R A D I O N I C S

D4112 Control/Communicator

Installation and Programming Manual

74-05365-002-E 6/93

Notice

The material and instructions in this manual have been carefully checked for accuracy and are presumed to be reliable. However, Radionics, Inc. assumes no responsibility for inaccuracies and reserves the right to modify and revise this manual without notice.

FCC Notice

This equipment generates and uses radio frequency energy. If not installed in accordance with the manufacturer's instructions, it may cause interference to radio and television reception. It has been type tested and found to comply with the specifications in Subpart J of Part 15 of FCC rules for Class B Computing Devices. If this equipment causes interference to radio or television reception — which can be determined by turning the equipment on and off — the installer is encouraged to correct the interference by one or more of the following measures: 1) Reorient the antenna of the radio/television, 2) Connect the AC transformer to a different outlet so the control panel and radio/television are on different branch circuits, 3) Relocate the control panel with respect to the radio/television.

If necessary, the installer should consult an experienced radio/television technician for additional suggestions, or send for the "Interference Handbook" prepared by the Federal Communications Commission. This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402, stock no. 004-000-00450-7.

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PART I: D4112 Installation

1. General System Description

1.1 The D4112 Installation and Programming Manual is divided into three sections. **PART I**, contains all of the Installation and Operation information, **Part II**, contains information on Programming the D4112 and **PART III** describes the procedures for programming your D4112 to meet U.L. specifications.

1.2 PART I: D4112 Installation

Control Panel - The Radionics D4112 Control/Communicator uses six protective hardwire zones and three software zones to detect and respond to intrusion and other system status conditions. These zones are programmable for a variety of responses, and are compatible with normally-open and/or normally-closed dry contact detection devices. Zone 1 is a class "B", powered loop, intended for use with two wire type smoke detectors. Zone 1 can also be reset from the command centers. The alarm output of the D4112 can be programmed for steady and pulsed outputs. Individual zones can initiate either response, depending on programming. An alternate alarm output can be activated for certain alarm conditions.

Communicator - The Radionics D4112 uses a built-in communicator to transmit reports to a central station receiver. The communicator can be programmed to report to a primary telephone number and back up all reports to an alternate number. The D4112 connects to an RJ38X jack for full phone line seizure, and complies with FCC regulations for using the public telephone network. It is also compatible with most major digital receivers.

Command Center - The D4112 must be operated with at least one Radionics D420A, D620 or D636A Command Center. The Command Centers are used to arm and disarm the D4112 controlled (burglar) zones. Up to two Command Centers can be installed in one D4112 system. The standard D4112 Comand Center, the D420A, is equipped to annunciate up to six protective zones and the system status(for specifications and installation procedures for the D636A Command Center, refer to the *D636A Installation Instructions #74-05475-000*).

RFI/Lightning Protection - The D4112 has been designed and tested to withstand radio frequency interference and high voltage surges common to lightning areas. Spark gaps and M.O.Vs provide the D4112 with additional protection.

1.3 PART II: D4112 Programming

PART II describes in detail how to program the D4112 Control/Communicator. The D4112 is programmed with the Radionics D5100 Bar Code Programmer or D9300 Remote Account Manager (R.A.M.). The D5100 Programmer must contain the 4112:MAIN Product Handler to enable programming functions for the D4112. The Radionics D9300 R.A.M., loaded with D9304 software, permits the central station to program the system, arm the system, request system status, or even troubleshoot the system over the telephone line. Part II also describes how individual zones may be selectively bypassed with the Remote Account Manager, and arm/ disarm passcodes can be changed without a service call.

1.4 PART III: D4112 U.L. Certification and System Specifications

In order for the D4112 to qualify for U.L. Certification it must be installed and programmed in accordance with certain U.L. requirements. PART III explains how to program the D4112 to meet U.L. standards and also lists the power and data specifications.

2. D4112 Control/Communicator Assembly

2.1 **Description -** The D4112 Control/Communicator Assembly is shipped as follows: The **D4112C** is shipped from the factory completely assembled and mounted in its enclosure complete with a lock and key. The printed circuit assembly (PCA) is mounted in the enclosure with four screws. Included is a D420A Command Center, an adhesive backed wiring diagram for the D4112 enclosure, a D1625 transformer, and 6 resistors (one 1.8K ohm, and five 1K ohm EOL resistors). The **D4112** includes all of the same equipment except does not include the D420A Command Center. The D4112 printed circuit assembly may be ordered separately as a **D4112M** which includes the D4112 on a D4102 mounting skirt, and an adhesive backed wiring diagram for installation in a D8108A Attack Resistant Enclosure (available for U.L. certificated Local, Central Station, and Police Connected burglary alarm applications), D6103, D8103, or D8109 Enclosure.

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The D4112 is U.L. listed for Central Station Grade A (with a D127 Reversing Relay, a D8122 Derived Channel S.T.U., or a compatible U.L. listed AST S.T.U) Grade B and Grade C Burglary Alarm, Digital Police Connection, Local Grade A Burglary Alarm, and Household Burglary Alarm applications. The D4112 is U.L. listed and California State Fire Marshal approved for Household Fire Alarm applications. At least one D420A or D636A Command Center must be installed with a D4112 for U.L. certification. See "Installation Guide for U.L. Certificated Systems" for more information. The D4112 should be installed in accordance with NFPA 70 (NEC) U.L. 681 Installation and Classification of Mercantile and Bank Burglar Alarm Systems, or U.L.1641 Installation and Classification of Residential Burglar Alarm Systems, and NFPA Household Fire Warning for fire applications.

2.2 D4112 Enclosure Specifications

Size:	11.25" x 11.25" x 3.00"
Color:	Light gray.
Construction:	Cold rolled steel. Base 20 gauge. Door 22 gauge.
Knockouts:	Two 1.625" (1 5/8") wiring knockouts in base. Six 0.875" (7/8") conduit knockouts in sides.
Lock and Key:	D101
Tamper switch:	D110 (ordered separately)

2.3 Wiring Diagram - Inside the D4112 enclosure is a wiring diagram label (see Figure 1). It also contains short descriptions of each terminal. Figure 2 displays a typical installation of the D4112 and accessories (for installing the D636A Command Center, refer to the *D636A Installation Instructions #74-05475-000*).

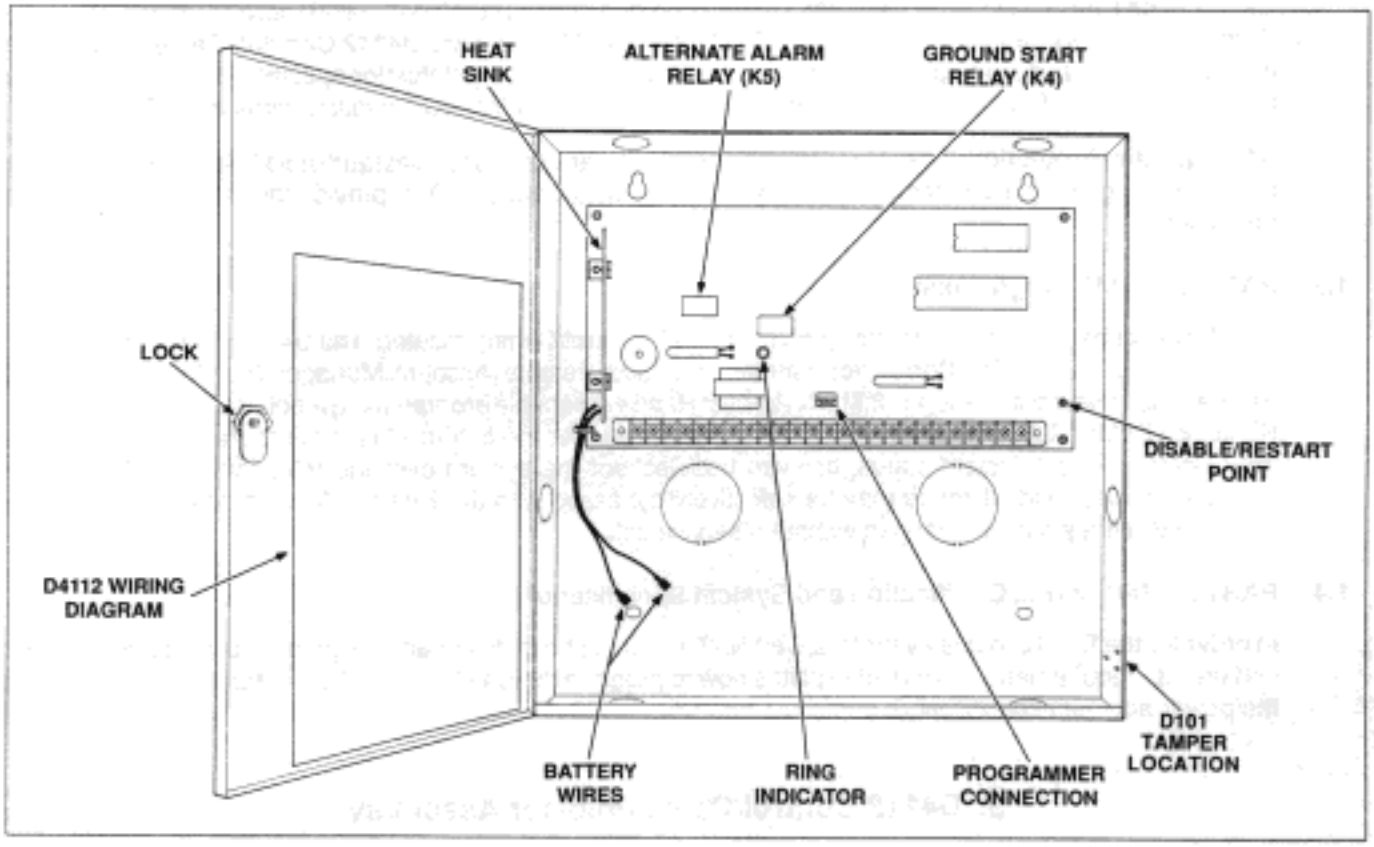

Figure 1: D4112 CONTROL/COMMUNICATOR ASSEMBLY

2.4 Reset Point - The D4112 disable/restart point is located in the lower right hand corner of the printed circuit assembly, to the right of the terminal strip (see Figure 1). Momentarily connect this point to terminal 25 (ground) to reset the Control/Communicator.

2.5 Ring Indicator - The neon light on the printed circuit board flickers when the D4112 phone line is "ringing."

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2.6 **Installation Checklist -** The following steps serve as an outline for installing components in the D4112 security system. For detailed information on each installation procedure, refer to the sections indicated.

1. **D4112 Mounting:** Permanently mount the D4112 in an upright position (with P.C. board on top leaving room on the bottom for the battery) within the protected area (see Figure 4).
2. **Earth Ground:** Earth ground the D4112 at terminal 4 (see section 10 "Secondary Power Supply and Charging Circuit").*
3. **Bell:** Connect alarm signalling devices to terminals 5 and 6 (see section 5 "Alarm Power Output").
4. **Auxiliary Power:** Connect auxiliary devices to terminals 3 and 4 (see section 4 "Auxiliary Power Supply").
5. **Telephone:** Connect the D160 phone cord to the D4112, brown to terminal 8 (T1), gray to terminal 9 (R1), green to terminal 10 (T), and red to terminal 11 (R). The D160 is then connected into the premises phone line.
6. **Command Center:** Install the Command Center(s) using terminals 12 through 15. See section 7 "D420A Command Center" for installing the D420A. For installing the D636A Command Center, refer to the *D636A Installation Instructions #74-05475-000.*
7. **Protective Zones:** Connect protective loops to terminals 16 and 17 (see section 8 "Smoke Detector Zone Input"), and terminals 18 through 25 (see section 9 "Protective Zone Inputs"). Install detectors on the protective loops. Install the appropriate end-of-line resistor at the end of the line for each protective zone.
8. **Transformer:** Connect the transformer to terminals 1 and 2. Plug the transformer into a 110-120VAC 60Hz unswitched commercial power outlet (see section 3 "Primary Power Supply").
9. **Battery:** The D4112 uses a 12 VDC 6 AH sealed lead-acid rechargeable battery (Radionics model #D126). Connect the black battery wire from D4112 to the negative (black) terminal of a 12V 6 Amp-hour battery. Connect the red battery wire from D4112 to the positive (red) terminal of the battery (see section 10 "Secondary Power Supply and Charging Circuit").

*NOTE: It may take as long as 12 hours to charge the battery. The battery should be charged prior to installation, or it can be connected at the beginning of installation, so that it can charge while the installation procedure is completed. A Jumper connected to the Disable/Restart point (see Figure 1) will disable the D4112 and still allow the battery to charge.

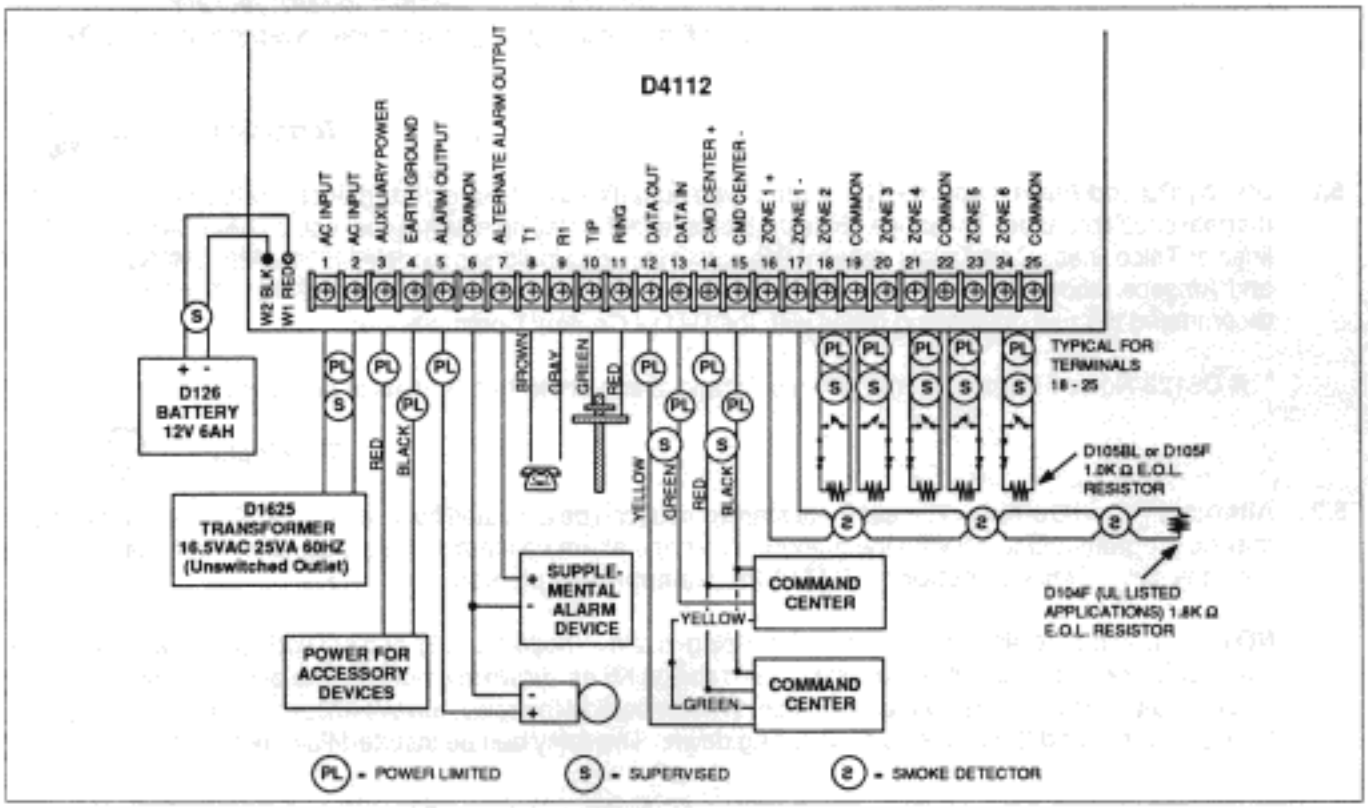

Figure 2: TYPICAL D4112 SYSTEM INSTALLATION

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3. Primary Power Supply (AC Transformer)

Terminals (1) (2)

3.1 **Transformer -** The D4112 Control/Communicator is powered by a 16.5 VAC 25 VA transformer (Radionics model #D1625). The transformer is included with the D4112. Connect the transformer to a 120 VAC 60 Hz commercial power outlet not controlled by a switch. Use 18 AWG cable (maximum length 50 ft.) to connect the transformer to the control/communicator.

NOTE: Never share the transformer with other equipment! A foreign ground on the AC input will damage the D4112's power circuit.

3.2 **Primary Power Circuit -** The primary power circuit is protected from voltage surges by spark gaps on the D4112. If primary power (AC) is lost, the D4112 switches immediately to secondary power.

4. Auxiliary Power Supply

Terminals (3) (4)

4.1 **Auxiliary Power -** Terminal 3 supplies positive (+) 10.2 to 14 VDC at 350 mA continuous current to power auxiliary devices. Terminal 4 is the ground (-) reference for the circuit. To determine the maximum power available for auxiliary devices, subtract the total Command Center, and Zone 1 current from the auxiliary current (350 mA). Detectors powered from this output must operate over a range of 10 to 14 VDC. A supervised self-resetting thermal circuit breaker protects the auxiliary power circuit against shorts. When a sustained short is applied to Aux Power, a TROUBLE ZONE 9 report (if programmed in ***9 Sys Test/Reset, Battery Supv***) is sent to the central station.

5. Alarm Power Output

5.1 **Description -** Terminals 5 and 7 supply positive (+) 10.2 to 14 VDC at 1.5 Amps maximum current for ALL alarm power outputs combined. *For Household Fire Warning it is recommended that you limit your alarm power output to 300 mA.* These outputs may be steady or pulsed voltage depending on the zone code programming. Terminal 6 is the ground (-) reference for these circuits.

Terminals (5) (6)

5.2 **Steady/Pulsed Alarm Output -** The alarm power output circuit is protected against shorts with a self-resetting thermal circuit breaker. To reduce noise problems, avoid installing alarm output cables near D4112 serial data lines or Telco lines. Compatible bells for this output include Radionics models M801, M802, M803, and M806, and Amseco models MSB-6B-PC4, MSB-8B-PC4, MSB-10B-PC4, and MSG-10G-12*. Radionics does not recommend the use of vibrating horns with the D4112 Control/ Communicator.

* A D8123 Noise Filter is required when bells and sirens other than Radionics are used.

Terminals (6) (7)

5.3 **Alternate Alarm Output -** The alternate alarm output can be activated by an alarm condition (individual zones may be programmed to activate the output). When the alternate alarm output is activated, terminal 7 provides a steady 12V. Consult **Section II, D4112 Programming** for programming details.

NOTE: The alternate alarm relay is an optional plug-in relay (model #D136), and it is *not* included with the control/communicator. The relay must be installed into socket K5 as shown in Figure 4. The plug-in relay has two legs on one side and three legs on the other side. When inserting the relay, always ensure that the three leg side is facing upwards and the two leg side is facing down. The relay can be inserted flush right or left.

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6. Telephone Connections

Terminals (8) (9) (10) (11)

6.1 Registration - The Radionics D4112 Control/Communicator is registered with the Federal Communications Commission under part 68, for connection to the public telephone network using an RJ38X/RJ31X jack installed by your local telephone company.

FCC Registration Number: AJ996H-15715-AL-E
Ringer Equivalence: 0.1B

6.2 Location - To prevent jamming of alarm and other signals, the RJ38X jack must be wired and located within the system so that normal phone use is temporarily interrupted while the communicator transmits data (see Figure 3). After installation, confirm that the communicator seizes the line, acquires dial tone, and reports correctly to the central station.

6.3 Notification - Registered equipment may NOT be connected to party lines or coin operated telephones. If the local telephone company requests notification before the communicator is connected to the telephone network, the following information should be supplied: 1) the particular line to which service is to be connected, 2) the make, model and serial number of the device, and 3) the FCC registration number and ringer equivalence. NOTE: If the telephone company makes changes in its communications facilities, equipment, operations, or procedures which may affect the performance of the communicator, the phone company is obligated to notify the user in writing.

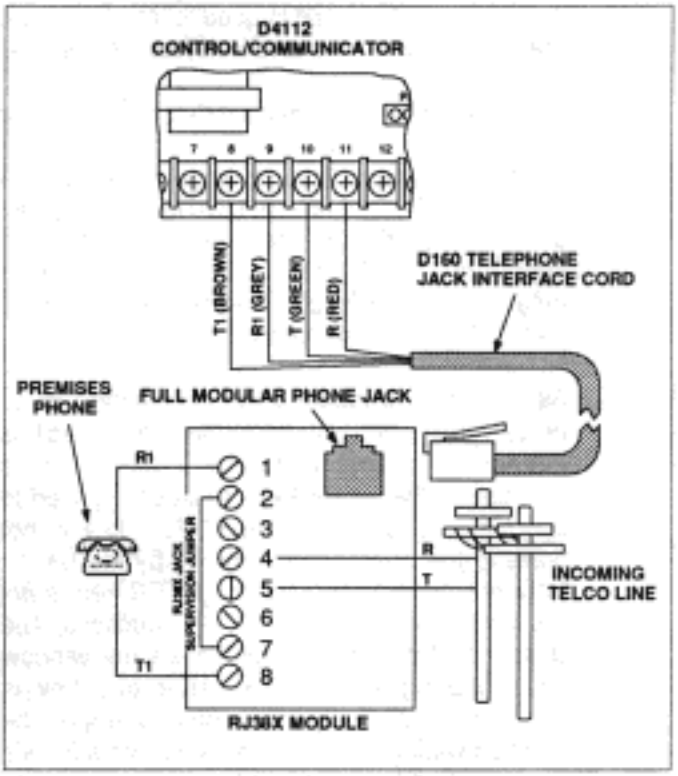

Figure 3: RJ38X WIRING

6.4 Telephone Cord Connection - Connect one end of the D160 Telephone Jack Interface Cord to the D4112 as shown in Figure 3. Connect the other end of the Interface Cord to an RJ31X or RJ38X phone jack.

6.5 Telephone Line Supervision - The D4112 does not have built in telephone line supervision. If RJ38X jack supervision is necessary, wire the orange and blue wires of the phone cord to a zone using the appropriate E.O.L. resistor.

6.6 Ground Start Systems - Some telephone systems require a momentary ground to initiate dial tone. To interface with a ground start system, a plug-in relay (Radionics model #D136) must be installed into socket K4 as shown in Figure 4.

NOTE: The plug-in relay has two legs on one side and three legs on the other side. When inserting the relay, always ensure that the three leg side is facing upwards and the two leg side is facing down. The relay can be installed flush left or right.

IMPORTANT: The D4112 Control/Communicator must be connected to an earth ground reference for the ground start system to function correctly. Use terminal 4 of the D4112 for earth ground reference.

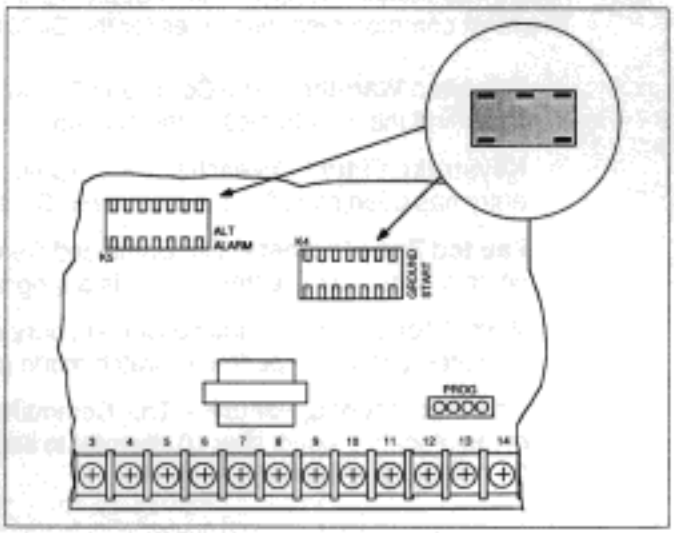

Figure 4: RELAY INSERTION

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7. D420A Command Center

Terminals (12) (13) (14) (15)

7.1 Command Center - Terminals 12 through 15 connect the D420A Command Center(s) to the D4112. (Terminal 12 - Data Out, Terminal 13 - Data In, Terminal 14 - Power, and Terminal 15 - Ground). The D420A Command Center, is a low profile surface mount, four-wire unit used for arming and disarming functions*. The D420A can annunciate up to six protective zones. A maximum of two Command Centers can be connected to a D4112. A four-conductor cable is used to interface the Command Center with the D4112. This cable is connected to the D4112 serial data and Command Center terminals.

* A D620 and D636A Command Center or a D611 Keyswitch Module can be substituted for the D420A.

7.2 D420A Command Center Keypad - The D420A Command Center has a COMMAND key, an ENTER key, two Function Keys, and number keys from 0 to 9. These fourteen keys are used to enter passcode and command functions into the D4112 Control/Communicator.

As each key is touched the Command Center emits a short beep to indicate that the keypad has accepted the entry. When a passcode is completed, the ENTER key must be pressed to enter the passcode. If the ENTER key is not pressed the passcode is ignored by the D4112 Control/Communicator. *The ENTER key is not required to enter COMMAND key functions.* The D4112 Control/Communicator has a time window for accepting key entries. After one key is pressed, the next key in the passcode must be pressed within five seconds. After five seconds have expired from the last key entry, the entire entry is cleared and the passcode must be restarted.

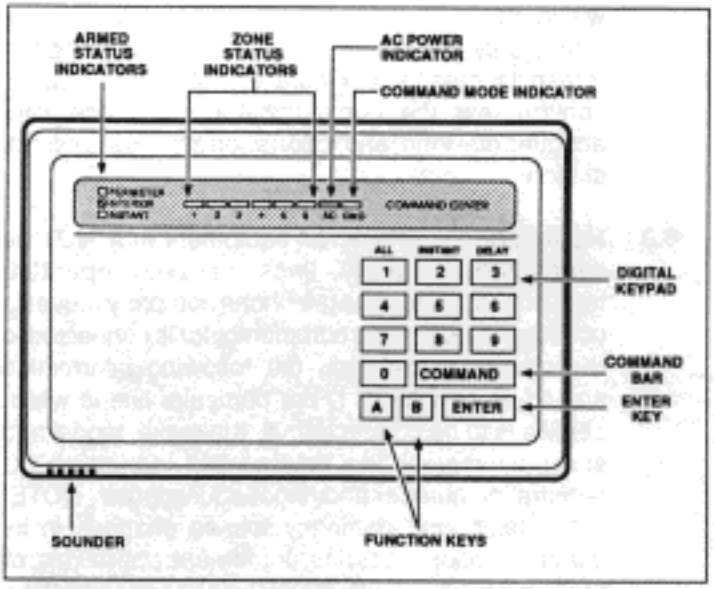

Figure 5: D420A COMMAND CENTER KEYPAD

7.3 The Function Keys - The D420A Command Center has two function keys labeled A and B. Function key A is programmed to perform COMMAND 44 (Local System Test), and function key B is programmed for COMMAND 47 (Reset Detectors). When using a D620 or D636A Command Center, function key C can be programmed for COMMAND 5 (Passcode Change) (program item ***CMD5PassChg*** as **Yes**).

7.4 Response Tones - The Command Center contains a sounder used to annunciate several system conditions. The most common response tones for the D420A are as follows:

Entrance Warning - The Command Center will emit a pulsed warning tone during the entry delay period to remind the user to disarm the security system. This is a programmable function of the D4112.

Keystroke Entry - As each key is touched the Command Center emits a short beep to indicate that the entry has been stored in the Command Center buffer.

Faulted Zone Protest - The Command Center will emit a short warning tone, to indicate a faulted zone, when a passcode is entered. This is a programmable function of the D4112.

Watch Tone - The Command Center sounder emits a two second warning beep when a perimeter zone is faulted during the perimeter watch mode (COMMAND 6).

Communications Failure - The Command Center will sound a slow pulsing warning for failure to communicate a signal after 10 attempts to each programmed number at the Central Station (approximately 24 minutes after the first attempt).

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24 Hour Loop Trouble - The Command Center will sound a steady warning for faults on 24 hour zones (disarmed or armed systems). The warning may be silenced by entering COMMAND 4 on a disarmed system. Priority 24 hour zones cannot be silenced until restored. If the system is armed, entering the passcode disarms the system and COMMAND 4 silences the sounder. If the 24 hour zone restores, the sounder will silence.

Failed Passcode Change Attempt - The Command Center will sound a one-second warning for a failed attempt to change the passcode with COMMAND 5. This is due to improper procedure and not due to a Command Mode timeout. If COMMAND 5 is entered and no digits are pressed the Command Mode will time out and the warning will not sound.

7.5 **The Display Panel -** The display panel for the D420A Command Center annunciates four different types of status: arming, zone, AC power, and Command Mode (see Figure 5).

Armed Status: Armed status shows the armed condition of the system. There are three different indicators to show the system armed status.

Perimeter - When this red indicator is lighted, the perimeter zones are armed. During exit delay time, this indicator flashes slowly.

Interior - When this yellow indicator is lighted, the interior zones are armed. During exit delay time, this indicator flashes slowly.

Instant- When this red indicator is lighted, the perimeter zones are armed without entry/exit delay time. When the system is armed and this indicator is not lighted, entry/exit delay time is enabled if programmed.

Zone Status: The D420A contains six *numbered* indicator lights, which are used to annunciate the condition of the D4112 protective zones (see Figure 5).

Zone Fault - While a zone is faulted, its indicator lights steadily. When the zone is restored to normal, the indicator goes "off".

Zone Alarm Memory - A zone alarm memory condition causes the indicator light to flash "on" and "off" *rapidly*. The indicator continues to flash rapidly until the system is next armed or COMMAND 4 is entered when the system is in the disarmed mode.

Shunted Zone - When a zone is shunted, the zone's indicator flashes "on" and "off" *slowly*. The indicator continues to flash slowly until the system is disarmed.

AC Power Indicator: The green AC indicator is lighted while the system is operating on AC power. The AC indicator flashes "on" and "off" when the system is operating from standby (battery) power.

Command Mode Indicator: When the COMMAND key is pressed, the Command Mode indicator is lighted approximately 9 seconds or until the command is completed.

7.6 **Command Center Sounder Disable -** To permanently disable the sounder, remove all power from the Command Center then cut the leads on diode CR6 (located in the lower right corner of the Command Center, see Figure 6). Remove the diode.

NOTE: For U.L. installations, the sounder on at least one Command Center in the D4112 system must remain connected.

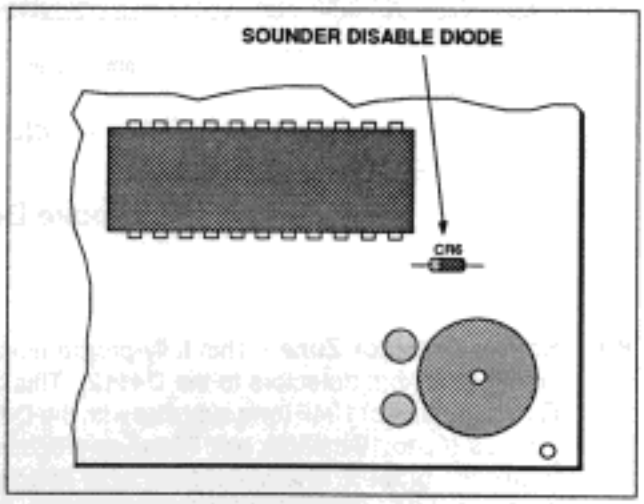

Figure 6: SOUNDER DISABLE CR6 DIODE

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7.7 **Installing a D420A Command Center -** The cable used to connect the Command Center to the D4112 can run no longer than a total combined length of 1000 feet when using 22AWG. A single D420A may be installed a maximum of 500 ft. from the D4112. Figure 2 depicts a typical installation using two D420A Command Centers.

IMPORTANT:
- Serial data lines must be wired in series (not parallel)when using two Command Centers.
- Unlike the D420, the D420A does NOT have a removable faceplate.
- Do not mount the Command Center in a location exposed to direct sunlight. Direct sunlight makes the display less visible and may also cause damage to electrical components.

1. Insert a small flatbladed screw-driver, into the recessed screw-driver slot located on the bottom of the Command Center (see Figure 8) and gently separate the cover from the base.
2. Remove the Command Center cover.
3. Connect the four-conductor wire assembly to the four-Conductor cable coming from the Control/ Communicator (see Figure 7).

D420A Wire Assembly	Four-Conductor Cable From D4112
Data-In (Yellow)	12 (Data Out)
Data-Out (Green)	13 (Data In)
12VDC (Red)	14 (CMD Ctr. +)
Common (Black)	15 (CMC Ctr. -)

Figure 7: INSTALLING THE D420A

4. Route the wiring assembly through the wire opening in the back of the enclosure base.
5. Using the three screws provided, mount the Command Center base in the desired location. Refer to Figure 8 for mounting hole locations.
6. Plug the wire assembly into the D420A.
7. Align the top tab of the Command Center cover with the top tab slot of the base. Slide the top of the cover into the base and gently push the bottom of the cover until it snaps into place.
8. Remove the protective film from the Command Center faceplate.

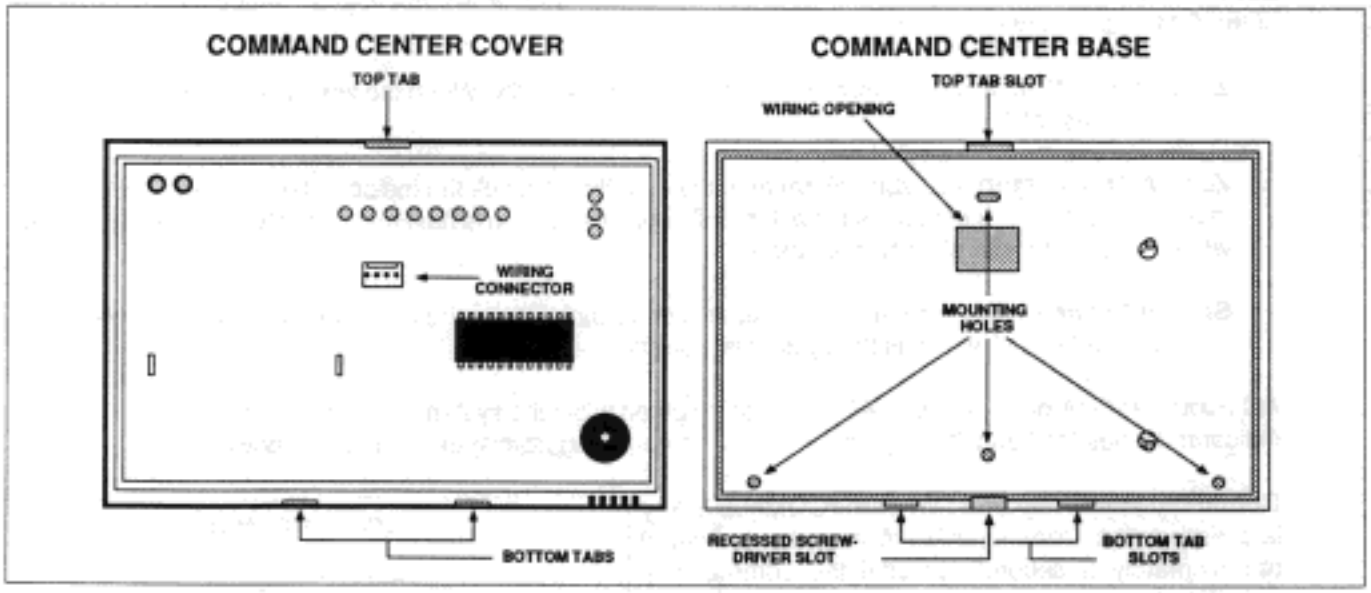

Figure 8: INSTALLING THE D420A

8. Smoke Detector Zone Input

Terminals (16) (17)

8.1 **Smoke Detector Zone -** This fully-programmable two-wire powered zone input is optimized for interfacing smoke and heat detectors to the D4112. This zone input is supervised with a 1.8K ohm end-of-line resistor: Radionics model 104F (one supplied with the D4112). Terminal 16 supplies positive (+) voltage to the detection devices (up to;19 mA idle, and 75 mA on a dead short). Terminal 17 , the loop return (-) for the circuit, is isolated from earth ground. *If terminal 16 or 17 is erroneously connected to earth ground (terminal 4) or another circuit common (terminals 4, 6, 19, 22, and 25) the smoke detector loop will not operate.* The smoke detector zone can be reset (voltage to detectors interrupted) using the Command Center function key B or by entering a COMMAND 47.

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Connection of Compatible Fire Detection Devices to Zone 1

1. **Two-Wire Smoke Detectors:** Up to 10 two-wire smoke detectors (identified by the manufacturer as U.L. listed for electrical compatibility with the D4112) can be connected to Zone 1 at the same time.

2. **Four-Wire Smoke Detectors:** Any number* of 12VDC four-wire smoke detectors can be connected to Zone 1. A suitable power supervision device must be installed according to the manufacturer's instructions. **NOTE:** If four-wire detectors are used, the detectors power connections must be connected to D4112 terminals 14 (+) and 15 (-) in order to provide the D420A Command Center with reset capabilities.

3. **Heat Detectors:** Any number.

Any number of burglar devices may also be connected to Zone 1 as long as fire detection devices and burglar devices are not connected to Zone 1 at the same time.

Zone Supervision - During an AC power loss, the battery supplies all power to the security system. In doing so the battery slowly discharges. When the battery voltage drops below 10.2 volts, the fire alarm circuit will no longer operate, and the Control/Communicator sends a TROUBLE ZONE 1 report to the central station receiver. A separate report (RESTORAL ZN 9) will be sent when the battery recharges to 12.5 volts (see Section 11 for specific events concerning the battery operations).

* The number of devices is limited by the available Auxiliary Power (see section **4 Auxiliary Power Supply**).

9. Protective Zone Inputs

Terminals 18 **19** 20 21 **22** 23 24 **25**

9.1 **Description -** The D4112 has five additional programmable protective zone inputs (loops 2 - 6). Each zone functions independently and does not interfere with the operation of the others. When wiring these zone inputs, a 1000 ohm end-of-line resistor is required at the far end of each loop to provide a reference for supervision. It is also recommended that a 1000 ohm end-of-line resistor is attached to any unused zones on the D4112. Use Radionics model D105BL (for UL listed burglar applications; five supplied with the D4112). Dry contact sensing devices may be connected to any of these zone inputs in series (normally-closed), in parallel (normally-open), or in a combination of series and parallel.

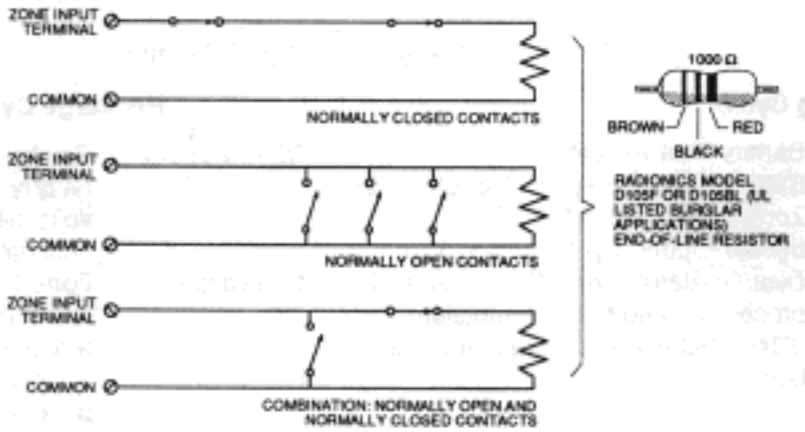

Figure 9: PROTECTIVE ZONE WIRING GUIDE

9.2 **Protective Zone Parameters -** Each D4112 protective zone is programmed to respond to different electrical conditions (e.g.; open, shorted, and normal circuits). To determine the electrical condition of any zone, use a voltmeter to measure the voltage across the zone input terminal connections. The loops must be connected, and the D4112 must be powered up.

Electrical Condition	Voltmeter Reading (measured zone input voltage)
Open	3.7 - 5.0 VDC
Normal	2.0 - 3.0 VDC
Shorted	0.0 - 1.3 VDC

9.3 **Loop Response Time -** The D4112 checks protective zones every 100 milliseconds. A zone must be in an abnormal condition on two successive checks to be recognized as a faulted zone. (This precaution reduces false alarms.) Loop response time is rated between 100 and 200 milliseconds.

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10. Secondary Power Supply and Charging Circuit

10.1 Battery - A 12 VDC 6 AH sealed lead-acid rechargeable battery (Radionics model #D126) supplies power for the system during interruptions in primary (AC) power. DO NOT SUBSTITUTE ANY OTHER TYPE OF BATTERY IN THIS CIRCUIT! The D4112 charging circuit is calibrated only for lead-acid type batteries.

IMPORTANT: The D4112 system must be earth grounded using terminal 4!

10.2 Installation - Install the battery in an upright position at the base of the enclosure (in battery location). Connect the negative side of the battery (black) to the black connection lead off the D4112, the positive side of the battery (red) to the red battery connection lead off the D4112. When adequate power is applied, the D4112 will send a Restoral ZN9. If AC power is supplied to the D4112, a Restoral ZN9 will be sent **even if the system is not connected to a battery**.

10.3 Replacement - Manufacturer recommends BATTERY REPLACEMENT EVERY 3 TO 5 YEARS under normal use. Do not exceed the maximum auxiliary and bell voltage output ratings and do not install the transformer in an outlet that is routinely switched off. This causes heavy discharges of the battery resulting in premature failure.

10.4 Battery Charging Circuit - The D4112 charges the battery with a trickle charge circuit. Charging voltage is 13.5 VDC at a maximum current of 700mA. (Actual current may be lower due to auxiliary power draw.)

10.5 Battery Supervision - During an AC power loss, the battery supplies all power to the security system. In doing so the battery slowly discharges. When the battery voltage drops below 11.3 volts, the Control/Communicator, if programmed, sends a TROUBLE report to the central station receiver.

10.6 Bell Disable - During an extended AC power outage, when the battery charge drops below 9.5 volts, the bell output voltage is disabled. This protects the battery from being damaged by deep discharge. When AC power is again restored the bell output voltage is enabled. See battery schedule below. The Auxiliary power remains enabled during bell disable.

10.7 Recharge Cycle - After the AC is restored the battery will begin to charge. When the battery reaches a charging level of 11.1 volts, and maintains battery voltage level above 10.3 volts for 1 minute, the panel will reset and a battery trouble report (Trouble Zn 9) will be sent to the Central Station. When the battery reaches the charging level of 12.5 volts a Restoral Zn 9 is sent to the Central Station. At 13.5 volts the battery will stop charging.

Battery Discharge/Recharge Schedule

Discharge Cycle		Recharge Cycle	
13.5 volts -	Battery float voltage	AC Power On -	Battery Recharging Begins (if the battery discharged below 9.7 volts, all functions remain disabled until battery reaches 11.5 volts
11.3 volts -	Battery Trouble Report (Trouble Zn 9)		
10.1 volts -	Zone 1 (terminals 16 & 17) trouble report (if programmed)	10.3 volts -	Zone 1 (terminals 16 &17) restoral report (if programmed, and if battery did not discharge below 9.7)
9.5 volts -	Disable Alarm Power Output, and all processing and memory functions (Deep battery discharge can occur below this level)	11.1 volts -	Battery Trouble Report (only if battery discharged below 9.7)
		12.5 volts -	Battery Restoral Report (Restoral Zn 9)
		13.5 volts -	Battery Charged

11. Programmer Connector

11.1 Programmer Connection - The Radionics D5100 Bar Code Programmer uses the D5106 Programmer Interface Cord to connect to the D4112 Control/Communicator for programming. This connection is made at the Programmer Connector (PROG) located on the bottom center of the D4112 just above Terminal 13 (see Figure 1 or 3). Plug one end of the Interface Cord to the PROG connector on the D4112 board. Snap the D5100 Data/Power Cord modular connector into the other end. For D4112 Control/Communicator programming instructions, consult **PART II: D4112 Programming**.

NOTE: While the D4112 Control/Communicator is addressing the Programmer, all control, detection and transmitting functions of the system are inoperable.

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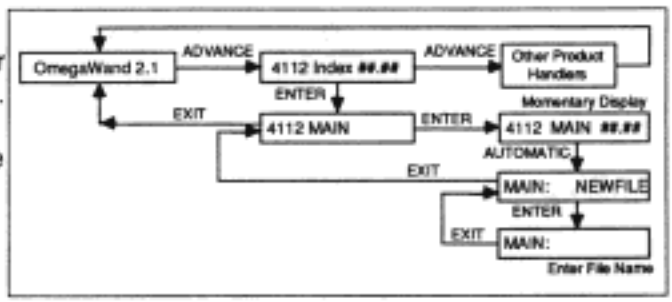
PART II. D4112 Programming

Introduction

The Radionics D4112 is programmed using either the Radionics D5100 Bar Code Programmer containing the 4112:MAIN Product Handler, or D9300 Remote Account Manager using D9304 software. Before programming the D4112 it is recommended that you read and become familiar with **Part I** and **II** of this manual and the *Index System D5100 Programmer Operation Manual*. Refer to **PART I**, section 11 for connecting the D5100 Bar Code Programmer to the D4112 for programming.

Accessing the 4112:MAIN Handler

1. Starting at ***OmegaWand 2.1***, scan the **ADVANCE** bar code until ***4112 Index ##.##*** appears. Scan **ENTER**.
2. When ***4112 MAIN*** appears, scan **ENTER**.
3. ***4112 MAIN ##.##*** flashes briefly displaying the Version Number.
4. ***MAIN: NEWFILE*** appears, scan ENTER.
5. When ***MAIN:*** appears, insert a file name.
6. Scan **ENTER** to access the Program Modules.



Program Modules

The Program Items in the 4112:MAIN Product Handler are grouped in *Program Modules*. To access a Module with the Programmer, **ADVANCE** the Programmer display until the desired *Module Title* is shown (all Module Titles begin with a module number). Scan the **ENTER** bar code to show the first *Program Item* of that module. If a particular module is not required for your application, that module may be bypassed by scanning the **ADVANCE** bar code when its title is displayed. Once a progam module has been **ENTER**ed, the Program Items of that module can be edited. After all the Program Items of that module have been edited, the Programmer will advance to the next module. When the **EXIT** bar code is scanned, the Programmer advances to the next program module title. NOTE: A module can be **EXIT**ed from any point within the module. To escape the D4112:MAIN Handler, scan the **EXIT** bar code until the Programmer displays ***OmegaWand 2.1***.

How to Edit the Program File

Each D4112 Control/Communicator programming option (Program Item) is listed with a *Display* and a *Default* (as they appear in the Programmer display), a set of *Selections*, and a *Description*. A typical Module Title and Program Item can be seen below. The Module Title appears first (***1 Account***), indicated by a shaded box, followed by the individual Program items (***Account #***).

The **Selections** are the only entries available for a particular Program Item. Below, the Program item ***Account #*** can only use **0** through **9**, **B** through **F**, or no entry. *Do not use unlisted entries.* Words in the description which have been printed in bold face are descriptive words which are used in the Program Item prompt.

NOTE: The D4112 Control/Communicator is loaded and shipped with the 4112:MAIN standard default program for your convenience.

1. Account Module

This module selects several functions of the D4112 security system, including account number, entry and exit delays, number of Command Centers to be used, and prewarning buzzers.

Display	Default	Selections	Description
1 Account		ENTER or ADVANCE	Scan the **ENTER** bar code to access this module. Scan the **ADVANCE** bar code to bypass this module.
Account #		0 through 9 B through F Blank	Enter three or four characters for the central station account number for the **Account**. For a Radionics D6000 Receiver enter three characters; for a D6500 Receiver enter four characters if Modem II format is used, and three characters for other transmitting formats. All entries should be flush right. Blank Entry = No account number.

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Display	Default	Selections	Description
Disable Sys	*No*	Yes or No	Enter **Yes** to turn off all functions of the Account except remote programming. If **Disable Sys** is changed to **Yes** using the Remote Account Manager, the account will be disarmed and turned off. If this item is **Yes**, remote programming can be initiated *only* from the central station and not by COMMAND 43 at the premise (see ***4 Remote Program***, *AnsArmRings*, and *AnsDisRings*).
Local	*No*	Yes or No	Enter **Yes** for the Account to be a **Local** alarm system (no central station reporting). If no account number is programmed in ***1 Account***, *Account #*, the account defaults to local, even if *Local* is **No**.
Entry Delay	*30*	10 through 120 Blank	**Entry Delay** time in ten second increments for the Account. UL systems have a maximum entry delay of 40 seconds. Blank Entry = no entry delay time.
Exit Delay	*60*	10 through 120 Blank	**Exit Delay** time in ten second increments for the Account. UL systems have a maximum exit delay of 60 seconds. Blank Entry = no exit delay time.
Prewarning	*Yes*	Yes or No	Sound **Prewarning** buzzer (sounder) during the entry delay time.
BuzzACFail	*No*	Yes or No	Pulse **Buzz**er (sounder) for **AC** power **Fail**ure. If this program item is **Yes**, a test report (if programmed for test reports or defered test reports in ***12 Test Reports***) will be transmitted to the central station when the AC is restored.
Device1 Type	*2*	1 through 3 Blank	Enter the **Device Type** code (**Blank**=No Device, **1**=D611, **2**=D420A or D620, **3**=D630 or D636A). Only Device 1 defaults to **2** (D420A). The other device prompt is blank and has no default code. At least one device must be installed. Device 1 is the first Command Center connected to terminal 12 (Data Out) on the D4112.
Device2 Type		1 through 3 Blank	

Note: The three zones of expansion built into the D630 and D636A can not be used by the D4112.

2. Passcodes Module: Command Center Arm/Disarm Passcodes

The D4112 Control/Communicator can be programmed with up to five arm/disarm passcodes. Each passcode can be from two to five digits in length. To arm and disarm a D4112 system with a programmed passcode, key in the passcode and then press the ENTER key.
Scan the **ENTER** bar code to access this module.
Scan the **ADVANCE** bar code to bypass this module.

Display	Default	Selections	Description
2 Passcodes		ENTER or ADVANCE	Enter the number of the **Passcode** you wish to program.
Passcode1	*2345*	0 through 9	Enter from one to four digits to complete the passcode. The passcode begins with the number shown in the display prompt. Example: *Passcode1* begins with a "**1**". *Passcode1* defaults to passcode 2345, therefore, enter 12345 when using this passcode at the Command Center.
Passcode2			
Passcode3			
Passcode4			
Passcode5			*Passcode5* can be used for a Duress Passcode. See DURESS TYPE on page 14.

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Display	Default	Selections	Description
UserIDs	*No*	Yes or No	**Id**entify opening/closing reports by **User** passcode. Zone 9 is reported if the account was master armed from the D9304 Remote Account Manager (R.A.M.) or master armed using COMMAND 1. Passcode1 = Zone 1 Passcode4 = Zone 4 Passcode2 = Zone 2 Passcode5 = Zone 5 Passcode3 = Zone 3 R.A.M. or Command 1 = Zone 9
Duress Code		0 through 9 B through F Blank	**Duress** report **Code**. Blank Entry = No duress alarm report. Do not use entries B through F for Radionics D6000 or D6500 Receivers operating in the D6000 format. B through F can be used with the Modem II format.

The "duress" signal is a silent alarm that is transmitted if the system is armed or disarmed by increasing the last digit of the passcode by one. Example: if the standard passcode is 12345, the duress passcode is 12346.

- If the last digit of the standard passcode is 0, the last digit of the duress passcode is 1.
- If the last digit of the standard passcode is 9, the last digit of the duress passcode is 0.
- The duress report cannot be cancelled.

Display	Default	Selections	Description
Duress Type		**Passcode +1** or Passcode 5	Passcode+1 causes the duress function to operate as explained in *Duress Code*. Passcode5 turns off all Passcode+1 duress features. If Passcode5 is selected, *UserIDs* must be **YES**, *Opening Code* must be **B**, *Closing Code* must be **C**, and a combination must be programmed in *Passcode5*. With these items set accordingly, entering the *Passcode5* combination causes the system to disarm or arm and send an Opening or Closing report from user ID 5. This report must be interpreted at the Central Station as a Duress condition.

This programming option is only available with the D5200 containing 4112 handler version 4.50, or RAM II revision 2.17 or higher.

3. Phone Module: Primary and Alternate Phone Numbers and Transmitting Format

If the D4112 is installed in a non-reporting (local) system, the Primary Phone (*PPhone#*) and Alternate Phone (*APhone#*) numbers may be bypassed. If the D4112 reports to only one Receiver, *APhone#* may be bypassed.

Before a D4112 Control/Communicator can report to a central station, it must be programmed with a telephone number and a transmitting format. This section of the Program Entry Guide describes the parameters for the Primary telephone number, usually associated with the primary central station receiver, and the Alternate telephone number, usually associated with the alternate central station receiver.

When more than one telephone number is used by the D4112 to transmit reports, the control/communicator may be programmed with a process for distributing the reports between the Primary and Alternate telephone numbers. This process is called *call routing*. Many combinations of call routing are available for the D4112. See the Routing Table on page 16 for specific details.

Display	Default	Selections	Description
3 Phone		ENTER or ADVANCE	Scan the **ENTER** bar code to access this module. Scan the **ADVANCE** bar code to bypass this module.
PPrefix#		0 through 9 C or D Blank	Telephone **number Prefix** for the **P**rimary central station receiver. Enter up to eight characters. **C** = 3 second pause. **D** = 7 second dial tone wait. Blank Entry = No prefix/area code. NOTE: A delay of up to 7 seconds will be automatically inserted in front of the prefix.
PPhone#		0 through 9 Blank	Tele**Phone number** for the **P**rimary central station receiver. Enter up to seven digits. Blank Entry = No telephone number.

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Display	Default	Selections	Description
APrefix#		0 through 9 C or D Blank	TelePhone number Prefix for the Alternate central station receiver. Enter up to eight characters. **C** = 3 second pause. **D** = 7 second dial tone wait. Blank Entry = No prefix/area code. NOTE: A delay of up to 7 seconds will be automatically inserted in front of the prefix.
APhone#		0 through 9 Blank	TelePhone number for the Alternate central station receiver. Enter up to seven digits. Blank Entry = No telephone number.
DTMF Dial	*No*	Yes or No	Enter Yes to enable Dual Tone Multi-Frequency Dialing of the telephone numbers. Enter **No** for pulse dialing.
CS Format	*6*	1 through 7 Blank	The Central Station transmission **Format** is: (7) Radionics Modem transmission format (6) Radionics BFSK superfast single round (5) Radionics single round with parity digit. (Reverts to double round after 2 single round attempts for each call.) (4) Ademco high speed double round (3) Silent Knight high speed double round (2) Ademco low speed double round (1) Silent Knight low speed double round (Blank Entry) Sescoa, Franklin high speed double round
1400 Hz Ack	*Yes*	Yes or No	Accept a **1400 Hz Ack**nowledgement tone from the primary/alternate central station receiver. If No is entered, a 1400 Hz acknowledgement tone will not be accepted. Enter No if *CS Format 7* (modem II) is used.
2300 Hz Ack	*Yes*	Yes or No	Accept a **2300 Hz Ack**nowledgement tone from the primary/alternate central station receiver. If No is entered, a 2300 Hz acknowledgement tone will not be accepted. Enter No if *CS Format 7* (modem II) is used.
Alarm Route	*0*	0 through 3	**Routing alarm** signals. See Routing Table for Program Entry descriptions.
Op / Cl Route	*0*	0 through 3	**Routing** for **opening** and **closing** signals. See Routing Table for Program Entry descriptions.
Trouble Route	*0*	0 through 3	**Routing** for **trouble** signals. See Routing Table for Program Entry descriptions.
Restoral Route	*0*	0 through 3	**Routing** for **restoral** signals. See Routing Table for Program Entry descriptions. NOTE: If **"0"** is selected for either *Alarm Route* or *Trouble Route*, then a **"0"** must also be entered in *Restoral Route*.

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Routing Table

Entry	Type	Response
0	Primary	Signal is sent to the Primary Telephone number only.
1	Primary, then Alternate	Signal is sent to the Primary Telephone number. If the signal cannot be sent to the Primary Telephone number, it is rerouted to the Alternate Telephone number.
2	Alternate, then Primary	Signal is sent to the Alternate Telephone number. If the signal cannot be sent to the Alternate Telephone number, it is rerouted to the Primary Telephone number.
3	Primary - Not Designated Alternate - Designated	Signal is sent to the Primary Telephone number if not a "designated" zone. "Designated" zones, programmed in "Digit Four " in the Zone Code Index, route signals to both the Primary Telephone Number and the Alternate Telephone number. NOTE: Battery restoral signals (*1.7 Bat Supv*), duress reports and cancel reports are always treated as designated zones for call routing transmission.

	Routing Entry				
	0	1	2	Designated Zone 3	Non-Designated Zone 3
Primary Number	All Reports	All Reports	Back Up all Reports	All Reports (1st)	All Reports
Alternate Number	N/A	Back Up all Reports	All Reports	All Reports (2nd)	N/A

Routing Operations:
When **Routing Entry 0** is used in the DTMF mode, the D4112 makes five dialing attempts to establish communication with the primary number before switching to pulse dialing. The D4112 will annunciate a "failure to report" after ten failed attempts are made to contact the receiver by each telephone number programmed. *A test report is automatically initiated once an hour after ComFail has begun. This continues until communication is re-established. Only* test reports and ComFail reports are routed to the primary telephone number even if an alternate number is programmed. Other types of events will attempt to call both Primary and Alternate Central Stations. In order for a test report to be sent should a communications failure occur, a test report or a defered test report must be programmed (in ***12 Test Reports***).

When using **Rounting Entries 1, 2,** or **3**, the D4112 will alternate dialing attempts between the primary and alternate numbers a total of twenty times before annunciating a "failure to communicate".

1. Primary	Tone or Pulse *	9. Primary	Tone or Pulse
2. Primary	Tone or Pulse	10. Alternate (or pause)	Tone or Pulse
3. Alternate (or pause)	Tone or Pulse	11. Primary	Pulse
4. Alternate (or pause)	Tone or Pulse	12. Alternate (or pause)	Pulse
5. Primary	Tone or Pulse	:	:
6. Alternate (or pause)	Tone or Pulse	:	:
7. Primary	Tone or Pulse	19. Primary	Pulse
8. Alternate (or pause)	Tone or Pulse	20. Alternate (or pause)	Pulse

* The dialing format (DTMF or Pulse) of the transmitted signal is determined by Program Item ***3 Phone, DTMF Dial***.

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4. Remote Programming Module

The Program Items listed in this module are used to enable Central Station programming.

Display	Default	Selections	Description
4 Remote Program		ENTER or ADVANCE	Scan the **ENTER** bar code to access this module. Scan the **ADVANCE** bar code to bypass this module.
Password	*9999*	0 through 9 B through F Blank	Remote programming security **Password**. A four character entry is required. Blank Entry = no remote programming. This entry enables the initiation of Central Station programming using COMMAND 43.
AnsArmRings	*0*	0 through 14 Blank	Set telephone **Ring** counter to **Answer** when master **Armed**. Blank Entry= no answer. This entry enables the initiation of Central Station programming when the system is armed. A password is required.
AnsDisRings	*0*	0 through 14 Blank	Set telephone **Ring** counter to **Answer** when account is not master armed (**Dis**armed). Blank Entry = no answer. This entry enables the initiation of Central Station programming when the system is disarmed. A password is required.

NOTES:
1) If the system is perimeter armed, the ring counter will follow the the entry in ***AnsDisRings***.
2) The actual number of rings may differ from the number of rings entered in ***4 Remote Program***, ***AnsArmRings*** and ***AnsDisRings*** if the first ring is short or if ring counting has occurred within the past 5 minutes.

Important: If ***AnsArmRings*** and ***AnsDisRings*** are left blank, then Remote programming can only be initiated by Command 43 at the premises. If ***AnsArmRings/AnsDisRings*** is programmed and ***1 Account, Disable Sys*** is **Yes**, then R.A.M. can only be initiated from the Central Station.

5. Troubles and Restorals Module

The Program Items listed in this module are used to select central station report codes. **If you are reporting to a Radionics Receiver skip this Module.**

Display	Default	Selections	Description
5 Tbl/Restorals		ENTER or ADVANCE	Scan the **ENTER** bar code to access this module. Scan the **ADVANCE** bar code to bypass this module.
Trouble Code	*F*	0 through 9 B through F Blank	**Trouble** report **Code**. For Radionics Receivers enter **F**. Blank Entry = no trouble report. F is automatic when using BFSK or Modem. **NOTE:** If Trouble reports are not desired, the loop codes must be programmed accordingly.
Restoral Code	*E*	0 through 9 B through F Blank	**Restoral** report **Code**. For Radionics Receivers enter **E**. Blank Entry = no restoral report. E is automatic when using BFSK or Modem. **NOTE:** If Trouble reports are not desired, the loop codes must be programmed accordingly.

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Display	Default	Selections	Description
Expanded T/R	*Yes*	Yes or No	Transmit **Expanded** Trouble and **R**estoral reports by zone number to the central station receiver. *See **5 Tbl/Restorals**, Trouble Code and Restoral Code for report codes*. For Radionics Receivers enter **Yes**. Reports are automatically expanded for modem and BFSK formats.
Delay Restore	*No*	Yes or No	**Delay Restore** reports from the system until the bell time expires, or until the bell is reset from a command center. Both audible and silent alarms start the bell time.

NOTE: If Radionics BFSK superfast single round or Modem central station formats are programmed *(**3 Phone**, CS Format 6* or *7)*, Program Items ***5 Tbl/Restorals***, *Trouble Code* and *Restoral Code* will default to the standard Radionics Receiver report code (e.g.; *Trouble Code F* and *Restoral Code E*).

6. Openings and Closings Module

The Program Items listed in this module are used to select central station report codes. **If you are reporting to a Radionics Receiver skip this Module.**

Display	Default	Selections	Description
6 Open/Closings		ENTER or ADVANCE	Scan the **ENTER** bar code to access this module. Scan the **ADVANCE** bar code to bypass this module.
Opening Code	*B*	0 through 9 B through F Blank	**Opening** report **Code**. For Radionics Receivers enter **B**. Blank Entry = no opening report.
Closing Code	*C*	0 through 9 B through F Blank	**Closing** report **Code**. For Radionics Receivers enter **C**. Blank Entry = no closing report.
Restrict O/C	*No*	Yes or No	**Restrict** Opening reports to transmit only when disarming the system after an alarm. **Restrict** Closing reports to transmit only when force arming the system, or when zone shunting using COMMAND 0 (enabled in ***8 Cmd Options***, *Cmd0ZnBypass*).

NOTE: Openings and Closings are reported only when the system is Master Armed using Command 1 or a passcode.

NOTE: If telephone line or central station equipment problems prevent the D4112 from communicating an Opening Report for a supervised account upon disarming, the D4112 cannot be rearmed until it has made ten dialing attempts to each telephone number programmed (approximately 10 to 15 minutes). After ten unsuccessful dialing attempts by each number, a fail-to-communicate signal is indicated (the command center buzzer pulses). This prevents an Opening Report from being "lost" without user knowledge.

Cancel Code	*D*	0 through 9 B through F Blank	**Cancel** report **Code**. For Radionics Receivers enter **D**. Blank Entry = no cancel report. Enable **cancel reports** for the system. If the system is disarmed during bell time, the alarm report is followed by a "cancel" report. If an alarm is canceled before the alarm report is transmitted, the cancel report will be transmitted *before* the alarm report.

NOTE: If a Cancel Code is not used, Command 4 may prevent opening reports from reporting to the Central Station. If Command 4 is pressed before the opening report is transmitted, the alarm memory and the opening report are erased.

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7. Bell Options Module

Display	Default	Selections	Description
7 Bell Options		ENTER or ADVANCE	Scan the **ENTER** bar code to access this module. Scan the **ADVANCE** bar code to bypass this module.
Bell Time	*06*	0 through 63	Alarm **Bell** output **Time** in minutes. Time restarts with each new alarm tripped. "0" entry = no bell output. The minimum bell time required for U.L. certificated applications is 4 minutes.
Test Bell	*No*	Yes or No	After the system has been armed, and the exit delay has expired the automatic **Bell Test** will occur. If the system reports openings/closings the bell test *will not* occur until *after* the Central Station acknowledges the closing. Bell test lasts for two seconds.
One Ring	*No*	Yes or No	Enter **Yes** for **One** alarm output per zone for non-fire zones. Enter **No** for alarm output after every trip on the same zone. If **Yes** is entered, alarms on non-fire zones do *not* restart the alarm output with a second trip from the same zone unless the system is disarmed and then rearmed. Alarms on fire zones (24 hour zones with pulsed bell response) *do* restart the alarm output.

8. Command Options Module: COMMAND Key Functions

Certain options should be carefully evaluated to determine whether they are appropriate for your specific installation.

After a system has been master armed using Command 1 or an arm/disarm combination, all COMMANDs except COMMAND 7 and 9 are disabled. If the system has been perimeter armed using COMMANDs 2, 3, or 8, COMMAND 4 silences trouble buzzers, but does not clear alarm memory; COMMANDs 7, 9, 40, 41, 42, and 47 operate as described in this manual. NOTE: The system must be completely disarmed in order to use COMMANDs 1, 2, 3, 8, 43 and 44, and to clear alarm memory. COMMANDs 41, 42, and 44 (system tests) do not test the battery.

For operation instructions concerning command functions, consult the D420A Command Center User's Guide.

Display	Default	Selections	Description
8 Cmd Options		ENTER or ADVANCE	Scan the **ENTER** bar code to access this module. Scan the **ADVANCE** bar code to bypass this module.
Cmd1MstrArm	*Yes*	Yes or No	Enable **COMMAND 1** to **Master Arm** the system. Entry/exit delay time is provided, if programmed in ***1 Account***, ***Entry Delay*** and ***Exit Delay***.
Cmd2InstPer	*Yes*	Yes or No	Enable **COMMAND 2** to **Instant Per**imeter arm the system (no entry/exit delay time).
Cmd3DlyPer	*Yes*	Yes or No	Enable **COMMAND 3** for **Delayed Per**imeter arming of an account (entry/exit delay time provided if programmed).
Cmd5PassChg	*Yes*	Yes or No	Enable **COMMAND 5** to put the system in the **Pass**code **Change** mode.
Cmd6PerWatch	*Yes*	Yes or No	Enable **COMMAND 6** to put the system in the **Per**imeter **Watch** mode.

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Display	Default	Selections	Description
Cmd8PerPartl	*Yes*	Yes or No	Enable **COMMAND 8** for **Per**imeter arming with entry/exit delay time. The system can be **Part**ially armed by bypassing any faulted perimeter zones while arming with this command. NOTE: The use of COMMAND 8 will *override* priority zones. Swinger shunt loops left faulted during a COMMAND 8 will be permanently bypassed until the system is disarmed.
Cmd0ZnBypass	*Yes*	Yes or No	Enable **COMMAND 0** for **Bypass**ing **Zones** from the command center while system is in exit delay mode.
Force Arming	*Yes*	Yes or No	Enable **Force Arming** by passcode and COMMANDs **1**, **2**, and **3**. NOTE: Enter **Yes** to force arm with a standard passcode. *Priority zones cannot be force armed.*
ForceArm Max	*1*	0 through 6	Enter the **max**imum number of faulted zones allowed when **force arm**ing.

If you are not using Force Arming but still want the Command Center to buzz when an attempt is made to arm the system with faulted zones, program *Force Arming* **No** and *Force Arm Max* **6**.

9. System Test/Reset Module

Display	Default	Selections	Description
9 Sys Test/Reset		ENTER or ADVANCE	Scan the **ENTER** bar code to access this module. Scan the **ADVANCE** bar code to bypass this module.
Cmd41RstRpt	*No*	Yes or No	Enable **COMMAND 41** to send unexpanded **Rest**oral **Reports** to the central station.
Cmd42DiagRpt	*Yes*	Yes or No	Enable **COMMAND 42** to perform a **Diag**nostic test and send system trouble **Reports** to the central station. See **System Trouble Report Codes** for more information.
Cmd44SysTst	*Yes*	Yes or No	Enable **COMMAND 44** to initiate local **System Test**. Function key "A" is preprogrammed for Command 44. If **No**, Command 44 and Function key "A" will not be operational.
Cmd47SmkRst	*Yes*	Yes or No	Enable **COMMAND 47** to **Reset** the **Smoke** detector zones at the command center. Function key "B" is preprogrammed for Command 47. NOTE: COMMAND 47 does NOT interrupt the auxiliary power (D4112 terminal 3) but will interrupt power to the powered loop and terminals 14 and 15. If **No**, Command 47 and Function key "B" will not be operational.
Battery Supv	*9*	0 through 9 B through F Blank	**Battery Supervision** report code. For Radionics Receivers enter **9**. Blank entry = no low battery reports. If a **9** is entered, battery supervision reports are transmitted as Trouble Zone 9 and Restoral Zone 9.

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10. Special Commands Module

The Program Items below determine the responses that occur when COMMANDs 7 and 9 are entered at a Command Center. These *software* zones are programmed independently from hardware loops that may have identical zone numbers. NOTE: Responses programmed for the same hardware and software zone numbers will generate duplicate reports.

Display	Default	Selections	Description
10 Special Cmds		ENTER or ADVANCE	Scan the **ENTER** bar code to access this module. Scan the **ADVANCE** bar code to bypass this module.
Cmd7RptCode		0 through 9 B through F Blank	Enter **Report Code** for **COMMAND 7** alarm to complete the ALARM ZONE __ report to the central station. Blank Entry = feature disabled. Suggested for use as a special alert. For Radionics D6000 or D6500 Receivers operating in non-Modem II format, do not use entries B through F.
Cmd7Bell	*No*	Yes or No	Ring alarm **Bell** when **COMMAND 7** is entered at a Command Center.
Cmd7PlsBell	*No*	Yes or No	Enter **Yes** to **Pulse** alarm **Bell** when the **COMMAND 7** is entered at a Command Center. Enter No for steady bell output. Alarm bell output is selected in ***Cmd7Bell***. This Program item selects only pulse or steady output.
Cmd7AltAlm	*No*	Yes or No	Activate **Alternate Alarm** when **COMMAND 7** is entered at a Command Center. The alternate alarm activation time follows the programmed bell time (see ***7 Bell Options***, *Bell Time*).
Cmd9RptCode		0 through 9 B through F Blank	Enter **Report Code** for **COMMAND 9** alarm to complete the ALARM ZONE __ report to the central station. Blank Entry = feature disabled. Suggested for use as a special alert. For Radionics D6000 or D6500 Receivers operating in non-Modem II format, do not use entries B through F.
Cmd9Bell	*No*	Yes or No	Ring alarm **Bell** when **COMMAND 9** is entered at a Command Center.
Cmd9PlsBell	*No*	Yes or No	Enter **Yes** to **Pulse** alarm **Bell** when the **COMMAND 9** is entered at a Command Center. Enter No for steady bell output. Alarm bell output is selected in ***Cmd9Bell***. This Program item selects only pulse or steady output.
Cmd9AltAlm	*No*	Yes or No	Activate **Alternate Alarm** when **COMMAND 9** is entered at a Command Center. The alternate alarm activation time follows the programmed bell time (see ***7 Bell Options***, *Bell Time*).

11. Zone Codes Module

Display	Default	Selections	Description
11 Zone Codes		ENTER or ADVANCE	Scan the **ENTER** bar code to access this module. Scan the **ADVANCE** bar code to bypass this module.

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Display	Default	Selections	Description
Show Zones	*Yes*	Yes or No	Enter **Yes** to **Show** the **Zone** status at the Command Center while the system is disarmed. Enter **No** to hide the zone status display while the system is disarmed. NOTE: Entering **No** does not hide the display of alarm memory at the Command Center. Refer to Zone Code Digit Five to make zones invisible.
Zone1 Code	*01454*	Zone Code	Enter a five digit response code for the protective zone specified. Enter five zeros if the zone is not used. See section **14. Recommended Zone Codes** for standard selections. The default zones codes are as follows: **Zone1 Code** = Fire, Trouble and Restorals **Zone2 Code** = Perimeter Delay, Trouble and Restorals **Zone3 Code** = Perimeter Instant, Trouble and Restorals **Zone4 Code** = Perimeter Instant, Trouble and Restorals **Zone5 Code** = Perimeter Instant, Trouble and Restorals **Zone6 Code** = Interior Instant, Trouble and Restorals
Zone2 Code	*26150*		
Zone3 Code	*22150*		
Zone4 Code	*22150*		
Zone5 Code	*22150*		
Zone6 Code	*12150*		

12. Test Reports Module: Automatic Test Report Parameters

The D4112 can generate automatic test reports in accurate, programmable intervals, timed by an internal clock. Program item ***IntervalDays*** determines whether the interval is measured in daily or hourly increments, *Interval* selects the interval between reports, and ***DaysTilRpt*** and ***HoursTilRpt*** determine the time until the initial report is transmitted. The automatic test report can transmit a RESTORAL ZONE E report *(**Test Code E**)* or a test code *(**Test Code**)* to the central station at test time. ***NOTE:*** *Once timer settings have been entered in DaysTilRpt and HoursTilRpt, do NOT disable/restart the Control/Communicator (simply disconnect the programmer cord). Disable/restart will default these program items to 0.*

Display	Default	Selections	Description
12 Test Reports		ENTER or ADVANCE	Scan the **ENTER** bar code to access this module. Scan the **ADVANCE** bar code to bypass this module.
TestPrimary	*Yes*	Yes or No	Transmit automatic **Test** reports to the **Primary** telephone number.
TestAlternate	*No*	Yes or No	Transmit automatic **Test** reports to the **Alternate** telephone number.
Test Code		0 through 9 B through F Blank	Transmit unexpanded automatic **Test** report **Code** message. *A Radionics Receiver interprets pulsed and BFSK number codes as alarms, and letter codes as events.* Blank Entry = no automatic test report code. B through F can only be used with the Modem II format.
Test Code E	*No*	Yes or No	Transmit RESTORAL ZONE **E** at automatic **Test** report time. If ten attempts to communicate with the receiver by each programmed telephone number are unsuccessful, test reports are transmitted as Trouble Zone E (BFSK or pulse formats) or a Restoral Zone E (Modem II format) once per hour (see Routing Operations) until communication is re-established. If **Yes** a test report will be transmitted every 24 hours.

If either ***TestPrimary*** or ***TestAlternate*** are **Yes** and a code has been entered in either ***Test Code*** or ***Test Code E*** , a test report will be sent to the Central Station every 24 hours.

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Display	Default	Selections	Description
Interval	*1*	0 through 63	Select automatic test time **Interval**. Time measured in hours or days: see *Interval Days* to determine hourly or daily interval.
IntervalDays	*Yes*	Yes or No	Enter **Yes** to set automatic test time **Interval** in **Day** increments. Enter **No** to set interval in *hour* increments.
DaysTilRpt	*0*	0 through 63	Number of **Days** unTil the *first* automatic test **Report** is transmitted.
HoursTilRpt	*0*	0 through 63	Number of **Hours** unTil the *first* automatic test **Report** is transmitted.

NOTE: If a disable/restart is performed after programming *DaysTilRpt* and *HoursTilRpt*, the programmed entry will revert back to the default value of "0".

The D4112 may be programmed to defer test reports any time a system report is generated. In the defer mode (*Defer Test*), if the D4112 generates any report other than the automatic test report, the time of the next report is deferred. For example, when a report is generated, the interval time is added to the present time of the D4112 internal clock. This sets the time of the next test report ahead. Automatic test reports may never be sent if the time of next test is continuously being deferred by other reports.

Defer Test	*No*	Yes or No	**Defer Test** reports when a system report is generated.

13. Zone Code Index

The zone code index is used to construct five digit response codes for the protective zones of the D4112 Control/Communicator (refer to Program Items ***11 Zone Codes***, ***Zone1 Code*** thru ***Zone6 Code***). The response code determines how a zone responds to command centers and loop faults. **All five digits must be used in a zone code. Blank or incomplete entries will not work.**

Digit One: Zone Response to Command Centers

Digit one determines the type of zone you are programming (e.g. 24-hour, interior, perimeter, priority). Descriptions of each type is given below. If you program your zone to be controlled (interior or perimeter), use the top part of the digit two chart to choose response to protective loops. If you program your zone to be 24 hour, use the bottom part of the digit two chart to choose response to protective loops.

24-hour zone — A 24 hour zone is not turned on and off from a command center. 24 hour zones are armed all the time, and can be used for fire protection, and panic, medical, and police alerts. NOTE: A 24 hour zone cannot be shunted from a Command Center but it can be programmed for swinger shunt.

Controlled zones (Perimeter & Interior) — are armed and disarmed by a Command Center.

Interior zone — Zones programmed as interior are armed only by master arming the system. They are NOT armed when using perimeter arming commands. These zones are typically used to monitor interior detection devices.

Perimeter zone — Zones programmed as perimeter may be armed as a group, separately from zones programmed as interior. This permits the user to partially arm the system to establish perimeter protection and still occupy the interior of the protected premises.

Priority zone — Each protective zone is programmed as either a 24-hour zone, an interior zone, or a perimeter zone. *Priority* zones cannot be force armed or shunted out of the arming procedure. Priority zones must be normal (not faulted) while attempting to arm the system, or the system cannot be armed. NOTE: The use of COMMAND 8 ***(8 Cmd Options, Cmd8PerPart!*** **Yes)** will *override* priority zones.

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Definition of each selection are as follows:

0 24 Hour Zone (zone is always armed, not turned on and off by a command center)

1 Interior Zone (can be left unarmed while perimeter arming)

2 Perimeter Zone (can be armed as a set, e.g. arm all perimeter zones)

3 Priority 24 Hour Zone

4 Priority Interior Zone

5 Priority Perimeter Zone

Digit One: Zone Response to Command Center						
	0	1	2	3	4	5
24 hour zone	X			X		
Interior zone		X			X	
Perimeter zone			X			X
Priority zone				X	X	X

Digit Two: Zone Response to Opens and Shorts on Loops

Digit two determines the zone response to an open or a short on a loop. The zone may be programmed to initiate a trouble signal, initiate an instant or delayed alarm, or ignore a fault on a protective loop. Descriptions of these options are as follows:

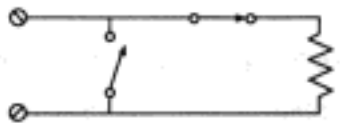
Open — An open circuit fault on the zone.

Short — A short circuit fault on the zone.

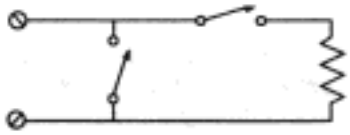
Trouble — Each protective zone is programmed to respond to open, short, and normal circuit conditions. Trouble is a response to an open or a short circuit condition. The Trouble response can generate a report to the central station, if programmed.

Delay alarm — Delay is a response to a detection circuit condition. When a user enters an armed system through a delay zone, the arming stations emit a warning tone to remind the user to disarm the system. If the system is not disarmed within the delay time (programmable), the system goes into alarm. NOTE: ***1 Account, Entry Delay*** must be programmed to enable entry delay warning.

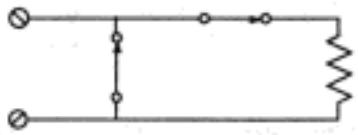
Instant alarm — Instant Alarm is a response to a detection circuit condition. When a user enters an armed system through a zone programmed for Instant Alarm, the system immediately initiates an alarm condition.



NORMALLY CLOSED AND NORMALLY OPEN CIRCUIT



OPEN CIRCUIT FAULT



SHORT CIRCUIT FAULT

Definition of each selection are as follows:

0 No trouble, no delay, instant alarm on OPEN or SHORT

1 Trouble on OPEN, instant alarm on OPEN or SHORT

2 Trouble on SHORT, instant alarm on OPEN or SHORT

3 Trouble on OPEN or SHORT, instant alarm on OPEN or SHORT

4 Delay on OPEN, instant alarm on SHORT,no trouble conditions

5 Delay on OPEN, instant alarm on SHORT, trouble on OPEN

6 Delay on OPEN, trouble on SHORT, instant alarm on SHORT

7 Delay on OPEN, trouble on OPEN or SHORT, instant alarm on SHORT

8 Delay on SHORT, instant alarm on OPEN, no trouble conditions

9 Delay on SHORT, instant alarm on OPEN, trouble on OPEN

A Delay on SHORT, instant alarm on OPEN, trouble on SHORT

B Delay on SHORT, instant alarm on OPEN, trouble on OPEN or SHORT

C Delay on OPEN or SHORT, no trouble conditions

D Delay on OPEN or SHORT, trouble on OPEN

E Delay on OPEN or SHORT, trouble on SHORT

F Delay on OPEN or SHORT, trouble on OPEN or SHORT

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Digit Two: Zone Response to Opens & Shorts on Loops																
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Controlled	Open loop while armed	I	I	I	I	D	D	D	D	I	I	I	I	D	D	D	D
	Shorted loop while armed	I	I	I	I	I	I	I	I	D	D	D	D	D	D	D	D
	Open loop while disarmed	-	T	-	T	-	T	-	T	-	T	-	T	-	T	-	T
	Shorted loop while disarmed	-	-	T	T	-	-	T	T	-	-	T	T	-	-	T	T
24 Hour	Open loop	A	T	A	T	-	-	A	T								
	Shorted loop	A	A	T	T	A	T	-	-								

Key to digit two: I = Instant alarm D = Delay alarm T = Trouble response A = Alarm (instant)

Digit Three: Zone Local Alarm Response

Digit three determines the local alarm response of the selected zone. The zone may be programmed to produce a silent, steady, or pulse alarm output, activate the alternate alarm output, produce a ring override, or a combination of these responses.

Silent alarm — No local alarm, no voltage output to sirens or bells. An alarm report is generated to the central station, if programmed.

Bell Power — Steady alarm output. When an alarm is initiated from this zone, the voltage supplied to Terminal 5 of the D4112 is steady, continuous DC voltage. Voltage is supplied for duration of bell time (programmable) or duration specified in Digit Five of the zone code.

Pulse option — Pulsed alarm output. When an alarm is initiated from this zone, the voltage supplied to Terminal 5 of the D4112 is pulsing DC voltage. Voltage is supplied for duration of bell time (programmable) or duration specified in Digit Five of the zone code. NOTE: A programmed pulse output has priority over a programmed steady output. Controlled zones with pulsed bell outputs cannot be selectively shunted from the Command Center but they can be force armed.

Alternate alarm output — When an alarm is initiated from this zone, the "steady" alternate alarm output is activated for the duration of the programmed bell time *(**7 Bell Options, Bell Time**)* or the duration specified in Zone Code Digit Five.

1 Ring Override — When an alarm is initiated from this zone, the alarm response is not limited to one ring. Selecting 1 Ring Override will pre-empt the ring response that is programmed in ***7 Bell Options, One Ring*** for this zone. Zones programmed for **1 Ring override** can not be shunted using the Command 0 sequence but they can be force armed.

Descriptions of each selection are as follows:

0 Silent alarm, no alarm output

1 Steady alarm output for bells/sirens

2 Alternate alarm output activiation for duration of bell timeout

3 Alternate alarm output activation and steady alarm output for bells/sirens

4 Pulsing alarm output for bells/sirens (overrides single bell per fault option)

5 Alternate alarm output activation (overrides single bell per fault option)

6 Alternate alarm output activation and pulsing alarm output for bells/sirens (overrides single bell per fault option)

Digit Three: Zone Local Alarm Response							
	0	1	2	3	4	5	6
Silent alarm	X		X			X	
Bell power		X		X	X		X
Pulse option					X		X
Alternate alarm output			X	X		X	X
1 Ring override					X	X	X

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Digit Four: Central Station Reporting Options

Digit four determines the central station reporting options such as the operation of the swinger shunt and the transmission of Restoral Reports. If an entry of "0" is made for digit four, the zone does NOT initiate any **reports to the central station**, and only local alarms will sound (if programmed).

Swinger shunt — When four events (troubles or alarms) are detected by the swinger event counter during the D4112 one-hour window, the zone is shunted and a trouble report is communicated to the central station if the fourth event is an *alarm*. (If the fourth event is a *trouble*, a trouble report will *not* be sent.) The shunted zone is indicated by a slowly blinking zone LED at the command center. Shunts are cleared when the system is disarmed. If fewer than four events are detected by the swinger event counter during the D4112 one-hour window, the counter is cleared.

NOTE: Swinger shunt zones can be force armed (shunted out if faulted during arming). If a swinger shunt zone is restored after the system has been force armed, it will become armed like the system and be able to detect system faults. Zones *not* programmed with swinger shunt will *not* become armed with the rest of the system until the entire system is re-armed.

Restoral reports — transmitted after an alarm report or a trouble report, and indicate that the zone has been restored to normal.

Designated zones — Users of the D4112 system can select areas to be "designated zones". These zones have special routing instructions. When a Routing Telephone reporting pattern (program items ***3 Phone, Alarm Route*** thru ***Restoral Route***) is set to "3", a "designated zone" transmits the selected report to both the Primary *and* the Alternate Telephone numbers. If a "0", "1", or "2" is selected for the Routing Telephone reporting pattern, the **Designated zone** bit of Digit Four has no effect.

Descriptions of each selection are as follows:

0 Non-reporting, local zone only
1 Standard reporting zone
2 Designated zone
3 Swinger shunt zone
4 Swinger shunt, designated zone
5 Standard reporting zone, includes restoral reports
6 Restoral reports, designated zone
7 Restoral reports , swinger shunt zone
8 Designated zone

Digit Four: Central Station Reporting Options									
	0	1	2	3	4	5	6	7	8
Reports to central station		X	X	X	X	X	X	X	X
Swinger shunt				X	X			X	X
Restoral reports						X	X	X	X
Designated zone			X		X		X		X

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Digit Five: Local Zone Annunciation and Options

Digit five selects options pertaining to zone invisibility and alarm sounding. Detailed descriptions are given below. An entry of "0" for digit five produces no options: the zone status is constantly displayed at the Command Center, the condition of the zone does not affect bell time-out, and there is no audible indication of a zone fault at the Command Center.

Invisible zone — Invisible zones do not display zone status at the Command Center.

Sound bells until restoral — Alarms initiated from this zone cannot be silenced from the Command Center until the zone has been restored to normal. Overrides programmable bell time.

Buzzer on fault — When this zone is faulted (open or short circuit) the Command Center buzzes. Buzzers are silenced by zone restoral or by entering COMMAND 4 at the Command Center.

Descriptions of each selection are as follows:

0 No options
1 Invisible zone
2 Ring sirens/bells until zone restoral
3 Ring sirens/bells until zone restoral, invisible zone
4 Sound buzzers for zone fault
5 Sound buzzers for zone fault, invisible zone
6 Sound buzzers for zone fault, ring sirens/bells until zone restoral
7 Sound buzzers for zone fault, ring bells until zone restoral, invisible zone

Digit Five: Local Annunciation of Zones & Options								
	0	1	2	3	4	5	6	7
Invisible zone		X		X		X		X
Sound bells until restoral			X	X			X	X
Buzzer on fault					X	X	X	X

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14. Recommended Zone Code

The recommended 24 hour Zone Codes and Controlled Zone Codes, explained below, have been designed with several standard functions. Although these standard functions may be changed by personalizing your zone code with custom entries, these are the recommended codes from Radionics. Find the description which best identifies the zone to be programmed, then find the column which represents the type of reporting desired for that zone. At the intersection point of the column and the description is a zone code number.

24 Hour Zone Standards

- Fire zones initiate a pulsed bell output on alarm, while Panic & Holdup zones initiate a steady bell output (if audible).
- Fire zones have audible and visual annunciation at the command center during trouble alerts, while Panic & Holdup zones have only visual annunciation at the command center during trouble.
- Bell output expires after bell timeout, or when the correct passcode is entered at the command center.

	Trouble & Restoral	Trouble No Restoral	No Trouble No Restoral	Local No Reports	Restoral No Trouble
Fire zones					
Standard	01454	01414	04414	04404	
+ Unlimited bell	01456	01416	04416	04406	
Panic & Holdup (Audible)					
Normally closed	02150	02110	00110	00100	
+ Unlimited bell	02152	02112	00112	00102	
+ Invisible zone	02151	02111	00111	00101	
+ Unlimited & invisible	02153	02113	00113	00103	
Normally open	01150	01110	00110	00100	
+ Unlimited bell	01152	01112	00112	00102	
+ Invisible zone	01151	01111	00111	00101	
+ Unlimited & invisible	01153	01113	00113	00103	
Panic & Holdup (Silent)					
Normally closed	02050	02010	00010	n/a	
+ Invisible zone	02051	02011	00011	n/a	
Normally open	01050	01010	00010	n/a	
+ Invisible zone	01051	01011	00011	n/a	
Independent Zone Controls					
D268/D269 and D279	01150*		04110	04100	04150

* NOTE: This loop code supervises the wiring between the control communicator and the sub-control only.

Controlled (Burglar) Zone Standards

- Controlled zones initiated a steady bell output on alarm.
- Bell output expires after bell timeout, or when the correct passcode is entered at the command center.
- Controlled zones display their status at the keypad.
- While the system is armed, a controlled zone initiates an alarm for either an open loop or a shorted loop.

	Trouble & Restoral	Trouble No Restoral	No Trouble No Restoral	Local No Reports
Perimeter Zones				
Delay (normally closed)	26150	26110	24110	24100
+ swinger shunt	26170	26130	24130	n/a
Delay (normally open)	29150	29110	28110	28100
+ swinger shunt	29170	29130	28130	n/a
Instant (normally closed)	22150	22110	20110	20100
+ swinger shunt	22170	22130	20130	n/a
Instant (normally open)	21150	21110	20110	20100
+ swinger shunt	21170	21130	20130	n/a
Glass Break Zone	23154	23114	20114	20104
Window Foil	23154	23114	20114	20104
Interior Zones				
Delay (normally closed)	16150	16110	14110	14100
+ swinger shunt	16170	16130	14130	n/a
Delay (normally open)	19150	19110	18110	18100
+ swinger shunt	19170	19130	18130	n/a
Instant (normally closed)	12150	12110	10110	10100
+ swinger shunt	12170	12130	10130	n/a
Instant (normally open)	11150	11110	10110	10100
+ swinger shunt	11170	11130	10130	n/a

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15. System Trouble Report Codes (COMMAND 42 and COMMAND 40)

Typically, when a system trouble occurs, the trouble buzzer of the Command Center will sound. When the subscriber calls his alarm company for service, the subscriber may be instructed to key in a COMMAND 42 (see ***9 Sys Test/Reset, Cmd42DiagRpt***).

If **pulsed format** is transmitted, only the trouble report code is sent to the central station. If there are *no* system troubles present when COMMAND 42 is entered, a restoral report will be transmitted. If the communicator transmits in **BFSK format**, a trouble report code and "STATUS REPORT" will be sent to the central station. If there are *no* system troubles, a restoral report and "STATUS REPORT" will be transmitted. If the **Modem II** format is used by the communicator, a trouble report code and "DIAG REPORT" will be sent to the central station. If there are *no* system troubles, only a "DIAG REPORT" will be transmitted.

Keying COMMAND 40 at a Command Center will replace the display of zone status on the four left indicator lights with a trouble report code. If applicable, a second trouble report can be displayed by keying in another COMMAND 40. Maximum number of troubles that can be held by COMMAND 40 is two. If no indicators light on the second COMMAND 40 entry, there is only one cause of system trouble. The table below indicates the nature of, probable source of, and required action for each trouble report. NOTE: Zones 1 through 4 must be programmed to enable COMMANDs 40 and 42.

After the panel is disabled/restarted, powered up, or serviced for the indicated system troubles, clear the system trouble memory by entering COMMAND 42 and/or COMMAND 40 until no troubles are displayed. Press any key to exit COMMAND 40. (COMMAND 40 is *not* automaticaly exited upon an alarm or a trouble condition, although alarm and trouble signals continue to be transmitted to the central station.) A disable/restart will update the trouble display.

Indicator Lights 1	2	3	4	Trouble Report Code	Description	Probable Cause	Action Required
□	■	□	■	0	D5100 Communication Error	bad connection to programmer	reprogram panel
■	□	□	□	1	Faulted Zone	protection loop fault	check zone status light
□	■	□	□	2	Command Center Communication Error	noisy environment or excessive wire length	service may be required
■	■	□	□	3	Communication Failure	unable to communicate with central station	service may be required
■	□	■	□	5	Aux Power Supervision	probable short on auxiliary device or wiring	service is required
□	■	■	□	6	AC Power Fail	transformer unplugged	service may be required
■	■	■	□	7	Battery Supervision	low battery or battery fail	service may be required
□	□	□	■	8	Command Center Fault	Command Center wiring fault or interface failure	service is required
■	□	□	■	9	Internal Hardware Fault	main D4112 board failure (local zone inputs are probably inoperative)	service is required
■	■	□	■	B	Missing Serial Device	serial device failure	service is required
□	□	■	■	C	Device Programming Error	serial device does not match program	reprogram device
■	□	■	■	D	Internal Software Error/ Cmd Center Comm Problems	internal memory failure	call Radionics Customer Service
□	■	■	■	E	Checksum Fail	EEPROM failure	call Radionics Customer Service
■	■	■	■	F	System ROM Failure	internal ROM failure	call Radionics Customer Service

■ = indicator light ON
□ = indicator light OFF

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PART III: U.L. Certification and System Specifications

1. Guide for U.L. Certified Systems

Introduction

The D4112 Control/Communicator is U.L. listed for Central Station Grade A, Grade B, and Grade C Burglary Alarm, Digital Police Connection, Local Grade A Burglary Alarm, Household Fire Warning, and Household Burglary Alarm applications. The D4112 should be installed in accordance with U.L. 681 Installation and Classification of Mercantile and Bank Burglar Alarm Systems, or U.L. 1641 Installation and Classification of Residential Burglar Alarm Systems, and applicable sections of the NEC. For U.L. certificated installations, at least one D420A Command Center must be installed with the D4112.

Programming Guidelines

U.L. certificated systems which include the D4112 must conform to several programming guidelines. Listed below are required program entries and enclosures for specific applications. Each section includes zone code entries. The specific function of each protective zone must be determined in order to verify that the correct entries have been chosen. Command 47 provides reset capability for smoke detectors. When these devices are used in the system, set program item ***9 Sys Test/Reset, Cmd47SmkRst*** to **Yes**. Systems which report to a digital alarm receiver must have a phone number programmed in ***3 Phone, PPhone#*** See **PART II: D4112 Programming** for specific details on all program entries and zone code functions.

A trained technician representing the installing or servicing company must perform all operations necessary to display the program for verification by inspecting authorities. These operations include connecting the programmer to the D4112 Control/Communicator, copying the program into the D5100 Bar Code Programmer, and using the D5100 Bar Code Programmer to display program items appropriate to the application. The performance of a reporting system must be tested by transmitting appropriate signal(s) to the central station.

1.1 Household Fire Alarm (reporting or non-reporting)

The D4112 can be housed in a standard enclosure for this application. At least one smoke detector, and at least one M806 bell (or equivalent) is required. The available emergency battery standby time for this unit is 10 hours plus a 4 minute alarm. The D4112 should be installed in accordance with the requirements of the NFPA 70 (NEC article 760) and NFPA 74 standards. *For Household Fire Warning it is recommended that you limit your alarm power output to 300 mA.*

Mandatory Program Entries:

1 Account, Disable Sys	***No***	***9 Sys Test/Reset, Cmd44SysTst***	***Yes***
1 Account, Local	***Yes*** (non-reporting system) ***No*** (reporting system)	***9 Sys Test/Reset, Cmd47SmkRst***	***Yes***
7 Bell Options, Bell Time	***05*** (minimum)		

Zone Code: ***11 Zone Codes, Zone1 Code***

Digit One:	0
Digit Two:	1
Digit Three:	1 through 6
Digit Four:	0, 1, 3, 5, or 7
Digit Five:	4 or 6

1.2 Household Burglary Alarm (reporting or non-reporting)

The D4112 can be housed in a standard enclosure for this application. At least one M806 bell (or equivalent) is required. The minimum battery standby time for this application is 4 hours. The D4112 should be installed in accordance with the requirements of the U.L. 1641 standard.

Mandatory Program Entries:

1 Account, Disable Sys	***No***	***1 Account, Exit Delay***	***060*** (maximum)
1 Account, Local	***Yes*** (non-rpt sys) ***No*** (rpt sys)	***7 Bell Options, Bell Time***	***05*** (minimum)
		9 Sys Test/Reset, Cmd44SysTst	***Yes***
1 Account, Entry Delay	***040*** (maximum)		

Zone Code: ***11 Zone Codes, Zone1 Code***

Digit One:	0 through 5
Digit Two:	0 through F
Digit Three:	0 (if reporting system), 1 through 6
Digit Four:	0 through 8
Digit Five:	0 through 7

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1.3 Household Fire Alarm and Burglary Alarm Combination (reporting or non-reporting)

Follow the requirements listed for the Household Fire Warning and Household Burglary Alarm applications above, using the appropriate zone codes specified for each application. The D4112 must be programmed to pulse the bell (Zone Code Digit Three: 4 or 6) for a fire alarm, and produce a steady bell output (Digit Three: 1 or 3; or 2 or 5 if the alternate alarm output is used) for a burglary alarm. *For Household Fire Warning it is recommended that you limit your alarm power output to 300 mA.*

1.4 Local Burglary Alarm

A D4112M (D4112 with mounting skirt) must be housed in a D8108A attack-resistant enclosure for this application. The selected bell must be installed in a U.L. listed bell housing. The minimum battery standby time for this application is 4 hours. The D4112 should be installed in accordance with the requirements of the U.L. 681 standard.

Mandatory Program Entries:

1 Account, Disable Sys	***No***	***7 Bell Options, Bell Time***	***30*** (minimum)
1 Account, Entry Delay	***030*** (maximum)	***7 Bell Options, Test Bell***	***Yes***
1 Account, Exit Delay	***060*** (maximum)		

Zone Code: ***11 Zone Codes, Zone1 Code***

Digit One:	0 through 5
Digit Two:	0, 4, 8, C
Digit Three:	1 through 6
Digit Four:	0
Digit Five:	0, 2, 4, 6

1.5 Digital Police Connection

A D4112M (D4112 with mounting skirt) must be housed in a D8108A attack-resistant enclosure for this application. The selected bell must be installed in a U.L. listed bell housing. The minimum battery standby time for this application is 4 hours. The D4112 should be installed in accordance with the requirements of the U.L. 681 standard.

Mandatory Program Entries:

1 Account, Disable Sys	***No***	***5 Tbl/Restorals, DelayRestore***	***No***
1 Account, Local	***No***	***7 Bell Options, Bell Time***	***30*** (minimum)
1 Account, Entry Delay	***030*** (maximum)	***7 Bell Options, Test Bell***	***Yes***
1 Account, Exit Delay	***060*** (maximum)	***9 Sys Test/Reset, Battery Supv***	***9****

*NOTE: This is the required entry for D4112 Control/Communicators operating with Radionics receivers. This entry may vary if a non-Radionics U.L. listed receiver is used.

Zone Code: ***11 Zone Codes, Zone1 Code***

Digit One:	0 through 5
Digit Two:	0 through F
Digit Three:	0 through 6
Digit Four:	1,3,5,7
Digit Five:	0 through 7

12 Test Reports, Test Code To provide 24-hour test, either a code must be entered in ***12 Test Reports, Test Code***, ***12 Test Reports, Test Code E, Test Code***, or ***12 Test Reports, Test Code E***, must be ***Yes***.
12 Test Reports, Interval ***01***
12 Test Reports, IntervalDays ***Yes***
12 Test Reports, Defer Test ***No****

* NOTE: ***12 Test Reports, Defer Test*** can be ***Yes*** if the signal is received by an automated system which is programmed to expect a signal from the protected premises at least once every 24 hours.

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1.6 Central Station Burglar

A D4112M (D4112 with mounting skirt) must be housed in a D8108A attack-resistant enclosure for this application. For Grades A and B, a bell must be installed in a U.L. listed bell housing. Additionally for Grade A, a D127 Reversing Relay must be installed. The minimum battery standby time for this application is 4 hours. The D4112 should be installed in accordance with the requirements of the U.L. 681 standard.

Mandatory Program Entries:

1 Account, Disable Sys	***No***	***6 Open/Closings, Closing Code***	***C*** [1]
1 Account, Local	***No***	***6 Open/Closings, Restrict O/C***	***No***
1 Account, Entry Delay	***030*** (maximum)	***7 Bell Options, Bell Time***	***30*** [2] (mimimum)
1 Account, Exit Delay	***060*** (maximum)	***7 Bell Options, Test Bell***	***Yes*** [2]
5 Tbl/Restorals, DelayRestore	***No***	***9 Sys Test/Reset, Battery Supv***	***9*** [1]
6 Open/Closings, Opening Code	***B*** [1]		

NOTES: [1] This is the required entry for D4112 Control/Communicators operating with Radionics receivers. This entry may vary if a non-Radionics U.L. listed receiver is used.

[2] Only required for Central Station Grades A and B.

Zone Code: ***11 Zone Codes, Zone1 Code***

Digit One:	0 through 5
Digit Two:	0 through F
Digit Three:	0 through 6
Digit Four:	1, 3, 5, 7
Digit Five:	0 through 7

12 Test Reports, Test Code To provide 24-hour test, either a code must be entered in ***12 Test Reports, Test Code***, or ***12 Test Reports, Test Code E*** must be ***Yes***.

12 Test Reports, Test Code E

12 Test Reports, Interval ***01***

12 Test Reports, IntervalDays ***Yes***

12 Test Reports, Defer Test ***No****

* NOTE: ***12 Test Reports***, *Defer Test* can be Yes if the signal is received by an automated system which is programmed to expect a signal from the protected premises at least once every 24 hours.

1.7 Instructions for Connection of D4112 to Morse PAL-200C to Comply with U.L. AA Certification

Derived channel hardware can be used to upgrade central station burglary systems from Grade B to Grade A or AA in lieu of using the D127 Reversing Relay mentioned in the section above. The system must be installed in compliance with U.L. standards 609, 611, and 681. The installation must be done in accordance with the information and wiring instructions presented below.

1. TS2 and TS3 jumpers must be set in the positions shown.
2. All unused alarm inputs (terminals 1-8) must be connected to Ground.
3. The D4112 must be programmed to send Opening and Closing signals to and receive ringback signals from the Central Station receiver (***7 Bell Options, Test Bell***).
4. To activate terminal 7 for use as an auxiliary Alarm Output a D136 Relay must be inserted in the K5 socket.
5. The PAL-200C includes a U.L. approved enclosure.
6. The Voltage Translator, shown in Figure 3 of the PAL-200 Installation and Operating Instructions (Morse document no. 3440-0160 Rev. B, or higher), must be used if the off hook voltage falls below 3.5 VDC.
7. Install enclosure and wiring as per PAL-200C Installation and Operating Instructions (Morse document no. 3440-0160 Rev B., or higher).
8. Tip and ring wires from the RJ11 jack must be connected to terminals 5 (green) and 4 (red) respectively in the RJ31X jack to maintain continuity to the PAL-200C when the D4112 is communicating.

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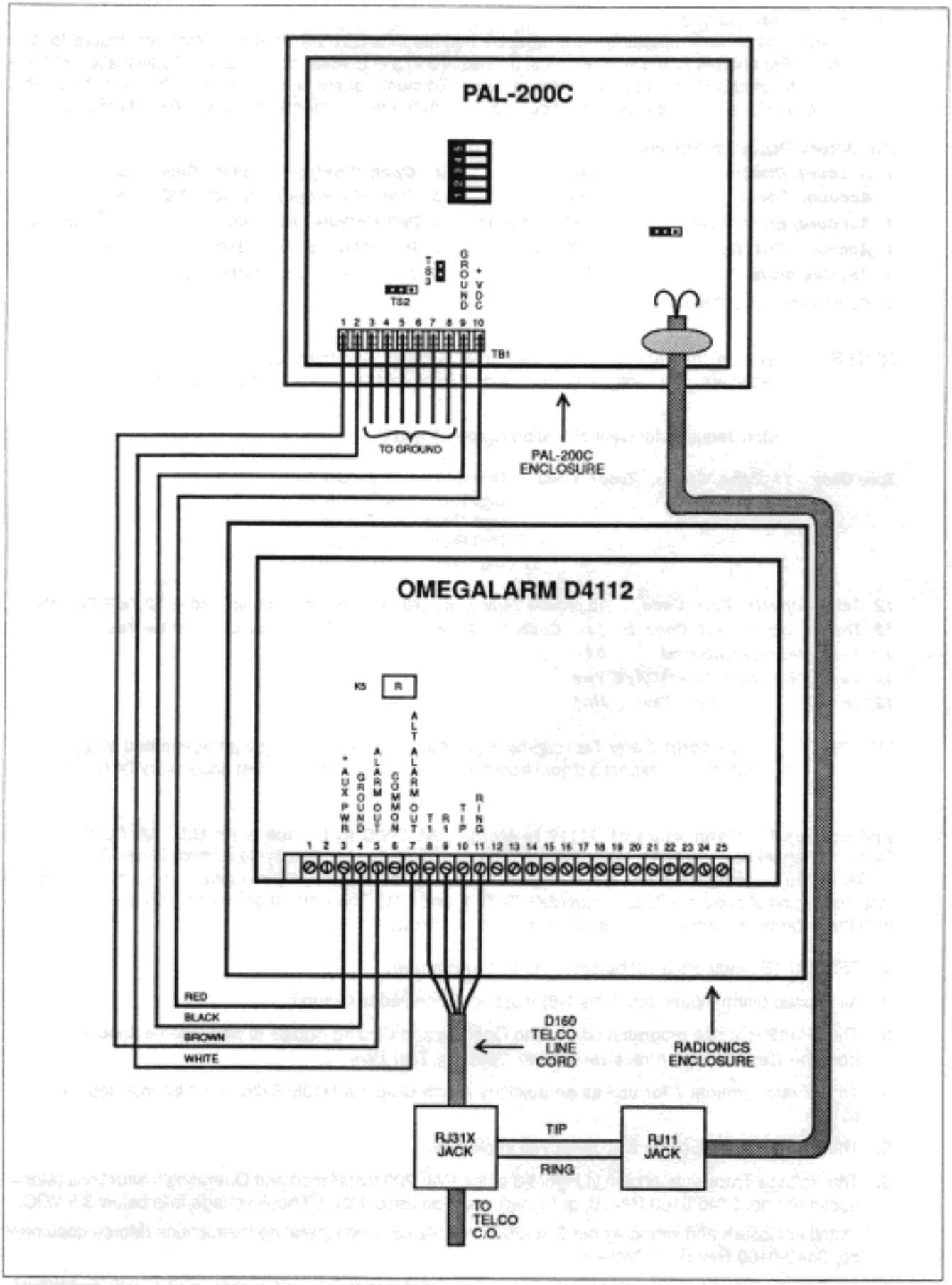

Figure 10: CONNECTION OF D4112 TO MORSE PAL-200C

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2. System Specifications

2.1 Radionics D4112 Control/Communicator Specifications

Operating Voltage:
Primary: 16.5 VAC 25 VA class 2 plug-in transformer (supplied with unit).

Secondary: 12 VDC 6 AH sealed lead-acid type rechargeable battery.

Auxiliary Power Output:
Continuous 350 mA of current at 10.5 to 14 VDC.

Telephone Connection: RJ38X or RJ31X jack

Operating Temperature:
0 to 50 °C (32 to 122 °F)*

Current Requirements:
Idle: 75 mA
Transmitting: 150 mA

Enclosure Dimensions:
Height 11.25", Length 11.25", Depth 3"

Alarm Power Output:
1.5 Amps of current at 10.2 to 14 VDC.
Output programmable for steady or pulsed voltage supply.
For Residential Fire (NFPA 74) it is recommended that you limit your alarm power output to 300 mA.

Non-condensing Relative Humidity:
5 to 85% at 30 °C (86 °F)

* NOTE: It is recommended that the D4112 be installed in a temperature-controlled environment to prolong the life of the Control/Communicator, Command Centers, and batteries.

2.2 D420A Command Center Specifications

Operating Voltage:
Nominal 12 VDC supplied from the control/communicator auxiliary power supply.

Enclosure Dimensions:
Height 4.56", Length 7.0", Depth .84"

Operating Temperature:
0 to 50 °C (32 to 122 °F)

Current Requirements:
Idle: 30mA
Maximum: 65mA Command Center warning tone "on."

Color: Warm gray.

Non-condensing Relative Humidity:
5 to 85% at 30 °C (86 °F)

Command Center Wiring:
A four-conductor wire assembly (included) supplies data-in, data-out, positive voltage, and common connections between the D420A and the D4112.

Display:
System Status Display: Annunciates system armed status by indicating perimeter arm, interior arm, instant arm, and exit delay.

Zone Status Display: Annunciates summary of account zone status.

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THE QUALITY LEADER

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