## LINEAR'S MULTI-CHANNEL RECEIVERS

Linear manufactures several multi-channel receivers for use in security systems and remote switching functions requiring more than one wireless zone or output. Using one multi-channel receiver instead of several single-channel receivers enables the installer to cut installation costs and improve system performance by eliminating RF interference problems present in multiple-receiver installations.

## THREE DIFFERENT TYPES OF OUTPUTS

Linear's two- and four-channel receivers are available in three different types of output configurations: two solid-state and one relay. Certain alarm control panels and communicators require a positive voltage to trigger. Other controls, especially those with end-of-line (EOL) resistors, can be triggered with a short-to-common output. All controls and communicators can be triggered with a dry contact relay output (normally open or normally closed).

## "C" TYPE VOLTAGE OUTPUT

### *D-4C and D-4C/K*

The output wires on the "C" type voltage output receivers supply a positive trigger voltage to the connected device when the receiver detects a properly coded digital RF signal from a Linear transmitter. Each output channel wire will switch from an open state to +9 volts DC when activated. The voltage outputs are current limited to 10 mA maximum at 9 VDC, 40 mA maximum into a short. See Figure 1 for a hook-up example.

## "D" TYPE SHORT-TO-COMMON OUTPUT

### *D-4D and D-4D/K*

The outputs of a "D" type short-to-common receiver are similar to a normally open switch that has one side connected to common or circuit ground. When any receiver channel is activated, the corresponding output wire will switch from an open state to 0 volts (common or circuit ground). The short-to-common outputs are current limited to a maximum of 40 mA. This is enough current to trigger most control panels with EOL resistors or drive a **small** relay. If driving a relay, be sure to connect a clamping diode across the relay coil. See Figure 2 for a hook-up example.

✶ ***NOTE: On all "C" and "D" type receivers, the common (-) of the receiver must be connected to the common (-) of the control panel or communicator (see Figures 1 & 2).***

## "R" TYPE RELAY OUTPUT

### *D-2R, D-2R/K, D-4R AND D-4R/K*

The outputs of the "R" type receivers are isolated dry relay contacts. Dry contacts indicate that the switching contacts are isolated from the receiver power supply. The receivers provide normally open and normally closed contacts for each channel. The current rating of the relay outputs is 1 amp at 32 volts maximum. **Do not exceed this rating.** See Figure 3. for a hook-up example.

## RECEIVER CODE SETTING

✶ ***CAUTION: Transmitters and receivers should be re-coded by the installer prior to installation. Do not leave units set to the factory code.***

Linear's two- and four-channel receivers contain an eight-key digital coding switch recessed in the back cover of each unit.

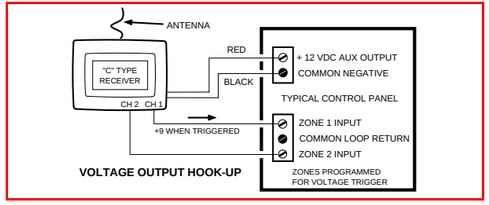



*Figure 1. Typical "C" Type Wiring*

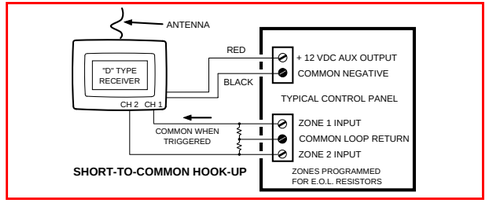



*Figure 2. Typical "D" Type Wiring*

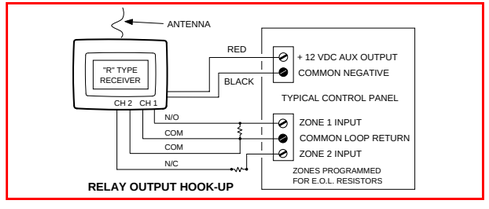



*Figure 3. Typical "R" Type Wiring*

The switch keys are numbered 1-8 (see Figure 4). **Keys #1 and #2 are not used when coding the receiver.** These keys are not connected, and their position doesn't matter.

To set a code, select a random pattern for keys 3-8. Set the code keys with a pointed object other than a pencil or pen. In the example shown in Figure 4, keys 4, 6 and 7 are set to *ON*, keys 1, 2, 3, 5 and 8 are set to *OFF*.

**The receiver code keys 3-8 must match exactly with code keys 3-8 in all Linear transmitters used with that receiver.**

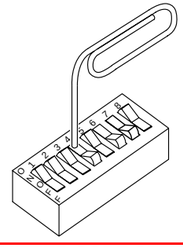



*Figure 4. Example Coding Switch*

## TRANSMITTER CODE SETTING

### *TWO- AND FOUR-CHANNEL TRANSMITTERS*

To code a D-4 four-channel portable transmitter to any two- or four-channel receiver, simply match keys 3 through 8 in the transmitter to keys 3 through 8 in the receiver.

To code D-22B, D-22C, or D-22D two-channel portable transmitters to a two-channel receiver, match keys 3 through 8 in the transmitter to keys 3 through 8 in the receiver and turn transmitter key #2 to the *OFF* position.

✶ ***IMPORTANT: When using the above two-channel transmitters with any two-channel receiver, key #2 in the transmitter must be OFF.***

To code D-22B, D-22C, or D-22D two-channel portable transmitters to a four-channel receiver, match keys 3 through 8 in the transmitter to keys 3 through 8 in the receiver. If key #2 in the transmitter is *OFF,* the transmitter will activate receiver channels one and two. If key #2 in the transmitter is *ON,* the transmitter will activate channels three and four.

### *SINGLE-CHANNEL TRANSMITTERS*

To code any Linear single-channel transmitter to a two- or four-channel receiver, set keys 3 through 8 in the transmitter to match keys 3 through 8 in the receiver. **Keys one and two in the transmitter determine which receiver channel will activate.** Refer to Figures 5, 6, 7 and 8 for the settings of keys one and two in the transmitter for selecting channels 1, 2, 3 and 4 respectively.

✶ ***NOTE: On multi-channel receivers, only one receiver channel can be activated at a time!***

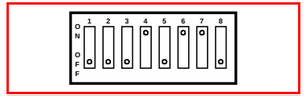



*Figure 5. Transmitter Setting for Channel One*

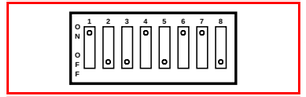



*Figure 6. Transmitter Setting for Channel Two*

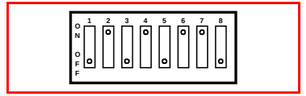



*Figure 7. Transmitter Setting for Channel Three*

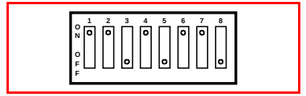



*Figure 8. Transmitter Setting for Channel Four*

## INSTALLATION

The receiver should be mounted on the wall above or next to the control panel. Generally, the higher the receiver is mounted above ground level, the better the radio range should be.

Use Table 1 as a guide and follow these steps to connect the receiver:

**STEP 1** Connect receiver negative COMMON (-) to the negative terminal on the 12-volt, 24-hour output from the control panel.

**STEP 2** Connect receiver positive (+) to the positive terminal on the 12-volt, 24-hour output from the control panel.

**STEP 3** Connect the outputs to the zone input terminals on the control panel (see Figures 1, 2, and 3).

**STEP 4** If the control panel uses end-of-line resistors, connect them across the receiver output for normally open loops, or in series with the receiver outputs for normally closed loops.

| | D-2R & D-4R | | | D-4C & D-4D |
|---|---|---|---|---|
| | **N/O** | **COMMON** | **N/C** | |
| **POWER +** | GOLD (ON WHITE PAIR) | | | RED |
| **POWER -** | SILVER (ON WHITE PAIR) | | | BLACK |
| **CH. 1** | BROWN 1 | RED 1 | ORANGE | YELLOW |
| **CH. 2** | YELLOW | GREEN | BLUE | BROWN |
| **CH. 3** | VIOLET | GRAY | WHITE | GREEN |
| **CH. 4** | BLACK | BROWN 2 | RED 2 | WHITE |

*Table 1. Installation Wiring Chart*

## CHECKOUT AND TEST

After installing the receiver, the system should be tested.

To test the receiver, perform the following steps:

**STEP 1** Apply power to the control panel. Be sure the control panel is disarmed or in a "test" mode.

**STEP 2** Trigger each of the system's transmitters, one at a time. Receiver activation indicates that the transmitters are operating properly and that the digital codes are correctly matched. Verify that the correct receiver channel and control panel loop is violated.

**STEP 3** With portable transmitters, operate them from various locations. This will help to locate possible null areas where structural steel, and/or certain obstacles may interfere with transmission.

If the transmitter fails to activate the receiver, first check the coding switches to see that the switch keys in the transmitter and receiver are properly matched. Next, check the battery and replace it if it is weak. Although transmitter batteries should last for a year with normal use, it is good practice to install new transmitter batteries every six months.

✶ ***Electronic products are no better than the inspection and maintenance they receive over time. Therefore, Linear recommends installers should instruct their customers to test their equipment regularly, at least once a week.***

## SPECIFICATIONS

| | |
|---|---|
| **CODING TECHNIQUE** | Pulse width A-1 modulation at 250 bits-per-second. Four 8-bit words are required for activation |
| **NUMBER OF CODES** | 64 system codes |
| **RF CARRIER** | 303.875 MHz for U.S.<br>318 Mhz for Canada |
| **RADIATED OUTPUT** | Complies with FCC Part 15 and D.O.C. Rules |
| **SELECTIVITY** | 5 MHz at 5 mV input |
| **POWER REQUIREMENTS** | "C" and "D" Type:<br>11 to 24 VDC or 12 to 16 VAC<br>Standby and operating current 15 mA typical<br>"R" Type:<br>11 to 24 VDC or 12-16 VAC<br>Standby current 15 mA, operating 60 mA typical |
| **OUTPUT RATING** | "C" Type: 9 VDC out @ 40 mA maximum<br>"D" Type: 40 mA maximum short-to-common<br>"R" Type: Form C, 1 Amp @ 32 VDC maximum |
| **OPERATING TEMPERATURE** | -40 to +140° F<br>(-40 to +60° C) |
| **SIZE** | "C" and "D" Type: 4.9 x 3.8 x 1.3 inches (125 x 97 x 33 mm)<br>"R" Type: 4.9 x 4.2 x 1.3 inches (125 x 107 x 33 mm) |

## LINEAR LIMITED WARRANTY

This Linear product is warranted against defects in material and workmanship for twelve (12) months. The Warranty Expiration Date is labeled on the product. **This warranty** extends only to wholesale customers who buy direct from Linear or through Linear's normal distribution channels. **Linear does not warrant this product to** consumers. Consumers should inquire from their selling dealer as to the nature of the dealer's warranty, if any. **There are no obligations or liabilities on the part of** Linear corporation for consequential damages arising out of or in connection with use or performance of this product or other indirect damages with respect to loss of property, revenue, or profit, or cost of removal, installation, or reinstallation. All implied warranties, including implied warranties for merchantability and implied warranties for fitness, are valid only until Warranty Expiration Date as labeled on the product. **This Linear Corporation Warranty is in lieu of all other warranties** express or implied.

For warranty service on Linear equipment return product, at sender's expense to:

**U.S.A.**
**Linear Corporation**
**2350 Camino Vida Roble,Ste.A**
**Carlsbad, CA 92009**
**Attention: Repairs Department**
**Ph# (800) 392-0123**

**Canada**
**Linear Canada Inc.**
**673 Consortium Court**
**London, Ontario, Canada N6E 2S8**
**Attention: Repairs Department**
**Ph# (519) 685-3020**

## IMPORTANT !!!

Linear radio controls provide a reliable communications link and fill an important need in portable wireless signalling. However, there are some limitations which must be observed.

- For U.S. installations only: The radios are required to comply with FCC Rules and Regulations as Part 15 devices. As such, they have limited transmitter power and therefore limited range.
- Receivers may be blocked by radio signals that occur on or near their operating frequencies, regardless of code settings.
- A receiver cannot respond to more than one transmitted signal at a time.
- Infrequently used radio links should be tested regularly to protect against undetected interference or fault.
- A general knowledge of radio and its vagaries should be gained prior to acting as a wholesale distributor or dealer, and these facts should be communicated to the ultimate users.

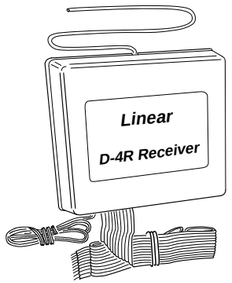


106226 B

# 2 & 4 Channel

## *Digital Security Receivers*

D-2C, D-2C/K, D-2R, D-2R/K, D-4C,
D-4C/K, D-4D, D-4D/K, D-4R, D-4R/K




*Code Setting and Installation Instructions*

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