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**Royce**   
ELECTRONICS CORPORATION

Model 1-610

OWNERS/SERVICE MANUAL

# CHAN-L-MATIC II

Digital Readout Deluxe  
AM Mobile Citizensband  
Transceiver



## FEATURES AND CONTROLS

### A. Chan-L-Matic II

Your new Royce 1-610 is equipped with a new dual speed remote control channel switching system. You can change channels by:

- a. depressing switch on microphone
- b. depressing pushbutton on front panel

#### 1. Normal Speed

If you briefly depress either of the channel changing switches, the channel will advance one at a time.

#### 2. Rapid Speed

If you depress and hold either of the channel changing switches for 2 to 3 seconds, a rapid channel advance is possible. The channel dial will advance 7 channels at a time.

The sequencer has a stop position at Channel 1. Once your dial indicates Channel 1 you must release and restart the sequencer. Listed below is the sequencing program for all channels.

<u>Channel Start</u>	<u>1st Position</u>	<u>2nd Position</u>	<u>3rd Position</u>	<u>Stop Position</u>
Ch. 1	Ch. 8	Ch. 15	Ch. 22	Ch. 1
2	9	16	23	1
3	10	17	—	1
4	11	18	—	1
5	12	19	—	1
6	13	20	—	1
7	14	21	—	1
8	15	22	—	1
9	16	23	—	1
10	17	—	—	1
11	18	—	—	1
12	19	—	—	1
13	20	—	—	1
14	21	—	—	1
15	22	—	—	1
16	23	—	—	1
17	—	—	—	1
18	—	—	—	1
19	—	—	—	1
20	—	—	—	1
21	—	—	—	1
22	—	—	—	1
23	—	—	—	1

### B. Warn-Tron

Your 1-610 is equipped with special protective circuitry to greatly minimize possible RF output transistor failure.

## GENERAL

Your new Royce 1-610 is a precision professional quality Citizensband Transceiver designed to operate on any of the available 23 Channels. It has several new innovative engineering features not found on any unit on the market. The latest state of the art circuit design is incorporated. Careful reading of the Instruction Manual before operation is essential for proper operation and prevention of damage.

## PACKING

This unit has been especially protected for shipment. Open the carton carefully to avoid damages. Examine the unit for any visible damage. If the transceiver has been damaged in shipment, save the box and packing material and notify the transportation company.

## DESCRIPTION

Royce proudly features Chan-L-Matic II in your new 1-610. Royce's exclusive Chan-L-Matic feature allowed remote control channel switching from the microphone. The original Chan-L-Matic was a mechanical device. Chan-L-Matic II is a fully solid state switching mechanism. Chan-L-Matic II does not require any channel dial. The system performs three main functions – all electronically. 23 Integrated Circuits in the system permit (a) Remote Channel Switching, (b) Electronically select the correct crystals, and (c) Supply the data to show you what channel you are on with Royce's "Digitron" dial readout system. An added feature in Chan-L-Matic II is a two speed channel sequencer. If you momentarily press the remote channel button on the microphone (or manual front panel switch) the dial will advance one channel at a time. However, if you depress and hold either of these buttons for 2 to 3 seconds, a rapid channel advance is possible. With this rapid advance feature you can advance the channel dial 8 channels at a time. It easily gets you moved 8 – 16 or 20 channels in fast order.

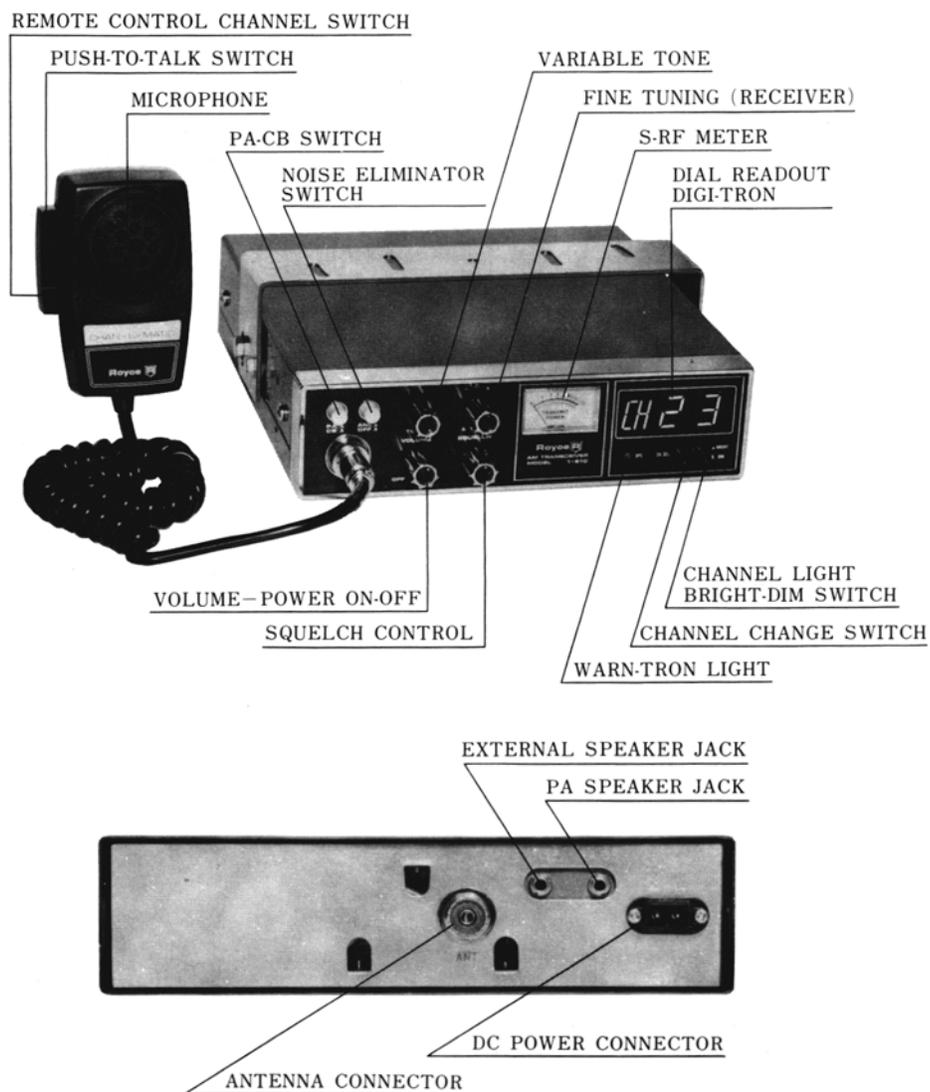
The 1-610 has Royce's new Digi-Tron II Channel Indicator system. Bright bold 5/8 inch high numerals show you what channel you are on at all times. When you depress the "PA" switch, the letters "PA" will appear on the channel indicator readouts. These readouts are L.E.D. (Light Emitting Diodes). Unlike tube readouts, they are all solid state and very reliable. A bright-dim switch is provided.

In addition to the above, your 1-610 has many standard features. The receiver incorporates a tuned RF stage for improved reception range. A dual conversion I.F. stage with ceramic filters reduce interference from nearby channels. Royce's continuously variable receiver fine tuning control lets you pinpoint adjust the receive frequency for best clarity. A pushbutton controlled noise eliminator circuit reduces substantially noise without loss of signal. A relay switching system is used so the receiver works even without the microphone being plugged in. A high output audio stage delivers crisp clear audio and also serves as a Public Address amplifier with use of an optional PA speaker. Other receiver features include Volume, Squelch, AGC, and "S" Meter.

The transmitter has Royce's Mod-U-Guard system which electronically prevents overmodulation. The audio stage develops maximum "Talk Power" for better range. A rugged metal type RF output transistor is used for reliability. Of course, the 1-610 delivers the maximum allowable output power allowed by the FCC.

The 1-610 also has Royce's new semi-leadless chassis. Over 80% of the wires found in regular CB sets have been eliminated. Since broken wires are a common service problem, this will improve the overall reliability of the 1-610.

# LOCATION OF CONTROLS



## Front Panel

- |                            |                                    |
|----------------------------|------------------------------------|
| a. PA-CB Switch            | f. Squelch Control                 |
| b. Noise Eliminator Switch | g. S-RF Meter                      |
| c. Variable Tone           | h. Warn-Tron Light                 |
| d. Fine Tuning (receiver)  | i. Channel Change Switch           |
| e. Volume - Power On-Off   | j. Channel Light Bright-Dim switch |
|                            | k. Dial Readout Digi-Tron          |

## Rear Panel

- |                          |                      |
|--------------------------|----------------------|
| l. DC Power Connector    | n. PA Speaker Jack   |
| m. External Speaker Jack | o. Antenna Connector |

## Microphone

- |                        |                                  |
|------------------------|----------------------------------|
| p. Microphone          | r. Remote Control Channel Switch |
| q. Push-To-Talk Switch |                                  |

## FEATURES AND CONTROLS

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4	12	20	1
5	13	21	1
6	14	22	1
7	15	—	1
8	16	23	1
9	17	—	1
10	18	—	1
11	19	—	1
12	20	—	1
13	21	—	1
14	22	—	1
15	—	—	1
16	23	—	1
17	—	—	1
18	—	—	1
19	—	—	1
20	—	—	1
21	—	—	1
22	—	—	1
23	—	—	1

### B. Warn-Tron

Your 1-610 is equipped with special protective circuitry to greatly minimize possible RF output transistor failure.

An electronic circuit monitors your antenna during all transmissions. Should a condition exist whereby your antenna SWR is above normal, the red WPC light on the front panel will come on. At the same time, another electronic circuit regulates the power being supplied to the RF output transistor. Should a condition exist that would damage your RF output transistor, all power is removed. These electronic circuits act instantly and reset themselves automatically every time you let up the Push-To-Talk switch on the microphone.

**NOTE: IF THE WPC LIGHT COMES ON, OR LOWER OR NO OUTPUT IS INDICATED ON THE RF OUTPUT METER, CHECK YOUR ANTENNA SYSTEM FOR DEFECTS.**

### **C. Digi-Tron Dial Readout**

Your 1-610 is equipped with Royce's Digi-Tron Dial Readout system. Modern light emitting diodes (L.E.D.'s) replace the conventional plastic knob with numbers printed on it. In the 1-610 each of the L.E.D.'s are 5/8 inch high giving you the largest readout in the industry. For your convenience, a pushbutton bright-dim switch is provided to control the light intensity of the dial system.

Direct sunlight may have an adverse effect on readout capability. A location for mounting in the car should be chosen to eliminate or minimize direct sunlight hitting the dial, such as under the dash. L.E.D.'s are reliable and should provide a long reliable life cycle.

### **D. Bright-Dim Switch**

The bright-dim switch controls the light intensity output of the Digi-Tron dial readout system. Choose either position to suit the lighting conditions.

### **E. S-RF Meter**

The 1-610 is equipped with a large, easy-to-read combination meter with a built-in transmit and modulation light.

In the receive position, the meter reads the level of the incoming signals.

In the transmit position, it indicates relative power output. When switched to the transmit mode, the meter color will change from white to red (visually indicating transmit mode). The intensity of the red will vary with your voice to indicate modulation.

### **F. Tune Control**

Your 1-610 incorporates Royce's continuously adjustable receiver fine tuning control. Previously Delta-Tune was used. This gave you only three positions usually 1.5KHz to the High side, 1.5KHz to the Low and Center position. On your 1-610 you can continuously adjust the frequency of the receiver over this entire range. This feature is extremely useful when the station transmitting to you is not exactly on frequency. To use, simply adjust this control for maximum reading of your "S" meter.

### **G. Tone Control**

This control varies the audio level response of the receiver. In noisy areas, a high treble audio response makes reception easier. This control can be varied through a range of audio response from bass to treble. Adjustment should be made to suit receiving conditions or individual preference.

#### **H. Volume Control with Power On-Off**

This combination control supplies power to your 1-610 and adjusts the receiver audio level. This switch should be turned clockwise from the "off" position. You will hear an audible "click". The channel dial and meter will light. To adjust the volume level, continue advancing this control in a clockwise direction.

#### **I. Squelch Control**

The squelch control is used to eliminate background noise when there are no signals present strong enough to overcome the noise. To adjust the squelch control, select a channel where there is no signal. Turn the volume up to normal listening levels. Rotate the squelch control clockwise until the background noise disappears.

#### **J. PA-CB Switch**

In the "PA" position, your 1-610 is converted to a public address amplifier or hailer. The PA function should not be used unless an 8-16 ohm external speaker is connected to the "PA" Jack located on the back of the chassis. Once this optional speaker has been connected, simply put the PA-CB switch to the "PA" position and depress the microphone push-to-talk switch. The letters "PA" will appear on the channel dial when this switch is in the PA mode.

**NOTE: THE VOLUME CONTROL ADJUSTS PA OUTPUT LEVEL.**

#### **K. ANL Switch**

Your 1-610 is equipped with a sophisticated electronic noise eliminator system to greatly reduce extraneous noise coming into the receiver. In effect, noise pulses are clipped from incoming signals before they reach the amplification stage of the receiver. This causes no loss in the signal receive level. The ANL circuit should normally be left on. A switch has been provided to eliminate this circuit if desired.

#### **L. Channel Change Switch**

This switch, located on the front panel, is used to change channels. Refer to Chan-L-Matic II copy for information.

#### **M. Semi-Leadless Chassis**

The chassis (the board that contains most electronic parts) in your new 1-610 is designed to eliminate over 80% of the wires that are usually found in conventional sets. Broken wires can account for many of the service problems. With Royce's semi-leadless chassis a higher degree of reliability can be anticipated than from conventional sets.

#### **N. Relay Switching**

Your 1-610 incorporates a relay to switch from transmit to receive modes. The main advantage is that you can listen to your receiver without the microphone being plugged in. Most electronic switching systems require that the microphone remain attached at all times even to listen.

#### **O. P.A. Speaker Jack**

For attaching optional 8-16 ohm PA speaker. Use 3.5mm jack.

**P. External Speaker Jack**

You may add any 3-16 ohm external speaker. Simply plug your accessory speaker into the jack. Inserting the 3.5mm plug will automatically disconnect the internal speaker.

**Q. Antenna Connector**

A standard SO-239 type connector is supplied for attaching either mobile or base antennas.

**R. DC Connector**

To attach to power source.

**S. Microphone**

Two switches are provided on the microphone. The top switch controls the Receive and Transmit function. The lower (red) switch is the channel advance switch.

To transmit, simply depress the top switch. Hold the microphone 3 to 4 inches from your mouth and speak clearly at normal voice levels.

# SPECIFICATIONS

## GENERAL

1. Semiconductors : 21 Transistors, 5IC's, 1LSI, 3LED's, 1SCR and 14 Diodes
2. Frequency Range : 26.965MHz – 27.255MHz
3. Modes of Operation : AM
4. Controls : Volume Control  
: Squelch Control  
: Tone Control  
: Fine Tune Control  
: Power On-Off Switch  
: ANL Switch  
: PA-CB Switch  
: BRIGHT-DIM Switch  
: Channel Selector Switch
5. Connectors and Jacks : Microphone Connector  
: Coaxial type Antenna Connector  
: Public Address Speaker Jack  
: External Speaker Jack  
: DC Power Jack
6. Speaker : 3-1/2 inches, 8 ohms
7. Microphone : Dynamic Microphone (500 ohms) with Remote Channel Selector
8. Power Supply : 13.8 VDC
9. Dimensions : 2-5/32"(H) x 8-9/16"(W) x 8-9/16"(D)
10. Weight : 5 LBS 8 OZS

## RECEIVER

1. Sensitivity at S/N 10 db :  $0.5\mu V$
2. Selectivity : 5 KHz
3. Adjacent Channel Rejection : More than 80 dB
4. Audio Power Output : More than 3 Watts at 10% distortion  
at 8 ohms
5. Audio Frequency Response : 400 – 2,500 Hz
6. AGC Figure of Merit : 80 db
7. Squelch Sensitivity : Less than  $0.5\mu V$   
(Threshold)
8. Spurious Response : More than 50 dB

## TRANSMITTER

1. RF Output Power : 4 Watts
2. Modulation Capability : Up to 98%
3. Spurious Suppression : More than 50 dB
4. Frequency Tolerance :  $\pm 0.005\%$

## POWER SUPPLY

Almost all cars and most trucks currently operating in the U.S. are negative ground. There are some large trucks and construction equipment which do operate on positive ground. Your Royce 1-610 will operate on either. In the negative ground systems the minus (–) pole of the battery is attached to the car body, engine block etc.

### NEGATIVE GROUND HOOKUP:

Attach the red (fused) wire to the fuse block terminal or any convenient plus (+) lead. Devices operated by the ignition key such as the radio, light etc. are best since when you turn the ignition off, the unit will be turned off. Attach the black lead to the car body via any convenient method.

**NOTE: MANY NEWER CARS USE PLASTIC DASH PIECES. MAKE SURE THE SCREW OR CONTACT YOU CHOOSE IS ATTACHED TO THE METAL FRAMEWORK OF THE CAR.**

### POSITIVE GROUND HOOKUP:

In the event that you do have a positive ground vehicle, the following hookup must be made. Attach the red (fused) lead to the car body via any convenient screw, bolt etc. Attach the black lead to the terminal block or any convenient wire which goes to the minus (–) pole of the battery.

**FAILURE TO MAKE THE PROPER CONNECTION COULD RESULT IN UNIT DAMAGE.**

## ANTENNA REQUIREMENT

This transceiver will operate with any standard 52 ohm ground-plane, vertical, mobile whip, long wire or other CB antenna. A standard SO 239 type connector is provided on the back panel.

## ANTENNA INSTALLATION

### BASE STATION:

When the 1-610 is used as a base station, any Citizens Band beam, dipole, ground plane or vertical antenna may be used. A ground plane type will provide greater coverage and, since it is essentially non-directional, it is ideal in base station to mobile operation. From base station to base station, or point to point operation, a directional beam will give greater distance even under adverse condition. The range of the transceiver depends basically on the height of the antenna and, whenever possible, select the highest location within F.C.C. limits. (These regulations limit the antenna height to 20 feet above an existing structure or 60 feet above ground for a non-directional antenna and 20 feet above an existing structure for a beam). Generally 26 feet

of lead-in cable should be used to minimize line losses. However, a desirable antenna location may justify the loss in extra lead-in length.

#### **MOBILE ANTENNAS:**

A vertical ship antenna is best suited for mobile use. A non-directional antenna must be used for best results in any case. The base loaded whip antenna will normally provide effective communication. For greater range and more reliable operation, a full quarter-wavewhip should be used. Either of these antennas use the metal car body as a ground plane and the shield of the base lead as well as the metal case of the transceiver should be grounded. A standard antenna connector (type SO 239) is provided on the transceiver for easy connection to a standard PL 259 cable termination.

## **MOBILE INSTALLATIONS**

A location in the car or truck should be chosen carefully for convenience of operation and non-interference with normal driving functions. Mounting may be under the dash or instrument panel or any place a secure installation can be made. The carrying handle again serves as the mounting bracket or additional perforated straps or brackets may be used as desired. The 12-volt cable may be connected to any convenient terminal but preferably to the ignition switch to prevent unauthorized persons from operation of your unit. With this method the unit will only operate when your key is turned on. Engine ignition interference should not be a problem and vehicles equipped with standard broadcast radios will have enough suppression to eliminate ignition interference. If interference is present, any skilled auto radio repairman should be able to eliminate it for you.

**NOTE: DIRECT SUNLIGHT MAY ADVERSELY AFFECT DIAL READOUT CAPABILITY. CHOOSE A LOCATION SO THAT NONE OR A MINIMAL AMOUNT OF DIRECT SUNLIGHT WILL HIT THE FACE OF THE UNIT (SUCH AS UNDER THE DASH).**

## **BASE STATION INSTALLATIONS**

For base station use, the Royce model 2-050 or 2-050A power supply is recommended. When this power supply is used, simply connect the red (+) and black (-) terminals on the power supply to the (+) and (-) leads on your 1-610. Do not attempt to operate this transceiver by connecting directly to 110 Volts AC.