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Royce 1-641 Owner's Manual
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Royce 
ELECTRONICS CORPORATION

OWNER'S/SERVICE MANUAL

Model I-641

DIGITAL READOUT

40 Channel
Gyro-Lock
SSB/AM Base Station
Citizensband
Transceiver



GENERAL

Your new Royce 1-641 is a professional quality Citizens Band Transceiver designed to operate on either AM, Lower Single Sideband (LSB) or Upper Single Sideband (USB). It has many innovative engineering and user functions. Among them, a Royce plus feature is an amplified AGC circuit, built in to your 1-641. This expands the range of a normal AGC circuit by many times, and is usually found only in the most expensive sets. Your amplified AGC will enable you to hear clearly, even a very weak distant signal, and still allow you to hear a unit parked next to you without distortion. Royce's Gyro-Lock synthesizer is also employed in your 1-641. This is a phase loop lock synthesizer, giving you all channel frequencies from only three crystals in conjunction with one LSI (large scale integrated circuit and an I.C. (integrated circuit). Royce's Gyro-Lock is self compensating for frequency drift, keeping your 1-641 on center channel, every channel. Careful reading of this 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 damage. 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

Receiver: Sensitivity of less than a 1/2 of a microvolt on SSB and AM. A tuned RF stage pulls in even the weakest signals.

A deluxe mechanical filter on SSB provides the highest degree of selectivity and rejection of unwanted adjacent channel signals. Four Ceramic Filters for AM reception deliver over 70 db adjacent channel rejection. Additional receiver features include: variable squelch, clarifier control, integrated circuit audio preamplifier stage, metering automatic noise eliminator, PA-CB switch.

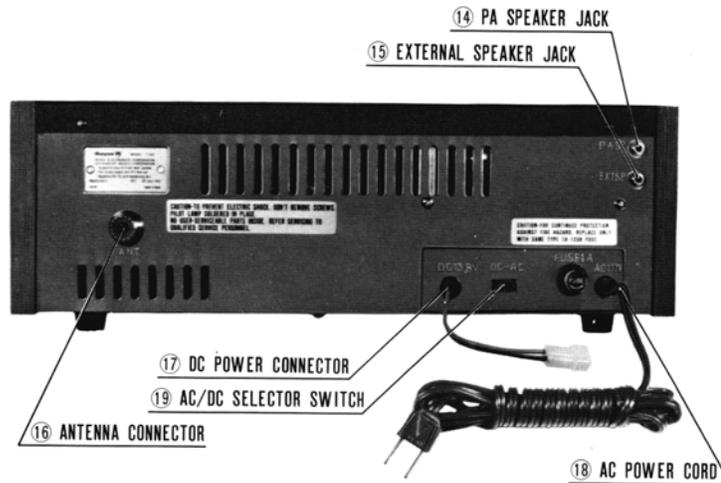
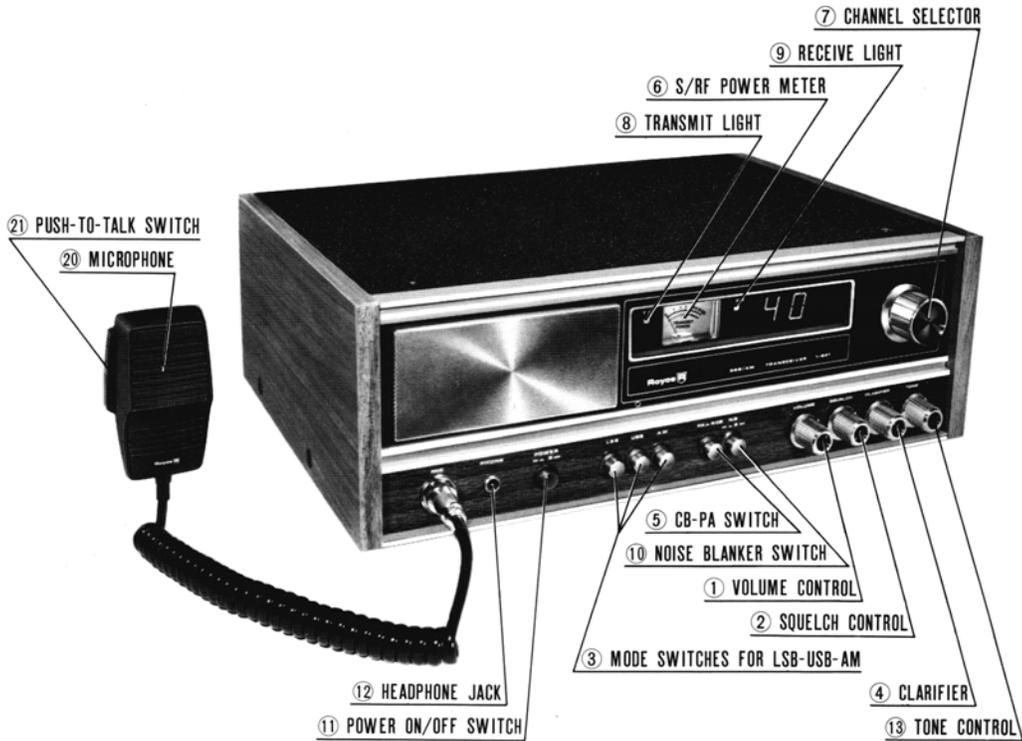
Transmitter: High efficiency is obtained through use of select components and sophisticated engineering design. An ALC circuit is employed in the SSB mode to provide maximum "Talk Power" without distortion. The SSB signal is generated by use of a integrated circuit balanced modulator and Royce's GYRO-LOCK synthesizer, to keep you on center channel, every channel. Relay switching is employed for dependability.

Power supply: Your 1-641 is designed to operate from ordinary house current (117 Volts AC, 60 cycle). Simply connect the AC Power to any convenient outlet. Either Positive or Negative Ground 12 Volts DC (13.8 VDC EIA) is built in.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

THE SERIAL NUMBER AND MODEL NUMBER OF YOUR 1-641 ARE LOCATED ON THE REAR PANEL OF THE TRANSCEIVER ON THE RIVETED PLATE. RECORD AND RETAIN THESE NUMBERS FOR FUTURE REFERENCE

OPERATION OF CONTROLS



- Front View:**
1. Volume Control
 2. Squelch Control
 3. Mode Switches for LSB-USB-AM
 4. Clarifier
 5. CB-PA Switch
 6. S/R/F Power Meter
 7. Channel Selector
 8. Transmit Light
 9. Receive Light
 10. Noise Blanker Switch
 11. Power On/Off Switch
 12. Headphone Jack
 13. Tone Control

- Rear View:**
14. PA Speaker Jack
 15. External Speaker Jack
 16. Antenna Connector
 17. DC Power Connector
 18. AC Power Cord
 19. AC/DC Selector Switch

- Microphone:**
20. Microphone
 21. Push-To-Talk Switch

FEATURES AND CONTROLS

1. VOLUME CONTROL

To adjust the volume continue advancing the control in a clockwise position.

2. 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.

3. PUSHBUTTON MODE SWITCHES FOR LSB-USB-AM

AM transmission is amplitude modulation of the radio frequency carrier with an audio signal (voice). The components of the transmitted signal include the carrier and its two sidebands, upper and lower. For 100% modulation, each sideband contains one-fourth as much power as the carrier. The information transmitted is in the sidebands.

USB transmission is the transmission of the upper sideband only of a single sideband signal. In single sideband transmission, the carrier and one sideband are removed from the transmitted signal. Thus, only one sideband is transmitted.

LSB transmission is the transmission of the lower sideband, only. Three push-buttons provide selection of the mode of operation desired.

4. CLARIFIER

The clarifier is an electronic tuning circuit which allows you to shift the frequency of your receiver plus or minus 1.5 KHz (3 KHz total). In SSB operation, even small differences in frequencies between stations can cause poor reception. In effect, the clarifier electrically fine tunes the station being received. In AM operation, this acts as a Delta Tune circuit.

5. PA-CB PUSH-BUTTON SWITCH

In the "PA" position, your 1-641 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.

6. SIGNAL/RF Power Meter

The 1-641 is equipped with a large, easy-to-read combination meter.

In the receive position, the meter reads the level of the incoming signals. In the transmit position, it indicates relative power output.

NOTE: (1) In the AM mode, the meter will read power at all times when the transmit button is depressed. On SSB, however, it will only indicate RF output power when you modulate the signal.

(2) In the SSB mode, no meter can follow the rapid voice peak power attained. Therefore, while the transmitter is developing much more power than on AM, this additional power will not be fully reflected on the meter.

7. CHANNEL SELECTOR

The Channel Selector switch is used to select the fixed center frequency. It automatically adjusts both the receiving and transmitting frequencies. Set the selector switch to the desired channel. The channel will be displayed by large (15MM) easy-to-read LEDs (light emitting diodes).

8. TX INDICATOR

Your 1-641 is equipped with a LED (light emitting diode) transmit indicator light on the front panel. When the PTT switch on the mike is depressed, the LED will light, indicating you are in the transmit mode.

9. RX INDICATOR

Your 1-641 is equipped with an LED (light emitting diode) receive indicator light on the front panel. When lit, it indicates you are in the receive mode.

10. NOISE BLANKER

Your 1-641 is equipped with a sophisticated electronic noise blanker system to virtually eliminate extraneous noise coming into the receiver. In effect, noise pulses are blanked (or eliminated) from incoming signals before they reach the amplification stage of the receiver. This causes no loss in the signal receive level. Noise blankers are much more effective than noise limiters in eliminating noise from power lines, auto ignitions, etc. Generally, the noise blanker should be left on at all times. A switch has been provided to eliminate the circuit if desired.

11. POWER ON/OFF SWITCH

The push-button switch simply turns your 1-641 on or off.

12. HEADPHONE JACK

For private, quiet operation of your 1-641. Accepts a standard one-fourth inch three-pin phone plug.

13. 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.

14. PA SPEAKER JACK

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

15. EXTERNAL SPEAKER JACK

You may add any 8-16 ohm external speaker. Simply plug your accessory speaker into the jack. Inserting the 3.5 MM plug will automatically disconnect the internal speaker.

16. ANTENNA CONNECTOR

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

17. DC POWER CONNECTOR

This jack accepts the DC Power Cord (supplied).

18. AC POWER CORD

Simply connect to any convenient household outlet (117 V AC).

19. AC/DC SELECTOR SWITCH

Simply set for power selection. AC for household use, DC for mobile use.

20. MICROPHONE JACK

This jack is used to attach your Royce microphone (supplied) or any optional microphone to your 1-641.

- NOTE:** (1) It is very important that the impedance of accessory microphones be similar to the one supplied. Your 1-641 uses a 500 ohms (impedance) dynamic microphone.
- (2) Microphone preamps, unless specifically designed for SSB, can cause distortion, loss of power, and cause unnecessary interference on adjacent channels.

SPECIFICATIONS

GENERAL

- | | |
|-------------------------|--|
| 1. Semiconductors | : 33 Transistors 6 FET, 8 IC's, 44 Diodes and 4 LEDs |
| 2. Frequency Range | : 26.965MHz—27.405MHz |
| 3. Modes of Operation | : AM, Lower Sideband and Upper Sideband |
| 4. Controls | : Volume Control
: Power on-off switch
: Variable Squelch Control
: Variable Tone Control
: Noise Blanker Switch
: Mode Selector Switches (3)
: Clarifier Control
: Channel Selector Switch
: CB-PA Switch
: AC-DC Switch |
| 5. Connectors and Jacks | : Microphone Connector
: Coaxial type Antenna Connector
: Public Address Speaker Jack
: Headphone Jack
: External Speaker Jack
: DC Power Jack |
| 6. Speaker | : 3-1/2 inches, 8 ohms |
| 7. Microphone | : Dynamic Microphone (500 Ohms) |
| 8. Power Supply | : 13.8 VDC /117 VAC |
| 9. Dimensions | : 10-5/8"(D) × 15-1/16"(W) × 5-9/32"(H) |
| 10. Weight | : 18 LBS 12 OZS |

RECEIVER

- | | | |
|------------------------------------|--|---------------------|
| 1. Sensitivity at S/N 10 dB | : AM.....0.7 μ V | SSB.....0.2 μ V |
| 2. Selectivity | : AM.....5KHz | SSB.....2.2KHz |
| 3. AGC Figure of Range | : 80 dB | |
| 4. Squelch Range | : 0.5 μ V—500 μ V | |
| 5. Audio Output Power | : 4 Watts | |
| 6. Distortion at input 100 μ V | : 6 % | |
| 7. Audio Frequency Response | : 300—2200Hz | |
| 8. Supurious Response | : More than 45 dB supurious signal is required to produce the same amount of audio output as the desired receive signal. | |
| 9. IF Frequency | : 1st IF 10.695MHz and 2nd IF 455KHz | |
| 10. Current Drain no audio | : 650 mA (AC) | |

SSB TRANSMITTER

- | | |
|----------------------------------|-------------------|
| 1. RF Output Power | : 12 Watts PEP |
| 2. Carrier Suppression | : More than 40 dB |
| 3. Unwanted Sideband Suppression | : More than 60 dB |
| 4. Harmonic Suppression | : More than 60 dB |
| 5. Current Drain | : 1000 mA (AC) |

AM TRANSMITTER

- | | |
|--------------------------|-------------------|
| 1. RF Output Power | : 4 Watts |
| 2. Modulation Capability | : More than 75 % |
| 3. Harmonic Suppression | : More than 60 dB |
| 4. Current Drain | : 800 mA (AC) |

POWER SUPPLY

1. AC OPERATION

Your Royce 1-641 is designed to operate from any 117-volts AC, 60 cycle (ordinary house current) outlet. Simply connect the AC power cord to any convenient house outlet.

2. DC OPERATION

While it is highly unlikely that you will use your 1-641 in an automobile, you may desire to run it off a 12-volt battery in case of emergencies. You can do this by attaching the DC cord to the set. Attach the red (fused) wire to the battery plus(+) terminal. Attach the black lead to the battery minus(-) terminal.

SHOULD YOU DESIRE TO OPERATE THE 1-641 IN YOUR VEHICLE, IT IS EQUIPPED TO OPERATE EITHER POSITIVE OR NEGATIVE GROUND. CAREFULLY FOLLOW THE INSTRUCTIONS BELOW.

NO MOBILE MOUNTING BRACKET IS SUPPLIED OR AVAILABLE.

3. 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.

4. 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 INSTALLATION

When the 1-641 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 limits are printed in the Part 95 F. C. C. regulations enclosed with this transceiver). Generally, a maximum of 26 feet of lead-in cable should be used due to line losses. However, a desirable antenna location may justify the loss in extra lead-in length.

MOBILE ANTENNAS

A vertical whip 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 communications. 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.

BASE STATION INSTALLATIONS

For base station use, simply plug in the AC power cord into any convenient 117 Volt household wall plug.

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 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.

MOUNTING INSTRUCTIONS

