

APPENDIX 5
USERS MANUAL

TWENTY (20) PAGE DRAFT OPERATOR'S MANUAL FOLLOWS THIS SHEET

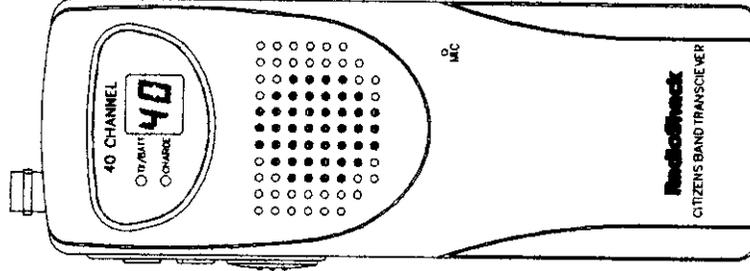
USERS MANUAL
FCC ID: AAO2101628
APPENDIX 5

OWNER'S MANUAL

TRC-239

4-WATT, 40 CHANNEL WALKIE-TALKIE

Please read before using this equipment.



FCC ID: AAO2101628

 Cat. No. 21-16:
RadioShack

Limited Ninety-Day Warranty

This product is warranted by RadioShack against manufacturing defects in material and workmanship under normal use for ninety (90) days from the date of purchase from RadioShack company-owned stores and authorized RadioShack franchisees and dealers. EXCEPT AS PROVIDED HEREIN, RadioShack MAKES NO EXPRESS WARRANTIES AND ANY IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE DURATION OF THE WRITTEN LIMITED WARRANTIES CONTAINED HEREIN. EXCEPT AS PROVIDED HEREIN, RadioShack SHALL HAVE NO LIABILITY OR RESPONSIBILITY TO CUSTOMER OR ANY OTHER PERSON OR ENTITY WITH RESPECT TO ANY LIABILITY, LOSS OR DAMAGE CAUSED DIRECTLY OR INDIRECTLY BY USE OR PERFORMANCE OF THE PRODUCT OR ARISING OUT OF ANY BREACH OF THIS WARRANTY, INCLUDING, BUT NOT LIMITED TO, ANY DAMAGES RESULTING FROM INCONVENIENCE, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, EVEN IF RadioShack HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Some states do not allow the limitations on how long an implied warranty lasts or the exclusion of incidental or consequential damages, so the above limitations or exclusion may not apply to you. In the event of a product defect during the warranty period, take the product and the RadioShack sales receipt, as proof of purchase date to any RadioShack store. RadioShack will, at its option, unless otherwise provided by law: (a) correct the defect by product repair with out charge for parts and labor; (b) replace the product with one of the same or similar design; or (c) refund the purchase price. All replace parts and products, and products on which a refund is made, become the property of RadioShack. New or reconditioned parts and products may be used in the performance of warranty service. Repaired or replace parts and products are warranted for the remainder of the original warranty period. You will be charged for repair or replacement of the product made after the expiration of the warranty period.

This warranty does cover: (a) damage or failure cause by or attributable to acts of God, abuse, Accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation or maintenance, alteration, lightning or other incidence of excess voltage or current; (b) any repairs other than those provided by a RadioShack Authorized Service Facility; (c) consumables such as fuses or batteries; (d) cosmetic damage; (e) transportation, shipping or insurance costs; or (f) costs of product removal, installation, set-up service adjustment or reinstallation. This warranty gives you specific legal rights, and you may also have other rights which vary from State to state.

RadioShack Customer Relations, 200 Taylor Street, 6th Floor, Fort Worth, TX 76102

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Fort Worth, Texas 76102

FEATURES

Your RadioShack TRC-239 4-Watt, 40-Channel Walkie-Talkie is a portable, easy-to-use, two-way radio you can carry almost anywhere. It will give you reliable communications in many different applications.

You can use your transceiver around the house, in your office, car or boat or anywhere on the go. It is useful on fishing and camping trips. Or in your business for security patrols, for supervisors, or warehouse personnel.

Its features include:

Automatic Modulation Limiter—prevents over-modulation to ensure a clear sound.

Automatic Noise Limiter—reduces noise caused by nearby electrical equipment such as motors or automotive ignition systems.

Transmit Power Selection—lets you adjust the output power to save battery power during short-rang transmissions.

TX/BATT (Transmit / Battery Low) Indicator—indicates when the transceiver is transmitting and Show when it is time to replace or recharge the batteries.

CHARGE (Charger) Indicator—indicates when the transceiver is on the chargeable to batteries.

For your permanent records, we recommend you record the serial number of your transceiver in the space provided below. The serial number is printed on the back panel of the transceiver.

Serial Number _____

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The FCC does not require you to have a license to operate the CB transceiver. However, the FCC does require you to read and know Part 95 of FCC Rules. These rules apply to the operation of a class D CB transceiver. We have provided a copy of these regulations with your TRC-239.

Warning: Do not open your CB to make any internal adjustments. Internal adjustments can be made only by under the direct supervision of a person holding a FCC 1st or 2nd Class radio operator's license.

Internal adjustments and/or modifications can lead to illegal operation as defined by FCC Rules, Part 95. Such illegal operation can lead to serious consequences.

To be safe and sure:

- Never open your CB transceiver's case.
- Never modify your CB transceiver.

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NO FCC LICENSE REQUIRED

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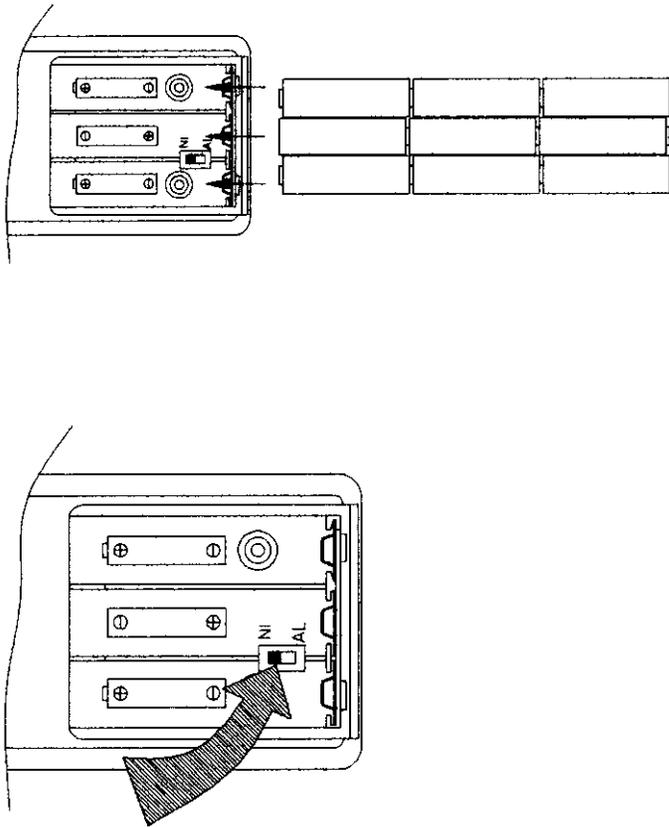
NOTES

SPECIFICATIONS

Receiver

Frequency Coverage.....	26.965 to 27.405 MHz
Sensitivity.....	0.5 μ V for 10 dB (S+N)/N Adjacent Channel
Rejection.....	60 dB
Squelch.....	Adjustable from 1 μ V

polarity symbols (+ and -) marked inside the battery compartment.
Importance: Please correctly you batteries kind with the deep switch selection AL or NI before install the batteries.



Use and store the transceiver only in normal temperature environments. Temperature extremes can shorten the life of electronic devices, damage batteries, and distort or melt plastic parts.

Handle the transceiver gently and carefully. Dropping it can damage its circuit boards and can cause the transceiver to work improperly.

Keep the transceiver away from dust and dirt, which can cause premature wear of parts.

Occasionally wipe the transceiver with a damp cloth to keep it looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the transceiver.

Modifying or tampering with the transceiver's internal components can cause a malfunction, invalidate the transceiver's warranty, and void your FCC authorization to use it. If you transceiver is not operating as it should, take it to your local Radio Shack store for assistance.

CARE AND MAINTENANCE

Your RadioShack TRC-239 4-Watt, 40-Channel Walkie-Talkie is an example of superior design and craftsmanship. The following suggestions will help you care for your transceiver so you can enjoy it for years.



Keep the transceiver dry. If it gets wet, wipe it dry immediately. Liquids can contain minerals that can corrode electronic circuits.

CITIZENS BAND FREQUENCY CHART

CHANNEL	FREQUENCY (MHz)	CHANNEL	FREQUENCY (MHz)
1	26.965	21	27.215
2	26.975	22	27.225
3	26.985	23	27.255
4	27.005	24	27.235
5	27.015	25	27.245
6	27.025	26	27.265
7	27.035	27	27.275

8	27.055	27.285
9	27.065	27.295
10	27.075	27.305
11	27.085	27.315
12	27.105	27.325
13	27.115	27.335
14	27.125	27.345
15	27.135	27.355
16	27.155	27.365
17	27.165	27.375
18	27.175	27.385
19	27.185	27.395
20	27.205	27.405

Charging Nickel-Cadmium Batteries

Nickel-cadmium batteries come fully discharged. You can charge the batteries while they are in the battery compartment using an optional AC adapter (such as Cat. No.21-516, not supplied), or you can use an optional external battery charger (such as Cat. No.23-239, not supplied).

Warning: Do not try charge non-rechargeable batteries. They might get very hot and they could explode.

Follow these steps to recharge nickel-cadmium batteries in the battery Compartment.

1. Turn **VOLUME** counterclockwise to **OFF**.
 2. Pushing deep switch in battery compartment to "N1"
 3. Insert the adapter's barrel plug into the transceiver's **CHARGE** jack.
 4. Plug the adapter's other end into a standard AC outlet.
- Note:** Fully discharged batteries require 16 to 18 hours to fully charge.
5. When the batteries are fully charged, unplug the AC adapter from the AC outlet, then disconnect the adapter from the transceiver.

Charging Tips

- Fully discharge the rechargeable batteries occasionally by using the transceiver until it no longer transmits or receives. Then fully recharge the batteries. This helps restore and maintain the batteries full charging capacity.
- Avoid charging the batteries in a hot (more than 113 degrees F) or cold (less than 40 degrees F) environment. Doing so can permanently reduce the batteries charging capacity.
- Do not overcharge batteries. Overcharging can severely reduce the battery's useful life.

Cautions:

- Improper installation (incorrect polarity) might damage the transceiver.
 - Always replace all the batteries. Never mix new and old batteries or chargeable and non-chargeable batteries in the transceiver.
 - Use only fresh batteries of the required size and type.
 - If you do not plan to use the transceiver for a month or more, or if you use AC or external DC power, remove the batteries. This protects the transceiver from possible battery leakage.
4. Replace the cover.

- Always disconnect the adapter's AC plug before you disconnect the barrel plug.

This product is capable of using nickel-cadmium batteries. At the end of the batteries' useful life, they must be recycled or disposed of properly. Contact your local, county, or state hazardous waste management authorities for information on recycling or disposal programs in your area. Some options that might be available are: municipal curb-side collection, drop-off boxes at retailers, recycling collection centers, and mail-back programs.

USING VEHICLE BATTERY POWER

You can power your transceiver from your vehicle's cigarette lighter socket using the supplied 12-volt power cord.

Cautions:

- Your vehicle must have a 12-volt, negative-ground electrical system.
- Using a power cord other than the one supplied might damage your transceiver.

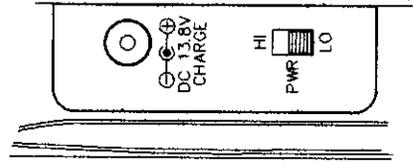
Operation Hints

Your transceiver's transmission range depends on a variety of conditions: the terrain, battery condition, and type and position of the antenna. Buildings absorb signals, and if the buildings contain metal, they might completely block signals. Trees and heavy cloud formations have a similar effect, though not as severe. Large bodies of water sometimes increase the range considerably.

To ensure maximum transmission and reception range, always use fresh or fully charged batteries. When the range decreases significantly, replace or recharge the batteries. (See "Installing/Replace Batteries" and "Charging Nickel-Cadmium Batteries")

5. Set TX PWR to HIGH or LOW as follows:

- To transmit at short distances (less than 2 miles) set TX PWR to LOW. This conserves battery power by transmitting at a low power level.
- To transmit at long distances (greater than 2 miles), or if the receiver you are transmitting to hears excessive noise during your transmission (even at short distances), set TX PWR to HIGH

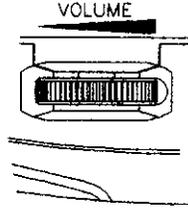
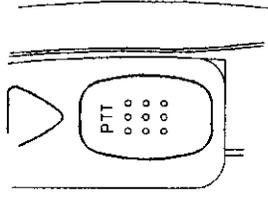


6. To transmit a message, hold the transceiver's microphone about 3 inches from your mouth. Press and hold PTT while you speak slowly and clearly into the transceiver's microphone. The TX indicator lights.

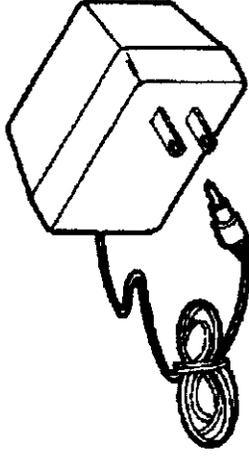
7. To receive a message, release PTT. button.

Note: To eliminate static noise between transmissions, readjust **SQUELCH** as necessary until you longer hear static.

8. Adjust **VOLUME** to a comfortable listening level.



Caution: You must use an AC adapter that supplies 12 volt DC power and delivers at least 1 amp. Its center tip must be set to positive, and it must have a plug that properly fits your receiver's CHARGE jack. Using an adapter that does not meet these specifications could damage your transceiver or cause it not to operate properly.



Follow these steps to power the receiver from AC power

1. Connect the adapter's barrel plug to the adapter's cord with the TIP set to POS.
2. Insert the barrel plug into the transceiver's CHARGE jack.

Caution: The CHARGE jack on your transceiver available for the Power external.

3. Plug the adapter into a standard AC outlet. This disconnects the internal batteries. (In case you have to select the deep switch to "AL").
4. When you finish using the AC adapter, disconnect it from the AC outlet. Then disconnect the adapter's barrel plug from your transceiver.

CONNECTING AN ANTENNA

Your transceiver includes a convenient, flexible rubber antenna that is ideal for most applications. Simply BNC the antenna into the transceiver's antenna socket.

1. Insert the power cord's barrel plug into the transceiver's Charge jack.

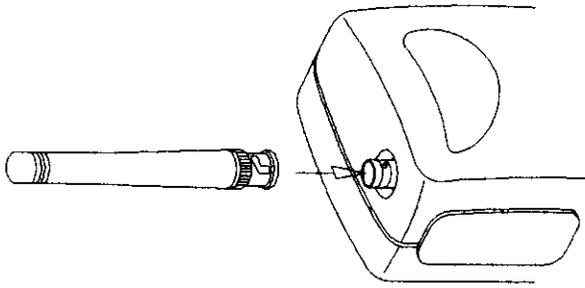
2. Plug the other end of the cord into your vehicle's cigarette lighter socket.

Note : If the transceiver does not operate when you use the power cord unplug the cord from the lighter socket and clean the socket to remove ashes in-line fuse in the power cord and your vehicle and replace either if necessary.

3. When you finish using the power cord, disconnect it from the cigarette lighter socket. Then disconnect the cord from your transceiver.

USING STANDARD AC POWER

To power your receiver from an AC outlet , you need an AC adapter (such as Cat. No.273-1653, not supplied)



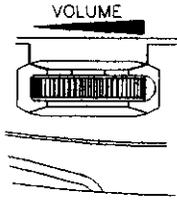
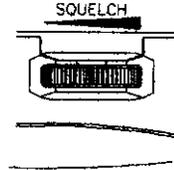
Caution: Never try to transmit without an antenna. You might damage the transceiver.

OPERATION

BASIC OPERATION

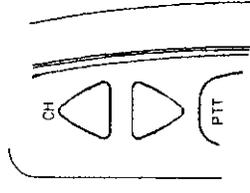
Follow these steps to operate your transceiver.

1. Turn **SQUELCH** fully clockwise to maximum.



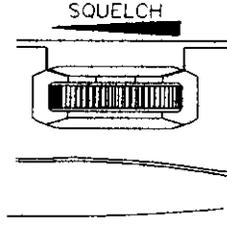
2. Rotate **VOLUME** clockwise until it clicks to turn on the power. A channel number line momentarily appears then disappears from the display.

3. Press the button ▲ or ▼ to select the desired channel.



Note: If you press CH ▲ when you are on channel 40, the channel selector return to channel 1. if you press CH ▼ when you are on channel 1, the channel selector returns to channel 40.

4. Slowly turn **SQUELCH** counter-clockwise until you hear static, then slowly turn it clockwise until you no longer hear static.



Note: Do not turn **SQUELCH** too far clockwise because you might not be able to hear weak signals.

APPENDIX 6

TRANSMITTER ALIGNMENT PROCEDURE

Warning: Any repairs or adjustment should be made under the supervision of a qualified radio-telephone technician.

8.1 VCO

- a. Connect the power supply (DC 13.8 V)
- b. Connect the oscilloscope probe to test point
- c. Adjust the coil L601 for 2V at 1-Ch RX
- d. Check that Ch-40 voltmeter of receiver reads from 2 to 4 volts

8.2 Transmitter

- a. TX Power alignments

With RF voltmeter at base of Q701, transmit on channel 18. Adjust in turn L701, L702 for maximum reading on RF voltmeter. Repeat as needed. Remove RF voltmeter.

- b. Max Mod Alignments

Adjust RV401 to obtain 90% MOD. At 16 dB greater than 50% MOD. AF 1 KHz.

- c. Final Check

1. Output power should be from 3.6 to 4.0 watts.
2. Frequency should be within +400 Hz of channel center frequency.
3. Spurious content as observed on spectrum synthesizer should be at least 60 dB below carrier.
4. With 2500 Hz modulation at 16 dB greater than that required to produce 50% modulation, occupied bandwidth should be at least 2 dB better than limit spec.

TRANSMITTER TUNE-UP PROCEDURE
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APPENDIX 7

CIRCUITS AND DEVICES TO STABILIZE FREQUENCY

All 40 channels of transmitting, and receiving, frequencies are provided by PLL (Phase Locked Loop) circuitry.

The purpose of the PLL is to provide a multiple number of frequencies from VCO (Voltage Controlled Oscillator) with quartz crystal accuracy and stability from on crystal oscillator reference frequency.

The reference crystal oscillator frequency is 10.24 MHz.

CIRCUITS AND DEVICES TO
STABILIZE FREQUENCY

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APPENDIX 7

APPENDIX 8

CIRCUITS FOR SUPPRESSION SPURIOUS RADIATION

The tuning circuit between frequency synthesizer and final amp Q704 and 4-stage "PI" network C718, C719, L711, C721, L712, C725, L725, L713 and C723 in the Q704 output circuit serve to suppress spurious radiation. This network serves to impedance match Q704 to the antenna and to reduce spurious content to acceptable levels in the frequency synthesizer.

CIRCUITS FOR LIMITING MODULATION

A portion of the modulating voltage is rectified by D402 which turns on IC401 attenuating the mic input. The resulting feedback loop keeps the modulation below 100 percent for inputs approximately 40 dB greater than that required to produce 50 percent modulation.

CIRCUITS FOR LIMITING POWER

During factory alignment, tuning is adjusted so that the actual power is from 3.6 to 3.9 watts. There are no other controls for adjusting power.

DEVICES AND CIRCUITS TO SUPPRESS
SPURIOUS RADIATION AND LIMIT
MODULATION

FCC ID: AAO2101628

APPENDIX 8