



# INSTALLATION INSTRUCTIONS

**No. 4160-12 C-COM**  
**Control/Communicator**  
**Version 3**

**EXTENSIVELY REVISED! Margin lines indicate principal changes in this 6/87 issue.**

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## GENERAL INFORMATION:

No. 4160-12 Control/Communicator is a microcomputer based product which conveniently combines the control panel and digital communicator into one package. This commercial-residential system provides every important feature required for a UL certified household fire/burglary alarm installation.

A typical system installation includes a No. 4160-12 C-COM, an optional No. 4165 Plug-In Siren Driver, one or two No. 5321 Security Consoles, optionally (up to four) No. 5314 Remote Keypads, and optionally (up to four) No. 9787/9789 Remote Key Arming Stations.

The No. 4160-12 C-COM monitors all inputs and generates appropriate output signals for interior and exterior audible warning as well as for remote communication to a central alarm monitoring service.

The No. 4165 Siren Driver is an optional plug-in module that provides the capability to drive an 8 ohm siren speaker with up to 25 watts of sound power with separate sound outputs for fire and burglary/emergency. In addition, two separate format pair combinations are programmable for this driver.

The (optional) No. 5321 Security Console(s) provide full system and individual zone status indication as well as system control. With the No. 5321, the system may be completely armed or just perimeter armed or disarmed. The entry delay may be turned off, zones may be shunted, and user security codes may be changed. Three types of emergency alarms may be triggered (fire, silent or audible police alarm, and optional audible emergency). A built-in speaker provides audible alarm, trouble, and annunciator functions. The keypad is illuminated for nighttime convenience.

The (optional) No. 5314 Remote Keypad(s) permit most of the keypad functions of the No. 5321 to be performed except for the panic alarm triggers, as well as providing limited display and audible annunciation for modes, trouble, alarms, and shunts.

The (optional) No. 9787/9789 Remote Key Arming Stations permit remote complete (AWAY) arming and disarming of the system as well as providing arming/disarming status indication. The system may also be force armed from these locations if one or more zones are faulted.

## I. INTRODUCTION

### A. SYSTEM CHARACTERISTICS

1. Six independent zones which may be configured in a variety of ways.
2. Up to five burglary zones (including one day trouble zone), two panic zones, and one fire zone.
3. Console digital numeric display of the zone identification for alarms, alarm memory, and trouble conditions.
4. Eight Keypad arm/disarm codes: one master code (PROM selectable) and seven secondary codes (user changeable from keypad) each uniquely reported to central station with open/close reports.
5. Individual Zone bypass from the keypad.
6. Chime mode, duress code, forced arming - additional keypad functions.
7. PROM variable entry/exit and alarm sounder activation delay, alarm sounder timeout, and delayed AC supervision reporting.
8. Alarm Relay and optional plug-in siren driver outputs for audible alarms.
9. Arming status output with programmable polarity for control of motion detectors.
10. Zone LEDs at the C-COM to indicate the status of each zone.
11. AC Power LEDs at the C-COM and Security Console to indicate that AC power is available and the battery is being charged.
12. Fire Test Switch to check the fire system functions.
13. Multi-format communicator (Ademco Low Speed, Ademco High Speed, SESCOA, Radionics, Radionics Superfast and Radionics "BFSK").
14. Touchtone or pulse dial call placement.
15. Touchtone or pulse tone data transmission.
16. Dual phone number calling with separate independent subscriber ID.
17. Double transmission verification or single transmission with check sum verification.

18. All reporting by zone for alarms, troubles, restores, shunts.
19. Low battery and AC power fail reporting.
20. Interface to serial data version (No. 7620SE) of Ademco 900 MHz Long Range Radio Transmitter.

## B. ZONE INPUTS

1. Zones 1-3: Burglary
  - Zone 1 and 2: Instant or Entry/Exit Delay - PROM selectable
  - Zone 3: Interior with or without Entry/Exit delay - PROM selectable
2. Zone 4: Fire, Day Trouble/Night Alarm Instant Burglary, or Standard Instant Burglary - PROM selectable
3. Zone 5: Police Panic (Audible or Silent) - PROM selectable
4. Zone 6: Instant Burglary or Audible Emergency Panic - PROM selectable.

## C. SYSTEM OPTIONS

The system can be configured in a number of ways. This allows the user to customize the system for his own particular needs. Before actually making the choices which affect how the system operates (see Section IV, INSTALLER PROM PROGRAMMING), it is important to understand the options. The discussion that follows broadly divides those options into two categories: control options and communicator options.

### Control Options:

#### 1. Entry Delay, Exit Delay

The entry delay is the time between entering the premises and when the system must be disarmed to avoid activating an alarm. The exit delay is the time between arming the system and when the premises must be exited to avoid activating an alarm. The entry and exit delays may be independently PROM selected to be between 0 and 135 seconds in 15 second increments.

**NOTE:** 60 seconds is the maximum exit delay and 45 seconds is the maximum entry delay allowed in a Listed U.L. household burglary installation by U.L. Standard 1023.

#### 2. Exterior Sounder/Primary Communicator Delay

The system may be set up to delay the activation of the exterior bell and/or siren (optional plug-in 4165 siren driver module required) and the triggering of the communicator. This feature may be used to reduce false alarms due to operator errors. The delay may be set in PROM between 0 and 135 seconds in 15 second increments, but applies only to those zones that have the delay feature enabled (see No. 15). See Communicator Option #2 for delay just to the communicator triggering.

#### 3. Bell/Siren Timeout

Bell/Siren audible indication may be PROM selected to last between 0 and 36 minutes in 4 minute increments, after which it "times out". Indefinite sounding may also be PROM selected for zone 4.

**NOTE:** 4 minutes is the minimum timeout allowed in a Listed U.L. household installation for burglary sounding (per U.L. Standard 1023). Fire sounding shall be present until the system is reset (per U.L. Standard 985).

#### 4. AC Power Loss Timer

To eliminate nuisance power failure central station and local audible reports, the system may be PROM programmed to ignore short duration outages. This delay in reporting an AC loss condition may be set between 0 and 36 minutes in 4 minute increments (As an example, if a timeout period of 16 minutes was selected, power outages of less than 16 minutes will be ignored - the POWER LED will extinguish immediately, however).

#### 5. Entry/Exit Zone Selection

The system allows a choice of zones that may be set up with entry/exit delay. Zones 1, 2, and 3, individually or in any combination, may be set up in PROM as entry/exit zones (For example, if the interior zone were set up with space protection, choosing an entry/exit delay on this zone would allow space protection devices to include the entry door in their area of protection which is to say, they could be held off during the normal entry/exit period).

#### 6. Fast Response Zone Selection

Fast (15 msec) response is used for certain devices (such as glass break detectors and some photoelectrics) that cannot be used with a normal (250 msec) response zone. Fast response can be PROM designated for zones 2, 3 and 4, individually or in any combination.

#### 7. Zone 4 Type Selection

As shipped, zone 4 is configured as a standard burglary zone. However, it can also be configured in PROM as either a fully supervised

fire zone or a day/night burglary zone (during disarmed period, a trouble indication is communicated and audibly sounded if the loop is opened or shorted; a burglary alarm is triggered if the loop is opened or shorted during armed period).

#### 8. Zone 5 and 6 Options

As shipped, zone 5 is configured as a silent panic zone, zone 6 as a burglary zone. Optionally, zone 5 and/or 6 may be configured in PROM as audible panic zones. In addition, if zone 5 is set up as a Silent Panic Zone, console display of both the panic condition as well as the activity of the communicator may be inhibited. (For example, if zone 5 is set up as a silent personal emergency zone, the user would want an indication that the alarm has been triggered, however, if zone 5 is intended for hold-up use, the display would not be desirable).

## 9. Miscellaneous PROM Selectable Control Options

### a. Alternate Siren Sounds:

As shipped, the system will give the following sounds: Steady rapid two-tone (Electronic bell) for Burglary/Panic; interrupted rapid two-tone for fire. Optionally, steady slow two-tone for Burglary/Panic may be PROM selected.

### b. Alarm Sounder "Ding" Confirmation of Arming:

When PROM selected, this option will cause a ½ second "Ding" of the exterior bell and/or siren at the end of the arming sequence. If the communicator has been set up to send opening and closing reports, the "Ding" will occur when the communicator has received a kissoff on a closing report. If opening/closing reports are not used, the "Ding" will occur when the exit delay period has expired.

### c. Arming Status Polarity:

The system has an output at TB1-1 that may be used to indicate the arm/disarm status of the system to other devices (for example, space protection). As shipped, the system will give the following output:

+12 volts when armed,

0 volts when disarmed

Optionally, the polarity can be PROM reversed to give:

0 volts when armed,

+12 volts when disarmed. Suitable for Ademco 12 volt and AC powered space protection devices.

## 10. Duress Digit

The duress digit is an increase of 1 to the last digit of the security code. Its purpose is to allow someone to initiate a silent panic condition but still give the impression that the control is working normally. For example, if the security code is 1234, the duress digit is 5. Entering 1234 + OFF will cause the system to disarm, but entering 1235 + OFF (assuming one is in a hostage situation) will cause the system to disarm and also trigger the communicator to send a silent panic message.

**NOTES:** 1. If the last digit of the security code is 9, there is no duress capability for that code.

2. The user must make certain to avoid assigning secondary codes that could be equivalent to another code (secondary or master) modified by its duress digit so as to not transmit false alarms to the central monitoring service. A simple caution to the user is to always have at least a numeric difference of 2 between security codes used.

## 11. Security Code

This 4 digit code restricts the use of the system to only those who know the code. Any digits, including repetitions, may be chosen. There are eight such codes. One (master code) is PROM programmed at installation and seven others (secondary codes) are user changeable from a keypad at any time, using the master code to enable the change.

## 12. Forced Arming Enable

Forced arming allows a user to arm the system even though certain zones are in a faulted condition. Such faulted zones will be shunted by depressing BYPASS to override fail safe arming during arming. Forced arming must be PROM enabled for each zone in which it is desired (with critical zones, such as safes for instance, arming of the system should be prevented when a faulted condition exists).

## 13. Bypass Enable

Zones in the system may be individually bypassed from the Security Console or Remote Keypad during the disarmed or armed period. This option allows the user to bypass zones that should be ignored, whether or not they are faulted at arming time (In this manner, "Swingers" may be ignored or a loading dock door that must be later opened can be left unsecured). To allow individual zone bypass, each such zone must be PROM enabled for this option.

#### 14. Zone Restore Enable

As shipped, the system has all zones set up as non-restore zones. Non-restore means that once a zone has gone into alarm during the armed period, subsequent faults of that zone will not trigger a new alarm. The zone is effectively "locked-out", preventing multiple false alarms in the event of a "Swinger".

Zones that have been PROM selected as restore zones will allow the bell/siren to sound more than once if the zone returns to normal and faults again after the bell/siren has timed out.

#### 15. Alarm Sounder/Primary Communicator Delay Enable

The "Exterior Sounder/Primary Communicator Delay" was explained as option #2, above. PROM option 15 is simply the choice of burglary zones for which exterior sounder and primary communicator delay is desired. It should be noted that the delay does not apply to zone 4 if it is set up as a fire zone nor to zones 5 or 6 if set up as panic.

#### Communicator Options:

##### 1. Communicator Enables

The system may be PROM programmed to transmit any combination of the following messages:

###### a. Open/Close Reports

A closing report, if enabled, will be sent whenever the system is put in the AWAY mode. The STAY mode will not generate a closing report.

###### b. Zone Shunt Reports

If PROM enabled, the system will report all shunted zones to the central station. These shunt reports will take place at the following times.

- 1) Whenever a 24 hour zone (fire, panic, etc.) is shunted.
- 2) Burglary zones will report shunting at the time of arming.
- 3) When the zone shunt is removed, a shunt restore message will be sent for 24 hour zones (burglary zones will not send shunt restore reports as an open report automatically signifies shunt restore for these zones).

###### c. Zone 4 Trouble Reports

The system will transmit a trouble report, if PROM enabled, whenever a trouble condition is sensed in zone 4. When the trouble condition has restored for 16 seconds, a restore message will be sent (if PROM enabled).

###### d. Cancel Code

If PROM enabled, the cancel code may be used for systems not utilizing opening/closing reports. The cancel code will be sent if a burglary alarm is turned off (cancelled) before the bell/siren times out. The cancel code does not apply for fire or panic reports, however.

#### 2. 16 Second Secondary Communicator Delay

An additional 16 second delay may be added to the communicator trigger to reduce the possibility of false alarms. This timing begins after any delay already provided by the Exterior Sounder/Primary Communicator Delay option (described above). The trigger delay option might be chosen, for example, on zones not utilizing the exterior sounder delay. In addition to zones 1-6, trigger delays are available for both trouble and closing reports.

#### 3. Report to Secondary Phone Number Only

The system allows for the various communicator reports to be divided between two central stations (or two receivers). This option is chosen in some situations, where, for example, all alarms may be routed to a primary alarm receiver while non-critical items, such as troubles or open and closing reports, might be routed to a secondary receiver.

#### 4. Miscellaneous Communicator Options.

##### a. All Messages On One Call

As shipped, the system is set up with a feature that gives alarm messages priority over trouble messages and other non-alarm messages, when sending in a format other than Ademco High Speed.

For example, if an alarm message for the primary receiver occurs while the communicator is reporting shunt conditions to the secondary receiver, the communicator will abort the shunt reports.

It will then call the primary receiver to report an alarm. After the alarm has been reported, the communicator will resume reporting the shunts.

Optionally, the system may be made to finish all messages to the active phone number before switching to the other phone number.

##### b. Duress Message to Second Phone Number

When PROM selected, this option routes duress messages to the secondary receiver.

##### c. AC Fail/Test/Low Battery to Second Phone Number

When PROM selected, this option routes AC Failure and Restore, Low Battery, and Test reports to the secondary receiver.

##### d. Low Battery Report Format Select

As shipped, when using Ademco High Speed Format, the system will report Low Battery messages as follows:

ACCT 5555 5555 8 Low Battery

A PROM option is available that enables battery failure reporting in a different manner (See Section on High Speed Format). This format also allows battery restore reports to be transmitted.

##### e. Dual Report

When PROM selected, this option causes all communicator messages to be sent to both a primary receiver and a secondary receiver.

##### f. ALT by 2's (Alternate by Pairs)

This option, when PROM selected, will cause the communicator to alternate between the primary receiver and the secondary receiver while it is attempting to get through. It will first make two attempts to the primary receiver, then two attempts to the secondary receiver, and so on until it either receives a kiss-off signal from one receiver or exhausts the maximum number of attempts.

##### 5. Central Station Restore Report Enable

If a zone is set up as a restore zone (see control option #14) and it is desired to communicate restore, the reporting can be PROM enabled for any such zone or zones.

##### 6. Communicator Channel Assignment

On the system, each alarm zone, as well as the duress report, may be assigned a communicator channel. How the zones are assigned to channels affects the types of reports that will be sent. As an example, each zone could be given a different communicator code for unique zone reporting. Or the zones could be grouped by function with duress and silent panic zones as Channel (or Code) 1, the fire zone as Channel (or Code) 2, and the burglary zones as Channel (or Code) 3 (this would allow the system to be compatible with an existing central station alarm code scheme).

##### 7. Communicator Format

Individually selectable for primary and secondary telephone numbers—Ademco Low Speed and/or Ademco High Speed, SESCOA, Radionics, Radionics Superfast, and Radionics "BFSK".

##### 8. Long Range Radio

See instructions accompanying No. 7621SE for all PROM PROGRAMMING OPTIONS, the most significant of which is the selection of which reports will and will not be transmitted via Long Range Radio.

## II. FUNCTIONAL DESCRIPTION

### A. FUNCTIONAL DESCRIPTION, NO. 4160-12 C-COM (See Diagram 4).

#### 1. Switches:

**FIRE TEST/RESET Switch:** Rightward movement of this momentary action, center off switch shorts the fire loop to initiate an alarm, causing the alarm sounder to activate. In addition, the charging current to the battery is interrupted while this switch is held, giving an indication of battery condition. The test is reported to the central station using the Test code. The fire test is reset by sliding the switch to the RESET position.

Leftward movement of this switch resets the fire circuit. In addition, the power to the smoke detectors is interrupted resetting any detectors that were activated. Clearing of the fire alarm memory indication on the console and on the C-COM requires entry of the security code and OFF at a console or keypad.

In addition, the fire circuit may be bypassed (if PROM selected) by holding the switch to the left for 5 seconds. A fire trouble indication will be provided when the fire circuit is bypassed.

#### 2. LED Indicators:

**ZONE LEDs FOR ZONES 1, 2, 3, 4, 6 (RED):** These LEDs indicate the status of their respective zones:

- ON STEADY — Existing Zone Fault
- SLOWLY FLASHING — Shunted
- RAPIDLY FLASHING — Memory of Alarm

**ZONE 4 TROUBLE LED (RED):** This LED indicates the trouble status of zone 4 whether it is operating as a supervised fire zone or as a day trouble burglary zone:

- ON STEADY — Existing Trouble
- RAPIDLY FLASHING — Memory of Trouble

**POWER LED (GREEN):** This LED indicates the presence of AC power to operate the system. This LED will turn off immediately when AC power is lost.

## **B. FUNCTIONAL DESCRIPTION, NO. 4185 SIREN-DRIVER (See Diagram 5)**

### **Controls:**

**PITCH ADJUSTMENT:** The small potentiometer permits the adjustment of the pitch of sound produced by the siren driver. Clockwise adjustment (as viewed from the right side of the cabinet) increases the pitch and counterclockwise adjustment decreases the pitch.

## **C. FUNCTIONAL DESCRIPTION, NO. 5321 SECURITY CONSOLE (See Diagram 6)**

### **1. Keypad, LEDs and Message Displays:**

**NOTE:** The interval between consecutive key depressions must not be greater than 2 seconds for acceptance of the entry.

**Keys 0-9:** These are used to enter the security code and the duress digit.

**OFF Key and LED (Green):** When depressed subsequent to entry of the security code, silences alarms, memory and trouble audibles and disarms the system. The OFF LED is lit when the system's burglary protection is turned off.

**AWAY Key and LED (Red):** When depressed subsequent to entry of the security code, arms the entire burglary system if there are no faulted zones. The AWAY LED is lit when the system is armed in this mode.

**STAY Key and LED (Red):** When depressed subsequent to entry of the security code, arms all of the burglary zones except Zone 3 (Interior Protection) if there are no faulted zones (other than Zone 3). The STAY LED is lit when the system is armed in this mode.

**POWER LED (Green):** This LED indicates the presence of AC power to operate the system. This LED will turn off immediately when AC power is lost.

**BYPASS KEY and LED (Yellow):** When depressed subsequent to entry of the security code and followed by one or more zone number(s) (1 to 6) while in the armed or disarmed state, will individually shunt the zone(s) designated [assuming that the programming of the system permits the shunting of the particular zone(s)].

When depressed subsequent to entry of the security code and either the AWAY or STAY keys, the burglary system will arm with any faulted zones shunted [assuming that the programming of the system permits the force automatic shunting of the particular zone(s)].

The BYPASS LED is lit when one or more zones are shunted either by force arming or by individual shunt selection. All shunts are automatically removed when the system is turned off.

**INSTANT Key and LED (Yellow):** When depressed subsequent to entry of the security code and either the AWAY or STAY keys, the burglary system will arm with the entry delay disabled on any zones designated as entry/exit zones, making them instant alarm zones for subsequent entry. The INSTANT LED is lit when the system is in this mode. The entry delay for these zones is restored subsequent to the system being turned off.

**CODE Key and LED (Yellow):** When depressed subsequent to entry of the master security code, will permit the entry of a secondary code designator (2-8) followed by a user changeable 4 digit secondary security code. A secondary code permits the performance of all of the functions permitted by the PROM programmed master code except change of itself or other secondary codes to a new code. In addition, a secondary code can be blocked from performance of any of its functions when the system is armed with the master code, as an added security feature (if so programmed). Repeating digits are permitted in code entries. If a secondary code entered happens to be similar to the master code (or another secondary code) except for the last digit being 1 higher, the duress silent panic capability will be triggered, causing a needless false alarm to be reported to the central alarm monitoring service. The CODE LED is lit whenever a secondary code is capable of being used.

**CHIME Key and LED (Yellow):** When depressed subsequent to entry of the security code during the disarmed state, will enable a mode in which any fault in Zones 1 or 2 will cause a brief loud tone to be heard at each security console and remote keypad. The mode can be disabled by subsequent reentry of the code and redepression of the CHIME key. The CHIME LED is lit whenever the CHIME mode is in effect. The CHIME mode is never in effect during the armed state.

**READY Key and LED (Green):** When depressed at any time, permits the Zone Identification Display to identify any presently faulted zones. Subsequent entry of the security code followed by depression of the OFF Key turns off the zone display. The READY LED is lit whenever all zones are intact (ready for arming) during the disarmed state. It is off at other times.

**ENTER Key:** When depressed subsequent to security code and function or mode entry, eliminates the 2 second keying delay that exists prior to acting on the function or mode request (use of this key is optional).

**FIRE and FIRE Keys and LED (Red):** Simultaneous depression of both keys causes manual activation of the fire alarm (if fire is programmed for Zone 4). The FIRE LED is lit when a fire alarm has been caused by this means or by a short in the fire zone and remains as a memory of alarm after timeout.

**POLICE and POLICE Keys and LED (Red):** Simultaneous depression of both keys causes manual activation of a Zone 5 alarm (audible or silent as a function of zone programming). The POLICE LED is lit when a Zone 5 Police alarm has been caused by this means or by a fault in Zone 5 AND Zone 5 has been programmed with the console display enabled. It remains lit as a memory of alarm after timeout.

**EMERG and EMERG Keys and LED (Red):** Simultaneous depression of both keys causes manual activation of a Zone 6 audible alarm (if Zone 6 was programmed as a 24 hour alarm zone). The EMERG LED is lit when a Zone 6 Emergency Alarm has been caused by this means or by a fault in Zone 6 AND Zone 6 has been programmed for 24 hour emergency alarms. It remains lit as a memory of alarm after timeout.

**ZONE IDENTIFICATION DISPLAY (Red):** This one digit display provides the zone identification for each zone programmed as a burglary zone during the disarmed and armed states, for both current faults as well as for memory of alarm.

**BURGLARY Message Display (Red):** This message is displayed subsequent to intrusion in one of the burglary zones when the system is armed and remains, along with the Zone I.D. Display, as a memory of alarm after the alarm condition is removed.

**CHECK Message Display (Red):** This message is displayed subsequent to a trouble condition being detected in Zone 4, when this zone is programmed as either a fire zone or a day trouble burglary zone, and remains as a memory of the trouble after the trouble condition is removed.

**PHONE Message Display (Red):** This message lights steadily while any phone transmission (except a silent alarm where the system is programmed for console inhibit) of an alarm, trouble, open/close, cancel, or restore is in process. When the central alarm monitoring service receiver acknowledges the transmission with a kiss-off, the message will flash for 30 seconds.

### **2. Audible Signals:**

**Fire Alarm:** Interrupted, rapidly alternating two-tone sound accompanied by lighting of FIRE LED.

**Burglary/Audible Police/Emergency Alarm:**

Either continuous rapidly alternating two-tone sound or continuous slowly alternating two-tone sound (dependent upon system programming) accompanied by lighting of BURGLARY message, POLICE LED, or EMERGENCY LED.

**System Turned OFF or Failure to Arm:** Single brief tone

**System Armed AWAY:** Two brief tones

**System Armed STAY:** Three brief tones

**Trouble:** Rapidly pulsing tones for a Zone 4 trouble or for a loss of AC power beyond the programmed time period.

**Prolonged AC Power Outage:** After a prolonged AC power outage beyond the programmed time period, the Control/Communicator may eventually go into a shutdown condition. The No. 5321 will emit a low tone and its Zone I.D. Display will indicate a "C". The tone can be silenced by depressing a 4 (or 7 for early production) on the keypad.

**Entry Warning:** Slowly pulsing tones activated during the entry delay period.

**Chime Annunciation:** Single tone each time Zone 1 or 2 is faulted when in this mode.

**Memory of Alarm:** Rapidly pulsing tones activated during the entry delay period subsequent to an alarm or after disarming subsequent to an alarm that has timed out.

**Key Depression Feedback:** Brief buzz tone for each key depressed.

**Note:** Keying of the first digit of the security code will immediately silence any pulsating tones or alarm sounds that the Console may be emitting (any alarms from external sounders will continue, however). This will allow the confirmation tone emitted by the Console to be heard as each key on the keypad is depressed. If the entire security code, plus OFF, are not keyed within 10 seconds, the pulsating tones or alarm sounds will resume at the Console.

## D. FUNCTIONAL DESCRIPTION, NO. 5314 REMOTE KEYPAD (See Diagram 7)

### 1. Keypad and LEDs:

**Keys 0-9:** These are used to enter the security code and duress digit.

**OFF Key:** When depressed subsequent to entry of the security code, silences alarms, memory, and trouble audibles and disarms the system.

**AWAY Key and LED (Red):** When depressed subsequent entry of the security code, arms the entire burglary system if there are no faulted zones. The AWAY LED is lit when the system is armed in this mode.

**STAY Key and LED (Red):** When depressed subsequent to entry of the security code, arms all of the burglary zones except for Zone 3 (Interior Protection) if there are no faulted zones (other than Zone 3). The STAY LED is lit when the system is armed in this mode.

**CHK.BYP LED (Yellow):** This LED lights steadily if a zone has been shunted by either force arming or individual zone shunting. It flashes if a trouble condition in Zone 4 has been detected. The trouble indication overrides the shunt indication if both are present simultaneously.

**BYPASS Key:** When depressed subsequent to entry of the security code and followed by one or more zone number(s) (1 to 6) while in the armed or disarmed state, will individually shunt the zone(s) designated [provided that the programming of the system permits the shunting of the particular zone(s)].

When depressed subsequent to entry of the security code and either the AWAY or STAY keys, the burglary system will arm with any faulted zones shunted [provided that the programming of the system permits the forced automatic shunting of the faulted zone(s)].

**INSTANT Key:** When depressed subsequent to entry of the security code and either the AWAY or STAY keys, the burglary system will arm with the entry delay disabled on any zones designated as entry/exit zones making them instant alarm zones for subsequent entry. The entry delay is restored subsequent to the system being turned off.

**CODE Key:** When depressed subsequent to entry of the master security code, will permit the entry of a secondary code designator (2-8) followed by a user changeable 4 digit secondary security code. A secondary code permits the performance of all of the functions permitted by the PROM programmed master code except change of itself or other secondary codes to a new code. In addition, a secondary code can be blocked from performance of any of its functions when the system is armed with the master code, as an added security feature (if so programmed). Repeating digits are permitted in code entries. If a secondary code entered happens to be the same code as the master code (or another secondary code) except for the last digit being higher by 1, the duress silent panic capability will be triggered causing a needless false alarm to be reported to the central alarm monitoring service.

**CHIME Key:** When depressed subsequent to entry of the security code during the disarmed state, will enable a mode where any fault in Zones 1 or 2 will cause a brief loud tone to be heard at each security console and remote keypad. The mode can be disabled by subsequent reentry of the code and depression of the OFF key.

**READY LED (Green):** This LED is lit whenever all zones are intact (ready for arming) during the disarmed state. It is off at other times.

**ENTER Key:** When depressed subsequent to security code and function or mode entry, eliminates the 2 second keying delay that exists prior to acting on the function or mode request (use of the key is optional).

**READY Key + ENTER Key (\* + #):** Simultaneous depression of both keys causes manual activation of a Zone 5 alarm (audible or silent, as programmed) on late production units (identifiable by an "EN" label affixed to the back of the unit).

### 2. Audible Signals:

**System Turned OFF or Failure to Arm:** Single brief buzz  
**System Armed AWAY:** Two brief buzzes  
**System Armed STAY:** Three brief buzzes  
**Trouble/Alarm:** Rapidly pulsing buzz for a Zone 4 trouble or for a loss of AC power beyond the programmed time period or for any audible alarm.

**Entry Warning:** Slowly pulsing buzz activated during the entry delay period.

**Memory of Alarm:** Rapidly pulsing buzz activated during the entry delay period subsequent to an alarm or after disarming subsequent to an alarm that has timed out.

**Key Depression Feedback:** Brief buzz for each key depressed.

## E. FUNCTIONAL DESCRIPTION, NO. 9787/9789 REMOTE KEY ARMING STATION (See Diagram 8)

**Arm/Disarm:** Momentary clockwise turning of the key causes

**Keyswitch:** AWAY arming, disarming, trouble and memory of alarm audible clearing.

Holding the keyswitch in the clockwise turned position for a period of 5 seconds when attempting to arm AWAY with a faulted zone, causes forced arming with automatic shunting of the faulted zones (if permitted by zone programming).

**Red LED:** When lit steady, this LED indicates that the burglary system is armed.

This LED flashes to provide a memory of alarm indication.

**Green LED:** When lit, this LED indicates that all zones are intact and ready for arming. This LED is only lit during the disarmed state.

## III. COMMUNICATOR OPERATION

The communications capability of the system links it with a monitoring central station using the telephone switched network. When alarm, trouble, or status information is to be communicated, it is translated into a message appropriate to the format selected via the various PROM options described previously. The system then seizes the phone line.

### A. LINE SEIZURE

A Double Pole Double Throw relay disconnects all extension phones on this telephone line so that the communicator cannot be blocked by outgoing calls or by a phone left off hook. The system then executes a short 1.6 second hang-up, to insure a disconnect in case an outgoing call was being made, and attempts to establish a communication link. At this time the PHONE message on the console will light for alarms not programmed to inhibit this action. If the system is unsuccessful in establishing the link, an anti-jam procedure is executed if the telco network used features "called party disconnect".

### B. ANTI-JAM

Many U.S. telephone networks will automatically disconnect the calling party if the called party hangs up for a period of time. The system automatically executes a 30 second anti-jam (hang up) AFTER the first call attempt and each successive call to prevent any incoming calls from blocking transmission.

**NOTE:** Only if PROM selected.

The communicator link is established in the following manner. The system checks for a dial tone.

### C. DIAL TONE DETECTION

In order to reduce response time, the system senses both local (PBX) and external (telco) dial tones. If a dial tone is detected, the system dials using the PROM selected Touchtone or rotary dial format. If a dial tone is not detected within a PROM programmed waiting period, the system will dial anyway, as it assumes that a good connection has been made and that the dial tone is not clear.

The PROM selectable waiting periods are:

- 5 seconds - for quick disconnect Telco systems
- 11 seconds - for normal telco systems
- 30 seconds - for slow response telco systems

**NOTE:** PABX System waiting period is fixed at 5 seconds.

The system dials up to two separate 16 digit telephone numbers. It may be programmed to do this in a number of ways.

#### D. PROM CALLING OPTIONS

- **Alternate by Pairs** - Call the second number upon failing to receive Kissoff after two attempts to the primary number, then alternate every two calls between the primary and second number until Kissoff is received from one or until the maximum number of attempts is reached.
- **Dual Report** - Always call the second number even after Kissoff from or having reached the maximum number of attempts to the first number.
- **Second Number Only** - Having selected alarm code/channels report only to the second number (e.g. open/close reports)

Successful connections are verified when the system receives an acknowledgment tone from the central station receiver. If this tone is not received within a defined period, the system will disconnect from the line and wait 30 seconds before trying again. The calling procedure will be repeated in varying combinations, as programmed, until a successful link is established or until the maximum number of attempts is reached.

#### E. ACKNOWLEDGE WAIT PROM OPTIONS

- 30 seconds - standard
- 60 seconds - slow response telephone switching systems

Message transmission will begin when the acknowledgment is received. The system will transmit in the Ademco LOW or HIGH SPEED formats depending upon which acknowledgment tone has been received from the central station. The latter is not true for SESCOA, Radionics, Radionics Superfast, or Radionics "BFSK" formats which are specifically programmed for proper response to their acknowledge and acknowledge-hold receiver signals.

#### F. TRANSMISSION FORMAT PROM OPTIONS

- Ademco High Speed Only (DTMF)
- Ademco High or Low Speed (10 pps) (depends on C.S. receiver tone received)
- SESCOA (20 pps)
- Radionics (20 pps)
- Radionics "Superfast" (40 pps)
- Radionics "BFSK"

**NOTE:** Extended reporting from each of the above formats, except Ademco High Speed, is separately PROM selectable. Ademco High Speed is automatically extended.

To ensure proper transmission, each message is sent up to four times. As soon as the central station receiver verifies the message, it sends a "Kissoff" tone to the system. This causes the PHONE display on the console to flash for 30 seconds.

#### G. MESSAGE VERIFICATION PROM OPTIONS

- Two successive identical messages — Ademco No. 673 and 685 receivers as well as Adcor, Franklin, Radionics, SESCOA, Silent Knight, and Vertex receivers.
- Single message transmission with check sum verification — Ademco High Speed, Radionics and Radionics Superfast formats.
- Single message transmission with checksum verification — Ademco Low Speed format.

If the system does not receive the "Kissoff" tone, it will disconnect and dial again. It will make as many attempts to obtain kissoff via the primary and secondary phone numbers as is PROM programmed.

- NOTES:** 1. Use single message transmission with checksum verification only if the receiver used can accommodate it.  
2. Radionics BFSK format automatically uses single message transmission with verification independent of any PROM selection.

#### H. ADEMCO LOW SPEED REPORTING FORMAT

This message consists of 3 or 4 digits of the subscriber identification numbers and a single digit alarm code. PROM assigned to that alarm/trouble/status report. Use 4 digit subscriber ID only if the receiver used can accommodate it.

If more than one alarm is triggered, the alarms will report in priority order (i.e. low alarm code first) unless the subsequent alarms trigger while one or more alarm messages have **already commenced** transmission. Each message must receive "kissoff" before the next is sent.

Example: If codes 3 and 6 of Subscriber 1890 are to be reported, the system will respond as follows:

890 3  
890 3\*  
"Kissoff"  
890 6  
890 6\*  
Final "kissoff" (system hang-up)

\*Assumes, in this example, that two identical messages verification and three digit subscriber identification number are used.

#### Expanded Reporting Optional Capabilities.

##### Alarm/Trouble Reporting by Zone

Each zone within the C-COM can be assigned its own alarm code or multiple zones can be grouped on a common code, installer choice. However, other types of reports can be uniquely identified by using extended reporting. Extended reporting operates as follows for each of the below cited examples:

##### Alarm Restoral

Message Sent = 890 R<sub>1</sub>  
R<sub>1</sub>R<sub>1</sub>R<sub>1</sub> Z

Where: R<sub>1</sub> = Numeric alarm restoral code selected  
Z = Channel code assigned to the zone.  
890 = Sample Subscriber Account Number

##### Trouble Transmission

Message Sent = 890 T  
TTT Z

Where: T = Numeric trouble code selected  
Z = Channel code assigned to the zone.

##### Trouble Restoral

Message Sent = 890 R<sub>2</sub>  
R<sub>2</sub>R<sub>2</sub>R<sub>2</sub> Z

Where: R<sub>2</sub> = Numeric trouble restoral code selected  
Z = Channel code for the zone that restoral

##### Shunt Report

Message Sent = 890 S  
SSS Z

Where: S = Numeric shunt code selected  
Z = Channel code for the zone shunted

##### Shunt Restoral

Message Sent = 890 R<sub>3</sub>  
R<sub>3</sub>R<sub>3</sub>R<sub>3</sub> Z

Where: R<sub>3</sub> = Numeric shunt restoral code selected  
Z = Channel code of the zone for which shunt was removed.

##### User Identification at Open/Close

Message Sent = 890 C Where: C = Numeric closing code selected  
CCC U U = User ID number, 1 through 8

**NOTES:** 1. Similar for Opening except that Closing Code is replaced by the Opening Code.

2. If the same security code is erroneously assigned to more than one code designator: a) If all are secondary codes (e.g., #3 and #7), the user ID that is the largest code designator for the multiple assignment (e.g., #7) will be transmitted with the opening and closing reports or b) If one is the Master Code, its user ID (#1) will be transmitted at opening and the largest secondary user ID (e.g., #7 if #1, #3 and #7 are so-assigned) will be transmitted at closing.

##### Low Battery Restoral

Message Sent = 890 B  
BBB R<sub>1</sub>

Where: B = Low battery report code selected  
R<sub>1</sub> = Numeric alarm restoral code selected (see above)

##### Loss of AC Restoral

Message Sent = 890 A  
AAA R<sub>1</sub>

Where: A = AC loss report code selected  
R<sub>1</sub> = Numeric alarm restoral code selected (see above)

#### I. ADEMCO HIGH SPEED REPORTING FORMAT

**NOTE:** In certain telco networks (e.g., General Telephone), the telco central offices may use Touchtone converters that convert Touchtone from the premises phone into pulses for dialing because their network is still a pulse dial network. Ademco High Speed transmission has difficulty with these networks because the message transmissions get converted to pulse dialing. In order to shut down the Telco Touchtone-to-dial pulse converters during message transmission so that Ademco's High Speed Format can be transmitted, it is **necessary to program an 11** into the communicator PROM **at the end of the primary** (and secondary, if used) **telephone number**. This is accomplished by keying an 8 on the first pass through that PROM Data Group and then by keying a 3 in that same location on a second pass (repeating the keying of the telco number) through the same PROM Data Group.

Receipt by the system of a high speed acknowledgment tone from a No. 685-2 Line Card in a No. 685 Digital Alarm Receiver will result in HIGH SPEED FORMAT transmissions, each containing 13 digits as follows: 4 digit subscriber identification number, 8 digits defining the status of each of the alarm reporting channels, and 1 digit defining the status of the ninth auxiliary channel.

**NOTE:** If the system is programmed for Ademco format (that is, neither the SESCOA nor the Radionics system programming option described under PROGRAMMING OPTIONS has been selected), it will automatically respond at HIGH SPEED to a high speed acknowledgment tone and at LOW SPEED to a low speed (or standard) acknowledgment tone. No special re-programming of the PROM chip is required for HIGH SPEED. Only the last 3 digits of the 4 digit subscriber identification code will be sent at LOW SPEED; therefore, to ensure the same identification at HIGH SPEED as at LOW SPEED, program the first digit as a "0" (unless programmed for a 4 digit LOW SPEED transmission to a receiver that can accommodate it).

**NOTE:** For telco message routing provided by orbiting satellite transmission, (e.g., 800/WATS network, long distance), it is required that an extended kissoff wait option be selected. The standard kissoff wait period is 0.5 seconds, whereas the extended kissoff wait period is 1.26 seconds. Check with your local central station before selecting this option. If Ademco's 685 receiver equipment is used, it must be equipped with software REV. 3.7 or later. If another manufacturer's receiver is used, have your central station check with the manufacturer about kissoff wait period compatibility.

As the number of subscribers calling into the central monitoring station increases beyond 1000 (subscriber identification number 999), the No. 685-2 Line Cards can easily be modified to send only the high speed acknowledgment tone. Subsequently connected systems may then be programmed with subscriber numbers 1000 through 9999.

**For the six alarm reporting channels** (digits 5 through 10), the channel status codes are as follows:

Code	Meaning
1	NEW ALARM OR CONDITION (previously unreported)
3	NEW RESTORE (previously unreported)
5	NORMAL (no event since previously reported RESTORE)
6	PREVIOUSLY REPORTED ALARM (OR CONDITION) STILL IN EFFECT

**For the ninth channel (digit 13), the following channel status codes are used:**

2	OPENING REPORT in the previous 8 channels
3	SHUNT REPORT in the previous 8 channels
4	CLOSING REPORT in the previous 8 channels
5	TROUBLE REPORT in the previous 8 channels
6	SYSTEM TROUBLE REPORTS in the previous 8 channels
7	NORMAL - alarms are reported in previous 8 channels
8	NEW LOW BATTERY (will not re-report on subsequent calls and will not send restore) - old high speed format method for reporting system low battery - alarms are reported in the previous 8 channels
9	TEST REPORT - alarms are reported in the previous 8 channels

**NOTE:** Only NEW events: ALARM (or OPENING), or RESTORE (or CLOSING) on any channel or TROUBLE or 24 hour zone SHUNTS or TEST will trigger transmission, at which time all 9 channels will report.

#### Examples (HIGH SPEED format):

- At subscriber #2890, channels 1 through 6 (7 and 8 are not used in this example) are normal and a low battery (channel 9) initiates a call. The following message will be sent:

Subscriber Identification	Channel Number
1 2 3 4 5 6 7 8 9	

Message: 2 8 9 0 5 5 5 5 5 5 5 8  
Channel 9: NEW LOW BATTERY

- At subscriber #5890, channels 2 and 5 go into alarm (and initiate a call) and channel 6, which has previously reported an alarm is still triggered.

Subscriber Identification	Channel Number
1 2 3 4 5 6 7 8 9	

Message: 5 8 9 0 5 1 5 5 1 6 5 5 7  
Channel 2: NEW ALARM  
Channel 5: NEW ALARM  
Channel 6: PREVIOUSLY REPORTED ALARM (still in effect)

- Still at subscriber #5890, following the events of example 2 above, channel 2 restores (initiating the call) and channels 5 and 6 remain in alarm:

Subscriber Identification	Channel Number
1 2 3 4 5 6 7 8 9	

Message: 5 8 9 0 5 3 5 5 6 6 5 5 7  
Channel 2: NEW RESTORE  
Channels 5,6: PREVIOUSLY REPORTED ALARMS (still in effect)

- Subscriber #0135 sends an opening:

Subscriber Identification	Channel Number
1 2 3 4 5 6 7 8 9	

Message: 0 1 3 5 1 2 2 2 2 2 2 2 2  
Channel 1: USER ID - User #1 opened  
Channels 2-9: OPENING REPORT TRANSMITTED

If the same security code is erroneously assigned to more than one code designator: a.) If all are secondary codes (e.g., #3 and #7), the user ID that is the largest code designator for the multiple assignment (e.g., #7) will be transmitted with the opening and closing reports or b.) one is the Master Code, its user ID (#1) will be transmitted at opening and the largest secondary user ID (e.g., #7 if #1, #3 and #7 are so-assigned) will be transmitted at closing.

- After transmission of Example 4, subscriber #0135 sends a closing:

Subscriber Identification	Channel Number
1 2 3 4 5 6 7 8 9	

Message: 0 1 3 5 1 4 4 4 4 4 4 4 4  
Channel 1: USER ID - User #1 closed  
Channels 2-9: CLOSING REPORT TRANSMITTED

- Subscriber #0135, User #1 force arms the system, causing faulted zone 2 be shunted (for the sake of this example, Zone 2 = Channel 3, not a requisite).

Subscriber Identification	Channel Number
1 2 3 4 5 6 7 8 9	

Message: 0 1 3 5 1 4 4 4 4 4 4 4 4 (Closing Report)  
0 1 3 5 5 5 1 5 5 5 5 3 (Shunt Report)

**NOTE:** Shunt reports always accompany closing reports when burglary zones are shunted. If individual zone shunting had been performed prior to arming, the shunt reports would be sent later when the system was armed and the closing report sent. If a 24 hour zone (e.g. fire, panic) were to be individually shunted (if permitted by installer PROM option), the shunt report depicted below would be transmitted immediately. The example below shows a shunt report for Zone 5 reporting in Channel 5.

Subscriber Identification	Channel Number
1 2 3 4 5 6 7 8 9	

Message: 0 1 3 5 5 5 5 5 1 5 5 5 3  
Shunt restores are not transmitted for burglary zones as these zones are known to have been restored when the system is disarmed and the opening report is transmitted. Shunt restores are transmitted for 24 hour zones, however, when the restore takes place.

5 8 9 0	5 3 5 5 5 5 5 5 3
---------	-------------------

- If a trouble condition occurs in Zone 4 for subscriber #5890 and Zone 4 was programmed to report a Code 2, a trouble report is transmitted.

Subscriber Identification	Channel Number
1 2 3 4 5 6 7 8 9	

Message: 5 8 9 0 5 1 5 5 5 5 5 5 5  
Trouble restore is transmitted as soon as it occurs.  
5 8 9 0 5 3 5 5 5 5 5 5 5

- If a system trouble condition occurs, a separate trouble message format exists.

Subscriber Identification	Channel Number
1 2 3 4 5 6 7 8 9	

**For Loss of AC Reporting** (Channel 1 is used)

Message: 0 1 3 5 1 5 5 5 5 5 5 5 6

**For AC Restore**

Message: 0 1 3 5 3 5 5 5 5 5 5 5 6

If the "Low Battery Report in New Format" option has been selected, th battery condition will be reported as follows:

**For Low Battery Reporting** (Channel 2 is used)

Message: 0 1 3 5 5 1 5 5 5 5 5 5 6



# For Low Battery Restoral

Message: 0135 5355 5555 6

## J. SESCOA/RADIONICS REPORTING FORMATS

Like the Ademco Low Speed format, each alarm/trouble/status message reported in SESCOA, Radionics, Radionics "Superfast" and Radionics "BFSK" formats contains a code digit which is PROM assigned to that message. Any digit from the full hexadecimal code set (0-9, B-F) can be used for each of these formats for trouble/status messages (only 1-8 for alarm messages).

**NOTE:** The full hexadecimal code set can also be used with the Ademco low speed format provided that the central station receiver used can decode and display the resulting messages. The Ademco No. 660/673 receiver can only accommodate the code set 1-9.

The Radionics central station receiver can be flagged to print the word "Fire" when it receives an alarm report, in "BFSK" format, if zone four is designated as a fire zone. Fire zone designation for "BFSK" alarm reporting purposes is made in the communicator PROM.

It should be further noted that the following reporting code assignments are required for the Radionics, Radionics "Superfast" and Radionics "BFSK" formats in order to attain the appropriate English language printout and display at the Radionics No. 6000 receiver. They apply as well to the Ademco Low Speed, Radionics, Radionics "Superfast" and Radionics "BFSK" formats for English language printout at the Ademco No. 685 Receiver.

- B = Open
- C = Close
- D = Cancel (if Openings/Closings are not programmed)
- E = Restore
- F = Trouble

BFSK format also requires that extended data reporting be selected in the communicator PROM and that new low battery format be selected in the control PROM.

## IV. INSTALLER PROM PROGRAMMING

The system employs two PROM integrated circuits for selection of system options, one primarily for control characteristics and one totally for communicator characteristics. These PROMs are ordered separately, Ademco No. 691 if blank and will be programmed by the installer or No. 691P3 (control) and No. 691P12 (communicator) if the programming is done by Ademco to customer order. In either case the following feature charts need to be completed as a record of the system configuration.

CUSTOMER NAME \_\_\_\_\_ CUST. NO. \_\_\_\_\_

CUSTOMER ADDRESS \_\_\_\_\_

**NOTE:** Program the numbers that you write into the boxes except for double boxes where you program the number preprinted in a box next to the box you check.

### A. CONTROL PROM

#### Control PROM Data Group 1

To program, set Phone No. Selector Switch to "Secondary" and Rotary Switch to Position 2 (Main Phone No.) on No. 690 PROM Programmer.

1. Entry Delay \*(1) (Select 0-9) ☐ X 15 secs = \_\_\_\_\_
2. Exit Delay\* (2) (Select 0-9) ☐ X 15 secs = \_\_\_\_\_
3. Exterior Alarm Sounder/Primary Communicator Delay (Select 0-9) ☐ X 15 secs = \_\_\_\_\_
4. Alarm Sounder \*(3) (select 0-9) ☐ X 4 mins = \_\_\_\_\_
5. AC Power Fail Reaction Delay (select 0-9) ☐ X 4 mins = \_\_\_\_\_

**NOTES:** Per U.L. Standard 1023 for a listed U.L. household burglary installation:

- \*(1) A maximum of 45 seconds is allowed.
- \*(2) A maximum of 60 seconds is allowed.
- \*(3) A minimum of 4 minutes is allowed.

## 6. Select Zones with Entry/Exit Delay: Check One

Number of Box Checked

Zn 1 = ☐ Zn 2 = ☐ Zns 1, 2 = ☐

Zn 3 = ☐ Zns 1, 3 = ☐ Zns 2, 3 = ☐

Zns 1, 2, 3 = ☐ None = ☐

## 7. Select Fast Response (15 msec) Zones: Check One

Zn 1 = ☐ Zn 3 = ☐ Zns 2, 3 = ☐

Zn 4 = ☐ Zns 2, 4 = ☐ Zns 3, 4 = ☐

Zns 2, 3, 4 = ☐ None = ☐

## 8. Zone 4 Type Selection: Check One

**Alarm Timeout:** Night Burglary = ☐ Fire\*\* = ☐

Day/Night Burglary = ☐

**No Alarm Timeout:** Night Burglary = ☐ Fire\*\* = ☐

Day/Night Burglary = ☐

**\*\*NOTE:** Selection of "No Alarm Timeout" for fire is mandatory for listed U.L. household fire installations per U.L. Standard 985

## 9. Zones 5 and 6 Type Selection: Check One

Zn 5 = Silent Panic (Console Display On), Zn 6 = Burglary: ☐

Zn 5 = Silent Panic (Console Display Off), Zn 6 = Burglary: ☐

Zn 5 = Silent Panic (Console Display On), Zn 6 = Audible Panic: ☐

Zn 5 = Silent Panic (Console Display Off), Zn 6 = Audible Panic: ☐

Zn 5 = Audible Panic, Zn 6 = Burglary: ☐

Zn 5 = Audible Panic, Zn 6 = Audible Panic: ☐

## 10. Alarm Sounder Options: Check One

There are two burglary siren output formats from which to select if the optional No. 4165 Siren Driver is to be used. Format #1 is a rapidly alternating HI/LO sound that is similar to an electronic bell sound. Format #2 is a slowly alternating HI/LO sound that is similar to the sound produced by emergency vehicles in some locales.

The confirmation of arming "ding" is a brief 1/2 second pulse of the exterior alarm sounder to advise the subscriber that the system has set up successfully after he is outside the premises. Primarily for commercial usage, this "Ding" is produced after kissoff (by the central station receiver) if "closing" reporting is programmed or after the exit delay has ended if "closing" reporting is not selected.

The separate A and B designations relate to the selection of the signal polarity of the output on TB1-1. This output presents the system's "arming status" to external controlled devices (e.g. motion detectors, contact identification annunciator). "A" selection yields a 0 Volt output for "Disarmed", a Voltage output for "Armed". "B" selection yields a Voltage output for "Disarmed", 0 Volt output for "Armed."

Burglary Siren Output #1 (Rapid Alt. HI/LO), No Confirmation of Arming "Ding":

A B  
☐ ☐

Burglary Siren Output #2 (Slow Alt. HI/LO), No Confirmation of Arming "Ding":

☐ ☐



Burglary Siren Output #1, Confirmation of Arming "Ding":

2	6
---	---

Burglary Siren Output #2, Confirmation of Arming "Ding":

3	7	
---	---	--

11. Not Used

12. Master Security Code Dominance Selection:

Select 1 if Secondary Security Codes are to be usable at any time or 0 if arming with the Master Code is to inhibit disarming by the secondary codes.

☐

#### Control PROM Data Group 2

To program, set Phone No. Selector Switch to "Primary" and Rotary Switch to Position 2 (Main Phone No.) on No. 690 PROM Programmer.

**\*NOTE:** Select 1-8 for communicator reports; duplicate assignments allowed.

Select 0 if communicator report not desired for a zone.

1. Communicator Alarm Code/Channel\* Assigned to Zone 1:

☐

2. Communicator Alarm Code/Channel\* Assigned to Zone 2:

☐

3. Communicator Alarm Code/Channel\* Assigned to Zone 3:

☐

4. Communicator Alarm Code/Channel\* Assigned to Zone 4:

☐

5. Communicator Alarm Code/Channel\* Assigned to Zone 5:

☐

6. Communicator Alarm Code/Channel\* Assigned to Zone 6:

☐

7. Communicator Alarm Code/Channel\* Assigned to Duress Alarm:

☐

8-12. Not Used.

#### Control PROM Data Group 3

To program, set Phone No. Selector Switch to "Primary" and Rotary Switch to Position 3 (Subs ID #) on No. 690 PROM Programmer.

**Master Security Code** (Select from 0-9 digit set, repeating digits permitted):

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

#### Control PROM Data Group 4

To program, set Rotary Switch to Position 6 ("Inverted") on No. 690 PROM Programmer and raise switches for checked boxes.

**Communicator Report Selection:**  
(check as many as desired)

##### SWITCHES

1 OPEN --- CLOSE	2 SHUNTED ZONES	3 ZONE 4 TROUBLE	4 AC FAIL --- LO BATT
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 CANCEL CODE	6 NOT USED	7 NOT USED	8 NOT USED
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### NOTES:

- Shunted Burglary Zone Report is transmitted at Armed AWAY time. Shunted 24 Hour Zone Report is transmitted immediately.
- Cancel Code is transmitted if a burglary alarm is turned off while the alarm sounder is sounding (not applicable to fire and panic alarms). When a Cancel Code is enabled in this Control PROM, Open/Close reporting must not be selected in this group and an Opening Code must be enabled in PROM Data Group 8 of the Communication PROM (if any format other than Ademco's high speed format is used).
- AC Fail/Low Battery Reporting should be selected if Radionics "BFSK" reporting is used.

#### Control PROM Data Group 5

To program, set Rotary Switch to Position 7 ("16 Sec Delay") and raise switches for checked boxes.

**Secondary 16 second Communicator Report Delay:** (check reports for which desired)

##### SWITCHES

1 ZONE 1	2 ZONE 2	3 ZONE 3	4 ZONE 4
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 ZONE 5	6 ZONE 6	7 ZONE 4 TROUBLE	8 CLOSING REPORT
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### Control PROM Data Group 6

To program, set Rotary Switch to Position 8 ("Secondary # Only") and raise switches for checked boxes.

**Communicator Report to Second Telephone Number ONLY:** (Check reports for which desired)

##### SWITCHES

1 ZONE 1	2 ZONE 2	3 ZONE 3	4 ZONE 4
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 ZONE 5	6 ZONE 6	7 ZONE 4 TROUBLE	8 OPEN/CLOSE AND SHUNTS
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### Control PROM Data Group 7

To program, set Rotary Switch to Position 9 ("Open/Close") and raise switches for checked boxes.

**Miscellaneous Communicator Reporting Selection:** (Check as many as desired)

##### SWITCHES

1 ALL REPORTS ON ONE CALL	2 DURESS ALARM TO 2ND TELCO NO. ONLY	3 AC FAIL, LOW BATTERY, TEST REPORT TO 2ND TELCO NO. ONLY	4 LOW BATT REPORT IN NEW ADEMCO HI SPEED FORMAT
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 NOT USED	6 NOT USED	7 DUAL REPORT	8 ALTERNATE BY PAIRS DIALING
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Control PROM Data Group 8**

To program, set Rotary switch to Position 10 ("Restore") and raise switches for checked boxes.

**Central Station Restore Reports:** (check as many as desired)

**SWITCHES**

1	2	3	4
ZONE 1	ZONE 2	ZONE 3	ZONE 4
5	6	7	8
ZONE 5	ZONE 6	ZONE 4 TROUBLE	NOT USED

**NOTE:** This selection is only relevant if Local Restore for Multiple Alarm Sounding has been selected (see PROM Data Group 11)

**Control PROM Data Group 9**

To program, set Rotary Switch to Position 11 ("Not Used") and raise switches for checked boxes.

**Permit Forced Arming Shunt**

**SWITCHES**

1	2	3	4
ZONE 1	ZONE 2	ZONE 3	ZONE 4
5	6	7	8
ZONE 5	ZONE 6	NOT USED	NOT USED

**NOTE:** User-permissible shunting of zones that are to be used as 24 hour zones (i.e. Fire or Emergency/Panic) should NOT be PROM enabled during programming if the central monitoring station has already standardized on reporting of Fire as Code 1 and Emergency/Panic as Code 2 (using low speed or high speed reporting). This will ensure proper communicator reporting of shunts.

If the above described standardization does not exist and Zone 4 (if used for fire) and zone 5 (or 6 if used for emergency/panic) can be reported as Codes 4 and 5 respectively, this warning does not apply).

**Control PROM Data Group 10**

To program, set Rotary Switch to Position 12 ("Not Used") and raise switches for checked boxes.

**Permit Individual Keypad Shunt**

**SWITCHES**

1	2	3	4
ZONE 1	ZONE 2	ZONE 3	ZONE 4
5	6	7	8
ZONE 5	ZONE 6	NOT USED	NOT USED

**NOTE:** See NOTE under PROM Data Group 9.

**Control PROM Data Group 11**

To program, set Rotary Switch to Position 13 ("Not Used") and raise switches for checked boxes.

**Local Restore for Sounding of Multiple Alarms in an Armed Period**

**SWITCHES**

1	2	3	4
ZONE 1	ZONE 2	ZONE 3	ZONE 4
5	6	7	8
ZONE 5	ZONE 6	NOT USED	NOT USED

**Control PROM Data Group 12**

To program, set Rotary Switch to Position 14 ("Not Used") and raise switches for checked boxes.

**Delay Exterior Alarm Sounding and Central Station Reporting for Period Defined Previously**

**SWITCHES**

1	2	3	4
ZONE 1	ZONE 2	ZONE 3	ZONE 4 (ONLY IF BURG ZONE)
5	6	7	8
NOT USED	ZONE 6 (ONLY IF BURG ZONE)	NOT USED	NOT USED

**B. COMMUNICATION FROM****Communication PROM Data Group 1**

To program, set Phone No. Selector Switch to "Primary" and Rotary Switch to Position 1 (Access #) on No. 690 PROM Programmer

**Primary PABX Access Number\*** (Select from 0-9, Up to 4 digits):

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------

(e.g., 9)

**Communication PROM Data Group 2**

To program, set Phone No. Selector Switch to "Secondary" and Rotary Switch to Position 1 (Access #) on No. 690 PROM Programmer.

**Secondary PABX Access Number\*** (Select from 0-9, Up to 4 digits):

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------

**Communication PROM Data Group 3**

To program, set Phone No. Selector Switch to "Primary" and Rotary Switch to Position 2 (Main Phone No.) on No. 690 PROM Programmer.

**Primary Telco Number\*** (Select from 0-9, Up to 12 digits):

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------

[eg: Out of Area Access digit (1), Area Code, Exchange, Line Number]

**Communication PROM Data Group 4**

To program, set Phone No. Selector Switch to "Secondary" and Rotary Switch to position 2 (Main Phone No.) on No. 690 PROM Programmer.

**Secondary Telco Number\*** (Select from 0-9, up to 12 digits):

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------

**\*NOTES:** 1. Trailing blanks are permissible for entries less than the maximum number of digits but leading or intermediate blanks are NOT allowed.

2. In certain Telco networks (G.T.& E.), it may be necessary to program an 11 in the position immediately following the last digit of the Telco number. See Note on Page 6 for details.

**Communication PROM Data Group 5**

To program, set Phone No. Selector Switch to "Primary" and Rotary Switch to Position 3 (Subs ID#) on No. 690 PROM Programmer.

Primary Subscriber ID\*\* (Select from 0-9):

**\*\*NOTE:** All 4 digits must be filled in. The leading digit is **not** transmitted for Ademco Low Speed, SESCOA, and Radionics. Unless a four digit low speed subscriber I.D. is selected, only the last 3 digits are transmitted.

**Communication PROM Data Group 6**

To program, set Phone No. Selector Switch to "Secondary" and Rotary Switch to Position 3 (Subs ID#) on No. 690 Programmer.

Secondary Subscriber ID\*\* (Select from 0-9):

   
**Communication PROM Data Group 7**

To program, set Rotary Switch to Position 4 ("Not Used") and raise switches for checked boxes representing bits set within the hexadecimal code.

**Ademco Low Speed/SESCOA/Radionics Reporting Codes for Trouble and Trouble Restore** (Select from 0-9, B-F)

<input type="text"/> **Trouble				<input type="text"/> **Trouble Restore			
1	2	3	SWITCHES 4	5	6	7	8
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bit Weights 1	2	4	8	1	2	4	8

(eg: 7 = 1 + 2 + 4, B = 1 + 2 + 8, C = 4 + 8, D = 1 + 4 + 8, see page 14)

**Communication PROM Data Group 8**

To program, set Rotary Switch to Position 5 ("Sys Options") and raise switches for checked boxes representing bits set within the hexadecimal code.

**Ademco Low Speed/SESCOA/Radionics Reporting Codes for Opening and Closing** (Select from 0-9, B-F)

<input type="text"/> **Opening*				<input type="text"/> **Closing*			
1	2	3	SWITCHES 4	5	6	7	8
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bit Weights 1	2	4	8	1	2	4	8

**NOTES:** \*1. When a Cancel Code has been enabled (PROM Data Group 4, bit #5 of the Control PROM) an Opening Code must also be enabled here in PROM Data Group 8.

\*\*2. The code assignments shown on page 8 are required

here in PROM Data Group 7 and 8 if English language printout is required at the Ademco 685 or Radionics 6000/6500 Receivers for the Ademco Low Speed, Radionics, Radionics "Superfast" and Radionics "BFSK" formats.

**Communication PROM Data Group 9**

To program, set Rotary Switch to Position 6 ("Inverted") and raise switches for checked boxes representing bits set within the hexadecimal code.

**Maximum Number of Attempts to Dial** (Select from 1-15, defaults to 8 if not programmed)

<input type="text"/> Number of Attempts (1-15)							
1	2	3	SWITCHES 4	5	6	7	8
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bit Weights 1	2	4	8	NOT USED*			

**\*NOTE:** Switches 5-8 must be in down position.

### Communication PROM Data Group 10

To program, set Rotary Switch to Position 7 ("16 sec Delay") and set switches for checked boxes as indicated.

Acknowledge Characteristics and Reporting Formats for Communication to PRIMARY Telco Number (check as desired):

	1	2	3	4	5	6	7	8
	ACK WAIT	FORMAT SELECTION FOR ACKNOWLEDGE	DATA FREQUENCY FOR LOW SPEED ONLY *	DIGIT TIME *	DATA SPEED		CHECK-SUM VERIFICATION (Ademco High Speed, Radionics, Radionics Superfast) *	LOW SPEED FORMAT SELECTION
BIT SET (RAISE SWITCH)	EXTENDED, 60 SECS.	ADEMCO HIGH SPEED TRANSMISSION	ADEMCO	SESCOA	ADEMCO, SESCOA, RADIONICS	ADEMCO, RADIONICS "BFSK"	SINGLE MESSAGE w/CHECK-SUM VERIFICATION	EXTENDED DATA REPORTING, RADIONICS "BFSK"
BIT NOT SET (SWITCH DOWN)	STANDARD, 30 SECS.	ADEMCO HIGH OR LOW SPEED TRANSMISSION	SESCOA, RADIONICS, RADIONICS SUPERFAST	ADEMCO, RADIONICS, RADIONICS SUPERFAST	RADIONICS SUPERFAST, RADIONICS "BFSK"	RADIONICS SUPERFAST, SESCOA, RADIONICS	STANDARD 2 MESSAGE VERIFICATION	STANDARD

\*The state of these PROM bits will have no effect on Radionics "BFSK" transmissions if "DATA SPEED" is set to the BFSK option.

### Communication PROM Data Group 11

To program, set Rotary Switch to Position 8 ("Secondary # Only") and set switches for checked boxes as indicated.

Acknowledge Characteristics and Reporting Formats for Communication to SECONDARY Telco Number (check as desired):

	1	2	3	4	5	6	7	8
	ACK WAIT	FORMAT SELECTION FOR ACKNOWLEDGE	DATA FREQUENCY FOR LOW SPEED ONLY *	DIGIT TIME *	DATA SPEED		CHECK-SUM VERIFICATION (Ademco High Speed, Radionics, Radionics Superfast) *	LOW SPEED FORMAT SELECTION
BIT SET (RAISE SWITCH)	EXTENDED, 60 SECS.	ADEMCO HIGH SPEED TRANSMISSION	ADEMCO	SESCOA	ADEMCO, SESCOA, RADIONICS	ADEMCO, RADIONICS "BFSK"	SINGLE MESSAGE w/CHECK-SUM VERIFICATION	EXTENDED DATA REPORTING, RADIONICS "BFSK"
BIT NOT SET (SWITCH DOWN)	STANDARD, 30 SECS.	ADEMCO HIGH OR LOW SPEED TRANSMISSION	SESCOA, RADIONICS, RADIONICS SUPERFAST	ADEMCO, RADIONICS, RADIONICS SUPERFAST	RADIONICS SUPERFAST, RADIONICS "BFSK"	RADIONICS SUPERFAST, SESCOA, RADIONICS	STANDARD 2 MESSAGE VERIFICATION	STANDARD

\*The state of these PROM bits will have no effect on Radionics "BFSK" transmissions if "DATA SPEED" is set to the BFSK option

### Communication PROM Data Group 12

To program, set Rotary Switch to Position 9 ("Open/Close") and set switches for checked boxes as indicated.

Dialing and Reporting Characteristics Selection (Check as desired):

	1	2	3	4	5	6	7	8
	LOW SPEED FORMAT SUBS ID	CHECK SUM VERIFY (LO SPEED)	ADEMCO HI SPEED KISSOFF DELAY **	30 SECOND ANTI-JAM *	DIAL PULSE RATIO	TYPE OF DIALING	EXTENDED DIAL TONE WAIT	NOT USED
BIT SET (RAISE SWITCH)	ENABLE 4 DIGIT SUBS ID	YES	1.26 SECS (800 NETWORK/ LONG DLY.)	YES	FOREIGN (67/33)	TOUCH TONE	30 SECS	
BIT NOT SET (SWITCH DOWN)	ENABLE 3 DIGIT SUBS ID	NO	500 MSEC (LOCAL LINES)	NO	U.S. / CANADA (60/40)	PULSE DIAL	USE SW 8 SETTING IN GROUP 13	✓

\*and\*\*: See Notes on next page.

\*Should be enabled on all telco networks which have called party disconnect (hanging up the phone for a period of time will cause disconnect of an incoming call)

\*\*The extended delay should only be used when orbiting satellites are used to relay telco transmissions and an Ademco 685 Receiver, Software Revision 3.7 or higher is used. When other receivers are used, consult with the manufacturer.

### Communication PROM Data Group 13

To program, set Rotary Switch to Position 10 ("Restore") and set switches for checked boxes as indicated.

Dialing and Reporting Characteristics Selection (Check as desired):

	1	2	3	4	5	6	7	8
	DATA TONE FREQUENCY	INTERDIGIT TIME	2ND SUB-SCRIBER ID TO 2ND TFLCO NO	UNLIMITED ATTEMPTS TO REACH C.S	NOT USED			NORMAL DIAL TONE WAITS
BIT SET (RAISE SWITCH)	1890Hz FOREIGN	OTHER (840 MSEC)	YES	YES				5 SECS
BIT NOT SET (SWITCH DOWN)								
	1900Hz U.S. (STANDARD)	U.S. (840 MSEC)	NO	NO. USE NUMBER SET PREVIOUSLY	✓	✓	✓	11 SECS

\*Only effective if Switch 7 in PROM Data Group 12 was down when that Data Group was programmed.

### Communication PROM Data Group 14

To program, set Rotary Switch to Position 11 ("Not Used") and raise switches for checked boxes representing bits set within the hexadecimal code.

Ademco Low Speed/SESCO/Radionics Reporting Codes for Loss of A.C. and Alarm Restore (Select from 0-9, B-F)

Loss of A.C.				Alarm Restore			
1	2	3	4	5	6	7	8

Bit Weights 1 2 4 8 1 2 4 8

\*NOTE: An entry is mandatory for these codes (e.g. 9) in the indicated formats, even though there is no interest in receiving these reports.

### Communication PROM Data Group 15

To program, set Rotary switch to Position 12 ("Not Used") and raise switch 4 if box is checked.

Fire Zone Designation for "BFSK" alarm reporting (check if zone four is selected as a fire zone)

1	2	3	4	5	6	7	8
ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	ZONE 6	NOT USED	NOT USED

### Communication PROM Data Group 16

To program, set Rotary Switch to Position 13 ("Not Used") and raise switches for checked boxes representing bits set within the hexadecimal code.

Ademco Low Speed/SESCO/Radionics Reporting Codes for Zone Bypass and Bypass Restore (Select from 0-9, B-F)

Zone Bypass				Bypass Restore			
1	2	3	4	5	6	7	8

Bit Weights 1 2 4 8 1 2 4 8

\*See note below next group.

### Communication PROM Data Group 17

To program, set Rotary Switch to Position 14 ("Not Used") and raise switches for checked boxes representing bits set within the hexadecimal code.

Ademco Low Speed/BESCOA/Radionics Reporting Codes for Test and Low Battery (Select from 0-9, B-F)

* <input type="checkbox"/> Test				* <input type="checkbox"/> Low Battery			
1		2		3		4	
5		6		7		8	
1		2		4		8	

\*NOTE: An entry is mandatory for these codes (e.g. 9) in the indicated formats, even if there is no interest in receiving these reports.

### Hexadecimal Coding Chart

Code	Bit Weight			
	1	2	4	8
0(10)		✓		✓
1	✓			
2		✓		
3	✓	✓		
4			✓	
5	✓		✓	
6		✓	✓	
7	✓	✓	✓	

	Bit Weight			
	1	2	4	8
8				✓
9	✓			✓
B(11)	✓	✓		✓
C(12)			✓	✓
D(13)	✓		✓	✓
E(14)		✓	✓	✓
F(15)	✓	✓	✓	✓

**CAUTION:** Throughout these reporting selections, the ability to select full Hexadecimal reporting codes is indicated. Make sure that the receiver, into which your signals are being reported, is capable of accommodating such reporting. For example, the Ademco No. 660/673 is only capable of accepting 1-9 for all reporting codes.

## V. INSTALLATION AND WIRING

### A. INSTALLATION AND WIRING, NO. 4160-12 C-COM

To assure proper system checkout with a charged battery, connect the battery to the red and black wires on the control's circuit board and then connect the transformer to the control and to a 110V outlet (see Diagram 9). Control need not be mounted but should be grounded. Do not insert PROMs or connect console at this time. Battery will charge while the installation is being wired. REMOVE ALL POWER, AC AND BATTERY, BEFORE CONNECTIONS ARE MADE TO CONTROL TERMINALS as instructed below. Use of twisted wiring is recommended for all runs, for greater immunity to unwanted induced voltages.

#### 1. TERMINALS: (See Diagram 9)

##### TB1

##### Terminals

**1 System Arming Status Output:** This terminal provides an output that can be used to control space protection devices such as those in the 650 series (Passive Infrared). See the individual instructions accompanying these devices.

The polarity of this output is settable in PROM (LO = ARM, HI = DISARM or HI = ARM, LOW = DISARM)

**2 Red LED Output (LO = ARM):** This output provides system arming status data to the Red LED on remote Keyswitch arming stations (e.g. Nos. 9787, 9789). A steady output is produced to indicate that the system is armed either "AWAY" or "STAY" and a flashing output is produced as a memory of alarm indicator. Up to four Key arming stations can be supported (30 MA MAX.)

##### 3 Not Used

**4 Loop Status Output (HI = READY):** This output provides zone status data to the Green LED on remote Keyswitch arming stations (e.g. Nos. 9787, 9789). A steady output is produced to indi-

cate that all zones are intact. Up to four Key arming stations can be supported (30 MA MAX.)

**5 Test Mode Select Input (LO = ON):** When this terminal is connected to circuit ground (e.g. TB1-7), a test call to the central station is initiated with the Test Code as the report (independent of whether the system is armed or not). In addition, the system is placed in a test mode (if the system is disarmed and no memory of alarm is present) in which activation of any zone causes a brief 1/2 second sounding from the exterior alarm sounder(s), as well as visual zone annunciation on the console's zone identification display and on the appropriate C-COM zone LED (all but zone 5). If the Test Mode is not manually terminated, the system will automatically come out of the Test Mode after 30 minutes.

**6 Arm/Disarm Input (Momentary HI to ARM or DISARM):** This input is normally provided by remote key arming stations (e.g. Nos. 9787, 9789) for the purpose of arming or disarming the system. If the zone status indicates an open zone and arming is desired in spite of the open zone, maintaining this input HI for 5 seconds causes forced arming of the system (automatic shunting of the open zone).

Once the system is disarmed, the silencing of any remaining trouble or alarm memory sound is accomplished by reactivating this HI input. As long as conditions remain that need to be cleared, activation of a key arming station cannot rearm the system, only reset the interior audible annunciations. Up to four arming stations can be supported by the system.

#### 7 & 8 Circuit Ground (-) Return

## TB2

### Terminals

- 1,3 Incoming Telco Line Pair:** Connect TB2-1 to the GREEN lead and TB2-3 to the RED lead on the No. 620 RJ31X Direct Connect Cord. Do not connect the latter cord to the RJ31X jack until all wiring in the system has been completed.

**2 Not Used**

- 4,5 Internal Handsets:** Connect TB2-4 to the BROWN lead and TB2-5 to the GRAY lead on the No. 620 RJ31X Direct Connect Cord.

- 6,7 ZONE 1 Burglary Protection Zones:** For each zone, run a pair of wires from that zone's terminals to all protection points in the zone and terminate with a 1000 ohm End-of-Line Resistor (supplied). Each loop has normal (250 msec) response to open and closed circuit devices such as mats magnetic contacts, foil, etc. Zones 2 and 3 are PROM programmable for fast response (15 msec) to quick acting devices such as vibration contacts and photoelectric units without built-in delay.

If zone not used, connect 1000 ohm resistor across its terminals.

**NOTE:** If fast response is programmed, that zone should not contain devices with exposed metallic contacts (to lessen the chance of false alarm).

All three of these zones may be programmed for entry/exit delay. Zone 3 (Interior) is not armed when the system is armed in the "STAY" mode.

An open or short in these zones will cause an alarm (instant or delayed, as a function of programming and mode selected) when the system is armed.

As cited previously, open circuit devices, such as mats, are directly usable between the wires of each zone (Do not use an Ademco No. 602 Mat Coupler).

Maximum permissible resistance in each zone: 600 ohms (plus 1000 ohm End-of-Line Resistor).

**10,11 ZONE 4 Fire Zone, Normal Burglary Zone, or Day/Night Burglary Zone**

If zone not used, connect 1000 ohm resistor across its terminals.

This zone may be PROM programmed for any of the above attributes.

**As a Burglary Zone,** it has attributes similar to Zones 1-3. It is programmable for fast response (15 msec). As a day/night zone, it is unique in that a fault during the disarmed period will produce latched audible and visual trouble annunciation at both the console and the keypad and visual annunciation at the C-COM. Optional transmission of a trouble signal to a central station can be programmed.

**If used as a fire protection zone,** run the supervised fire detection loop from these two terminals to all U.L. Listed thermostats, smoke detectors, combustion detectors or other detection devices to be used. Runs of up to 500 feet may be made with #22 wire. Run one continuous loop (no branches) through all devices, connecting any trouble relay contacts in series with the loop and normally open alarm contacts across the loop's two wires. At the last device, terminate the loop with the furnished 1000 ohm End-of-Line Resistor and a BRK No. A7771600 Supervisory Module, as shown in the instructions for the smoke detector. Maximum permissible resistance in the zone is 600 ohms (plus the 1000 ohm End-of-Line Resistor). The fire zone will detect trouble for an open in the zone and alarm for a short across the zone. A separate console LED annunciates a FIRE alarm.

**NOTE:** Low current smoke and/or combustion detectors such as the BRK Nos. BK2812, 2812TH, or 1812 should be used. NFPA Standard No. 74 requires the use of at least one smoke or combustion detector in every residential installation.

- 12,13 ZONE 5 Police Panic Zone:** These terminals provide an additional means to activate the POLICE panic alarm that can be triggered by simultaneous depression of the two POLICE keys on the console. Connect open circuit momentary switches (e.g. 219, 273, 4024, 4026) in parallel across these terminals or closed circuit momentary switches (e.g. Nos. 273, 4024, 4026) in series with these terminals. At the last switch, terminate the loop with the furnished 1000 ohm End-of-Line Resistor.

If zone not used, connect 1000 ohm resistor across its terminals.

The zone is PROM programmable for either audible or silent alarm. A separate PROM programming option is whether or not the console should be inhibited from indicating the silent alarm (e.g. inhibit for hold-up but permit indication if used for personal emergency).

Maximum permissible resistance in the zone is 600 ohms (plus the 1000 ohm End-of-Line Resistor). This zone has a normal response (250 msec) to activations.

**13,14 ZONE 6 Emergency or Burglary Protection Zone**

If zone not used, connect 1000 ohm resistor across its terminals.

This zone may be PROM programmed as a 24 hour audible EMERGENCY zone, in which case it provides an additional means to activate the emergency alarm that can be triggered by simultaneous depression of the two EMERG keys on the console. Connect open circuit momentary switches (e.g. Nos. 219, 273, 4024, 4026) in parallel across these terminals or closed circuit momentary switches (e.g. Nos. 273, 4024, 4026) in series with these terminals.

This zone may alternatively be PROM programmed as a night burglary protection zone. It has attributes similar to Zones 1-3. The zone is strictly an instant alarm zone (not programmable for delay). When the zone is programmed for burglary protection, the EMERG keys on the console are not usable.

The zone has normal response (250 msec) to alarm activations. At the last device, terminate the loop with the furnished 1000 ohm End-of-Line Resistor. Maximum permissible resistance in the zone is 600 ohms (plus the 1000 ohm End-of-Line Resistor).

- 15 Console/Keypad Data Input:** This terminal is one of the four wire connection points (GREEN) for remote keypads and security consoles. Data entered from the keypads on these units is fed into the C-COM at this terminal.

- 16 Circuit Ground (-) Return:** This terminal is one of the four wire connection points (BLACK) for remote keypads and security consoles.

- 17 Console/Keypad Data Output:** This terminal is one of the four wire connection points (YELLOW) for remote keypads and security consoles. Data from the C-COM to activate displays and audible sounding is fed to the keypads and consoles from this terminal.

- 18 Circuit Ground (-) Return**

- 19 Switched Power Output:** This terminal provides a HI output (5 MA. MAX) when communication is underway, for control of a listen-in device or for activation of a remote LED.

- 20 6.5 Volt Continuous Power (+) for Powering Remote Keypads and Security Consoles:** 500 mA MAX. (from same current pool as TB3-3 and TB3-5)

## TB3

### Terminals

- 1,2 External Siren Speaker (optional):** Nos. 705-8 or 713 speakers or other like 8 ohm speakers may be used. This output is only active if the optional plug-in No. 4165 Siren Driver is added to the system. The output is driven by 12 volts while AC is present and when AC is absent and operation is from the standby battery. Up to 25 watts of power may be delivered to the siren speaker(s). Speakers may be connected singly or in parallel (for concentrated sound intensity) at full output voltage or in series (for reduced sound intensity but spread over a wider area) with each speaker receiving half voltage. Diagram 1 indicates the allowable speaker configurations for staying within the siren driver's power limit capability.

**NOTE:** This output will be produced in both the System Test and the Fire Test Modes.



ALLOWABLE SPEAKER CONFIGURATIONS		
No. 705-8 737-10  (8 OHM, 10W)	No. 705-820 737-20  (8 OHM, 20W)	No. 713   (8 OHM, 30W)
B,C	A,B,C	A,B,C

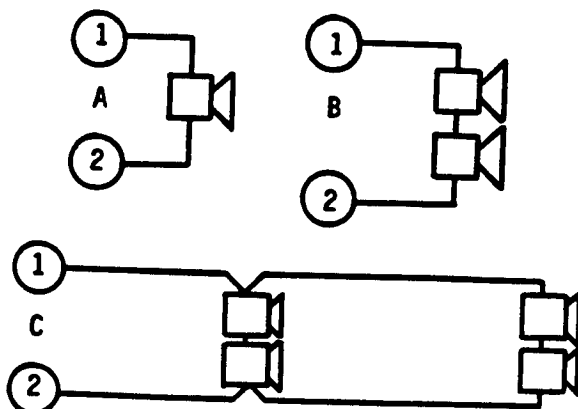


Diagram 1. SIREN SPEAKER CONFIGURATIONS

3(-), 4(+) 12V.DC power for Smoke (Nos. BK-2812 or BK-2812TH) or Combustion (No. BK-1812) Detectors (interruptible by the FIRE TEST/RESET switch). Observe polarity. Use wire sizes in accordance with the following tabulation and connect the power terminals of the detectors in parallel:

SMOKE OR COMBUSTION DETECTOR POWER WIRING			
Maximum distance to farthest detector	Number of No. BK-2812 BK-2812TH and/or BK-1812's		
	1 or 2	3 to 6	7 to 10
100 feet	#22	#22	#20
200	#22	#20	#18
300	#22	#18	#16
500	#20	#16	.

\*Use separate power runs for up to 6 detectors each.

**NOTE:** Do not exceed the auxiliary total output current limitations described under SPECIFICATIONS.

5(+), 6(-) Continuous 12V.DC Auxiliary Power for Accessories: Observe polarity. These terminals provide power for accessories such as space protection devices, e.g. ultrasonic or passive infrared detectors, photo-electrics, etc.

The total combined current drain from these terminals, the smoke detector power terminals (3,4) and TB2-20 must not exceed 1000mA. (See SPECIFICATIONS).

7(+), 8(-) Alarm Bell Voltage: These terminals provide 12V.DC during an audible alarm, at a drain of up to 2A. This output is steady for burglary and audible panic and pulses for fire.

**NOTE:** This output will be produced in both the System Test and the Fire Test Modes.

9 Cabinet Ground (-): Connect this terminal to the GREEN wire secured to the free side of the PC board mounting bracket and thence to a good earth ground (cold water pipe or electrical box ground is frequently satisfactory for this usage, but in some locales is not). This connection is critical to enhancing the immunity of the system to unwanted induced voltages.

10, 11 Power Input, 18V.AC: Connect these terminals to the secondary output terminals of the No. 1323 Transformer.

Do not plug in the transformer yet, or connect the battery.

## 2. ADDITIONAL CONNECTION POSTS (See Diagram 9)

These posts are provided to permit the connection of accessory devices (such as the No. 674 Select-A-Line and the No. 675 Ground Start Module) that require special signals.

**GROUND START OUTPUT POST:** An output point to provide a momentary input (until dial tone is obtained) to a No. 675 Ground Start Module which causes its relay to momentarily ground the incoming phone line for the purpose of obtaining a dial tone out board of a PBX.

**ALTERNATE TELCO LINE OUTPUT POST:** An output point that only provides an alternate line selection request to a No. 674 Select-A-Line if there is a failure to receive "Kisoff" from the primary telco line receiver. If there is a failure to receive "Kisoff" on the first attempt, this output will request service from the alternate phone line. If there is a failure to receive "Kisoff" on the alternate phone line, this output will switch back to primary line selection. If a No. 659 Telco Line Fault Monitor is used and detects a line cut, it will override the alternate line selection described here and maintain transmission on the intact line (a No. 659 will require power from terminal TB2-20).

**GROUND (-) POST:** Circuit Ground (-) Return.

3. **LONG RANGE RADIO CONNECTOR** Provides serial data communication to the 7621SE Long Range Radio Serial Data Interface Unit.

4. **GREEN FLYING LEAD**, positioned alongside TB3-9, is provided as an accessory earth ground connection.

## B. INSTALLATION, No. 4165 SIREN DRIVER

The No. 4165 Siren Driver, if used, must be installed behind the C-COM's circuit board as follows (see Diagrams 5 and 9):

1. Mount the 3 standoffs, provided with the No. 4165, to the component (connector) side of the No. 4165's circuit board. Use the 3 holes indicated in Diagram 5, and 3 of the 6 screws provided.
2. Carefully remove the C-COM's circuit board from the cabinet and plug the No. 4165's connector into the mating connector on the rear of the circuit board.
3. Secure the No. 4165 by fastening its standoffs to the 3 holes in the C-COM's circuit board with which they line up. Use the 3 remaining screws.
4. Carefully replace the C-COM's circuit board in its cabinet.

## C. INSTALLATION AND WIRING, NO. 5321 SECURITY CONSOLE(S)

1. Select a location for the console that will be convenient for the entering of system commands and the receiving of the various visual and audible system signals.
2. Run wiring for connection of the console to the Control/Communicator. Use a 4 wire run (See Diagram 2). A second console (if used) may be connected in parallel with the first, as indicated in Diagram 2, with a separate wiring run from the Control/Communicator.

For runs of less than 100 feet, 4 #22 conductors may be used. For longer runs, the wire size to be used depends upon the distance from the C-COM. Use the following table to determine the correct wire size.

DISTANCE TO C-COM	WIRE SIZE
100'	#22
100' to 200'	#20
200' to 300'	#18

**NOTE:** Twisted pairs are recommended for greater immunity to unwanted induced voltages.

3. Mount the console as follows: Snap off the front cover of the console, after pushing in the lower tab. Move up the keypad retaining tab above the keypad illumination bulb to free the keypad and PC board assembly. Remove the assembly. Disconnect the speaker cable by unplugging the brown connector from the PC board. Slide out the transmitter data drawer to expose one of the mounting holes and use the back of the console as a template to locate the 3 screw mounting holes (2 keyslot) and the wiring access hole. Drill the necessary holes, route the wiring in the wall through the access hole and mount the back of the console. Splice the wire run to the console's wires and plug in the speaker cable. Push the interface wiring back into the wall and snap in the keypad and PC board assembly. Snap on the front cover.

Alternatively, if mounting with only two screws via the keyslot holes on the back of the unit is acceptable, the mounting template supplied with the unit may be used to locate the two holes and the wiring access hole. In this case, the PC board need not be removed.

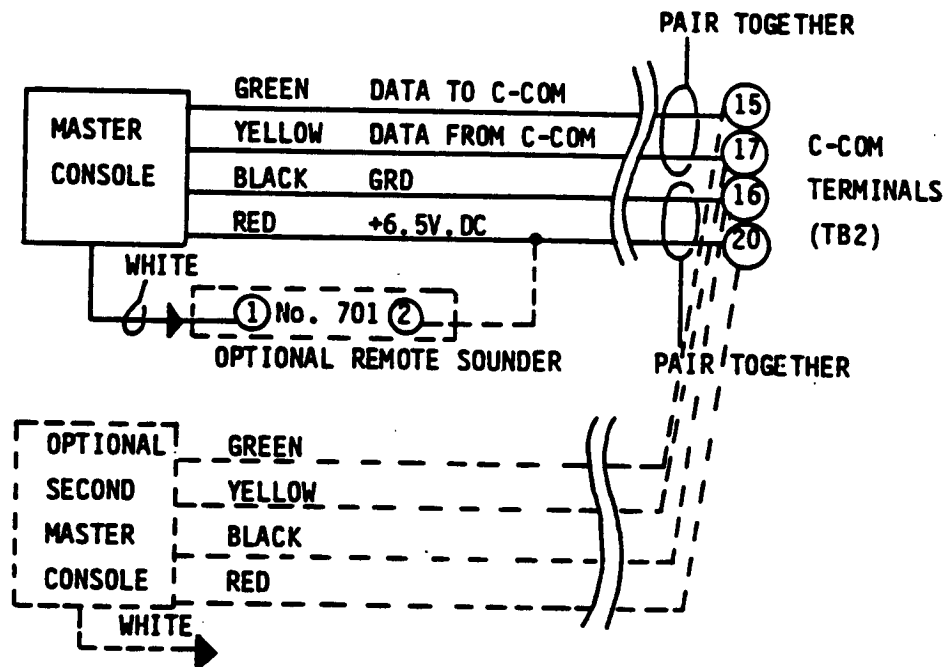


Diagram 2: CONSOLE CONNECTIONS

#### D. INSTALLATION AND WIRING, NO. 5314 REMOTE KEYPAD(S)

1. Select the locations for the remote keypads that will be convenient for the entering of system commands and the receiving of the various visual and audible system signals.
2. Remove the front cover of the Keypad by squeezing its sides near the top or bottom and pulling outward.
3. Remove the PC board by spreading the two plastic retaining tabs located near the center of the board's side edges. SEE OPTIONAL STEP 10.
4. Use the back of the case as a template to mark the two mounting holes and the cable access slot.
5. Cut an opening in the wall, within the marked location for the cable access slot, for wiring from the Control/Communicator.
6. Mount the back of the case to the wall.
7. Bring the wires through the access slot and splice the remote Keypad's 4-wire cable to the control/communicator wiring in accordance with Diagram 3. The control/communicator is assumed to be already connected and capable of supplying power, but not yet powered.

Unlike the security consoles, the remote keypads can be daisy chained together up to the maximum number of keypads supported (4) and their wire run should be separate from the run to a security console.

For runs of less than 100 feet, 4 #22 conductors may be used. For longer runs, the wire size to be used depends upon the distance from the C-COM. Use the following table to determine the correct wire size.

DISTANCE TO C-COM	WIRE SIZE
To 100'	#22
100' to 200'	#20
200' to 300'	#18

**NOTE:** Twisted pairs are recommended for greater immunity to unwanted induced voltages.

8. Remount the PC board by snapping it into its retaining tabs. Push any excess cable back into the wall.
9. Snap the front cover onto the back of the unit.
10. **OPTIONAL.** If it is desired to mount a Keypad side-by-side with one or more Contact Identification Annunciators, a metal locking plate is provided to couple units together. THIS PLATE, IF USED, MUST BE MOUNTED SUBSEQUENT TO STEP 3 OF THIS "INSTALLATION AND WIRING" SECTION.
  - a. Position the plate in the molded recessed walls on the backs of two adjacent case backs, with its locking tabs inserted through the slots in the case backs.
  - b. Bend the plate's four central tabs from the inside of the case backs, thus locking the backs together.

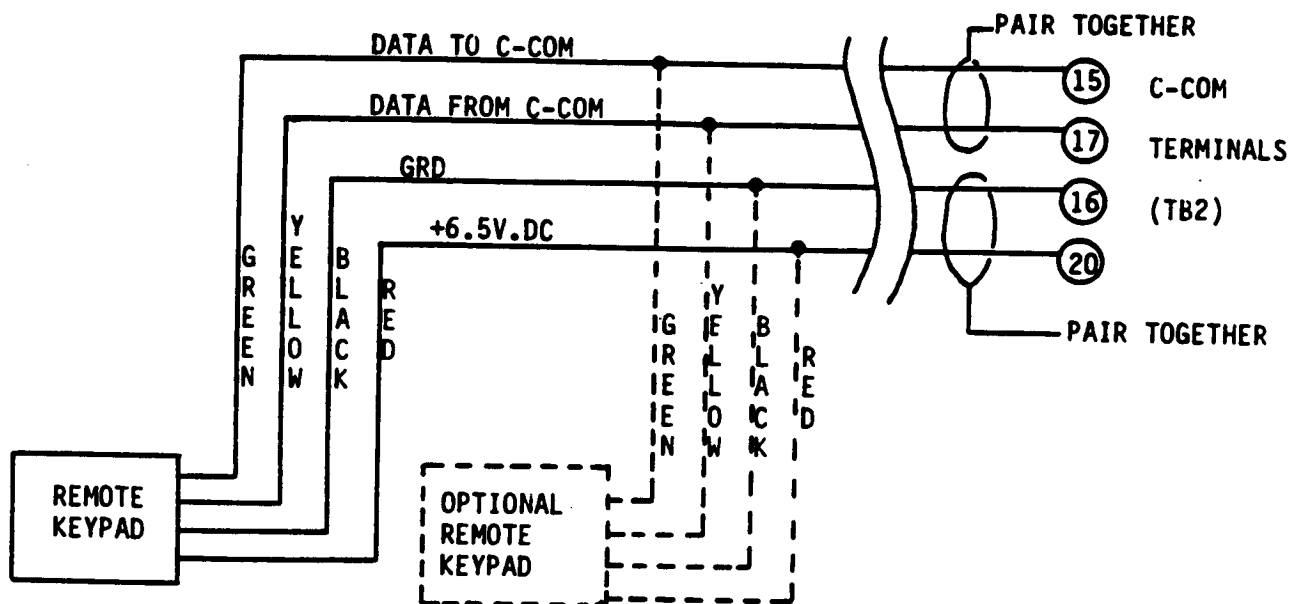


Diagram 3. KEYPAD CONNECTIONS

## VI. SYSTEM CHECKOUT

Perform these tests after the wiring and option selections desired in the previous sections have been completed.

1. **Install both the control and the communicator PROMs** (No. 691) into their respective sockets (see Diagram 4) after making certain that there is no power going to the system. Take care to align the PROM orientation marks. Install the PROMs using the No. 692 Insertion Tool.

2. **Connect the telephone line and handsets via a No. 620 Direct Connect Cord** (See Diagram 9).

3. **Connect the batteries** by connecting the black circuit board wire FAST-ON to the (-) terminal of a battery. Connect the red circuit board wire FAST-ON to the (+) terminal of the other battery. Connect the FAST-ON jumper provided between the (+) and (-) of the two batteries. See Diagram 9. (See note in GENERAL SPECIFICATIONS Section A2 regarding alternative use of Gel type battery.) Rapid beeping will occur, 0 will briefly appear on the console display at the upper right, and the READY light will go on. Enter the security code and OFF to stop the beeping.

4. **Plug the transformer into a 110V.AC outlet that is ON 24 hours a day.** The POWER LED will light on the Security Console and on the C-COM.

5. **Observe the Digital Display on the Security Console after depressing the READY Key.** Nothing will appear if the protective loops are properly wired and all contacts are properly set. Similarly, none of the zone status LEDs on the C-COM will be lit.

6. **With no alarm or trouble being indicated, do the following and observe the response:**

a. **Open each of the burglary zones momentarily, one at a time.** The appropriate zone number should appear on the Security Console Zone I.D. Display and the appropriate zone LED should light on the C-COM while the zone is open.

b. **Short each of the burglary zones momentarily, one at a time.** The appropriate zone number should appear on the Security Console Zone I.D. Display and the appropriate zone LED should light on the C-COM while the zone is shorted.

**NOTE: If Zone 4 has been set up as a Day/Night Zone** (trouble by day, alarm by night), the above actions will also cause the CHECK display to light on the Security Console, the CHK.BYP LED on any Remote Keypad (if used) to light, and the Zone 4 TRBL LED on the C-COM to light. In addition, the Security Console and the Remote Keypad will produce a rapidly pulsing sound.

7. **If zone 4 has been set up as a fire zone, do the following:**

a. **Observe the CHECK display on the Security Console or the CHK.BYP LED on any Remote Keypad or the Zone 4 TRBL LED on the C-COM.** They should be off if the protective loop and detector power circuits are properly wired.

b. **Disconnect one wire of the fire zone.** The CHECK display on the Security Console and the Zone 4 TRBL LED on the C-COM should light and the CHK.BYP LED on any Remote Keypad should flash. A rapidly pulsing tone should be heard from the Security Console's speaker and a rapidly pulsing buzz should be heard from the Remote Keypad's buzzer.

c. **Silence the trouble sounding** by keying the security code and depressing OFF at a console or keypad (or by turning a key at a key arming station). The sound should stop but the visual LED indications should continue.

d. **Reconnect the fire zone wire.** All visual fire trouble indications should go out.

e. **Momentarily short the fire zone.** A fire alarm should be triggered, accompanied by a loud rapidly alternating or pulsed rapidly alternating (depending upon configuration programmed) two-tone siren sound from both the console and any other interior or exterior speakers used (or by a pulsed bell output). In addition, the FIRE LED on the Security Console will light and the Zone 4 Alarm LED on the C-COM will light.

Silence the alarm by using the FIRE TEST/RESET switch on the C-COM, by entering the security code followed by OFF at a console or keypad, or by turning the arm/disarm key at a keyswitch arming station.

**NOTES: 1.** The battery may not be fully charged. **If this test is tried with a low battery there will not be enough power to ring bells or activate sirens.** Let the battery charge (transformer plugged in) for at least one-half hour if the battery is low.

2. If the fire zone remains shorted after the alarm is silenced (such as if a smoke detector were still filled with smoke), the system will enter the fire trouble mode until the short has been eliminated. When the zone has restored, the system will return to normal.

8. **Test the Zone 5 panic circuit** by momentarily shorting terminals TB2-12 and 13, by operating an external zone connected panic switch, or by depressing both of the POLICE keys on the Security Console. If the zone is programmed for audible alarm, both the console and exterior speakers should sound [steady two-tone siren sound (slowly alternating or rapidly alternating, as a function of sound programmed)]. If bells are used, a steady bell sound will be produced. The POLICE LED on the console will light. These conditions continue after the short is removed. A message will be transmitted to the central station. Reset the system by entering the security code at a console or keypad or by turning the arm/disarm key at a keyswitch arming station.

If the zone is programmed for silent operation, none of the above mentioned sounds will be heard. The POLICE LED may or may not light as a function of selection of a separate programming option for silent panic.

9. **Shunt any zone** (permitted by installer programming) from a console or a keypad by entering the security code followed by BYPASS depression and the number of the zone to be bypassed. The BYPASS LED on the console will light, the CHK.BYP LED on any remote keypad will light steady and the zone LED on the C-COM for the bypassed zone will slowly flash.

Activate that zone to see if a fault is indicated by the Zone I.D. display at the console, by the READY LED going out at a console, a keypad or a key arming station or by the zone LED lighting at the C-COM. None of the above cited displays should indicate the presence of the zone fault.

Turn the system OFF.

10. **Force arm the system**, automatically shunting any purposely faulted zone (permitted by installer programming), from a console or a keypad by entering the security code followed by the arming command (AWAY or STAY) and the depression of BYPASS or by turning the arm/disarm key clockwise on a key arming station and holding it for 5 seconds before allowing it to return to the key removal position. The BYPASS LED on the console will light, the CHK.BYP LED on any remote keypad will light steady and the zone LED on the C-COM for the bypassed zone will slowly flash.

Turn the system OFF.

11. **Arm the system from a console or keypad and immediately follow** the arming sequence of security code entry plus arming command (AWAY or STAY) by depression of the **INSTANT** key. The INSTANT LED on the console should light. After allowing for the exit delay to expire, any fault introduced in the entry/exit zone will cause an immediate alarm. Disarm the system and note that the INSTANT LED will go out.

12. **Turn on the Chime Mode** by entering the security code followed by depression of the CHIME key during the disarmed state. Open and close any contact in zone 1 and a single tone will be produced at any console or keypad for each fault, announcing the entry of someone. Remove the Chime Mode by reentering the security code followed by depression of the CHIME key.

13. **Conduct a burglary test** (or of any zone if desired) by shorting terminals TB1-5 to TB1-7 during the disarmed state by a N.O. switch or by jumper. As long as these terminals remain shorted, the system is in the Test Mode. It should be noted, however, that the duration of the Test Mode is limited to approximately 30 minutes, at which time the mode will automatically terminate and the system will return to the disarmed state (where both fire, if programmed, and panic alarm capabilities are operative).

In this mode, a momentary fault in any zone will cause a loud single tone from the console as well as a 1/2 second alarm sound from the exterior siren or bell.

14. **All the zone contacts may now be checked** by disturbing each contact in each zone and listening for the short siren and/or bell sound (whichever is used).

15. **Remove the Test Mode jumper** to restore the system to normal functioning.

16. **Disconnect AC power to the system.** The POWER LED on the console and on the C-COM should go out within 5 seconds, but the system should remain operable. After an installer PROM programmed AC Loss delay (up to 36 minutes), a rapidly pulsing trouble sound will be produced at consoles and keypads and an AC Loss report will be communicated to the central station. Keying of the security code and OFF or turning of the arm/disarm key is required to silence the trouble sounding.

**NOTE:** The AC Loss sounding is suppressed while the system is armed. The sound is only produced when the OFF LED (on the console) is lit.

Restore AC power to the system.

17. **Arm the system and simulate leaving the premises** by following the procedures in the OPERATION Section.
18. **Simulate entering the premises and disarm the system** by following the procedure given in the OPERATION Section.

## VII. OPERATION

**AC POWER LED ON THE C-COM AND EACH SECURITY CONSOLE SHOULD BE LIT AT ALL TIMES.** If not, AC failure is indicated and the system is operating on battery. Check plug-in transformer or for power failure.

### TO ARM BURGLARY SYSTEM:

1. **Make sure the AC POWER LED is lit.**
2. **The READY LED** on the console, remote keypad, or remote key

arming station should be lit to indicate that all zones are properly closed.

If the **READY LED** is not lit, check the Zone I.D. Display on the console (depress READY key to get display) or the zone LEDs on the C-COM. A faulted zone indication denotes a fault which must be cleared or the zone shunted (prior to arming by individual zone shunt or during arming by the special automatic shunting forced arming sequence, in order to arm the system). Make sure that the exit door is closed!

3. **Enter the security code at the console or remote keypad or turn the arm/disarm key.**

a. If remaining on the premises after arming, immediately (within 2 seconds of code entry) press the STAY key. Interior zone 3 should now be turned OFF and the rest of burglary zones in the system should now be armed (entry/exit zones after exit delay timeout). This is indicated at consoles and keypads by 3 brief tones and the lighting of the STAY LED.

b. If leaving the premises after arming, immediately (within 2 seconds of code entry) press the AWAY key. All burglary zones should now be armed (entry/exit zones after exit delay timeout). This is indicated at consoles and keypads by 2 brief tones and the lighting of the AWAY LED.

**NOTE:** When key arming stations are used, the only type of arming that can be performed at them is AWAY Mode arming. The RED LED on this type of station indicates arming of any type — AWAY or STAY.

Depart before the exit delay period ends, via an entry/exit door.

**NOTE:** Failure to arm is indicated by a single tone at consoles and keypads and by failure to turn off the OFF LED (at consoles) and turn on either the AWAY or STAY LED (or the Red LED at key arming stations).

### TO DISARM BURGLARY SYSTEM:

1. **When entering the premises, enter only via the entry/exit door.** A slowly pulsing tone will be heard from consoles and keypads during the entry delay period.

**NOTE:** If a rapidly pulsing tone is heard, it is an indication of the memory of an alarm that took place previously. The user should immediately leave the premises and call the police from a safe location.

If already within premises, go directly to the nearest console, keypad, or key arming station.

2. **Before the entry delay period (if any) ends, enter the security code and OFF or turn arm/disarm key.**

**NOTE:** While the system is disarmed, the READY and Zone LEDs will go on and off as the protected zones open and close during normal operation of doors, windows, PIRs, etc....

### TO TEST FIRE SYSTEM:

The fire system should be tested at least every week.

**IMPORTANT:** The test described below causes communicator transmission of a Test Report to the central station.

1. **Slide the FIRE TEST/RESET switch on the C-COM to the right and hold it in that position.** The fire alarm will sound and the FIRE LED will light. While this switch is held to the right, the AC driven power supply is interrupted, thus checking the battery by sounding the alarm from battery alone.

2. **Release the FIRE TEST/RESET switch and reset the system by sliding the same switch to the left to the RESET position.** This will silence the alarm sounding. Clearing of the FIRE LED indication from the console and from the C-COM will either require security code entry plus OFF depression at a console or a keypad or turning of the key in a key arming station.

### TO TEST BURGLARY SYSTEM:

The burglary system should be tested as follows every week:

**IMPORTANT:** The central station should be alerted before conducting the below described test, particularly if the communicator messages are not programmed by the installer for delayed transmission.

1. **Arm the system in the AWAY Mode.**
2. **Open a window or other sensor in a perimeter zone.**
3. **The console speaker will sound a burglary alarm immediately.**
4. **Either immediately or delayed** (depending upon PROM programming), the exterior alarm sounder will produce the burglary sound.
5. **At this time or 16 seconds later** (depending upon PROM programming), the communicator will transmit an alarm message to the central station.

6. Disarm the system by code entry and OFF depression or by turning the key at a key arming station.

#### TO ACTIVATE A POLICE ALARM:

1. a. Depress both POLICE keys simultaneously at the console, or  
b. Depress a momentary switch connected to Zone 5.
2. If the zone is programmed for audible alarm, the alarm sounder will commence immediately, the POLICE LED on the console will light, and communicator will transmit a message to the central station (delayed by 16 seconds, if so programmed).
3. If the zone is programmed for silent alarm, the communicator will transmit a message to the central station. A separate programming option determines if the POLICE LED and the PHONE message on the console should light.
4. To reset, enter the security code at a console or a keypad and depress OFF or turn the key at a key arming station.

#### TO ACTIVATE AN EMERGENCY ALARM:

The Emergency Alarm is only operative if Zone 6 is programmed as a 24 hour zone. Otherwise, it is a burglary zone.

1. a. Depress both EMERG keys simultaneously at the console, or  
b. Depress a momentary switch connected to Zone 6.
2. Immediately a loud alarm sound will be produced from the console and exterior sounders. This sound is the same as the burglary and police (if audible) alarm sound. The EMERG LED on the console and the Zone 6 LED on the C-COM will light. An emergency message will be transmitted to the central station via telex linkage (PHONE message will light).
3. To reset, enter the security code at a console or a keypad and depress OFF or turn the key at a key arming station.

#### TO ENTER SECONDARY SECURITY CODE:

This action may be done while the system is armed or disarmed.

1. Key master security code (in PROM) and depress CODE key at a console or keypad.
2. Immediately follow with entry of the secondary code designator (2-8) and the 4 digit secondary code.

This secondary code can permit every function that the master security code can allow except changing of a secondary security code. If the master code is used to arm the system, the secondary codes are blocked from being able to disarm the system (i.e. master code takes precedence over the secondary codes).

3. Removal of the secondary code is accomplished by entering the master security code, by depressing CODE, and by entering the appropriate code designator and a new secondary code (not the master code).

#### TO ACTIVATE THE CHIME FEATURE:

This mode may only be entered during the disarmed state.

1. Enter the security code followed by CHIME depression at a console or keypad.
2. Any opening in Zone 1 will result in a loud single tone being produced at consoles and keypads, annunciating entry.
3. End the mode by entering the security code followed by CHIME depression.

#### TO QUICKEN THE EXECUTION OF KEYED FUNCTIONS:

Up to a 2 second delay exists from the time that a function key is pressed following security code entry until the function is executed. This delay can be terminated by pressing the ENTER key at the end of any keying sequence (e.g. Security Code Entry, STAY, ENTER).

## VIII. TURNING THE SYSTEM OVER TO USER

1. Fully explain the operation of the system to the user by going through each of the features as well as the OWNERS MANUAL supplied.
2. Describe the operation of each zone. Clarify which contacts or devices are used at night, which are used in the interior, which are day/night (if programmed).
3. Encourage the user to find and remedy zone problems arising when arming the system. Show the user how to individually bypass zones as well as how to force arm the system in the presence of a bad zone.

## IX. GENERAL SPECIFICATIONS

### A. NO. 4160-12 CONTROL/COMMUNICATOR

See Diagrams 4 and 9.

1. Physical: Width: 14" (36.5 cm)  
Height: 12" (30.5 cm)  
Depth: 3.3" (8.4 cm)

#### 2. Electrical:

Voltage: 18 VAC (from No. 1323 30VA Plug-in Transformer)

Maximum Permissible Resistance (per zone): 600 Ohms (plus external line resistor: 1000 Ohms)

Zone Response: 250 msec (normal), 15 msec (fast)

Be Relay (Wet) Output: SPST, Maximum Output: 2A @ 12 VDC

12V.DC Regulated Output:

Continuous Power for Accessories, Smoke Detectors: 1 Amp (Max.)

6.5V.DC Regulated Output:

Continuous Power for Console and Keypads: 0.5 Amp (Max.) from same power pool as defined above for 12V.

12 V.DC Siren Power Output: On Alarm: 2A max.

Use of External Siren Drivers:

If a siren driver other than the plug-in No. 4165 is to be used, it is important that the type used has power applied to it constantly (i.e., from TB3 terminals 5 and 6) and is activated only by the switching on of a low current control signal via the control/communicator's alarm relay (i.e., from TB3 Bell terminals 7 and 8).

An example of a suitable siren driver (in addition to the plug-in No. 4165) is the No. 714. Examples of unsuitable siren drivers include the Ademco Nos. 732 and 733, Moose MP111, and ADCOR SD7. Failure to follow this advisory can result in erratic behavior of the system because of the overly large current surges that result when power is switched to the type of siren driver indicated as unsuitable.

Arm/Disarm Status Output: Armed: +12 V.DC, 10 mA  
(Reversible in PROM) Disarmed: 0V

Fuses: Three fuses -

No. 90-14: 1A 6.5V auxiliary power for consoles/keypads.

No. 90-12: 3A 12V output for optional siren driver (No. 4165) and speaker power, auxiliary current, fire detectors, bell power.

No. 90-17: 4A for battery protection.

Standby: Two 6V Sealed Lead Acid Rechargeable Batteries, 2.7 AH (No. 465-627) or 5.4 AH (No. 465-654)

FOR SEALED LEAD ACID BATTERY ONLY		MAXIMUM STANDBY TIMES WITH VARIOUS AUXILIARY, SMOKE/COMBUSTION DETECTOR, AND CONSOLE CONTINUOUS LOAD (ASSUMES ONE SECURITY CONSOLE PLUS ONE REMOTE KEYPAD, NO ALARMS)							
MODEL:		MA:	0	50	100	150	200	250	300
4160SB12 (2.7 AH)	HRS		7.5	6.7	5.9	5.3	4.8	4.3	4
4160XB12 (5.4 AH)	HRS		15	13.3	11.8	10.5	9.5	8.6	8

Battery normally need not be replaced for at least 5 years.

**NOTE:** An ORANGE jumper is provided near the lower right hand corner of the C-COM'S circuit board cover which, if cut, permits a gel type battery to be used to power the unit. Its amp-hr. rating should be equal to or greater than that of the sealed lead

acid battery normally used. **IMPORTANT:** The "standby times" tabulation above applies only to the sealed lead acid batteries indicated.

3. **Transmission Format:** Low Speed Ademco (and Silent Knight)  
Sescoa/Radionics  
Radionics Superfast  
Ademco High Speed, Expanded  
Radionics "BFSK"

4. **FCC Registration No:** AC 398U - 68192 - AL - E  
Ringer Equivalence O.OB.

**B. NO. 4165 SIREN DRIVER (OPTIONAL)**

See Diagram 5.

1. **Physical:** Width: 2-5/8" (6.6 cm)  
Height: 5-5/8" (14.2 cm)  
Depth: 1" (2.5 cm)

2. **Electrical:**

See Diagram 9.

**Voltage:** Operates from 12V.DC regulated when AC is present and in absence of AC, from standby battery.

**Load**

**Capability:** 2A. max. at 12V.DC from C-COM, providing up to 25 watts into an 8 ohm speaker load. Speaker input impedance must not be less than 8 ohms.

**Interface:** Plug-in connection from rear of C-COM P.C. board.

**C. NO. 5321 SECURITY CONSOLE**

See Diagram 6.

1. **Physical:** Width: 6-1/2" (17.7 cm) requires additional 3" (7.6 cm) clearance at right, if opening of zone data drawer is desirable.  
Height: 4-3/8" (11.1 cm)  
Depth: 1-3/8" (3.5 cm)

2. **Electrical:**

**Current Drain:** 120 mA @ 6.5V.DC from C-COM, normal.  
225 mA @ 6.5V.DC from C-COM during alarm.

**Interface:** 4-wire connection to C-COM.

**D. NO. 5314 REMOTE KEYPAD**

See Diagram 7.

1. **Physical:** Width: 3-1/2" (8.9 cm)  
Height: 5-3/8" (13.7 cm)  
Depth: 1-1/4" (3.2 cm)

2. **Electrical:**

**Current Drain:** 55 mA @ 6.5V.DC from C-COM, normal.  
125 mA @ 6.5V.DC from C-COM during alarm.

**Interface:** 4-wire connection to C-COM.

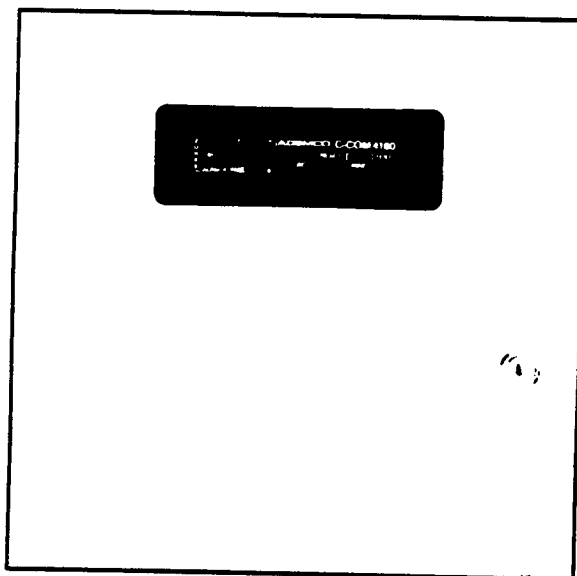


Diagram 4: No. 4160-12 CONTROL/COMMUNICATOR

**MOUNTING HOLES  
(SEE TEXT)**

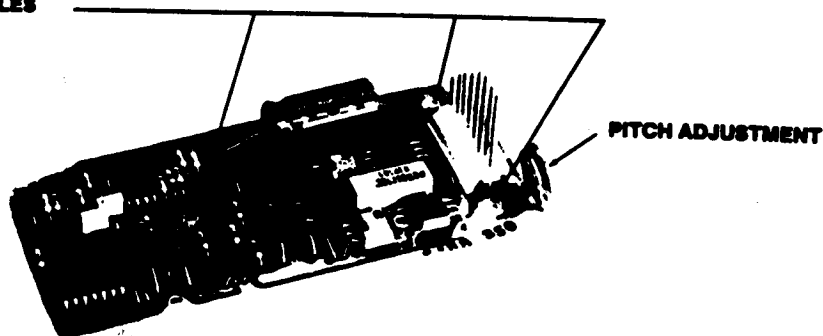


Diagram 5: No. 4165 SIREN DRIVER

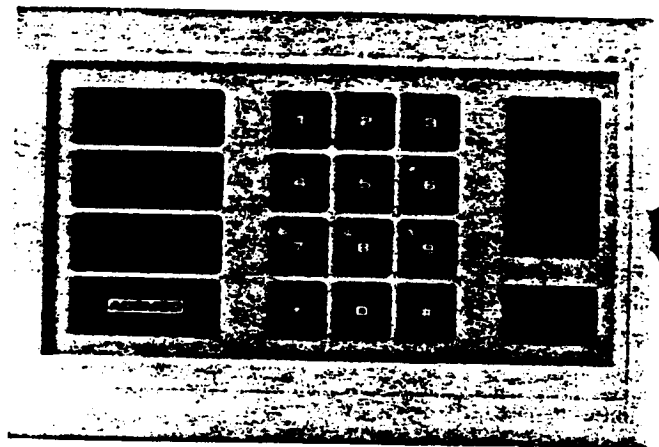


Diagram 6: No. 5321 SECURITY CONSOLE

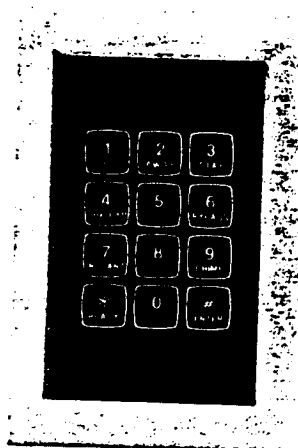


Diagram 7: No. 5314 REMOTE DIGITAL KEYPAD

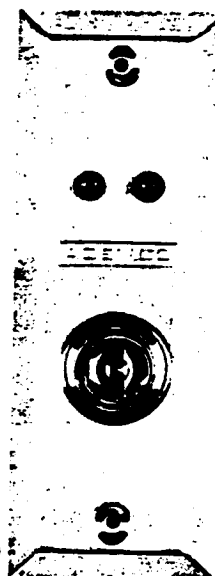


Diagram 8: No. 9787/9 REMOTE KEYSWITCH ARMING STATION

#### TO THE USER

This equipment has been tested to FCC requirements and has been found acceptable for use. The FCC requires the following statement for your information:

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- If using an indoor antenna, have a quality outdoor antenna installed.
  - Reorient the receiving antenna until interference is reduced or eliminated.
  - Move the receiver away from the control/communicator.
  - Plug the control/communicator into a different outlet so that control/communicator and the receiver are on different branch circuits.
  - Move the antenna leads away from any wire runs for control/communicator.
- If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems."

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock No. 004-000-00345-4.

In the event of telephone operational problems, disconnect the control/communicator by removing the plug from the RJ31X jack. We recommend your certified installer demonstrate disconnecting the phones on installation of the system. Do not disconnect the phone connection inside the control/communicator. Doing so will result in the loss of your phone lines. If your regular phone works correctly after the control/communicator has been disconnected from the phone lines, the control/communicator has a problem and should be returned for repair. If, upon disconnection of the control/communicator, there is still a problem on your line, notify the telephone company that they have a problem and request prompt repair service. The user may not under any circumstances (in or out of warranty) attempt any service or repairs on the system. It must be returned to the factory or an authorized service agency for all repairs.

**NOTE:** When the system is communicating with the central alarm monitoring service, the phone line is seized and the user phones are disconnected. Under normal circumstances, the phone line seize should only be 1-2 minutes. However line seize could last up to 15 minutes if trouble exists. If this occurs regularly, contact your installer.