - Digital Keystations with Night Light provide complete system control, Zone status Display and built in speaker for audible indications.
- * Audible Touch Pad Annunciation.
- * Exit/Entry Delay - Programmable duration. Entry Warning Tone. Optional Exit Warning Tone.
- * Interior Touch Switch enables/disables Interior Zones. Option to disable switch when system is Armed.
- * Exterior Door Chime monitor when system is Disarmed with switch to enable/disable.
- * Follower Zone option for interior zone delay after an Entry delayed zone has been violated.
- * Instant Touch Switch - One touch switches Delayed Zones to Instant. Touch again and they will revert back to Delayed Zones.
- * Local Alarm Memory - Zones in Alarm will be displayed at the Digital Keystation even after Disarming system.
- * System Test initiated from Digital Keystation.
- * Optional Duress (ambush/holdup) Reporting.
- * Selectable Detection Delay times to accommodate different types of initiating devices.
- * Optional Mechanical Key instead of Digital Keystation.
- * Alarm Shutdown/Reset Time programmable from 10 to 2550 seconds (42.5 min.)
- * Fast Reset Option (Zones can restore before Alarm Shutdown).
- * Automatic Repeat Alarm Shunting.
- * Built-In Automatic Battery Charge/Test circuit.
- * EEPROM Programming - Not subject to memory loss if power is removed. Allows reprogramming up to 1000 times.
- * Touch-Tone or Rotary Dialing.
- * Several Reporting Formats available:
(Silent Knight, Sescoa, Radionics, Ademco)
- * Can Report to two phone numbers with same or different data.
- * Optional Intercom Capability.
- * Optional Local Alarm Zones when using the Model 2734.
- * Optional use of Model 5255 On-Site Printer.
- * Optional use of Model 1521 Supervised RF Receiver.
- * 2.2A Power Supply. 1.2 A of continuous Accessory Power Available.
- * Latching Smoke Detectors may be Reset from the Digital Keystations.

5 CONTROL PANEL DESCRIPTION

Figure 5A represents the Model 2730 printed circuit board. This board contains the mechanical and, electronic components and connectors needed to install, monitor and protect the system. The following paragraphs describe the major components of the system.

5.1 AC POWER TRANSFORMER

An external transformer (Model 9220 included) is used to supply 16.5 VAC (45 VA) to power the system under normal conditions and to supply charging current to the backup battery. The primary of this transformer plugs directly into a conventional 115VAC unswitched outlet. The secondary is wired into Terminals 1 and 2 of the 2730 with a two-conductor cable (preferably shielded).

5.2 BATTERY CABLES

The RED (+) and BLACK (-) Battery Cables are used to connect a 12VDC battery (Silent Knight Model 6812) to the system. The battery provides backup power to the 2730 in the event of AC power interruptions.

CAUTION: Observe proper polarity when connecting the battery cables of the 2730. A bimetal switch is mounted on the 2730 circuit board which will automatically remove battery power to the board in the event of reversed battery polarity (see power-up sequence on page 13).

NOTE: The Model 6812 12V 4.5AH battery will provide at least 4 hours of standby operation to the basic 2730 system. The use of accessories may reduce this time so that additional battery capacity may be needed.

5.3 FUSES

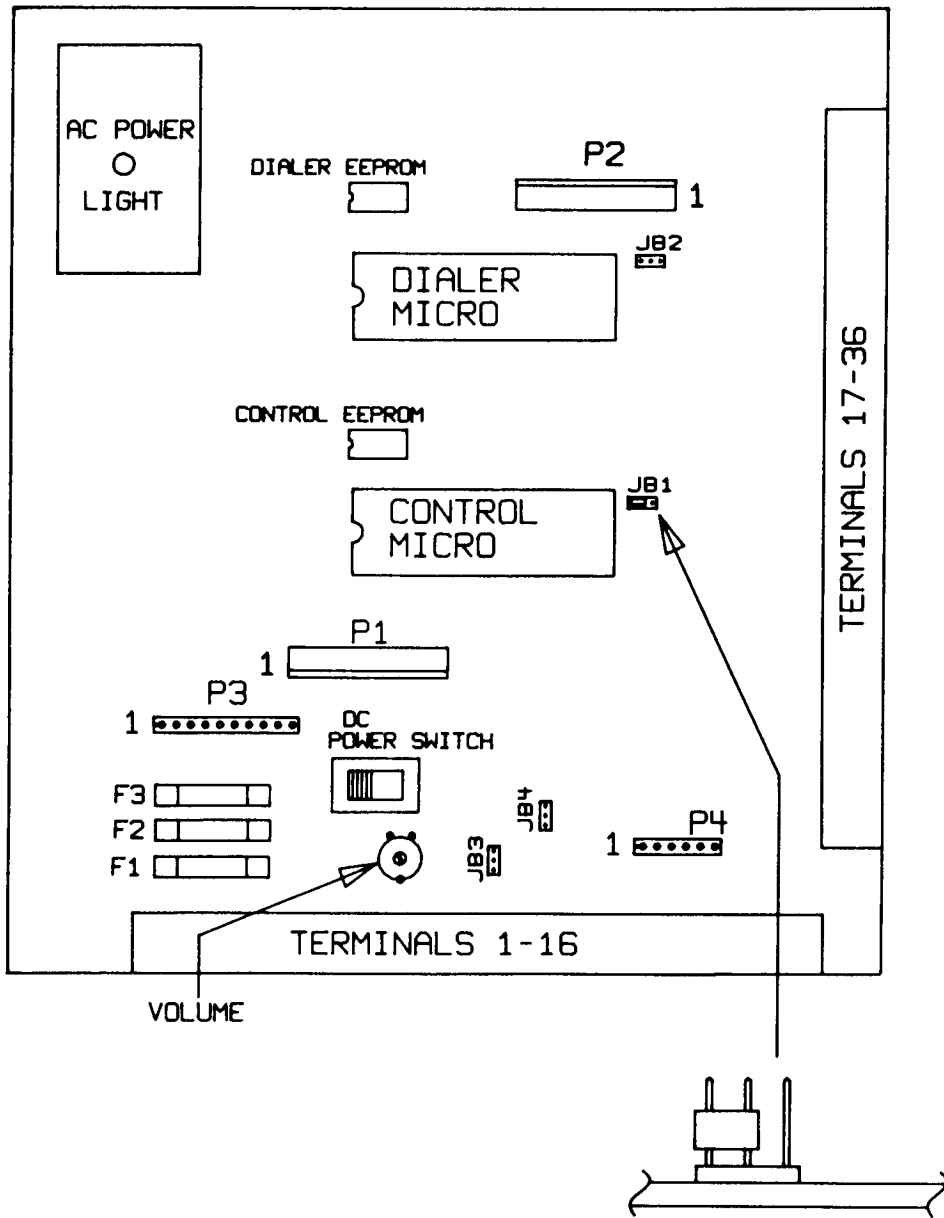
F1 is a 1^{1/2}A Fuse that provides over-current protection for any accessories connected to terminal 6 or 8 of the 2730. F2 is a 1/2A Fast Blow Fuse that provides over-current protection for the smoke detectors or any other accessories connected to terminal 18 of the 2730. F3 is a 2^{1/2}A Fuse that provides over-current protection for sirens or any other accessories connected to Terminal 4.

5.4 DC POWER SWITCH

The DC power switch is used to remove DC power from the circuitry of the 2730. With AC connected the only thing that remains functional when this switch is in the OFF position is the battery charging circuit. If AC is not connected it is recommended that the standby battery not be connected since some leakage current through the charging circuit could discharge the battery over a period of time.

5.5 CONTROL EEPROM

The Control EEPROM (Electrically Erasable Programmable Read Only Memory) contains information that is used by the Control Microprocessor. This information determines what control options the system will perform. This information must be programmed into the EEPROM by using either the Model 5506 or 5520 Desk Top Programmers, or the Model 5510 Hand Held Programmer. Refer to Sections 10, 11, 12, 13 and 25.1 for programming instructions.



REPRESENTATION OF JB1 WITH
JUMPER SHOWN IN LEFT POSITION

FIGURE 5A: MODEL 2730 CIRCUIT BOARD

5.6 AC POWER LIGHT

This green LED is on whenever AC power is present, the DC power switch is in the ON position and the accessory power fuse (F1) is good.

5.7 DIALER EEPROM

The Dialer EEPROM contains information that is used by the Dialer Microprocessor. This information includes telephone numbers and dialer options which will be performed by the system. This information is programmed into the EEPROM using one of the Programmers mentioned in Section 5.5. Again, refer to Sections 11 and 13.4 for details.

5.8 CONNECTOR P1

Sixteen-pin Connector P1 is used to interface with the Silent Knight Models 1521 Supervised RF Receiver. For more information on installing the Supervised RF Receiver, see Section 20 of this manual.

5.9 CONNECTOR P2

Sixteen-pin Connector P2 is used to interface with the Silent Knight Model 5255 On-Site Printer (see Section 21).

5.10 CONNECTOR P3

Not used on the Model 2730.

5.11 CONNECTOR P4

Six-pin Connector P4 is used to interface with the Silent Knight Model 7361 Intercom Board (see Section 19).

5.12 TROUBLE ALERT VOLUME CONTROL

The Trouble Alert Volume Control is a potentiometer which controls the volume of the trouble alert and annunciator tones at the digital keystations. Rotate the control clockwise to increase the volume.

5.13 JUMPER BLOCK 1

Place JB1 in the left position (by the control chip) when using the Model 4180. Place JB1 in the right position when using Armed output on Terminal 17.

5.14 JUMPER BLOCK 2

Place JB2 in the left position when Alarm output is desired on Terminal 31. Place JB2 in the right position when ground start or dialer failed is desired.

5.15 JUMPER BLOCK 3

Place JB3 in the top position for siren sounds at the keystations. Place JB3 in the bottom position for no siren sounds.

5.16 JUMPER BLOCK 4

Place JB4 in the top position if an external 8- Ω speaker is being used. Place JB4 in the bottom position if a bell is being used.

6 ACCESSORIES

The following accessories will be available for use with the Model 2730. Below is a brief description of each accessory and its function with respect to the control panel.

- * Model 6812 12VDC 4.5AH Rechargeable Battery - Provides 4 hours standby power to the basic 2730 unit. Additional accessories will reduce this time.
- * Model 9220 16.5VAC 45VA Transformer - Supplied with the Model 2730. Provides AC power to the 2730 and accessories.
- * Model 2090 Digital Keystation - Provides complete system control. Contains indicators for zone and system status, keypad with 16 touch switches plus backlight and built-in speaker for audible annunciation. Allows remote arming, disarming, zone shunting, system test and manual activation of emergency and fire alarms. You can also program and enter up to 10 user access codes from the Model 2090.
- * Model 2089 Digital Keystation - Provides all the features of the Model 2090 Digital Keystation but also performs as an Intercom Station. When using the Model 2089 Digital Keystations you must also use the Model 7361 Intercom Module, which plugs directly into the 2730 circuit board.
- * Model 2730 with Intercom Feature - A system consisting of the Model 2730, the Model 7361 Intercom Module and up to 4 Model 2089 Keystations with Intercom capability (instead of the standard 2090 keystations), allows the keystations to talk and listen to a Model 7380 Speaker/Microphone so that the user can interrogate people at that outside speaker.

NOTE: The intercom cannot be used to talk/listen to the other keystations.

- * Model 7361 Intercom - Provides Intercom capabilities to the systems keystations. Must be used with Model 2089 Digital Keystations.
- * Model 1521 Supervised RF Receiver - To receive transmissions from the Models 1501, 1502, 1504 and 1507 RF Transmitters. The Supervised RF Receiver will connect to the Model 2730 through a prewired interconnect harness (shipped with receiver) which quickly plugs into the 2730 circuit board.
- * Model 7380 6" diameter white metal bezel with 8- Ω speaker for use as intercom Speaker/Microphone when using Model 7361 Intercom Module and Model 2089 Digital Keystations.
- * Model 5255 On-Site Printer - Provides a permanent record of all the Model 2730's activity. Enables you to reduce central station costs by minimizing the number of events reported.
- * Model 4180 Serial To Parallel Status Display Module - May be used for Derived Channel or Long Range RF applications. Includes 4 Form C relays.
- * Model 7360 Listen-In Module - Terminal 36 (Dialer Active) has been provided so that a listen in module may be easily connected to the Model 2730.
- * Model 7367 Listen-In/Talk Back Module - Provides two-way communications between the protected premises and the central station.

ACCESSORY CURRENT RATINGS

ACCESSORY	STANDBY CURRENT	ALARM CURRENT
Model 1521 Supervised RF Receiver	75 mA	75 mA
Model 2089, 2090 Digital Keystation	95 mA	110 mA
Model 4180 Status Display Module	20 mA	20 mA
Model 5255 On-Site Printer	40 mA	40 mA
Model 7150 Line Fault Monitor	25 mA	25 mA
Model 7360 Audio Listen-In Module	0 mA	0 mA
Model 7361 Intercom Module	45 mA	45 mA
Model 7367 Listen-In/Talk-Back Module	25 mA	25 mA
ESL 425C 2-Wire Smoke Detector	0.05 mA	25 mA
ESL 425CT 2-Wire Smoke Detector	0.05 mA	25 mA
ESL 445AT 4-Wire Smoke Detector	1.5 mA	60 mA

7 REPORTING FORMATS

7.1 MODEL 2730 REPORTING FORMATS

The Silent Knight Model 2730 can transmit information in four different formats. The type of format you select is determined by the type of receiver used at the central station. The four formats are:

- * Silent Knight 3/1 - Old format, transmits a 3-digit account number and a 1-digit alarm code.
- * Sescoa 3/1 - Old format, transmits a 3-digit account number and a 1-digit alarm code.
- * Silent Knight 4/2 - Silent Knight expanded tone burst format, transmits a 4-digit account number and a 2-digit alarm code.
- * Silent Knight FSK - High speed, single-round format for use with the Model 9000 and 8510/8520 receivers. 4-digit account number and 2-digit alarm code.

7.2 MODEL 2734 REPORTING FORMATS

The Model 2734 is identical in operation to the Model 2730 except for the reporting formats available. If you order the Model 2734 you can choose from the following two reporting formats:

- * Radionics BFSK - High speed format for use with Radionics receivers.
- * Ademco Touch-Tone - High speed format for use with Ademco receivers.

The format you select is determined by the type of receiver used at the central station.

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

These formats transmit a 3-digit account number and a single-digit alarm code. These formats will greatly limit the information that can be reported. To avoid confusion at the central station, a standard alarm digit format should be chosen. The user selects through programming what alarm digits will be reported for different events. You may select not to report restores or not to use zone numbers that might be duplicated by a supervisory transmission. Because these alarm digits are programmable, the following chart will refer to the appropriate step number on the PROM Coding Form rather than defining actual alarm digits.

7.4 SILENT KNIGHT FSK AND 4/2 FORMATS

The Silent Knight FSK and Silent Knight 4/2 formats transmit a 4-digit account number and a 2-digit alarm code as shown in the following chart. Also in the chart are the step numbers in which alarm digits are programmed for the Silent Knight 3/1 and Sescoa 3/1 formats (see Section 13.4.1).

FIXED 2-DIGIT EVENT CODE	SILENT KNIGHT FSK OR 4/2 FORMATS CODE DESCRIPTIONS	PROGRAMMABLE SK 3/1, SESCOA 3/1 STEP# TO SELECT DIGIT
02	FIRE ALARM *1	STEP #1
03	EMERGENCY ALARM *1	STEP #2
09	DURESS	STEP #10
11-18	ZONES 1-8 RESPECTIVELY ARE IN ALARM *1	STEPS # 3 & 4
21-28	ZONES 1-8 RESPECTIVELY HAVE BEEN RESTORED	STEP #6
30	DIALER TEST	STEP #9
38	CANCEL	STEP #9
40-49	ARMED BY USER # 0-9 RESPECTIVELY	STEP#7
51-58	ZONES 1-8 RESPECTIVELY HAVE BEEN SHUNTED *1	STEP #5 *2
62	FIRE ZONE TROUBLE *1	STEP #5
63	EMERGENCY ZONE TROUBLE *1	STEP #5
69	LOW BATTERY VOLTAGE*1	STEP #5 *2
72	FIRE ZONE RESTORED	STEP #6
73	EMERGENCY ZONE RESTORED	STEP #6
79	BATTERY VOLTAGE RESTORED	STEP #6
90-99	DISARMED BY USER # 0-9 RESPECTIVELY	STEP #8

*1 - Optional memory reporting may be selected for these codes.

*2 - Indicates event that is reported as a trouble (Old Formats).

7.5 MODEL 2734 FORMATS

The Radionics BFSK format reports only digits 0-9. The Ademco Touch-Tone format reports only channels 1-8. You select the digits (channels) you want reported for each alarm zone. Generally you will select the digits that the central station requires for each alarm zone. If it is desirable to have local alarm zones along with reporting zones, program a hex character, i.e. A, B, C, etc. into the programming step of the zone(s) selected to be local alarm only. Multiple inputs can report the same digit (channel). Local annunciation will not be affected and would still indicate zones separately.

7.6 ADEMCO TOUCH-TONE FORMAT

This format uses standard Touch-Tone DTMF signals to transmit data. Thirteen numbers are transmitted each time the system reports. The first 4 digits are the Account number (you must program leading 0's if using less than four digits). The next 8 digits represent the 8 reporting zones available in this format. There are 6 possible condition codes for each of these channels (1-8). The codes are listed in the following table.

- 1 = ALARM**
- 2 = OPENING**
- 3 = RESTORE**
- 4 = CLOSING**
- 5 = NORMAL**
- 6 = PREVIOUS ALARM**

The last digit transmitted is the 9th or Status Channel. The Status Channel has 7 possible condition codes. The codes are listed in the following table.

- 2 = OPENING**
- 3 = RESTORE**
- 4 = CLOSING**
- 5 = TROUBLE**
- 7 = BATTERY NORMAL**
- 8 = LOW BATTERY**
- 9 = DIALER TEST**

The chart on the next page lists examples of what will be printed or displayed on a Radionics BFSK and Ademco Touch-Tone format receiver using the Silent Knight 2-digit event codes as a reference. An "X" indicates a digit or value that is programmed by the user. Refer to Section 13.4.2, Steps 1-11, for information on programming "X".

2-DIGIT EVENT CODE	RADIONICS BFSK FORMAT	ADEMCO TOUCH-TONE FORMAT CHANNEL 1234 5678 9
02	ALARM ZONE X (Step 1)	5155 5555 7 (Zone 2 alarm)
03	ALARM ZONE X (Step 2)	5515 5555 7 (Zone 3 alarm)
09	ALARM ZONE X (Step 11)	5555 5555 9 (Zone 9 alarm)
11-18	ALARM ZONE X (Steps 3-10)	5515 5555 7 (Zone 13 alarm)
21-28	RESTORAL ZONE X (Steps 3-10)	5553 5555 7 (restore Zone 14 from alarm)
30 (TEST)	RESTORAL ZONE 9	5555 5555 9
40-49	CLOSING ZONE Y where Y = user ID number (0-9)	Y444 4444 4 where Y = user ID number (0-9)
51-58 (SHUNTS)	TROUBLE ZONE X (Steps 3-10) WAS FORCE ARMED	5555 5155 3 (Zone 16 shunted)
62-63	TROUBLE ZONE X (Steps 1&2)	5515 5555 5 (Zone 3 trouble)
69	TROUBLE ZONE 9	5555 5555 8
72-73	RESTORAL ZONE X (Steps 1&2)	5535 5555 5 (restore Zone 3 from trouble)
79 (BATTERY RESTORE)	RESTORAL ZONE 9	5555 5555 9
81-88 (SHUNT RESTORE)	NOT USED	5555 5555 3 (restore a zone from shunt)
90-99	OPENING ZONE Y where Y=user ID number (0-9)	Y222 2222 2 where Y = user ID number (0-9)

NOTE: The 2730 has 11 channels - 8 intrusion zones, 1 fire zone, 1 emergency and duress. Since the Radionics BFSK format only has 10 channels and the Ademco format only has 8 channels it will not be possible to use all the 2730 channels when using these formats without using the same reporting digit for more than one zone.

8 MODEL 2730 CONTROL PANEL INSTALLATION

8.1 SELECT A LOCATION

When selecting a location to mount the 2730 control panel, consider the following factors: The unit should be mounted where it will not be exposed to extremes in temperature, and where it will be free from moisture. The panel should be accessible to "Main Drop" wiring runs. The 2730 should be located well within a secured area, but should be accessible for testing and service.

8.2 MOUNT THE 2730

Mount the 2730 so it is firmly secured to the wall surface. When mounting on concrete, especially when moisture is expected, attach a piece of $\frac{3}{4}$ -inch plywood to the concrete surface before attaching the 2730. Mount any other desired components (such as an optional 7140 module) to the plywood interface.

8.3 INSTALL THE 9220 POWER TRANSFORMER

Figure 8.3A shows the connection of shielded 2-conductor cable and the Model 7890 Transient-Surge Protector to the Model 9220 UL Listed Class II Power Transformer (16.5 VAC, 40 VA). Both Models are included with the 2730. The transformer should be plugged into a 120VAC 60Hz continuous duty (unswitched) grounded outlet.

WARNING: The Model 9220 contains an internally fused secondary winding. DO NOT SHORT the secondary terminals together when power is applied or the internal fuse will blow. Be sure the shield conductor cannot come in contact with the AC output screws.

The Model 7890 Transient-Surge Protector will protectively clamp the AC output of the transformer, reducing transient voltages caused by lightning and other sources. The AC power lines are the most common source of transient/lightning damage in alarm systems. The Model 7890 consists of 2 bipolar transient suppressors with lugs at its connecting points.

CAUTION: Make sure the AC outlet you intend to use for the Model 9220 plug-in transformer has a "good" connection to earth ground. This can be done at the outlet, using a digital voltmeter, by measuring the AC voltage between the "hot" side of the outlet and neutral, then comparing that voltage to the voltage reading made between the "hot" side and the ground connection. The difference between these two voltage readings should not exceed .2 VAC. If these voltages are not within .2 VAC, the outlet does not have an earth ground and must be grounded by running a 14-gauge wire from the outlet to a good source for earth ground.

NOTE: A licensed electrician may be required to perform this procedure.

CAUTION: To reduce the risk of fire or electrical shock, connect directly to a grounded (3-prong) receptacle.

8.4 CONNECT ALL INITIATING DEVICES AND ACCESSORIES

Connect all initiating devices and accessories to the 2730 terminal strips before connecting AC or DC power to the panel. Use the wiring diagram in Figure 15A and the terminal strip description as a guide.

8.5 CONNECT POWER TO THE 2730

Make sure the EEPROMs have been programmed and reinstalled into the 2730 circuit board before continuing (see section 12). Once all the connections have been made to the Model 2730 and associated equipment, double check them against the installation manual. When they are confirmed to be correct, the system may be powered up in the following sequence.

- a. DC power switch in the OFF position.
- b. Connect the battery cables to the 12VDC rechargeable battery.
- c. Turn the DC power switch ON.
- d. Program the control panel using the Model 2090 keystation.
- e. Take the recommended action according to the following responses:
 1. If the system does program properly, proceed to connect the 16.5VAC transformer.
 2. If the system does not operate, check for the following possible problems:
 - * A dead rechargeable battery.
 - * Poor battery connections.
 - * Reverse polarity battery connections.
 - * Blown fuses

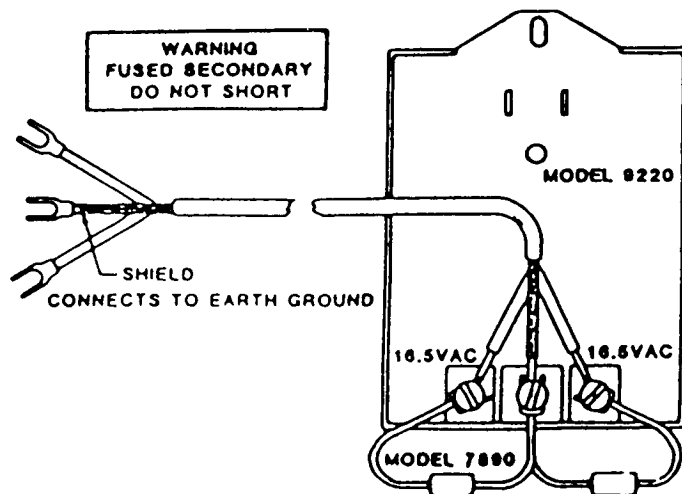


FIGURE 8.3A: MODEL 9220 TRANSFORMER

9 ZONE FEATURES AND OPTIONS

The Model 2730 contains inputs for 8 intrusion zones, 1 supervised fire zone and 1 supervised emergency input. The following is a list of features which are individually programmed for each of the 8 intrusion zones.

- * EOL Zones For UL installations you must use an end-of-line resistor in zones that employ any Normally Closed initiating devices. You must also use an EOL resistor in zones that use only Normally Open contact devices. In these zones, a break in the loop or closed contacts will cause an alarm. When you use an EOL resistor you must also program that zone as an EOL zone. (Refer to Figure 10.1A.)
- * Fast Zones Allows the use of fast acting sensors without the use of a "pulse stretcher". Select for 5 ms or 100 ms.
- * Slow Zones Select for zones requiring detection delay of 100 ms, 1 second, 10 seconds or 60 seconds as selected in Step 12 of the PROM Coding Form. Different types of sensors require different detection delays. Selecting slow detection avoids possible false alarms due to poor contacts or RF transients.
- * 24-Hour Zones Select for zones that will initiate an alarm signal even when the system is disarmed (panic, tamper, auxiliary).
- * Silent Zones Select for zones that will not cause a local audible alarm indication. They will still report the alarm. The keystation will show the alarm zone violation.
- * Entry/Exit Delay Select for zones that will not cause an immediate alarm when violated. These zones will allow the user to enter/exit for disarming/arming the system. An entry tone will sound during entry delay. An optional exit tone can be selected in Step 13.5 of the PROM Form.
- * Interior Zones Select for interior zones. Interior switch allows enabling/disabling of interior zones, or zones to be shunted as a group. When the Interior LED is on it indicates that a zone is enabled. The option to have interior switch disabled when armed is selected in Step 14.1 of the PROM Form. Interior zones are always exit delayed and will optionally operate as "follower zones". This option is selected in Step 14.2 of the control PROM Form.
- * Shuntable Zones (Bypassable) Select for zones that you want to be able to shunt. If not selected for a zone, you will not be able to shunt that zone.

The following is a list of programmed options and timing selections.

- * Shutdown Time Selectable in increments of 10 seconds. Range from 10 seconds to 42.5 minutes. Controls how long after an alarm the audible indication will sound.
- * There are several options available regarding operation of interior zones. Options 1 and 2 of Step 12 of the Control EEPROM programming procedure (see Section 13.3) will cause the interior zones not to arm when an alarm occurs, (Control EEPROM Revision Level 2723), or will cause the interior zones to arm automatically when the system is armed (Control EEPROM Revision Level 2725).

- * Exit Delay Time Selectable in increments of 10 seconds. Range from 10 seconds to 150 seconds. Affects only those zones selected for Entry/Exit delay. Exit delay is the time you have to leave a zone after arming without causing an alarm.
- * Exit Tone Option to sound a tone pattern during the exit delay time. This includes a distinct tone pattern during the 8 seconds just before exit time expiration.
- * Entry Delay Time Selectable in increments of 10 seconds. Range is from 10 seconds to 150 seconds. Affects only those zones selected for Entry/Exit delay. Entry delay is the time you have to disarm the system after you have violated an Entry/Exit zone before causing an alarm. A tone pattern will sound during the entry delay time.
- * Fast Zone Detection Time Selectable as either 5 ms or 100 ms. Affects all zones not selected as slow. It is the time it takes the system to detect an alarm.
- * Slow Zone Detection Time Selectable as either 100 ms, 1 second, 10 seconds or 60 seconds. Affects all zones selected as slow. It is the time it takes the system to verify an alarm signal. Slow Zones will not be in alarm until a signal is present at the zone input for at least this long.
- * Force Arm Enables force arming. When you attempt to arm the system and some zones are not ready, the system will automatically shunt the zones that are Not Ready and the system will arm.

NOTE: Force Arming will shunt any "not-ready" zones, even if they are programmed as not shunable in Step 7.

- * Auto Unshunt at Disarm Allows all shunted zones to automatically unshunt when system is disarmed.
- * Swinger Shunt Select this option to enable the system to automatically shunt a zone that has reported 4 separate consecutive alarms within a 4-hour period. The system will report a shunt rather than an alarm after the fourth occurrence.
- * Fast Restore This option enables the system to detect new events before shutdown time has elapsed.
- * Bell Test at Arming Selecting this option will cause the 2730 to sound a brief bell test whenever system is armed.
- * Duress Allows a report to be sent to the central station when the user is forced to disarm the system. No indication of alarm or reporting is made at digital keystation. When using the Duress feature, it is recommended that you use a 4/2 reporting format.

When using 3/1 formats, the system **must be armed** for the Duress feature to function. With these formats, the 2730 cannot send a Duress report when the panel is in Alarm.

- * Interior Zone Follower Allows interior zones to be ENTRY DELAYED if a perimeter zone selected for ENTRY/EXIT delay is violated first. (Interior zones are always delayed during Exit.) Allows user to disarm at keystation located in an interior zone.
- * Shunt Display Disabled When Armed When this option is selected, zone LEDs won't display shunted zones when system is armed.
- * Fire Audible Won't Shutdown Won't allow fire alarm audible indication to be silenced without disarming. This is required by some local Fire Marshals.
- * Silent Emergency Alarm This option makes the emergency alarm silent for use with panic switches etc. The **EMERGENCY** LED on the keystation still indicates the alarm, even though no sound is heard.
- * Codes 1-8 Only Shunt One Zone Would be selected for use in a an installation where each access code 1-8 would be used to shunt the corresponding zone. For example, Code 4 could only shunt Zone 4.
- * Codes 8 and 9 Cannot Disarm Removes the disarming capability from Access Codes 8 and 9.
- * Codes 1-9 Cannot Arm or Disarm This option allows only Access Code 0 to arm or disarm the system. To be used in a commercial installation in conjunction with "Codes 1-8 only shunt one zone".

10 ZONE WIRING AND CONFIGURATION

The zones of the Model 2730 can be wired in three basic ways. These three ways are illustrated in Figure 10.1A. Combining these basic zone wiring methods with the various zone programming options, results in a great variety of possible zone configurations. It is recommended that you bench test any configurations before you install the control panel.

NOTE: In UL Certificated installations an end-of-line resistor must be used with each zone as illustrated in Figure 10.1A-(2) and (3). The wiring diagram in Figure 10.1A-(1) is not acceptable for UL Certificated installations.

10.1 END-OF-LINE RESISTORS

An EOL resistor MUST be used with any intrusion zone using a Normally Closed initiating device. If you wish, you MAY use an EOL resistor with intrusion zones using only Normally Open initiating devices. (If no EOL is used, the installation will not be acceptable for UL certification.) If you use an EOL, a break in the loop or closed contacts will cause an alarm. An intrusion zone using both Normally Open and Normally Closed initiating devices MUST use an EOL resistor. Any intrusion zone using an EOL resistor must also be programmed as an EOL zone. The end-of-line resistors are Silent Knight Model 7630, 15-K Ω resistors. Refer to Figure 10.1A.

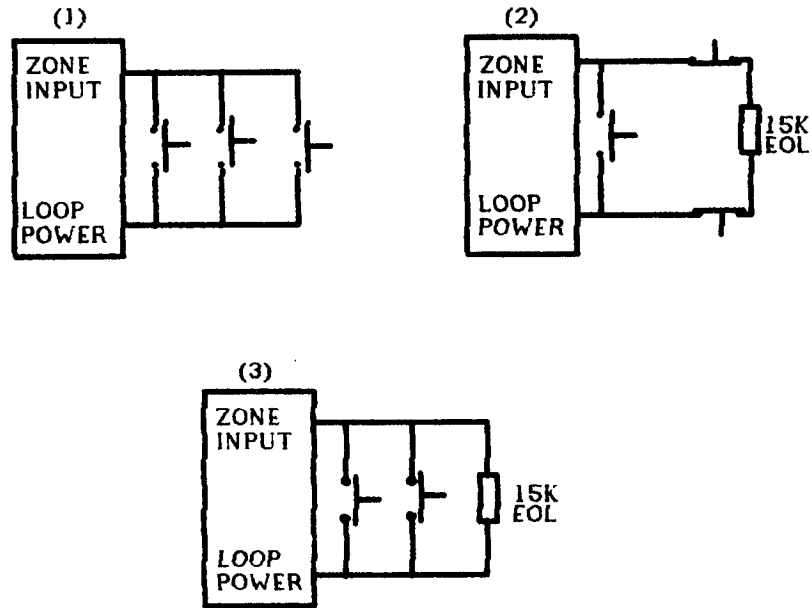


FIGURE 10.1A: MODEL 2730 ZONE WIRING

- (1) - Unsupervised Intrusion Zone using Normally Open contact initiating devices only and no end-of-line resistor (not acceptable for UL installations).
- (2) - Intrusion Zone using both Normally Open and Normally Closed initiating devices and an end-of-line resistor. The Normally Open and Normally Closed contacts will be supervised; i.e. an alarm will occur if the loop is crossed or broken.
- (3) - Supervised Fire, Intrusion or Emergency zones using Normally Open contact initiating devices only and an end-of-line resistor.

10.2 ZONE CONFIGURATION EXAMPLE

In the following chart, sample configurations are described. See Section 13.3 for instructions on programming these options into the Control EEPROM. (Reminder--You must use an EOL resistor with Normally Closed contact initiating devices.)

- * ZONE 1 - Intrusion zone using Normally Open contact devices. Not shuntable.
- * ZONE 2 - Intrusion zone using both Normally Open and Normally Closed contact devices and an end-of-line resistor. Not shuntable.
- * ZONE 3 - Intrusion zone with slow detection time. Shuntable. N.O. contacts
- * ZONE 4 - Tamper detection. Active 24 hours a day. Not shuntable N.O. contacts.
- * ZONE 5 - Intrusion zone, exit/entry delayed. Shuntable. N.O. contacts.
- * ZONE 6 - Interior zone using Normally Closed contact devices. Shuntable.
- * ZONE 7 - Intrusion zone, active 24 hours a day with slow detection time. Shuntable. N.O. contacts.
- * ZONE 8 - Intrusion zone, exit/entry delayed. Shuntable. N.O. contacts.

NOTE: The Fire and Emergency zones are always supervised, end-of-line, 24-hour zones using Normally Open contact devices only. The only programming options for these zones are in Step 14.4, "Fire Audible Alarm won't shutdown" and Step 14.5, "Silent Emergency Alarm".

10.3 ESL 425C OR 425CT TWO-WIRE SMOKE DETECTOR

The ESL 425C or 425CT Smoke Detector can be used when wiring the fire zone of the Model 2730. Figure 10.3A illustrates how it should be wired. The ESL Smoke Detectors are rated at .05 mA in the normal supervisory condition and 40 mA in the alarm condition. A maximum of 11 two-wire detectors may be used with the 2730 Control Panel. Maximum loop resistance is 30 Ω .

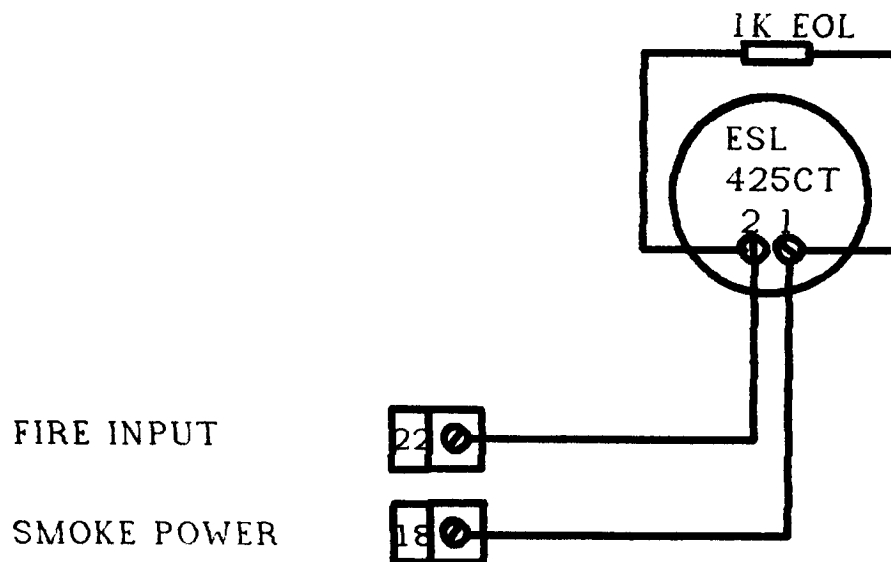


FIGURE 10.3A: MODEL ESL 425C OR 425CT 2-WIRE SMOKE DETECTOR

10.4 ESL 445AT 4-WIRE SMOKE DETECTOR

The ESL 445AT 4-Wire Smoke Detector can be used when wiring the fire zone of the Model 2730. Figure 10.4A illustrates how it should be wired. The ESL 445AT draws 1.5 mA in the normal standby mode and 60 mA in the Alarm mode. A maximum of 7 ESL 445ATs may be used on the 2730. Maximum loop resistance is 30 Ω

NOTE: You may not run both two-wire and four-wire smoke detectors to one Model 2730.

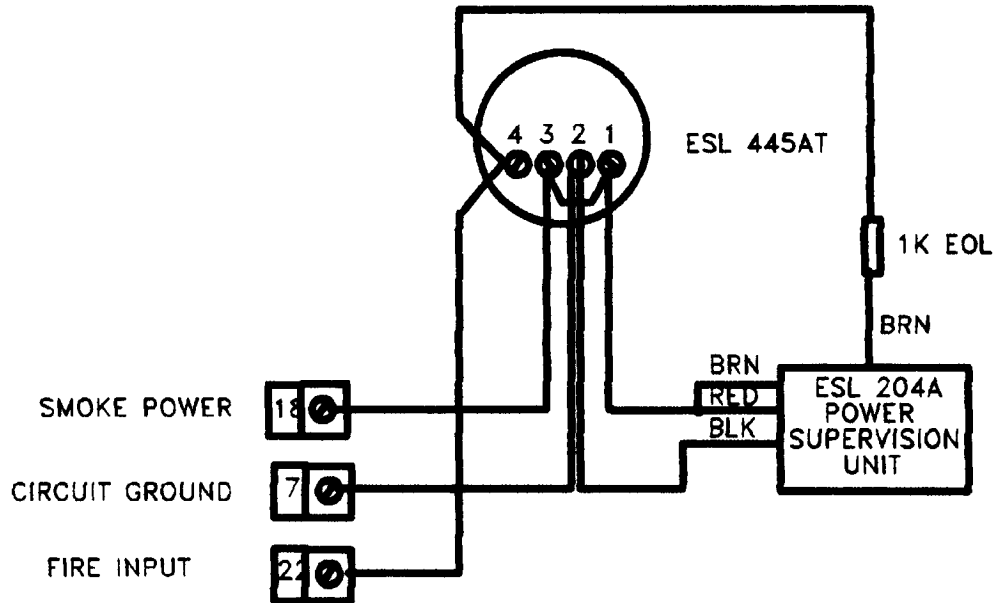


FIGURE 10.4A: ESL 445AT 4-WIRE SMOKE DETECTOR

10.5 EMERGENCY ZONE WIRING

Figure 10.5A is a typical wiring diagram of an emergency zone using panic switches. The zone is supervised and employs only normally open initiating devices and an end-of-line resistor.

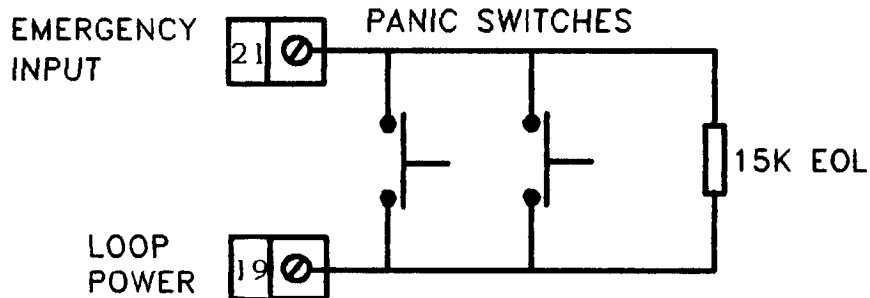


FIGURE 10.5A: EMERGENCY ZONE WITH PANIC SWITCHES

11 DIALER OPTIONS

The Model 2730 and the Model 2734 each have their own Dialer Chip programming procedures. Refer to Section 13.4 for details on programming dialer options. Both models allow you to select reporting channels for use with older formats that report single digit alarm codes. You also select such options as:

- * Number of attempts before switching phone numbers.
- * Total number of attempts.
- * Rotary or Touch-Tone dialing.
- * Ground start.
- * Reporting format and acknowledge tone.
- * Events which will be reported.
- * Account numbers.
- * Telephone numbers.

12 EEPROMS

The Model 2730 provides a very wide variety of features that may be selected for use depending on your needs. These features are selected and then programmed into two EEPROM (Electrically Erasable Programmable Read Only Memory) chips. The control panel comes with factory programmed EEPROMs as described in Section 12.3.

To "customize" installation, the EEPROM chips are programmed with either a Model 5506 Desk Top Programmer or a Model 5510 Hand Held Programmer, as explained in Section 13.2. The EEPROM chips are 8-pin integrated circuit chips that can be reprogrammed up to 1000 times. Therefore, if you need to change or add an option you simply reprogram the EEPROM. Up to 10 user access codes can be programmed into the system directly from any digital keystation in the system. Access codes can be changed or added by the user from the digital keystation.

The Control EEPROM contains all the zone information and user access codes. The Dialer EEPROM contains all the telephone and account information. For specific information regarding features and options refer to the following sections:

- * Reporting Formats (Sections 7)
- * Zone Features and Options (Section 9)
- * Dialer Options (Section 11)
- * Programming User Access Codes (Section 13.5)

12.1 PROM REMOVAL

CAUTION: Be sure the DC switch on the 2730 is in the OFF position before inserting or removing EEPROMs.

The 2730 is shipped with two EEPROMs already inserted in their sockets on the printed circuit board. They must be removed and programmed one at a time before installation of the 2730, unless you wish to use the system as it was programmed at the factory. To remove the EEPROM from its socket on the PC Board, use either the PROM puller supplied with your programmer or a small, flat-blade screwdriver to lever the PROM gently out of its socket. Slip the screwdriver under one end of the PROM and pry up slightly, then place the screwdriver under the other end and finish removal.

12.2 PROM INSERTION

To reinsert the PROM into the 2730 PC Board, carefully press the PROM back into its socket. Pay careful attention to which way the notched end of the PROM is facing. The notch should be on the LEFT side if the board is oriented as shown in Figure 12A. Apply even pressure on each end of the PROM so that it goes in squarely. Check to make sure that all of the PROM pins are correctly inserted into the socket.

12.3 FACTORY PROGRAMMED EEPROMS

To facilitate testing and use without a programmer, each 2730 is shipped with EEPROMs that have been preprogrammed with the following features: Zones 1-7 require the use of Normally Closed contact devices and EOL resistors. They are also shuntable zones. Zones 1 & 2 are Exit/Entry delay zones with exit delays of 1 minute and entry delays of 30 seconds. Zone 7 is an interior zone. Zone 8 is a 24-hour silent zone requiring Normally Open contact devices. Zone 8 is also NOT shuntable. All shunted zones will be re-enabled when disarming. Swinger shunts and Duress reporting have been selected. Interior key is disabled when armed. Interior zone follower is selected. Shunt display is disabled when armed. Fire audible won't shut down and Codes 8 & 9 cannot disarm the system. The system will make one dialing attempt per event. No telephone numbers were programmed.

13 PROGRAMMING

Before you start programming, go through the appropriate PROM Coding Forms at the end of Section 13.3, and circle or write down the options you wish to select. The PROM Coding Forms are perforated to allow easy removal from the manual. See Section 25.1 for requirements for UL Certificated installations.

13.1 USING THE 5520 AND 5521 PROGRAMMERS

The 5520 and 5521 programmers have built-in descriptions for all programming options for the 2730 and 2734, and do not require PROM coding forms. See the 5520/21 manual for operating instructions.

13.2 USING THE 5506 AND 5510 PROGRAMMERS

NOTE: The 5506 or 5510 programmer must have Software Revision 8609-1 or newer. The Control EEPROM may be programmed using older software, but the options in Steps 12.1 and 12.2 will not be available. For the latest programmer software revision, contact the Silent Knight Security Systems Technical Service Department at 800-328-0103.

When you turn the programmer on, the display will read "HELLO". If you are using a Model 5506 programmer, press the <PROGRAM> key before you insert the EEPROM. The display will read "CHIP#1", which refers to Socket #1 of the 5506 programmer.

The sockets of both programmers are designed to accept 16-pin ICs. It is important that the EEPROM be inserted in the correct half of the programmer socket (see Figure 13.2A). Insert the EEPROM chip on the left side of the socket, with the notched end facing left. Lower the lever to latch the chip in place. When using the Model 5506 programmer, always use Socket #1 to prevent damage to the EEPROM.

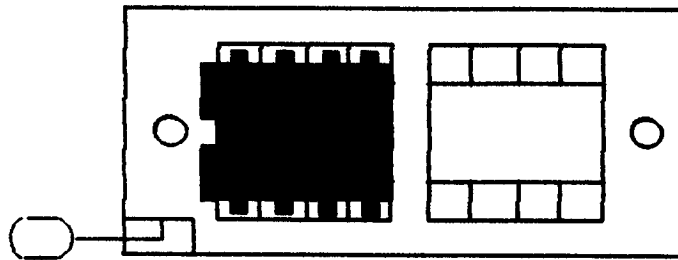


FIGURE 13.2A: EEPROM SOCKETS

For steps in which you select more than one option, key in all the numbers *before* you press **<ENTER>**. Press **<ENTER>** only *between* steps. The next step number will appear on the left side of the display.

The programmer can display only 4 digits at a time. If more than 4 digits have been keyed in, the display will alternate between digits 1-4 and 5-8. If you do NOT want a specific option, be sure the digit associated with it is NOT displayed.

To go back to a previous step, press **<STEP>**, key in the step number, then press **<ENTER>**. The data you programmed for that step will appear. Press **<CLEAR>** to get rid of the old data, key in the new data, and press **<ENTER>**.

To skip steps, press **<ENTER>** repeatedly until you get to the step you want.

As you go through the steps, you will actually be entering data into the programmer, not onto the EEPROM. If you prefer, you can wait until you have entered all the information to insert the EEPROM into the programmer.

After you have pressed **<ENTER>** for the final step, press **<ENTER>** again. The display will show the EEPROM ID# (for example, "02723").

Press the **<PROGRAM>** key. If you have not yet inserted the EEPROM, and you are using a Model 5506 programmer, the display will read, "CHIP#1". Insert the EEPROM, following the directions at the beginning of Section 13.2. Press **<PROGRAM>** again, to record the data onto the EEPROM. The display will read "PASS". Unlatch the EEPROM, remove it from the programmer and reinsert it in its socket on the 2730 printed circuit board (see Section 12.2).

If you want to program another EEPROM, and you are using a Model 5506, press **<PROGRAM>** before you insert the EEPROM. The Model 5506 will again display "CHIP#1". Insert the second EEPROM in Socket #1. If you want to program the same data onto this chip, press **<PROGRAM>** again, to record the data. Remove the EEPROM from the programmer. If you want to program new data onto the EEPROM, go through the steps and enter the new data before pressing **<PROGRAM>** the second time.

13.3 PROGRAMMING THE CONTROL EEPROM

In the step descriptions below, the **Default** column shows the information normally contained in the programmer's internal ROM. If you don't change anything in a step, the default values will be programmed. The **Range** column shows the minimum and maximum values that can be used for that step.

Step 0 - Key in <2> <7> <2> <3> (the Control Chip ID#). Press <ENTER>.

Steps 1-7 - Key in the zones that will function as described in each step below. Press <ENTER> after you've keyed in all the zones you want for that step--NOT after each zone number.

<u>Step</u>	<u>Zones</u>	<u>Description</u>
1	1 2 3 4 5 6 7 8	Zones using End-of-Line Resistors (may use Normally Open and/or Normally Closed Contacts).
2	1 2 3 4 5 6 7 8	Slow Response Zones. (Detection delay time is selected in Step 12.)
3	1 2 3 4 5 6 7 8	24-Hour Zones, e.g. Panic (will cause an alarm even if disarmed).
4	1 2 3 4 5 6 7 8	Silent Zones (no local audible alarm). Do NOT select this option for any zones used as burglary zones.
5	1 2 3 4 5 6 7 8	Exit/Entry Delayed Zones (see Steps 9 and 10). Interior Zones are always delayed during Exit.
6	1 2 3 4 5 6 7 8	Interior Zones (can be disabled and enabled with <INTERIOR> key--see Step 14, Options 1 and 2).
7	1 2 3 4 5 6 7 8	Shuntable Zones (must select in order to shunt).

Steps 8-10 - Key in the number of seconds of delay time *divided by 10*. For example, if you want a 30-minute Siren Shutdown Time, divide 1800 seconds by 10, and key in <1> <8> <0>. A few commonly used Siren Shutdown Time values (Step 8) are shown in the chart below. Select the time length you want and key in the corresponding "programmer value."

TIME IN MINUTES	PROGRAMMER VALUE (Enter in Step 8.)
5 =	30
10 =	60
15 =	90
20 =	120
25 =	150
30 =	180
35 =	210
40 =	240

NOTE: In UL Certificated installations, Exit Delay Time MUST NOT exceed 45 seconds, and Entry Delay Time must not exceed 45 seconds.

<u>Step</u>	<u>Default</u>	<u>Range</u>	<u>Description</u>
8	1	1-255	Siren Shutdown Time in 10-second increments.
9	1	1-15	Exit Delay Time in 10-second increments.
10	1	1-15	Entry Delay Time in 10-second increments.

STEP 11 NOT USED - SKIP TO NEXT STEP.

Step 12 - Before selecting any of Options 1-4, check the revision level on the Control Microprocessor of your panel. If the second line on the Control Micro reads "CONTROL2723," select the data from the left-hand column below. If the second line reads "CONTROL2725," select the data from the right-hand column.

NOTE: If you do NOT select Option 2 in the left-hand column in Step 12, you must also SELECT Option 2 in Step 13 to enable the Interior to change states.

2723 Control Microprocessor

2725 Control Microprocessor

<u>Option</u>	<u>Description</u>	<u>Option</u>	<u>Description</u>
1	Interior will NOT change states when an ALARM occurs.	1	Interior will NOT change states when an ALARM occurs.
2	Interior will NOT change states when Disarming.	2	Interior WILL automatically Arm when system is Armed.
3	NOT USED (Do NOT select).	3	Changes Emergency input to Holdup input. (Silent and not displayed at keystation.
4	NOT USED (Do NOT select).	4	Commercial System - Chime feature only; no Interior zones

Options 5-8 of Step 12, in conjunction with Step 2, will determine how long it will take for a zone violation to cause an alarm. The slow zone options allow you to minimize false alarms. The fast zone selections eliminate the need for pulse stretchers. Because each zone input is sampled periodically, the actual response time will vary between the selected value and twice the selected value. For example, if you select a response time of 10 seconds in Step 12, the actual response time will be from 10 to 20 seconds.

NOTE: Select no more than one of the three Options 6-8. If none are selected, the slow zone response time will be 60 seconds.

<u>Option</u>	<u>Description</u>
5	Fast Zones=100 ms (if option 5 not selected, Fast Zones=5 ms).
6	Slow Zones=100 ms \
7	Slow Zones=1 second } Choose no more than one.
8	Slow Zones=10 seconds /

Step 13 - Key in all the desired options, then press **<ENTER>**.

<u>Option</u>	<u>Description</u>
1	Force arming capability.
2	Automatically Clear Shunts.
3	Swinger Shunts (automatically shunts a zone after 4 consecutive alarms within a 4-hour period).
4	Fast Restores. Zones may restore before shutdown occurs.
5	Exit warning tone.
6	Bell-test after Arming.
7	Not Used--Do not select.
8	Report Duress. (Access Code 9 cannot be used if this option is selected.)

Step 14 - Key in all the desired options, then press **<ENTER>**.

<u>Option</u>	<u>Description</u>
1	<INTERIOR> key disabled when system is Armed.
2	All Interior Zones follow the Entry doors. (Interior Zones Instant unless the Entry loop is broken first.)
3	Shunt display disabled when system is Armed.
4	Fire audible will not shut down.
5	Silent emergency alarm (displayed at keystation).
6	Limited shunting. Codes 1-8 can each shunt only one zone. (For example, Code 2 can only shunt Zone 2.) Code 9 can't shunt any zones. Codes are needed even when system is Disarmed.
7	Codes 8 and 9 cannot Disarm system.
8	Codes 1-9 cannot Arm or Disarm system. Only Code 0 can Arm or Disarm.

13.4 PROGRAMMING THE DIALER EEPROM

If you are using the Model 2734 Control/Communicator, skip to Section 13.4.2. Note that there is a separate EEPROM Coding Form for programming the Model 2734 Dialer EEPROM (last form in Section 13.6).

13.4.1 MODEL 2730 DIALER EEPROM

Step 0 - Key in <2> <7> <2> <2> (the Control Chip ID#). Press <ENTER>.

Steps 1-10 - If you are using 3/1 formats, key in the appropriate report digit for each event listed. **If not using 3/1 format, skip to Step 11.** Press <ENTER> after each digit, because each event is entered in a separate step.

<u>Step</u>	<u>Default</u>	<u>Range</u>	<u>Description</u>
1	1	0-9	Fire Alarm.
2	2	0-9	Emergency Alarm.
3	3	0-9	Intrusion Alarm (Zones 1-7).
4	3	0-9	Auxiliary Alarm (Zone 8).
5	8	0-9	Trouble (Fire, Emergency, Low Battery).
6	7	0-9	Restore (All channels must restore).
7	4	0-9	Closing
8	6	0-9	Opening
9	9	0-9	Test and Cancel
10	5	0-9	Duress

Steps 11-19 - Key in the numbers for the options you choose, pressing <ENTER> after each step.

NOTE 1: For Step 12, UL approved installations must be in the range of 5-10 total number of attempts.

NOTE 2: If you select the Ground Start feature in Step 17, you cannot use a Dialer Failed indicator, which is required in UL Certificated installations (see Sections 14.3 and 14.4).

<u>Step</u>	<u>Default</u>	<u>Range</u>	<u>Description</u>
11	1	1-15	Number of Attempts Between Switching Phone Numbers. (Dialer will alternate back and forth between phone numbers.)
12	10	1-15	Total Number of Attempts (combined total of both telephone numbers). Must be more than Step 11 if both numbers are used.
13 and 14	----	----	Not Used--Skip to Step 15.
15	0	0-1	Telephone #1 Dialing Type. 0=Rotary 1=Touch-Tone
16	0	0,3,4,8	Telephone #1 Reporting Format. 0=Silent Knight 3/1 (Old Format) 3=Sescoa 3/1 (Old Format) 4=Silent Knight 4/2 8=Silent Knight FSK
17	0	0-1	Ground Start Used? 0=No, 1=Yes
18	0	0-1	Telephone #2 Dialing Type. 0=Rotary 1=Touch-Tone
19	0	0,3,4,8	Telephone #2 Reporting Format. 0=Silent Knight 3/1 (Old Format) 3=Sescoa 3/1 (Old Format) 4=Silent Knight 4/2 8=Silent Knight FSK

In Steps 20 and 21, key in the digits next to the events you want reported to Phone #1 and Phone #2. Press **<ENTER>** only between steps.

NOTE 1: Alarms are always reported.

NOTE 2: If you select Option 8 in Step 20 (No Memory Reporting), previously reported alarms will not be retransmitted when another event causes a report.

Step 20

<u>Phone #1</u> <u>Data</u>	<u>Event</u>
1	Report Trouble Conditions.
2	Report Shunts.
3	Report Restores.
4	Report Openings and Closings.
5	Report Opening if Disarming from an ALARM condition.
6	Report Tests.
7	Phone #1 Must Be Called.
8	No Memory Reporting (applies to both phone numbers).

Step 21

<u>Phone #2</u> <u>Data</u>	<u>Event</u>
1	Report Trouble Conditions.
2	Report Shunts.
3	Report Restores.
4	Report Openings and Closings.
5	Report Opening if Disarming from an ALARM condition.
6	Report Tests.
7	Phone #2 Must Be Called. (Select both 7 and 8.)
8	Phone #2 Can Be Called (when used as backup).

Key in the account numbers for the two phones in Steps 22 and 23. If using a 3/1 format, enter a 3-digit account number. If using a 4/2 format, enter a 4-digit account number. Use leading 0's if needed. The programmer will display "F" to fill any unused space.

Step 22 _ _ _ _ Account #1 (for Phone #1)
Step 23 _ _ _ _ Account #2 (for Phone #2)

Enter the two telephone numbers in Steps 24 and 25. Each phone number can contain up to 16 digits. Enter "A" (**<SHIFT> <1>**) for a 2-second pause, "B" (**<SHIFT> <2>**) for the Touch-Tone "*" button, "C" (**<SHIFT> <3>**) for the Touch-Tone "#" button, and "D" (**<SHIFT> <4>**) to look for a second dial tone. The programmer will automatically display "F" to fill any unused space.

Step 24 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ Phone #1
Step 25 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ Phone #2

13.4.2 MODEL 2734 DIALER EEPROM

NOTE: Use the Dialer EEPROM Coding Form for the Model 2734 (last form in Section 13.6).

Step 0 - Key in <2> <7> <2> <4> (the Control Chip ID#). Press <ENTER>.

Steps 1-11 - Select the digits you want to use to represent each alarm zone, when an alarm is being reported to the central station. If Ademco high-speed format will be used, select from digits 1-8. If Radionics BFSK format will be used, select from digits 0-9. If you want local alarms only (alarm sounds, but no report is sent) for any of the zones, enter Hex characters A-F (<SHIFT> <1> - <SHIFT> <6>) in the appropriate steps.

NOTE: Where multiple zone inputs use the same reporting digit (channel), be aware that if these zones become active together and this event is reported, then if any single zone of the multiple group restores, a Restore report will be sent regardless of the status of the other zones in this group. Then if another zone in this multiple group restores, another Restore report will be sent. The exception is Duress, which does not report restore.

<u>Step</u>	<u>Default</u>	<u>Description</u>
1	1	Fire
2	2	Emergency
3	1	Zone 1
4	2	Zone 2
5	3	Zone 3
6	4	Zone 4
7	5	Zone 5
8	6	Zone 6
9	7	Zone 7
10	8	Zone 8
11	2	Duress

For Steps 12-15, key in the options you want, pressing <ENTER> after each step.

NOTE 1: If you select the Ground Start option in Step 12, you cannot use the Dialer Failed feature.

NOTE 2: When Report Memory is selected in Step 13, previously reported alarms will be retransmitted when another event causes a report.

NOTE 3: In UL Certificated installations, the number of attempts selected in Step 15 must be in the range of 5-10.

<u>Step</u>	<u>Default</u>	<u>Range</u>	<u>Description</u>
12	0	0-1	Ground Start Used? (Applies to both phone #'s) 0=No, 1=Yes
13	1	0-1	Report Memory. 0=No, 1=Yes
14	1	1-15	Number of Attempts before switching phone numbers.
15	10	1-15	Total Number of Attempts to be made (combined total of both phone numbers).

Step 16

Key in the dialing and reporting formats for each telephone number. Do not press <ENTER> until you have keyed in all the digits you want to select for this step.

<u>Data</u>	<u>Description</u>
1	Phone #1 Dialing Type. 1=Touch-Tone. No Entry selects Rotary.
2	Phone #1 Acknowledge Tone. 2=2300 Hz tone. No Entry selects 1400Hz tone.
3	Phone #1 Reporting Format. 3=Ademco DTMF format. No Entry selects Radionics BFSK.
---	(4 Not Used).
5	Phone #2 Dialing Type. 5=Touch-Tone. No Entry selects Rotary.
6	Phone #2 Acknowledge Tone. 6=2300Hz tone. No Entry selects 1400Hz tone.
7	Phone #2 Reporting Format. 7=Ademco DTMF format. No Entry selects Radionics BFSK.
---	(8 Not Used).

In Steps 17 and 18, key in the digits next to the events you want reported to Phone #1 and Phone #2. Press <ENTER> only between steps.

NOTE: Alarms are always reported.

Step 17

<u>Phone #1</u> <u>Data</u>	<u>Event</u>
1	Report Trouble Conditions.
2	Report Shunts.
3	Report Restores.
4	Report Openings and Closings.
5	Report Opening if Disarming from an ALARM condition.
6	Report Tests.
---	(7 Not Used)
8	Must call Phone #1.

Step 18

<u>Phone #2</u> <u>Data</u>	<u>Event</u>
1	Report Trouble Conditions.
2	Report Shunts.
3	Report Restores.
4	Report Openings and Closings.
5	Report Opening if Disarming from an ALARM condition.
6	Report Tests.
7	Phone #2 Can Be Called (when used as backup).
8	Phone #2 Must Be Called. (Select both 7 and 8.)

Key in the account numbers for the two phones in Steps 19 and 20. If using the Radionics BFSK format, you must enter an "A" (<SHIFT> <1>) in place of any 0's. If you enter a 0, it will print as a blank on the Radionics receiver. Use a 3-digit account number if using BFSK format. If using DTMF format enter a 4-digit account number, entering leading 0's if needed. The programmer will display "F" to fill any unused space.

Step 19 _ _ _ _ Account #1 (for Phone #1)
Step 20 _ _ _ _ Account #2 (for Phone #2)

Enter the two telephone numbers in Steps 21 and 22. Each phone number can contain up to 16 digits. Enter "A" (<SHIFT> <1>) for a 2-second pause, "B" (<SHIFT> <2>) for the Touch-Tone "*" button, "C" (<SHIFT> <3>) for the Touch-Tone "#" button, and "D" (<SHIFT> <4>) to look for a second dial tone. The programmer will display "F" to fill any unused space.

Step 21 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ Phone #1
Step 22 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ Phone #2

13.5 PROGRAMMING USER ACCESS CODES

User access codes are programmed directly from any of the system keypads without the use of an additional programming device. First the 2730 must be in the PROGRAM Mode. PROGRAM Mode is indicated by a flashing TROUBLE SILENT light. Upon power-up the 2730 automatically enters the PROGRAM Mode. When the 2730 is already operating, you can enter the PROGRAM Mode by pressing <SHUNT>, then <TEST>, then enter User Access Code 0 (System must be disarmed with no shunted zones). Once the system is in the PROGRAM Mode, you can program access codes by first entering the desired user access code (2-5 digits long, 1st digit unique for each code) then press <TEST> after each code. Up to 10 user access codes can be programmed. Press <SHUNT> to clear any errors in programming, or wait for 5 seconds and the system will auto-clear. Press <TEST> 3 times to exit the PROGRAM Mode. The user access codes will be stored in the Control EEPROM. This is nonvolatile memory, so even after power is turned off and then on again, all access codes will remain operational. If no access code changes are required after the system is powered up, simply press the <TEST> key 3 times after turning the DC power switch to the ON position.

13.6 EEPROM CODING FORMS

PAGES 33-38 CONTAIN THE PERFORATED EEPROM CODING FORMS

CONTROL EEPROM CODING FORM—MODEL 2730/2734

Programmer Requirements: Model 5506 with Revision 8609-1 or later software.
 Model 5510 with Revision 8609-1 or later software.

PROM Type: Electrically Erasable (8-pin) X2443

<u>Step</u>	<u>Data</u>	<u>Description</u>
0	2723	Program ID number for Control Chip.

<u>Step</u>	<u>Zones</u>	<u>Description</u>
1	1 2 3 4 5 6 7 8	Zones using End-of-Line Resistors (N.O. and/or N.C. contacts).
2	1 2 3 4 5 6 7 8	Slow Response Zones. (Detection delay time is selected in Step 12.)
3	1 2 3 4 5 6 7 8	24-Hour Zones, e.g. Panic (alarm even if disarmed).
4	1 2 3 4 5 6 7 8	Silent Zones (no local audible alarm). Do NOT select for zones used as burglary zones.
5	1 2 3 4 5 6 7 8	Exit/Entry Delayed Zones (see Steps 9 and 10). Interior Zones are always delayed during Exit.
6	1 2 3 4 5 6 7 8	Interior Zones (can be disabled and enabled with <INTERIOR> key--see Step 14, Options 1 and 2).
7	1 2 3 4 5 6 7 8	Shuntable Zones (must select in order to shunt).

<u>Step</u>	<u>Data</u>	<u>Default</u>	<u>Range</u>	<u>Description</u>
8	---	--- (1)	1-255	Siren Shutdown Time in 10-second increments (commonly used values shown below).
9	--	-- (1)	1-15	Exit Delay Time in 10-second increments.
10	--	-- (1)	1-15	Entry Delay Time in 10-second increments.

NOTE: In UL Certificated installations, Exit Delay Time MUST NOT exceed 60 seconds, and Entry Delay Time must not exceed 45 seconds.

TIME IN MINUTES	PROGRAMMER VALUE (Enter in Step 8.)
5 =	30
10 =	60
15 =	90
20 =	120
25 =	150
30 =	180
35 =	210
40 =	240

STEP 11 NOT USED—SKIP TO THE NEXT STEP.

CONTROL EEPROM CODING FORM—MODEL 2730/2734

(Continued on back of page)

Step 12—Options 1-4

2723 Control Microprocessor

2725 Control Microprocessor

<u>Option</u>	<u>Description</u>	<u>Option</u>	<u>Description</u>
1	Interior will NOT change states when an ALARM occurs.	1	Interior will NOT change states when an ALARM occurs.
2	Interior will NOT change states when Disarming.	2	Interior WILL automatically Arm when system is Armed.
3	NOT USED (Do NOT select).	3	Changes Emergency input to Holdup input.
4	NOT USED (Do NOT select).	4	Commercial System - Chime only; no Interior zones

Step 12—Options 5-8

Option Description

- | | | |
|---|--|---|
| 5 | Fast Zones=100 ms (if option 5 not selected, Fast Zones=5 ms). | |
| 6 | Slow Zones=100 ms | Choose no more than one. |
| 7 | Slow Zones=1 second | If none are selected, Slow Zone Response Time=60 seconds. |
| 8 | Slow Zones=10 seconds | |

NOTE: The actual response time will vary between the selected value and twice the selected value. For example, if you select a response time of 10 seconds, the actual response time will be from 10 to 20 seconds.

Step 13

Option Description

- 1 Force arming capability.
- 2 Automatically Clear Shunts.
- 3 Swinger Shunts (automatically shunts a zone after 4 consecutive alarms within a 4-hour period).
- 4 Fast Restores. Zones may restore before shutdown occurs.
- 5 Exit warning tone.
- 6 Bell-test after Arming.
- 7 Not used--Do not select.
- 8 Report Duress. (Access Code 9 cannot be used if this option is selected.)

Step 14

Option Description

- 1 <INTERIOR> key disabled when system is Armed.
- 2 All Interior Zones follow the Entry doors. (Interior Zones are Instant unless the Entry loop is broken first.)
- 3 Shunt display disabled when system is Armed.
- 4 Fire audible will not shut down.
- 5 Silent emergency alarm.
- 6 Limited shunting. Codes 1-8 can each shunt only one zone. Code 9 can't shunt any zones. Codes are needed even when system is Disarmed.
- 7 Codes 8 and 9 cannot Disarm system.
- 8 Codes 1-9 cannot Arm or Disarm system. Only Code 0 can Arm or Disarm.

Step 20

Phone #1

Data

Event (Alarms are always reported.)

- 1 Report Trouble Conditions.
- 2 Report Shunts.
- 3 Report Restores.
- 4 Report Openings and Closings.
- 5 Report Opening if Disarming from an ALARM condition.
- 6 Report Tests.
- 7 Phone #1 Must Be Called.
- 8 No Memory Reporting (applies to both phone numbers).
If 8 is selected, previously reported alarms will not be retransmitted when another event causes a report.

Step 21

Phone #2

Data

Event (Alarms are always reported.)

- 1 Report Trouble Conditions.
- 2 Report Shunts.
- 3 Report Restores.
- 4 Report Openings and Closings.
- 5 Report Opening if Disarming from an ALARM condition.
- 6 Report Tests.
- 7 Phone #2 Must Be Called. (Select both 7 and 8.)
- 8 Phone #2 Can Be Called (when used as backup).

Step 22 - - - - Account #1 (for Phone #1)

Step 23 - - - - Account #2 (for Phone #2)

NOTE: Enter a leading 0 if using a 3/1 format.

Step 24 - - - - - - - - - - - - - - - - Phone #1

Step 25 - - - - - - - - - - - - - - - - Phone #2

NOTE: "A" = 2-second pause, "B" = Touch-Tone "", "C" = Touch-Tone "#", and "D" = Look for second dial tone. Programmer displays "F" to fill unused space.*

DIALER EEPROM CODING FORM—MODEL 2730

DIALER EEPROM CODING FORM—MODEL 2734

Programmer Requirements: Model 5506 with Revision 8501-1 or later software.
 Model 5510 with Revision 8501-1 or later software.

PROM Type: Electrically Erasable (8-pin) X2443

<u>Step</u>	<u>Data</u>	<u>Description</u>
0	2724	Program ID number for Control Chip.

Steps 1-11 - Select the digits to represent each **alarm zone**, when an alarm is being reported to the central station. If using Ademco high-speed format, select from digits 1-8. If using Radionics BFSK format, select from digits 0-9. For local alarms only, select from Hex characters A-F.

NOTE: Where multiple zone inputs use the same reporting digit (channel), be aware that if these zones become active together and the event is reported, a Restore report will be sent each time one of these zones restores, except in the case of Duress.

<u>Step</u>	<u>Data</u>	<u>Default</u>	<u>Description</u>
1	—	1	Fire
2	—	2	Emergency
3	—	1	Zone 1
4	—	2	Zone 2
5	—	3	Zone 3
6	—	4	Zone 4
7	—	5	Zone 5
8	—	6	Zone 6
9	—	7	Zone 7
10	—	8	Zone 8
11	—	2	Duress

<u>Step</u>	<u>Data</u>	<u>Default</u>	<u>Range</u>	<u>Description</u>
12	—	1	0-1	Ground Start Used? (Applies to both phone #'s) 0=No, 1=Yes If 1 is selected, Dialer Failed feature (required by UL) cannot be used.
13	—	1	0-1	Report Memory. 0=No, 1=Yes If 1 is selected, previously reported alarms will be retransmitted in subsequent reports.
14	— —	1	1-15	Number of Attempts before switching phone #'s.
15	— —	0	1-15	Total Number of Attempts to be made (combined total of both phone numbers). 5-10 range for UL installations.

DIALER EEPROM CODING FORM—MODEL 2734

(Continued on back of page)

Step 16

<u>Data</u>	<u>Description</u>
1	Phone #1 Dialing Type. 1=Touch-Tone. No Entry selects Rotary.
2	Phone #1 Acknowledge Tone. 2=2300 Hz tone. No Entry selects 1400Hz tone.
3	Phone #1 Reporting Format. 3=Ademco DTMF format. No Entry selects Radionics BFSK.
--	(4 Not Used).
5	Phone #2 Dialing Type. 5=Touch-Tone. No Entry selects Rotary.
6	Phone #2 Acknowledge Tone. 6=2300Hz tone. No Entry selects 1400Hz tone.
7	Phone #2 Reporting Format. 7=Ademco DTMF format. No Entry selects Radionics BFSK.
--	(8 Not Used).

Step 17

Phone #1

<u>Data</u>	<u>Event (Alarms are always reported.)</u>
1	Report Trouble Conditions.
2	Report Shunts.
3	Report Restores.
4	Report Openings and Closings.
5	Report Opening if Disarming from an ALARM condition.
6	Report Tests.
--	(7 Not Used)
8	Must call Phone #1.

Step 18

Phone #2

<u>Data</u>	<u>Event (Alarms are always reported.)</u>
1	Report Trouble Conditions.
2	Report Shunts.
3	Report Restores.
4	Report Openings and Closings.
5	Report Opening if Disarming from an ALARM condition.
6	Report Tests.
7	Phone #2 Can Be Called.
8	Phone #2 Must Be Called. (Select both 7 and 8.)

Step 19 -- -- -- Account #1 (for Phone #1)

Step 20 -- -- -- Account #2 (for Phone #2)

NOTE: If using the Radionics BFSK format, you must enter an "A" in place of any 0's.

Step 21 -- -- -- -- -- -- -- -- -- -- -- -- Phone #1

Step 22 -- -- -- -- -- -- -- -- -- -- -- -- Phone #2

NOTE: "A" = 2-second pause, "B" = Touch-Tone "", "C" = Touch-Tone "#", and "D" = Look for second dial tone. Programmer displays "F" to fill unused space.*

DIALER EEPROM CODING FORM—MODEL 2734

14 ACCESSORY WIRING

14.1 EXTERNAL DC ALARM BELL OR DC SIREN

Figure 14.1A shows the wiring of an external alarm bell. You may also use a Model 7760 Electronic Siren. If you use a bell you must install the supplied transient suppressor, Model 7800, as close as possible to the bell contacts. Place shunt block JB4 in the bottom position. If you use the electronic siren you do not need to install the transient suppressor. It may be desirable to disable the alarm tones at the digital keystations when you are using an external alarm bell or siren. To accomplish this, move the shunt block at JB3 to the bottom position. The digital keystations will still emit all the low volume audio indications.

NOTE 1: In UL Certificated installations an external alarm bell must be enclosed in a UL Listed cabinet with tamper switches.

NOTE 2: The Wheelock Model 46T.G10 will provide up to 85 dB at 10 feet.

NOTE 3: CSFM listed systems require one (1) listed audible driver to be installed inside residence.

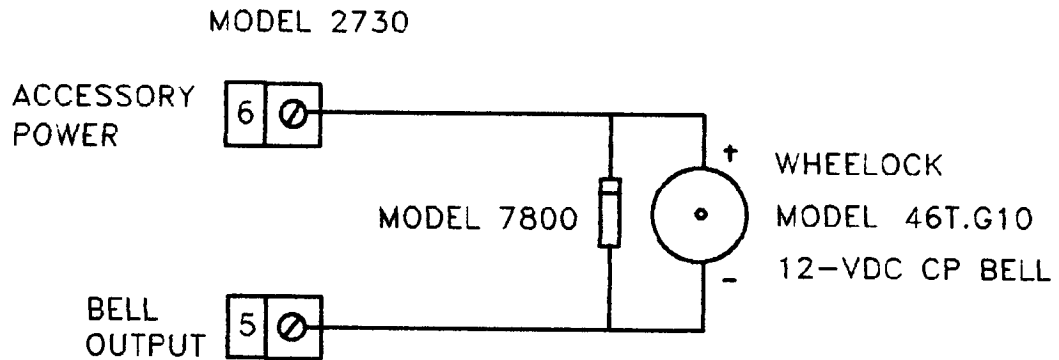


FIGURE 14.1A: EXTERNAL ALARM BELL WIRING

14.2 EXTERNAL SPEAKER OUTPUT

Terminal 4 (siren power) was designed for use with an 8- Ω speaker. If you wish to use a siren, it must be connected between Terminal 4 (siren power) and Terminal 5 (siren/bell output). For proper operation, move shunt block JB4 to the top position on the 2730 PC board. For a UL Listed installation use an ATLAS VT-158U Speaker.

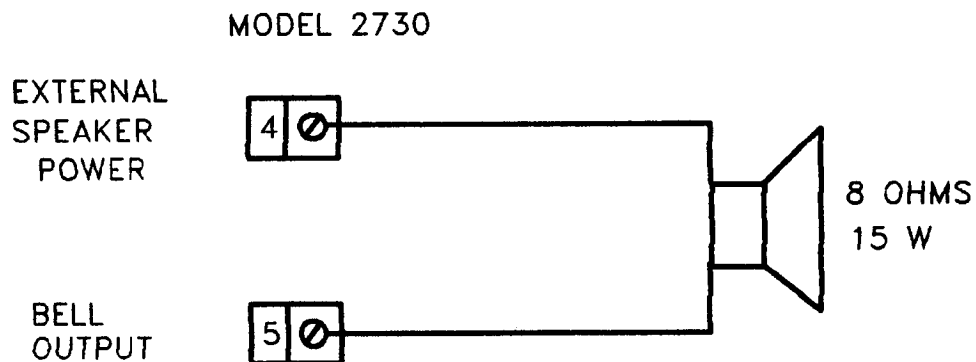


FIGURE 14.2A: EXTERNAL SIREN WIRING

14.3 GROUND START RELAY

The Model 2730 normally communicates to the Central Reporting Station over standard "Loop Start" telephone networks. In some instances, it may be necessary to communicate over "Ground Start" telephone networks. Ground Start networks require a momentary connection between one side of the telephone line and earth ground to enable dial tone. The Model 2730 will accommodate Ground Start trunks with the addition of a 12 VDC relay. Figure 14.3A shows the wiring of the Ground Start relay. If you use the Ground Start feature you must select it when programming the dialer EEPROM. If you use the Ground Start feature you may not use a dialer failed indicator.

NOTE: In UL Certificated installations you may not use a ground start telephone network because it cannot be supervised.

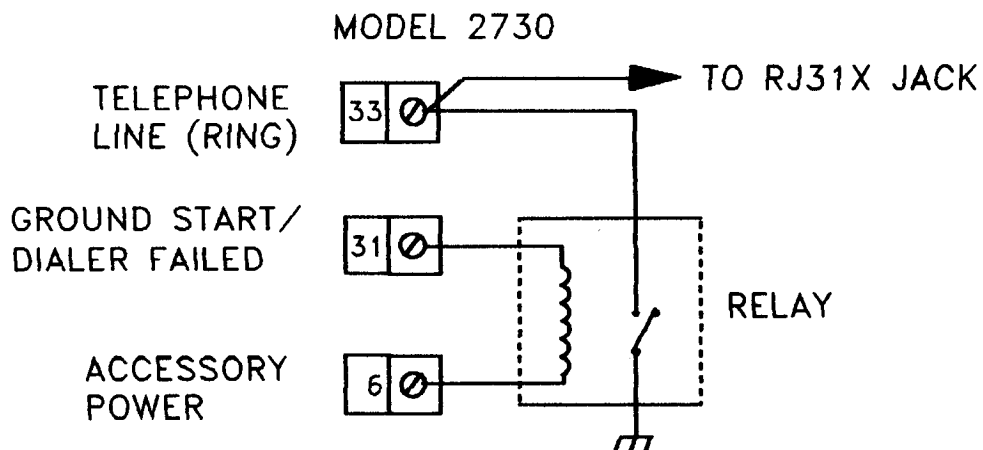


FIGURE 14.3A: GROUND START RELAY WIRING

14.4 EXTERNAL DIALER FAILED INDICATOR

A 12VDC device such as an indicator lamp or the coil of a relay may be wired as a dialer failed indicator, provided you are not using the Ground Start feature. Figure 14.4A shows how to wire the device so it will activate whenever the unit fails to communicate with the central station within the selected number of attempts.

NOTE: In UL Certificated installations a "Dialer Failed Indicator" must be used.

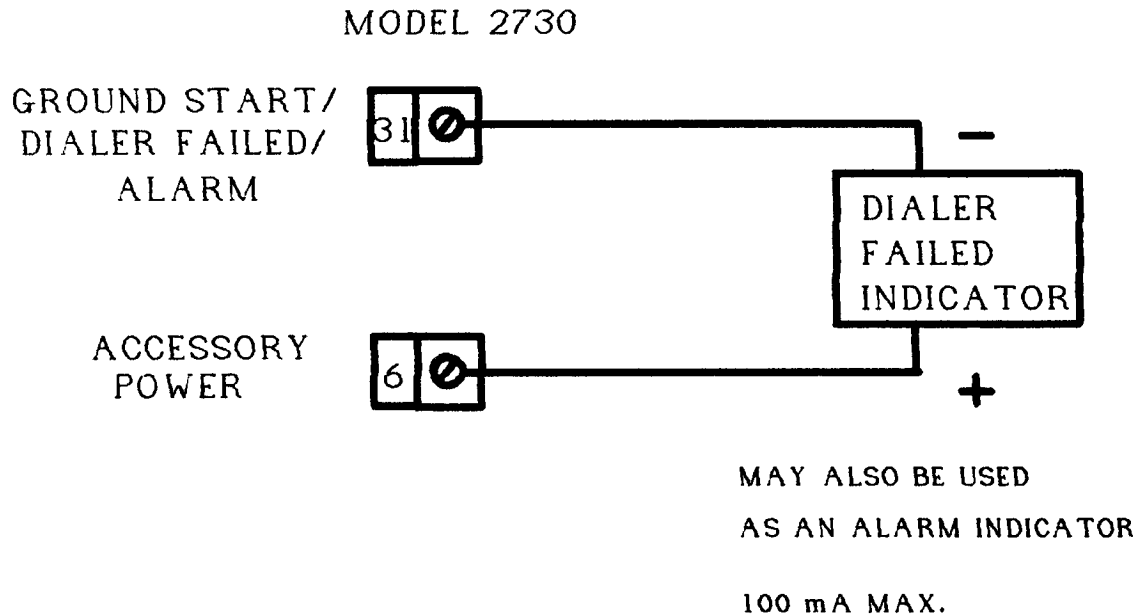


FIGURE 14.4A: DIALER FAILED INDICATOR WIRING

14.5 ALARM OUTPUT

Terminal 31 may also be used for an ALARM output. See Section 5.14 for jumper block configuration.

14.6 KD2/ARMED OUTPUT

Terminal 17 is used as an ARMED output. The maximum current rating for this output is 50 mA. Terminal 17 may also be used with the Model 4180 status display module. See Section 5.13 for jumper block configuration.

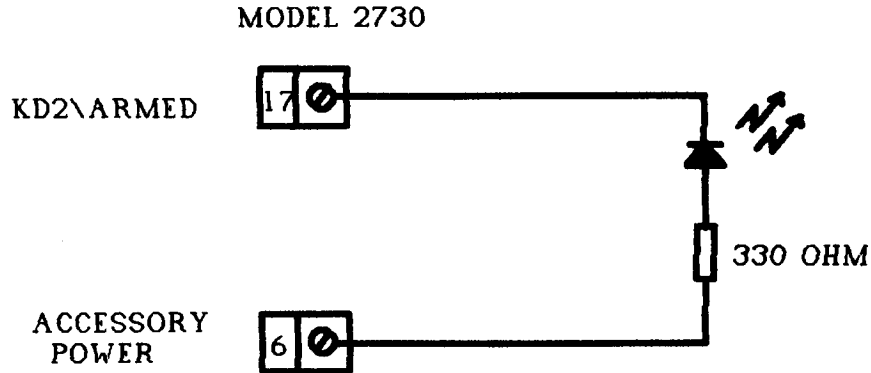


FIGURE 14.6A: KD2/ARMED OUTPUT WIRING

14.7 TELEPHONE LINE WIRING

The Model 2730 communicates to the central station over the same telephone line already installed at the protected premises. You should connect the 2730 to the phone line using an RJ31X type phone jack. The telephone company will install an RJ31X jack upon request. The Model 7860 connecting cord will mate to the RJ31X and can be wired into the 2730 as shown in Figure 14.7A.

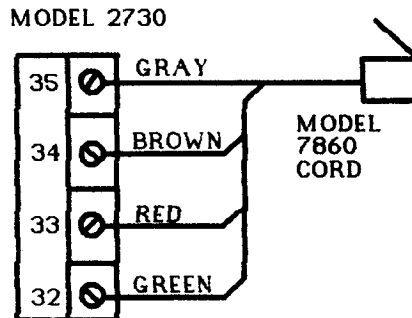


FIGURE 14.7A: WIRING THE 2730 TO THE TELEPHONE LINE

14.8 MODEL 2090 DIGITAL KEYSTATION WIRING

The Model 2090 Digital Keystations are wired as listed in the following chart. Installation requires the use of a 10-conductor cable from each keystation to the 2730 control panel. Each keystation includes a short pigtail cable which may be unplugged to simplify installation or replacement. You must orient the pigtail cable so that its wires are leading over the circuit board when plugged in. Refer to Sections 16 and 18 for more information about the 2090. The pigtail cable should be wired as follows:

2730 TERMINAL NUMBER	COLOR	FUNCTION
* 16	BROWN	* KEY INPUT 3
15	RED	KEY INPUT 2
14	ORANGE	KEY INPUT 1
13	YELLOW	KEY INPUT 0
12	GREEN	KEYSTATION CLOCK
11	BLUE	KEYSTATION DATA
10	VIOLET	KEYSTATION ENABLE
9	GRAY	AUDIO
6 OR 8	WHITE	ACCESSORY PWR +12 VDC
7	BLACK	CIRCUIT GROUND

- * In some instances it may be desirable to install one or more keystations outside of a protected premises. In these cases, you would want to disable the Fire, Emergency, Instant and Interior keyswitches. To accomplish this, simply do NOT connect KEY INPUT 3 (Brown) to Terminal 16 on the 2730.

NOTE: Keystations for the Model 2730 should be wired with 22-gauge wire, with a maximum wire length of 500 feet.

14.9 MODEL 2089 KEYSTATION WIRING

Refer to the Model 2730 Intercom Section (Section 19) of this manual for wiring diagram.

14.10 MECHANICAL KEYSWITCH INSTALLATION

Before installing the mechanical keyswitch, use a digital keystation to program User Codes 17 and 71. Additional user codes may be programmed, but these two are required. Press <TEST> 3 times to exit the PROGRAM Mode.

Connect one side of a Normally Open, momentary contact, mechanical keyswitch to Terminal 13 (KO) and the other side to Terminal 19 or 20 (Loop Power). Use 22-gauge wire, not to exceed 500 feet in length.

The system may now be armed and disarmed by making contact with the mechanical keyswitch, or by using the digital keystation in the normal way. During operation of the keyswitch, the keystation will emit 2 short beeps.

NOTE 1: Do NOT enable the Mechanical Key option using a programmer. The feature is enabled only by programming the special access codes shown above.

NOTE 2: Whenever the system powers up, the <TEST> key must be used to exit the PROGRAM Mode, or the system must be allowed to time out of the PROGRAM Mode (default mode is ARM) before the mechanical key will work.

14.11 MODEL 7040 EMERGENCY MODULE

The Model 7040 Emergency Module provides additional emergency and 24-hour intrusion zone push buttons for manual alarm activation. The Model 7040 also contains an internal speaker for all alarm tones. Figure 14.11A shows how to install the Model 7040 to the Model 2730.

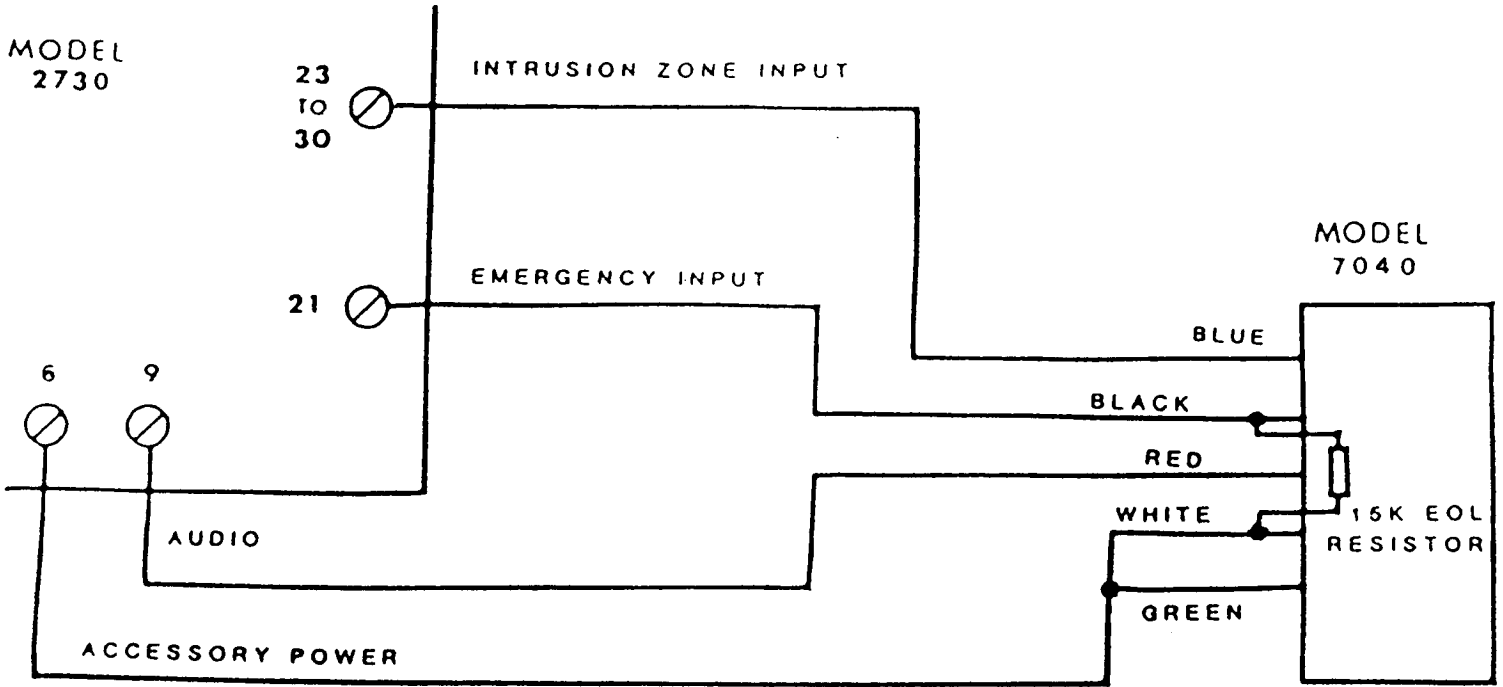


FIGURE 14.11A: MODEL 7040 WIRING DIAGRAM

NOTE: The Model 7040 has been discontinued.

15 TERMINAL STRIP DESCRIPTION

TERMINAL	DESCRIPTION
1	- 16.5 VAC 60 Hz. (40 VA)
2	- 16.5 VAC 60 Hz.
3	- Earth Ground
4	- Siren Power 2.25 A MAX. (Fused at 2.5 A)
5	- Siren/Bell Output, 10.2 VDC - 12 VDC, 2 A MAX. (1 A if UL Fire Installation)*1
6	- Accessory Power, 10.2 VDC - 12.5 VDC, 1.25 A MAX. (fused at 1.5 A)*1*2
7	- Circuit Ground*5
8	- Accessory Power, 10.2 VDC - 12.5 VDC, 1.25 A MAX. (fused at 1.5 A)*1*2
9	- Audio (to keystation speaker), 13 VDC
10	- Keystation Enable
11	- Keystation Data
12	- Keystation Clock
13	- Key Input 0
14	- Key Input 1
15	- Key Input 2
16	- Key Input 3
17	- Keystation Data 2 (to Model 4180)/Armed output 50 mA MAX.
18	- Smoke Detector Power, 10.2 VDC - 12.5 VDC, 0.4ma MAX. (Fused at .5A) *1*3
19	- Loop Power, 10.2 VDC - 12.5 VDC, 30 mA MAX. (current limited)*1
20	- Loop Power, 10.2 VDC - 12.5 VDC, 30 mA MAX. (current limited)*1
21	- Emergency Zone Input
22	- Fire Zone Input
23	- Zone 1 Input
24	- Zone 2 Input
25	- Zone 3 Input
26	- Zone 4 Input
27	- Zone 5 Input
28	- Zone 6 Input
29	- Zone 7 Input
30	- Zone 8 Input
31	- Ground Start/Dialer Failed/Alarm Output, 10.2 VDC - 12.5 VDC, 100 mA MAX.*1*4
32	- Telephone Company line (TIP)
33	- Telephone Company line (RING)
34	- Telephone House line (TIP)
35	- Telephone House line (RING)
36	- Dialer Active, 10.2 VDC - 12.5 VDC, 100 mA MAX.*1

\

0 VDC normal if N.O.,
2.3 VDC normal if N.C.

10.2 - 12.5 VDC alarm if N.O.,*1
0 VDC alarm if N.C.

/

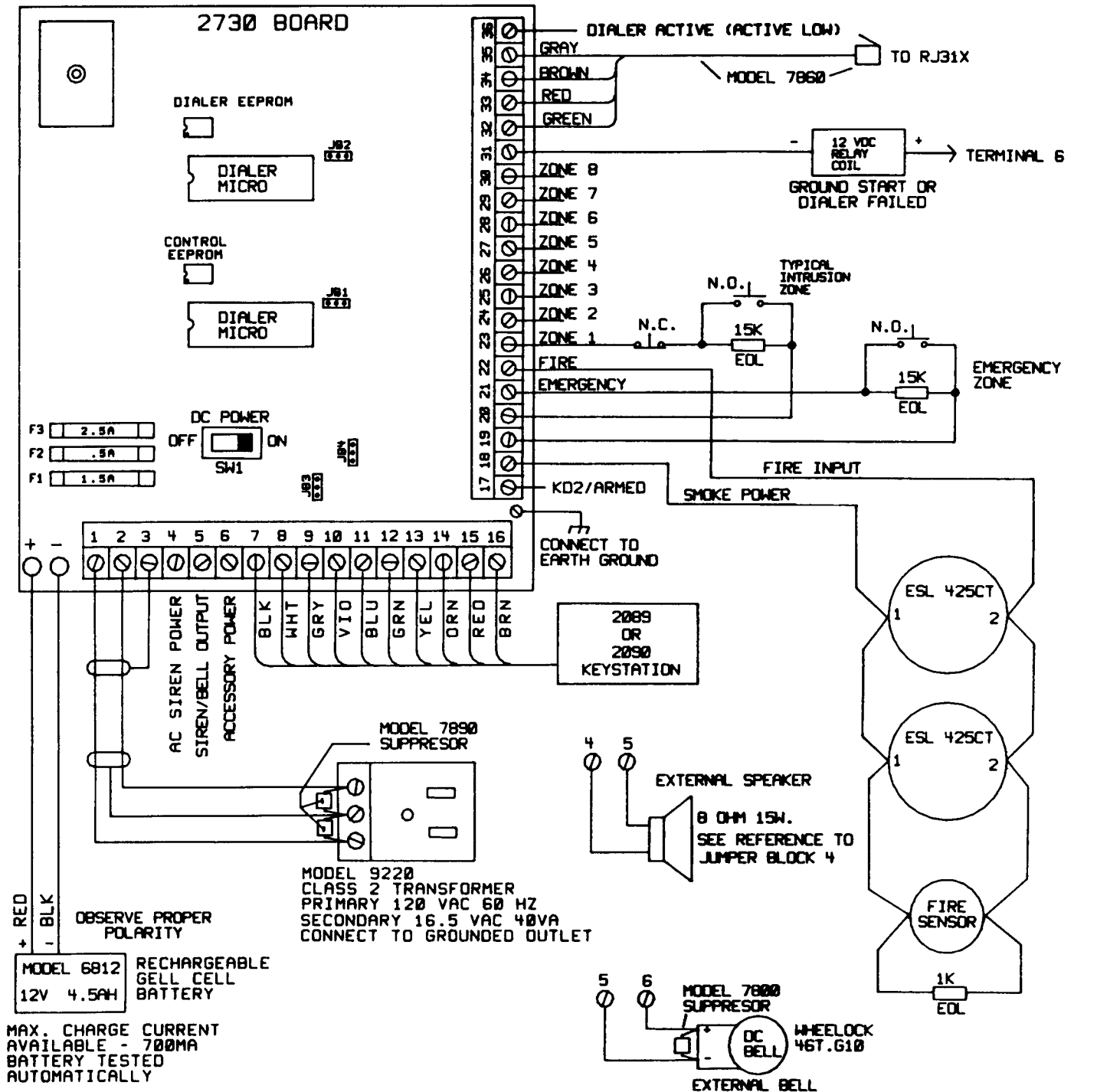
*1 NOTE: Devices connected to terminals 5, 6, 8, 18, 19, 20, 23-30, 31 and 36 must be rated for the voltage ranges specified. The **minimum** voltage occurs when AC power is **off** and the battery is discharging under **load**. The **maximum** voltage occurs when AC power is on and the output is **not** loaded.

*2 NOTE: The sum of the current ratings of all 12-VDC accessories connected to terminals 6 & 8 must not exceed 1.25 A.

*3 NOTE: The maximum number of ESL 445AT smoke detectors allowed per control panel is 7.

*4 NOTE: See Accessory Wiring for Ground Start/Dialer Failed/Alarm.

*5 NOTE: Earth ground is connected to circuit ground internally.



JUMPER BLOCK OPTIONS

- JUMPER BLOCK 1**
PLACE JB1 IN THE LEFT POSITION (BY THE CONTROL CHIP). WHEN USING MODEL 4180, PLACE JB1 IN THE RIGHT POSITION WHEN USING ARMED OUTPUT ON TERMINAL 17.
- JUMPER BLOCK 2**
PLACE JB2 IN THE LEFT POSITION WHEN ALARM OUTPUT IS DESIRED ON TERMINAL 31. PLACE JB2 IN THE RIGHT POSITION WHEN GROUND START OR DIALER FAILED IS DESIRED.
- JUMPER BLOCK 3**
PLACE JB3 IN THE TOP POSITION FOR SIREN SOUNDS AT THE KEYSTATIONS. PLACE JB3 IN THE BOTTOM POSITION FOR NO SIREN SOUNDS.
- JUMPER BLOCK 4**
PLACE JB4 IN THE TOP POSITION IF AN EXTERNAL 8 OHM SPEAKER IS BEING USED. PLACE JB4 IN THE BOTTOM POSITION IF A SIREN IS BEING USED.

FIGURE 15A: MODEL 2730 WIRING DIAGRAM

16 KEYSTATION OPERATION

The Model 2090 (or Model 2089) keystation is used to control all the system functions and contains system status lights and built-in speaker for audible indications. Most of the LEDs on the keystation are encoded to indicate more than one condition. For example, when the READY light is *ON steadily*, the intrusion zones are all secure, but when the READY light is *flashing*, it indicates that the system is communicating. The following list explains what each light indicates and also describes the audible indications. Refer to Figure 16A for a photo of the 2090 keystation.

- ZONE STATUS LEDES 1-8 - LED OFF indicates normal condition.
LED ON indicates a NOT READY zone.
LED FLASHING SLOW indicates a SHUNTED zone.
LED FLASHING FAST indicates a zone was/is in alarm.
- FIRE LED - LED OFF indicates normal condition.
LED ON Indicates a TROUBLE condition.
LED FLASHING indicates a FIRE alarm.
- EMERGENCY LED - LED OFF indicates normal condition.
LED ON indicates a TROUBLE condition.
LED FLASHING indicates an EMERGENCY alarm.
- TROUBLE SILENT LED - LED OFF indicates normal condition.
LED ON indicates a Trouble has been silenced.
LED FLASHING indicates system is in programming mode.
- READY LED - LED OFF indicates system is armed or one or more zones are Not Ready to be armed.
LED ON indicates system is disarmed and all zones are either good, shunted, or bypassed by the interior switch.
LED FLASHING indicates system is reporting.
- ARMED LED - LED OFF indicates controlled zones are disarmed.
LED ON indicates controlled zones are armed.
LED FLASHING indicates system is in alarm.
- INSTANT LED - LED OFF indicates that the delay for Exit/Entry
(toggled by delayed zones is enabled.
<INSTANT> key) LED ON indicates that all Exit/Entry delayed zones are now instant (delay disabled).
- DOOR CHIME/INTERIOR LED - Toggled by <CHIME/INTERIOR> key
- SYSTEM ARMED - LED OFF indicates Interior zones are disabled.
LED ON indicates Interior zones are enabled.
- SYSTEM DISARMED - LED OFF indicates Door Chime feature is disabled.
LED ON indicates Door Chime feature is enabled.
Opened or Closed sensor in a perimeter zone will cause a chime at the keystation.

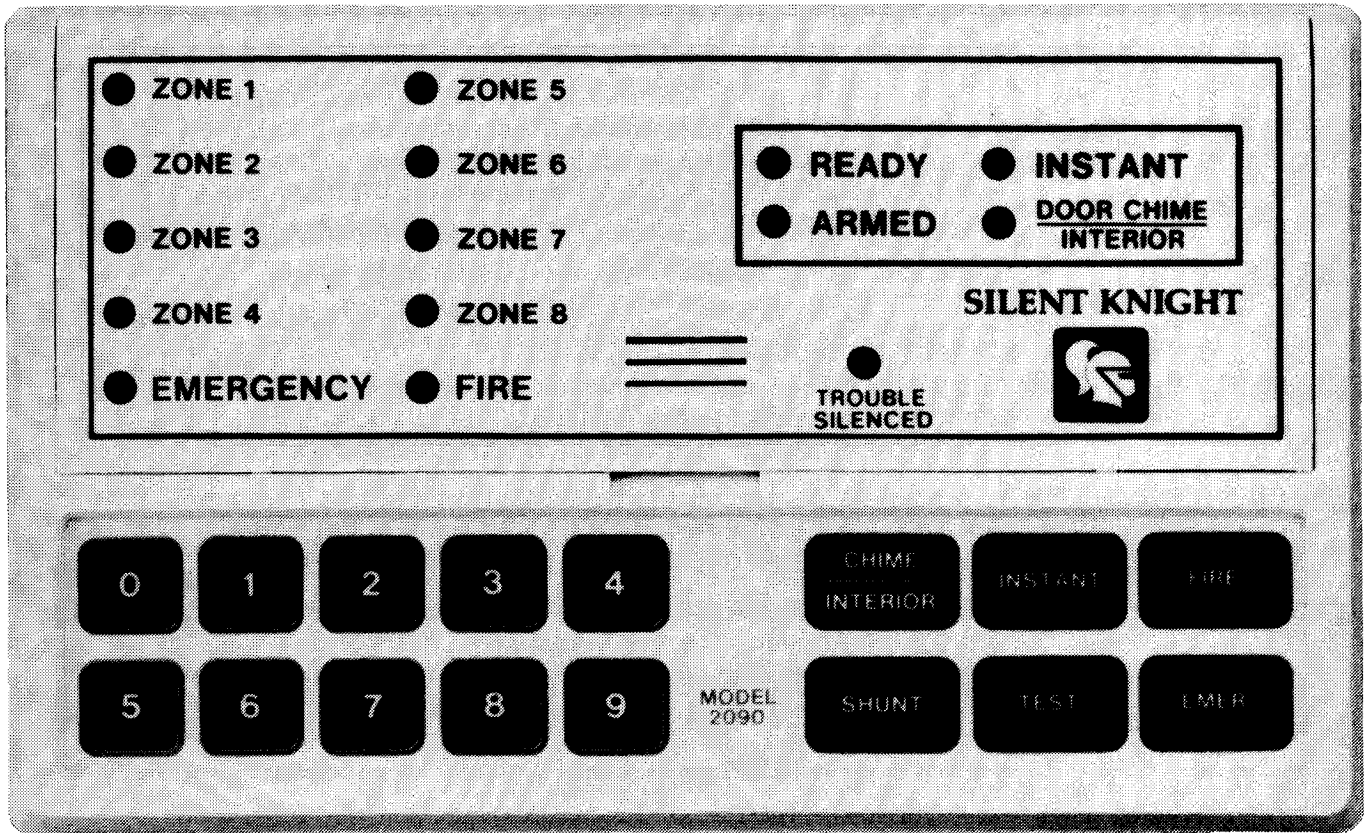


FIGURE 16A: MODEL 2090 DIGITAL KEYSTATION

BUILT-IN SPEAKER - The keystation's built-in speaker gives audible BUILT-IN SPEAKER indications of alarms, troubles, exit/entry warning tones and a short "beep" whenever a key is pressed. The speaker is also used for the optional intercom feature (refer to Intercom section). All low volume audible indications may be adjusted using the trouble alert volume control (See Figure 5A). This control does not affect the high volume alarm tones. The following is a short description of each audible indication.

- Fire Alarm - High volume, high pitch intermittent tone.
- Emergency Alarm - High volume, low pitch intermittent tone.
- Intrusion Alarm - High volume, alternating high/low pitch constant tone.

- Trouble Condition - Low volume, high pitch tone sounds for 1 second every 10 seconds.
- Exit Tone - Low volume, low pitch intermittent tone.
(beep-beep-----beep-beep...)
Last 8 seconds of exit tone changes to rapid intermittent tone (beep-beep-beep-beep...)
- Entry Tone - Low volume, alternating high/low pitch intermittent tone.
(deedle-deedle-----deedle-deedle-----deedle-deedle...)
- Door Chime - Low volume, high to low pitch tone similar to a doorbell.
Sounds once each time a perimeter zone sensor is opened or closed.
- Key "Beep" Response - Short, low volume "beep" that sounds each time you press a key on the keypad.

17 SYSTEM OPERATION

System operating instructions that are not covered elsewhere in this manual are briefly described in the following paragraphs. A detailed description of system operation is found in the 2730 operation manual.

1. To Arm the System - Enter your access code.
2. To Disarm the System - Enter your access code.
3. To Shunt or Unshunt a Zone - Press the <SHUNT> key. Press the zone number you wish to shunt/unshunt (one zone at a time). If you don't hear a long beep, enter your access code.
4. To Silence a Trouble - Press the <SHUNT> key. Press the <0> key. Enter your access code. Once the trouble condition has been corrected, the appropriate zone LED and "TROUBLE SILENT" LED will turn off.
5. To Manually Activate Fire or Emergency Alarm - Press the <FIRE> or <EMERGENCY> key and hold it down for 1 FULL SECOND.
6. To Test the Communicator - Press the <TEST> key. Enter the 0 access code.

NOTE: The system must be disarmed to test.

7. To Activate Duress when Disarming - Press the <9> key. Enter your access code.
8. To Enter PROGRAM Mode - (there are two different methods)
 - a. Press <SHUNT> key, Press the <TEST> key, then enter Code 0.
(System must be disarmed and no zones shunted).
 - b. System will be in the PROGRAM Mode when it is first powered up.
(Turn system off and then on again.)
9. To Change Access Codes - Enter PROGRAM Mode. Enter the codes to be changed. Press <TEST> key after each code. Press <SHUNT> key to clear any errors. Press <TEST> key three times to exit program mode.
10. To Delete A Code - Enter PROGRAM Mode. Enter the first digit of the code to be deleted. Press the <TEST> key. Press the <TEST> key three times to exit the programming mode. Since a code must be at least two digits in length, the code is now invalid and will not function. A new code may be entered at a later time.

18 DIGITAL KEYSTATION INSTALLATION

To mount the keystations, you must first remove the rear mounting plate. Insert a flat-blade screwdriver into the slots located on the bottom edge of the keystation. 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 a double-gang outlet box (required by UL). 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 keystation.

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

NOTE: A maximum of 4 Model 2090 keystations may be used per 2730 control panel under normal conditions. Two additional keystations can be used if their speakers are disabled (cut speaker wire).

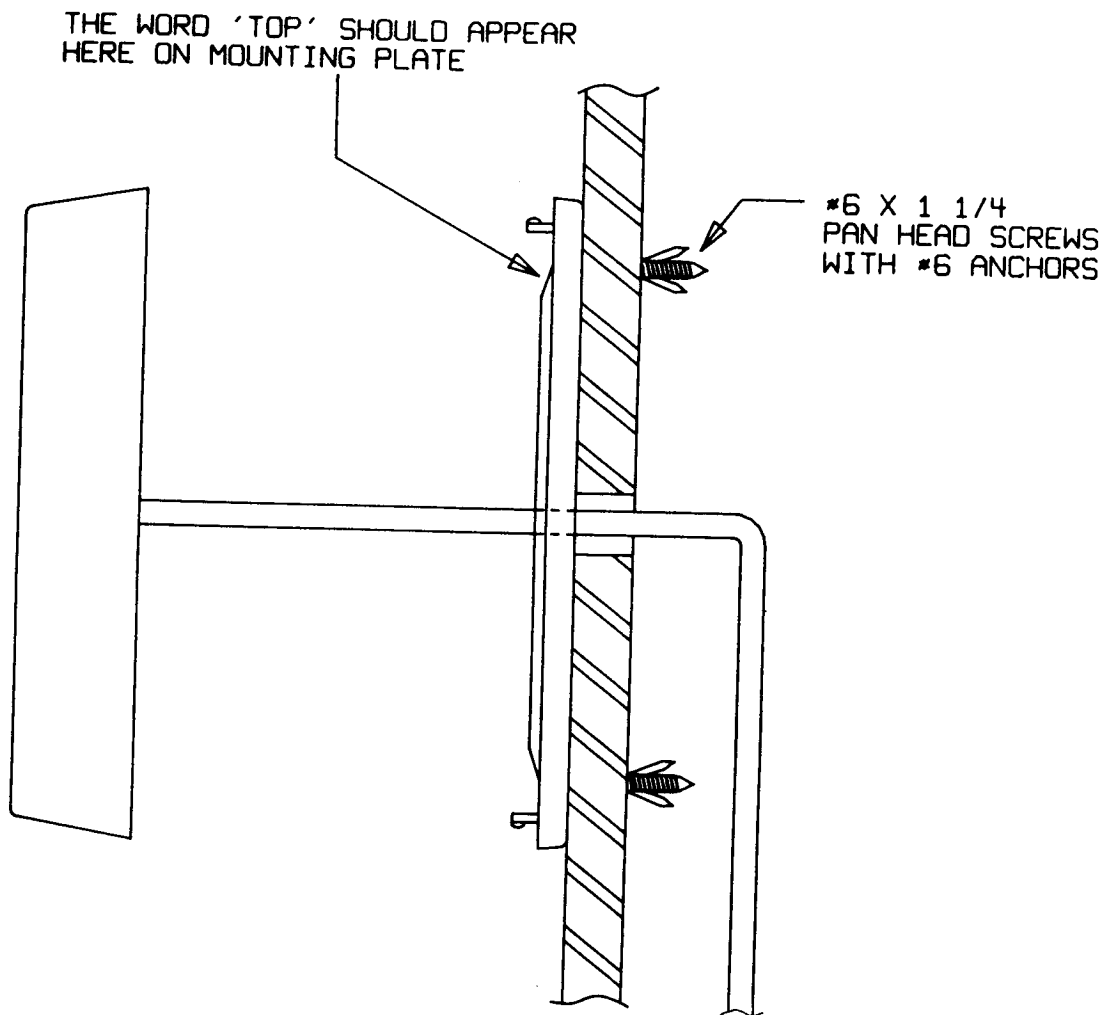


FIGURE 18A: DIGITAL KEYSTATION INSTALLATION

19 MODEL 2730 WITH INTERCOM

A system consisting of the Model 2730, one Model 7361 Intercom Module and up to 4 Model 2089 Digital Keystations allows the keystations to talk and listen in to a Model 7380 Speaker/Microphone. This enables the user to interrogate people at that outside speaker.

NOTE: The Intercom cannot be used to talk/listen to other keystations.

19.1 INTERCOM WIRING

The Model 7361 Intercom Module plugs into Connector P4 on the Model 2730 circuit board. Refer to Figure 19A for a wiring diagram of the Intercom System.

The Model 2089 Digital Keystation is identical to the Model 2090 keystation with the exception of one keyswitch. The Model 2089 has an additional key labeled **<INTERCOM>** located between the **<INSTANT>** key and the **<DOOR CHIME/INTERIOR>** key.

19.2 INTERCOM OPERATION

All the operating features of the Model 2089 Keystation are identical to the Model 2090 Keystation with the exception of the Intercom. To operate the Intercom feature simply press and hold the **<INTERCOM>** key to talk to someone near the external speaker/microphone. When you have finished talking and upon the release of the **<INTERCOM>** key you will be able to listen in to the external speaker/microphone. This listen-in capability will last from about 2 to 10 seconds depending on how the Intercom Module is adjusted. Potentiometer VR1 on the 7361 board controls this time. Potentiometer VR2 on the 7361 board controls the intercom volume level (refer to Figure 19A for the locations of these controls).

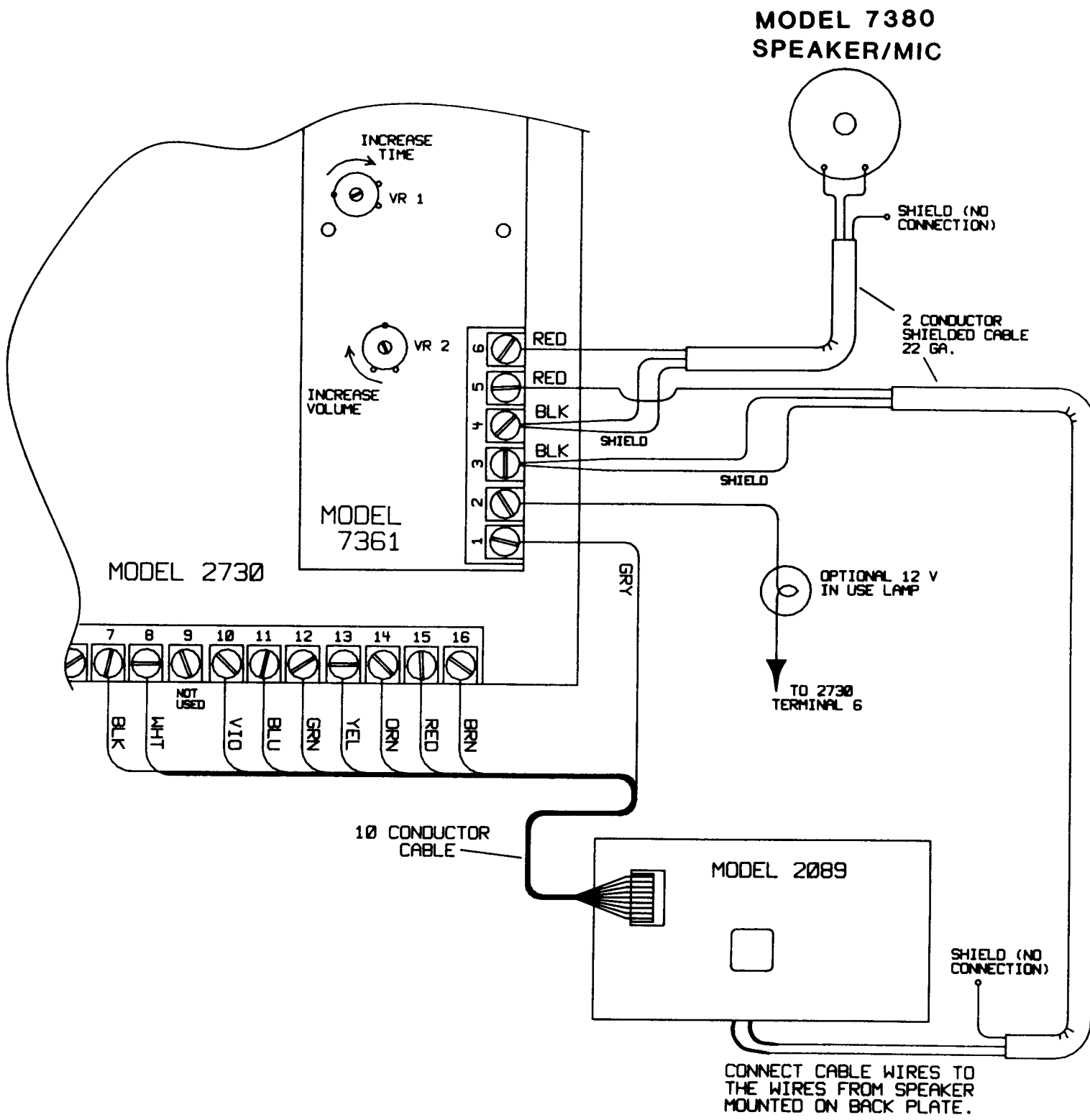


FIGURE 19A: MODEL 2730 INTERCOM WIRING

20 INSTALLING THE MODEL 1521 SUPERVISED RF RECEIVER

Locate both the 2730 control panel and the 1521 receiver as close to the center of the building as possible. The receiver is shipped with a 4-foot long interconnect cable, which allows the RF receiver to be located at least 1 foot away from the metal control panel cabinet. It is important that the RF receiver be installed in an area not surrounded by metal or metal objects. Metal affects radio signals in such a way that will cause reduced reception in an RF receiver. Check for wire lath or foil-backed insulation before committing to an installation location.

Use the wire harness that has 16 pins on one end and 22 on the other (P/N 130283, supplied with the Model 1521). First, plug the 22-pin connector onto the 1521. Plug the 16-pin end of the cable into Connector Header P1 on the 2730 circuit board.

RF ZONE - 2730 ZONE CROSS REFERENCE

The following list cross references the RF zone number with the affected 2730 zone. For example, the Trouble output of the RF receiver is connected to the Emergency Zone Trouble input of the 2730.

<u>PIN NUMBER</u>	<u>RF FUNCTION</u>	<u>2730 FUNCTION</u>
1	CIRCUIT GROUND	CIRCUIT GROUND
2	+8 TO +18 VDC	+12 VDC
3	TEST BEEP	BEEP
4	* TROUBLE	EMERGENCY ZONE TROUBLE
5	ARMED	ARMED
6	TEST	N/A
7	ZONE 1	ZONE 1
8	ZONE 2	ZONE 2
9	ZONE 3	ZONE 3
10	ZONE 4	ZONE 4
11	ZONE 5	ZONE 5
12	ZONE 6	ZONE 6
13	ZONE 7	ZONE 7
14	ZONE 8	ZONE 8
15	ZONE 9	FIRE ZONE
16	ZONE 10	EMERGENCY ZONE
17-22	ZONES 11-16	NOT USED WITH 2730

** NOTE: If RF trouble occurs, you may silence the periodic 10-second trouble tone in the normal way, but a 1-second tone every 60 seconds will continue. This distinguishes RF trouble from Emergency circuit trouble and will continue until RF trouble is resolved.*

21 INSTALLING THE MODEL 5255 ON-SITE PRINTER

The Silent Knight Model 5255 On-Site Printer can be used with the Model 2730 Control Panel to provide a permanent record of all the 2730's activity. This will allow you to program the 2730 for minimum reporting to the central station, providing lower costs while still maintaining records of all activity. The 5255 is shipped with two 36-inch long, 16-conductor interconnect cables (P/N 130047). One end of each cable is plugged into the Connector Header P1 on the 5255 circuit board and the other end is plugged into Connector Header P2 on the 2730 circuit board. (Refer to Figure 5A in this manual and Figure 1 in the printer manual.) Install the 5255 as close as possible to the 2730 Control Panel (not more than 36 inches away). Make sure that the 5255 is programmed for the 2720 product mode. Please refer to the 5255 installation manual for more information about the printer.

NOTE: The 5255 uses printer paper with the part number 005257. Three short beeps indicate that the printer has run out of paper.

22 TRANSIENT VOLTAGE PROTECTION

The Model 2730 Control Panel is protected from transient voltage damage due to lightning or static electricity in several ways.

1. **AC INPUT PROTECTION** - Fast acting "Transorbs" (Model 7890) connected between each side of the Class II transformer and earth ground (refer to Figure 8.5A. MOV (Metal Oxide Varistor) protection between each side of the AC input and earth ground.
2. **TELEPHONE CIRCUIT PROTECTION** - MOV (Metal Oxide Varistor) protection between TIP, RING and earth ground. Line seizure relay provides an air gap between the 2730's internal circuitry and the phone lines.
3. **LOOP INPUT PROTECTION** - Fast acting zener diode protection on all zones, between zone input and circuit ground.
4. **SYSTEM PROTECTION BY DESIGN** - The Model 2730 circuit board layout isolates vulnerable components from known transient sources.

22.1 EARTH GROUND

The key to any good transient voltage protection plan is making the proper earth ground connection to all protection devices. Failure to use all of the recommended protection devices will jeopardize the effectiveness of the protection plan.

Finding a good earth ground is always the first step. Connecting to a water pipe may not always provide an earth ground. Check for PVC (plastic) pipe--It is **NOT** a good earth ground. Electrical ground may not be at a true earth ground potential. Old and/or poor ground connections in the electrical system may allow electrical ground to float at some potential above earth ground. Be observant when selecting your ground source. When in doubt, a grounding rod should be driven into moist earth and used as the earth ground source.

2730 EARTH GROUND CONNECTIONS

1. Connect the Green wire attached to the 2730 circuit board to earth ground.
2. Connect the common lead of the Model 7890 protection device to earth ground (via shielded two-conductor cable and the ground prong of the Class II transformer as shown in Figure 8.3A).

22.2 BATTERY TESTING

The Model 6812 Rechargeable Backup Battery is tested by the Model 2730 every 60 seconds. If the battery voltage drops below 10.2 volts during the test, a low-battery signal is sent to the central station if the system is programmed to report trouble conditions.

23 MODEL 2730 TROUBLESHOOTING GUIDE

This section allows the service person to verify proper (nominal) voltage on input and output terminals when the system is configured as indicated. Compare the voltages you read with the ones listed in the following chart to help determine failures. Set your voltmeter on the appropriate range selection. Connect the minus (black) lead of the voltmeter to Terminal 7 (ground). Probe with the positive (red) lead of the meter. (Be careful not to short circuit terminals with the meter lead.)

<u>TERMINAL NUMBER</u>	<u>TERMINAL DESIGNATION</u>	<u>NOMINAL VOLTAGE READING</u>
1	AC	16 to 18 VAC
2	AC	16 to 18 VAC
3	EARTH	0 VDC (isolated)
4	SIREN PWR	Approximately 20 VDC
5	BELL	10.2 - 12 VDC normal (if connected to bell), <1 VDC active
6	PWR	10.2 - 12.5 VDC
7	GND	0 VDC (common circuit ground)
8	PWR	10.2 - 12.5 VDC
9	AUD	13 VDC normal (if connected to speaker) appr. 12 V (oscillating) during beep appr. 6 V (osc.) during alarm
10	KE	appr. 1 V pulsing
11	KD	appr. 1-4 V pulsing (lower voltage as more LEDs turn on)
12	KC	appr. 2.5 V pulsing
13	K0	0 6 0 6 0 6 0 6 0 6 0 6 0 0 6 0 6
14	K1	0 0 6 6 0 0 6 0 6 6 0 0 6 0 0 0 0
15	K2	0 0 0 0 6 6 6 0 0 0 6 6 6 0 0 0 0
16	K3	0 0 0 0 0 0 0 0 0 0 0 0 0 6 6 6 6
KEY PRESSED		N 1 2 3 4 5 6 7 8 9 S 0 T I I F E O H E N N I M <6> = 6 V N U S S T R E <0> = 0 V E N T T R E R T A U G N S E T I N O C N Y

NOTE: Always check for both presence and absence of voltage.

<u>TERMINAL NUMBER</u>	<u>TERMINAL DESIGNATION</u>	<u>NOMINAL VOLTAGE READING</u>
7	GND	0 VDC
17	KD2	Same as Terminal 11
18	VF	10.2 - 12.5 VDC normal, 0 VDC for 2 seconds after disarming
19	VZ	10.2 - 12.5 VDC normal, should not drop below 10 VDC with all zones in alarm.
20	VZ	10.2 - 12.5 VDC normal, should not drop below 10 VDC with all zones in alarm.
21	E	2.3 VDC normal, <1.3 V = trouble, >3.3 V = alarm
22	F	1.25 VDC normal, <.7 V = trouble, >1.6 V = alarm

<u>TERMINAL NUMBER</u>	<u>TERMINAL DESIGNATION</u>	<u>NOMINAL VOLTAGE READING</u>
23 through	Z1 \ through Z8 /	0 VDC normal if N.O., 2.3 VDC normal if N.C. 10.2 - 12.5 VDC alarm if N.O., 0 VDC alarm if N.C.
30	Z8 /	
31	GS	10.2 - 12.5 VDC normal (if connected to relay) <1 VDC active
32	TIP	0 VDC (isolated) 48 VDC Tip to Ring nominal "on hook"
33	RING	0 VDC (isolated) 48 VDC Tip to Ring nominal "on hook"
34	T1	0 VDC (isolated)
35	R1	0 VDC (isolated)
36	DA	10.2 - 12.5 VDC normal - <1 VDC active

24 FSK REPORTING

As a result of design changes to enhance the reporting capabilities of the Model 2730, an adjustment of the FSK card of the Models 8510 and 8520 may be required. This adjustment is only required if you intend to use the FSK reporting option of the 2730 and then only if the Model 8510 and/or 8520 has not already been factory adjusted.

If, when the 2730 reports to the 8510/8520, the data does not appear, but instead, the display shows "B"s and/or "C"s or is blank, the FSK card must be adjusted.

To do this, remove the 6 Phillips-head screws holding the receiver back panel in place.

Carefully slide the receiver section out until the fourth card (counting from the rear) is exposed (see Figure 24A).

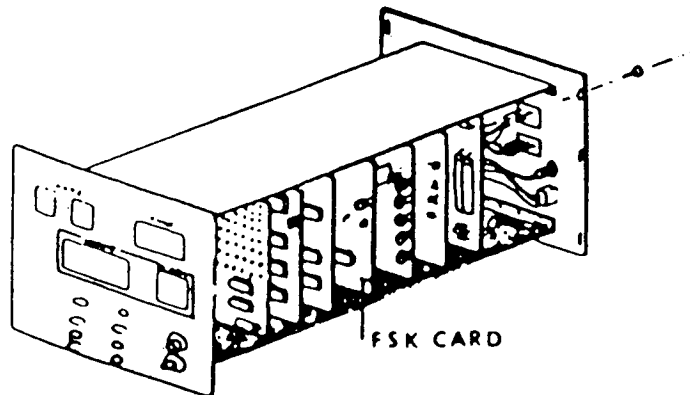


FIGURE 24A: RECEIVER SECTION

Note the present position of the slot of the potentiometer labeled (P1) in Figure 24B.

Using a small flat blade screwdriver, turn the slot of P1 $\frac{3}{4}$ of a turn in the CLOCKWISE direction.

CAREFULLY replace the receiver and secure with the 6 Phillips-head screws.

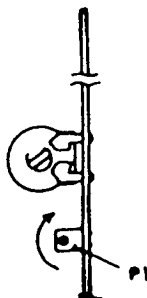


FIGURE 24B: POTENTIOMETER SLOT

25 UL INSTALLATION REQUIREMENTS

If the Model 2730 is to be installed as a UL Listed System the following requirements must be met.

The items listed below are NOT included in a UL Listed System.

1. The Model 5255 On-Site Printer
2. The Models 1521 RF Receiver
3. The Model 7171 Class A Circuit Module
4. The Model 3500 Alarm Panel
5. The Model 4180 Status Display Module

25.1 PROM PROGRAMMING

For a UL Listed System, the Control EEPROM must be programmed as follows:

1. All initiating loops must be supervised.
2. A maximum entry delay of 15 seconds must be programmed.
3. A maximum exit delay of 60 seconds must be programmed.
4. Sounding appliance shutdown must be programmed for not less than 4 minutes.

For a UL Listed System, the Dialer EEPROM must be programmed as follows:

1. The number of attempts of dialout must be between 5 and 10 inclusive.
2. The Ground Start option must not be selected.

25.2 SPECIAL INSTRUCTIONS

1. The Smoke Detector Loop is to be terminated in a 1-K Ω end-of-line resistor; the loop must have a maximum of 50 Ω of line resistance.
2. The maximum total current draw from Terminals 6 & 8 (DC Sounding Appliance) or from Terminals 5, 6, and 8 (AC Sounding Appliance) must not exceed 1.2 A.

26 HOUSEHOLD EVACUATION PLANNING

It is vital for each household to have an evacuation plan in the event of a fire. Fire is the third cause of accidental death. This is due to the fact that the time between when a fire starts and the time that it can become deadly can be as little as 1 to 2 minutes. The main emphasis on an evacuation plan should be **RAPID ESCAPE**. Once a plan has been established, it should be practiced on a regular basis so that each household member will know exactly what to do if a fire should occur.

1. Since most deaths occur while a family is sleeping, make sure that each family member knows where the nearest exit to his or her bedroom is.
2. Instruct family members to feel any closed doors **BEFORE** opening them. If the door is warm, **DO NOT** open the door. When this situation occurs it may be necessary to exit through a bedroom window.
3. Thick smoke usually accompanies a fire. It is a good idea to have a flashlight in good working order nearby. When moving through the smoke, stay as close as possible to the ground.
4. A good escape plan should include a meeting place outside of the building so that all family members can be accounted for.
5. Keep in mind that personal belongings can be replaced but family members cannot. When a fire is detected, get out of the house as soon as possible and let the fire department put out the fire.

27 POST-INSTALLATION TEST

Because of the flexibility of the 2730 system, many combinations of operation and reaction to sensor activity may occur. It is important that every desired feature be fully tested, i.e., time factors, loop responses, audible functions etc.

All questions concerning system programming and operation should be directed to Silent Knight Technical Service Department, Telephone 1-800-328-0103. Any errors or omissions in this manual should also be reported to Silent Knight Customer Service. Your suggestions and advice on product application are always welcome.

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IMPORTANT: Silent Knight products should be tested every month (under no circumstances less than every three months) to insure complete and proper operation and proper input and output connections.

LIMITED WARRANTY

Silent Knight Security Systems warrants that the products of its manufacture shall be free from defects in materials or workmanship for one year from the date of 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 SECURITY SYSTEMS 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.

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