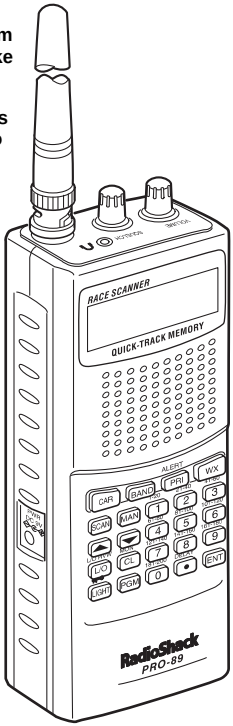
RadioShack®
www.radioshack.com℠

PRO-89 200 Channel VHF/Air/UHF/800MHz Handheld Race Scanner

OWNER'S MANUAL —
Please read before using this equipment.

20-514 A



Five Service Banks — Search preset frequencies in separate fire/police, air, ham radio, auto race, and marine banks, to make it easy to locate specific types of calls.

Two-Second Scan/Search Delay — Delays scanning for 2 seconds before moving to another channel, so you can hear more replies.

Ten Channel-Storage Banks — Store up to 20 channels in each of 10 different banks, to group channels so you can more easily identify calls.

20 Monitor Memories — Temporarily save up to 20 frequencies located during a search, so you can move selected frequencies to channel storage later.

Memory Backup — Keeps the channel frequencies stored in memory for about 1 hour during a power loss.

Triple Conversion Superheterodyne Receiver — Eliminates interference from intermediate frequency (IF) images, so you hear only the frequency you select.

HyperSearch™ and HyperScan™ — Set the scanner to search at up to 50 steps per second and scan at up to 25 channels per second, to quickly find interesting transmissions.

Duplicate Frequency Check — Automatically notifies you if you are about to store a frequency you have already stored, to help avoid wasting storage space.

Direct Search — Search for new and unlisted frequencies starting from a specified frequency.

! IMPORTANT !

If an icon appears at the end of a paragraph, go to the box on that page with the corresponding icon for pertinent information.

⚠ **— Warning** **! — Important** **— Caution**
— Hint **— Note**

Features

CONTENTS

(continued)

Other features include:

Priority Channel — Designate a channel to scan every two seconds so you do not miss important calls.

Weather Band Key — Scans seven preprogrammed weather frequencies to keep you informed about current weather conditions.

Weather Alert — Automatically sounds the alarm tone to advise of hazardous weather conditions when it detects the alert signal on the local NOAA weather channel.

Lock-Out Function — Set the scanner to skip over specified channels or frequencies when scanning or searching.

Key Lock — Lock the scanner's keys to prevent accidentally changing the scanner's programming.

Two Supplied Antennas with BNC Connector — Select the antenna that best meets your needs. The supplied stub antenna helps your scanner receive strong local signals and makes the scanner easy to carry and use at events. The supplied flexible antenna provides excellent reception of weaker signals and is designed to help prevent antenna breakage.

Liquid Crystal Display — Makes it easy to view and change programming information.

Display Backlight — Makes the scanner easy to read in low light situations.

Three Power Options — Power the scanner from internal batteries (non-rechargeable batteries, rechargeable Ni-MH (nickel-metal hydride) or regular or high-capacity Ni-Cd (nickel-cadmium) batteries), external AC power (using optional adapters), or vehicle battery power (using optional adapters).

Thank you for purchasing the RadioShack 200-Channel VHF/Air/UHF/800 MHz Handheld Race Scanner. It lets you in on all the action in the pits or on the track at the big race. This scanner gives you direct access to over 33,500 frequencies, including those used by participants and staff at auto races, police and fire departments, ambulance services, and amateur radio services. You can select up to 200 channels to scan, and you can change your selection at any time.

Your scanner can receive all of these frequencies:

- 29–54 MHz
- 108–136.9875 MHz
- 137–174 MHz
- 380–512 MHz
- 806–823.9875 MHz
- 849–868.9875 MHz
- 894–960 MHz

This Owner's Manual also includes the section "A General Guide to Scanning" on Page 52 to

help you target frequency ranges in your service area so you can search for a wide variety of transmissions.

FCC NOTICE

Your scanner might cause TV or radio interference even when it is operating properly. To determine whether your scanner is causing the interference, turn off your scanner. If the interference goes away, your scanner is causing it. Try to eliminate the interference by:

- moving your scanner away from the receiver
- connecting your scanner to an outlet that is on a different electrical circuit from the receiver
- contacting your local RadioShack store for help

If you cannot eliminate the interference, the FCC requires that you stop using your scanner.

NOTE

Mobile use of this scanner is unlawful or requires a permit in some areas. Check the laws in your area.

This device complies with Part 15 of the *FCC Rules*. Operation is subject to the following conditions: (1) This device must not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

SCANNING LEGALLY

Your scanner covers frequencies used by many different groups

including police and fire departments, ambulance services, government agencies, private companies, amateur radio services, military operations, pager services, and wireline (telephone and telegraph) service providers. It is legal to listen to almost every transmission your scanner can receive. However, there are some transmissions you should never intentionally listen to. These include:

- telephone conversations (cellular, cordless, or other private means of telephone signal transmission)
- pager transmissions
- any scrambled or encrypted transmissions

According to the Electronic Communications Privacy Act (ECPA), you are subject to fines and possible imprisonment for intentionally listening to, using, or divulging the contents of such a transmission unless you have the consent of a party to the communication (unless such activity is otherwise illegal).

This scanner has been designed to prevent reception of illegal transmissions. This is done to comply with the legal requirement that scanners be manufactured so as to not be easily modifiable to pick up those transmissions. Do not open your scanner's case to make any modifications that could allow it to pick up transmissions that it is not legal to listen to. Doing

NOTES

- Dispose of old batteries promptly and properly.
- Do not burn or bury batteries.
- Use only fresh batteries of the required size and recommended type.
- Do not mix old and new batteries, different types of batteries (standard, alkaline, or rechargeable), or rechargeable batteries of different capacities.
- If you do not plan to use the scanner for a month or more, remove the batteries. Batteries can leak chemicals that can destroy electronic parts.

WARNING

Never install non-rechargeable batteries in the yellow rechargeable battery holder. Non-rechargeable batteries can get hot or explode if you try to recharge them.

CAUTION

The battery holder fits only one way inside the battery compartment. Do not force it.

so could subject you to legal penalties.

We encourage responsible, legal scanner use.

PREPARATION

Installing Batteries

You can power your scanner with four AA batteries (not supplied).

You can use either the black non-rechargeable battery holder or the yellow rechargeable battery holder (both supplied) to hold the batteries. If you use the yellow battery holder, we recommend nickel-cadmium or nickel-metal hydride batteries (not supplied).

1. Press down on the battery compartment cover then slide the cover in the direction of the arrow to remove it.
2. If you are using non-rechargeable batteries, place them into the black holder, as indicated by the polarity symbols (+ and –) marked on the holder. Or, if you are using rechargeable batteries, place them into the yellow holder as indicated by the polarity symbols (+ and –) marked on the holder.
3. Place the battery holder into the battery compartment.
4. Replace the cover.

When **B** flashes on the display and the scanner beeps, or if the scanner stops operating properly, replace the batteries.

Using AC Power

You can power the scanner using a 9V, 300-mA AC adapter and a size B Adaptaplug™ adapter (neither supplied). Both are available at your local RadioShack store.

Cautions:

- •You must use a Class 2 power source that supplies 9V DC and delivers at least 300 mA. Its center tip must be set to positive and its plug must fit the scanner's **PWR DC 9V** jack. Using an adapter that does not meet these specifications could damage the scanner or the adapter.
- Always connect the AC adapter to the scanner before you connect it to AC power. When you finish, disconnect the adapter from AC power before you disconnect it from the scanner.

To power the scanner using an AC adapter, attach the Adaptaplug to the AC adapter so the tip reads positive (+), then insert the Adaptaplug into the scanner's **PWR DC 9V** jack. Connect the other end of the adapter to a standard AC outlet.

Using Vehicle Battery Power

You can power the scanner from a vehicle's 12V power source (such as a cigarette-lighter socket) using a 9V, 300-mA DC adapter and a size B Adaptaplug (neither supplied). Both are available at your local RadioShack store.

Cautions:

- You must use a power source that supplies regulated 9V DC and delivers at least 300 mA. Its center tip must be set to positive and its plug must fit the scanner's **PWR DC 9V** jack. Using an adapter that does not meet these specifications could damage the scanner or the adapter.
- Always connect the DC adapter to the scanner before you connect it to the power source. When you finish, disconnect the adapter from the power source before you disconnect it from the scanner.

To power the scanner using a DC adapter, attach the Adaptaplug to the DC adapter so the tip reads positive (+), set the adapter's voltage switch to 9V, then insert the Adaptaplug into the scanner's **PWR DC 9V** jack. Plug the other end of the DC adapter into your vehicle's cigarette-lighter socket.

NOTE

If you use a cigarette-lighter power cable and your vehicle's engine is running, you might hear electrical noise from the engine while scanning. This is normal.

Charging Rechargeable Batteries

Your scanner has a built-in charging circuit that lets you charge rechargeable batteries while they are in the scanner. To charge rechargeable batteries, you need to use an AC adapter which supplies 9V (RadioShack Cat. No. 273-1767) or a DC adapter which supplies 10V (RadioShack Cat. No. 273-1830). Connect a size B Adaptaplug to the adapter's cable with the tip set to positive then insert the Adaptaplug into the scanner's **PWR DC 9V** jack.

It takes between 14 and 16 hours to recharge Ni-MH or 7 and 8 hours to recharge Ni-Cd batteries that are fully discharged. You can operate the scanner while recharging the batteries, but charging takes longer. **!**

NOTE

- Do not overcharge Ni-Cd batteries. Overcharging causes them to get hot and shortens their life.
- Ni-Cd batteries last longer and deliver more power if you occasionally let them fully discharge. To do this, simply use the scanner until **B** flashes on the display and the scanner beeps. Then fully charge the batteries.

! IMPORTANT !

The EPA certified RBRC® Battery Recycling Seal on the nickel-cadmium (Ni-Cd) battery indicates RadioShack is voluntarily participating in an industry program to collect and recycle these batteries at the end of their useful life, when taken out of service in the United States or Canada. The RBRC program provides a convenient alternative to placing used Ni-Cd batteries into the trash or the municipal waste stream, which may be illegal in your area. Please call 1-800-THE-SHACK (1-800-843-7422) for information on Ni-Cd battery recycling and disposal bans/restrictions in your area. RadioShack's involvement in this program is part of the company's commitment to preserving our environment and conserving our natural resources.

Connecting an Antenna

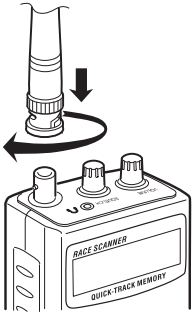
Connecting a Supplied Antenna

You must install an antenna before you can operate the scanner.

The supplied stub antenna helps your scanner receive most strong transmissions at events and makes the scanner easier to carry and use. The supplied flexible antenna provides slightly better reception and helps your scanner receive strong local signals.

1. Align the slots around the antenna's connector with the tabs on the antenna jack.

2. Press the antenna down over the jack and turn the antenna's base clockwise until it locks into place.



Connecting an Outdoor Antenna

Instead of a supplied antenna, you can connect an outdoor base-station or mobile antenna (not supplied) to your scanner using a BNC connector. Your local RadioShack store sells a variety of antennas. Choose the one that best meets your needs.

When deciding on a mobile or base-station antenna and its location, consider these points:

- The antenna should be as high as possible on the vehicle or building.
- The antenna and its cable should be as far as possible from sources of electrical noise, such as appliances or other radios.

- The antenna should be vertical for the best performance.

Always use 50 Ohm coaxial cable, such as RG-58 or RG-8, to connect the base-station or mobile antenna. For lengths over 50 feet, use RG-8 low-loss dielectric coaxial cable. If the antenna cable's connector does not fit in the scanner's antenna jack, you might also need a PL-259-to-BNC antenna plug adapter. Your local RadioShack store carries a wide variety of coaxial antenna cable and connectors.

Once you choose an antenna, follow the mounting instructions supplied with the antenna, after removing a supplied antenna. Then route the antenna's cable to the scanner and connect the cable to the scanner's antenna jack. ⚠

CAUTION

- Do not run the cable over sharp edges or moving parts that might damage it.
- Do not run the cable next to power cables or other antenna cables.

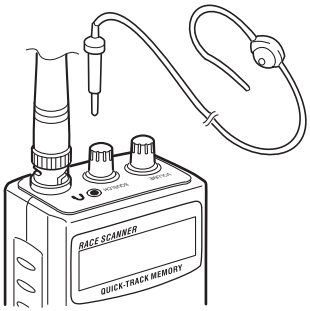
⚠ WARNING ⚠

Use extreme caution when you install or remove an outdoor antenna. If the antenna starts to fall, let it go! It could contact overhead power lines. If the antenna touches a power line, contact with the antenna, mast, cable, or guy wires can cause electrocution and death. Call the power company to remove the antenna. DO NOT attempt to do so yourself.

Connecting an Earphone/Headphones

For private listening, you can connect an earphone or headphones with a 1/8-inch (3.5-mm) plug to the 🎧 jack on the top of the scanner. (Your local RadioShack store carries a wide selection of earphones and headphones). Connecting an earphone or headphones

automatically disconnects the internal speaker.



Listening Safely

To protect your hearing, follow these guidelines when you use an earphone or headphones.

- Set the volume to the lowest setting before you begin listening. After you begin listening, adjust the volume to a comfortable level.
- Do not listen at extremely high volume levels. Extended high-volume listening can lead to permanent hearing loss.
- Once you set the volume, do not increase it. Over time, your ears adapt to the volume level, so a volume level that does not cause discomfort might still damage your hearing.

Traffic Safety

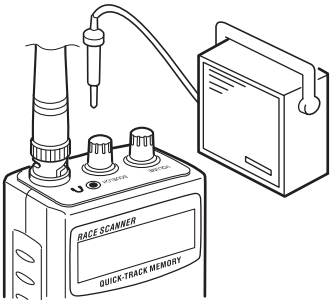
- Do not use an earphone or headphones with your scanner when operating a motor vehicle or riding a bicycle in or near traffic. Doing

so can create a traffic hazard and could be illegal in some areas.

- If you use an earphone or headphones with your scanner while riding a bicycle, be very careful. Do not listen to a continuous transmission. Even though some earphones or headphones let you hear some outside sounds when listening at normal volume levels, they still can present a traffic hazard.

Connecting an Extension Speaker

In a noisy area, an amplified extension speaker (available at your local RadioShack store) might provide more comfortable listening. Plug the speaker cable's 1/8-inch (3.5-mm) plug into your scanner's jack.



NOTE

Connecting an external speaker disconnects the scanner's internal speaker.

UNDERSTANDING THE SCANNER

Once you understand a few simple terms used in this manual and familiarize yourself with your scanner's features, you can put

the scanner to work for you. You simply determine the type of communications you want to receive, then set the scanner to scan them.

A **frequency** is the tuning location of a station (expressed in kHz or MHz). To find active frequencies, you can use the **search** function.

You can also search the **service-search banks**, which are preset groups of frequencies categorized by type of service.

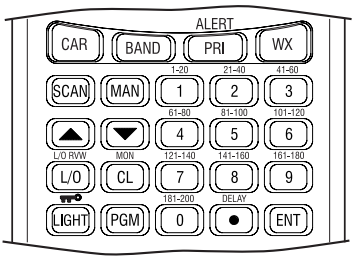
When you find a frequency, you can store it into a programmable memory location called a **channel**, which is grouped with your other channels in a **channel-storage bank**. You can then **scan** the channel-storage banks to see if there is activity on the frequencies stored there. Each time the scanner finds an active frequency, it stays on that channel until the transmission ends.

NOTE

Some of the scanner's keys perform more than one function and are marked with more than one label. The steps in this Owner's Manual show only the label on the key appropriate to the action being performed.

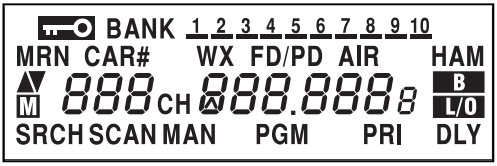
A Look at the Keypad

If your scanner's keys seem confusing at first, the following illustration and information should help you understand each key's function.



Key	Function
CAR	Store car numbers and frequencies in the scanner's channels, add and delete frequencies from car numbers, display car numbers, and listen to the channel where a car number is stored. Each time you press **CAR**, you see the following information: - Manual Mode - Car Number Input Mode - Car Number Display Mode - Car Number Input Mode - Manual Mode
BAND	Search the scanner's preprogrammed service-search banks.
PRI/ALERT	Turns the priority feature on and off; turns the WX alert mode on and off.
WX	Scans the seven preprogrammed weather channels.
SCAN	Scans any programmed channels.
MAN	Stops scanning and lets you directly enter a channel number.
Number Keys	Each key has single-digit (0 to 9) and a range of numbers. Use the single digits to enter a channel or frequency. The range of numbers above the key (21–40 for example) indicate the channels that make up a channel-storage bank. See "Understanding Banks" on Page 19.
▼ / ▲	Searches up or down for active frequencies or selects the direction when scanning channels.
L/O RVW/L/O	Reviews locked-out frequencies; lets you lock out selected channels or frequencies.
MON/CL	Lets you listen to frequencies stored in the 20 monitor memories; clears an incorrect entry.
LIGHT/ 🔑	Locks and unlocks the keypad to prevent accidental entries; turns the backlight on and off.
PGM	Programs frequencies into channels.
DELAY/.	Programs a 2-second delay for the selected channel; enters a decimal point.
ENT (enter)	Enters frequencies into channels.

A Look at the Display



Scanner Status	Description
🔑	Appears when you lock the keypad.
BANK	Appears with numbers (1–10) to indicate the scan bank. Bank numbers with a bar under them show which banks are turned on for scanning (see “Understanding Banks” on Page 19).
MRN	Indicates that the scanner is searching the marine service bank.
CAR#	Appears when you store car numbers and frequencies into the scanner’s channels, add and delete frequencies from car numbers, display car numbers, and move to the channel where a car number is stored.
WX	Indicates that the scanner is searching the weather channels.
FD/PD	Indicates that the scanner is searching the fire/ police service bank.
AIR	Indicates that the scanner is searching the air service bank.
HAM	Indicates that the scanner is searching the amateur radio service bank.
▼ / ▲	Indicates the search or scan direction.
M	Flashes with a number (1–20) to show which monitor memory you are listening to.
CH	Appears with digits (1–200) or **P** and a frequency to show which channel the scanner is tuned to.
B	Appears when the batteries are low.
L/O (lockout)	Appears when you manually select a channel that was previously locked out during scanning or when you review a locked-out frequency.

SRCH	Appears during service bank and direct frequency searches.
SCAN	Appears when the scanner scans channels.
MAN	Appears when you manually select a channel.
PGM	Appears when you program frequencies into the scanner's channels.
PRI	Appears when the priority feature is turned on.
DLY	Appears when you program a 2-second delay.
Error	Appears when you make an entry error.
-dUPL-	Appears when you try to store a frequency that is already stored in another channel.
-d-	Appears during a direct frequency search.
-b-	Appears during a service bank frequency search (except auto race and marine bank).
CAr	Appears when you listen to the car race service bank.
CAr No. _ _ _	Appears when you input the car number.
Ch-FULL	Appears when you try to enter a frequency into a channel during a search when all channels are full.
F L-out	Appears when you start a direct search from a locked-out frequency.
FLo-FULL	Appears when you try to lock out a frequency during a search when 50 frequencies are already locked out.
L-r	Appears when you review the locked-out frequencies.
dEFAULt	Appears when you remove all the lock-outs from the service bank frequencies.
FLo ALL-CL	Appears when you remove all the locked-out frequencies during a service bank or direct search.
L-o ChOOOO	Appears when you clear all locked-out channels.
Lo ALL-CL	Appears when you remove all lockouts from channels.
ALL ChOOOO	Appears when you clear all stored channels.
P	Appears when the scanner is tuned to the priority channel.

ALErt	Appears when the weather alert is on.
On Air	Appears when you set on-air programming mode to program frequencies into your scanner.
WirEd	Appears when you set wired programming mode to program frequencies into your scanner.
StArt	Appears when the scanner starts wired or on-air programming
C-Err	Appears when the scanner receives a checksum error during wired or on-air programming.
d-Err	Appears when the scanner receives a data error during wired or on-air programming.
End	Appears when the scanner has finished wired or on-air programming.
oFF tonE	Appears when you turn off the key tone.
on tonE	Appears when you turn on the key tone.
P.-SA	Appears when the power save function is turned on.
on P.-SA	Appears when you turn on power save.
oFF P.-SA	Appears when you turn off power save.

UNDERSTANDING BANKS

CHANNEL STORAGE BANKS

To make it easier to identify and select the channels you want to listen to, channels are divided into 10 banks of 20 channels each. Use each channel-storage bank to group frequencies, such as those used by the police department, fire department, ambulance services, or aircraft (see “Guide to the Action Bands” on Page 54).

For example, the police department might use four frequencies, one for each side of town. You could program the police frequencies starting with Channel 1 (the first channel in bank 1) and program the fire department frequencies starting with Channel 21 (the first channel in bank 2).

SERVICE BANKS

The scanner is preprogrammed with the frequencies allocated by auto racing, fire/police, aircraft, ham radio, and marine services. This is handy for quickly finding active frequencies instead of searching through an entire band (see “Searching the Service Banks” on Page 26).

NOTE

The frequencies in the scanner’s service banks are preset. You cannot change them.

Auto Racing

Group	Frequency Range (MHz)	Step (kHz)
1	150.995–151.995	5
	152.870–153.725	5
	154.490–154.625	5
2	460.000–470.000	12.5
3	851.0375 851.6625 852.0375 852.1875 853.1625 853.2625 853.4875 854.2625 854.2875 854.7875 855.0375 855.2875 855.5125 855.5625 855.5875 855.7375 855.7875 856.7875 856.9125 857.8375 858.7375 858.7875 858.8375 859.8375 865.6125 865.6625 865.7125 936.2125 937.1500 937.2000 937.2875	–

Fire/Police

Group	Frequency Range (MHz)	Step (kHz)
1	33.420–33.980	20
	37.020–37.420	20
	39.020–39.980	20
	42.020–42.940	20
	44.620–45.860	40
	45.880	–
	45.900	–
	45.940–46.060	40
	46.080–46.500	20
2	153.770–154.130	60
	154.145–154.445	15
	154.650–154.950	15
	155.010–155.370	60
	155.415–155.700	15
	155.730–156.210	60
	158.730–159.210	60
	166.250	–
	170.150	–
3	453.0375–453.9625	12.5
	458.0375–458.9625	12.5
	460.0125–460.6375	12.5
	465.0125–465.6375	12.5
4	856.2125–860.9875	25
	866.0125–868.9875	12.5

Air

Frequency Range (MHz)	Step (kHz)
108.000–136.9875	12.5

Amateur Radio

Group	Frequency Range (MHz)	Step (kHz)
1	29.000–29.700	5
2	50.000–54.000	5
3	144.000–148.000	5
4	420.000–450.000	12.5

Marine

Channel	Frequency (MHz)
06	156.3000
07	156.3500
08	156.4000
09	156.4500
10	156.5000
11	156.5500
12	156.6000
13	156.6500
14	156.7000
15	156.7500
16	156.8000
17	156.8500
18	156.9000

Channel	Frequency (MHz)
19	156.9500
20	157.0000/161.6000
21	157.0500
22	157.1000
23	157.1500
24	157.2000/161.8000
25	157.2500/161.8500
26	157.3000/161.9000
27	157.3500/161.9500
28	157.4000/162.0000
64	156.2250
65	156.2750
66	156.3250
67	156.3750
68	156.4250
69	156.4750
70	156.5250
71	156.5750
72	156.6250
73	156.6750
74	156.7250
77	156.8750
78	156.9250
79	156.9750
80	157.0250
81	157.0750

Channel	Frequency (MHz)
82	157.1250
83	157.1750
84	157.2250/161.8250
85	157.2750/161.8750
86	157.3250/161.9250
87	157.3750/161.9750
88	157.4250

NOTE
Both frequencies (transmission and reception) are shown for marine channels used for duplex transmission.

Monitor Memories

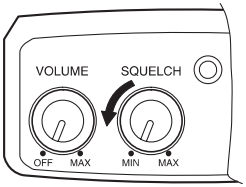
The scanner has 20 monitor memories that you can use to temporarily store frequencies while you decide whether to save them into channels. This is handy for quickly storing an active frequency when you are searching through an entire band. You can store a frequency into a monitor memory during a service bank or direct search. See “Finding and Storing Active Frequencies” on Page 26.

You can select monitor memories manually, but you cannot scan them. See “Listening to a Monitor Memory” on Page 30.

OPERATION

Turning On the Scanner/Setting Volume and Squelch

1. Turn **SQUELCH** until the indicator points to **MIN** before you turn on the scanner.



2. To turn on the scanner, turn **VOLUME** clockwise until you hear a hissing sound.

3. Turn **SQUELCH** clockwise, just until the hissing sound stops.

4. To turn off the scanner when you finish, turn **VOLUME** counterclockwise to **OFF**.

Storing Known Frequencies into Channels

Good references for active frequencies are the RadioShack *Police Call Guide including Fire and Emergency Services*, *Official Aeronautical Frequency Directory*, and *Maritime Frequency Directory*. We update these directories every year, so be sure to get a current copy.

1. Press **MAN**, enter the channel number (1–200) where you

NOTE

- To listen to a weak or distant station, turn **SQUELCH** counterclockwise. If reception is poor, turn **SQUELCH** clockwise to cut out weak transmissions.
- If **SQUELCH** is adjusted so you always hear a hissing sound, the scanner will not scan or search properly.

NOTE

- If you made a mistake in Step 2, **Error** appears and the scanner beeps three times when you press **ENT**. Start again from Step 2.
- The scanner rounds the frequency down to the closest valid frequency. If you enter a frequency of 151.473, the scanner accepts it as 151.470.
- If you enter a frequency that is stored in another channel, the scanner beeps three times, the lowest channel number where the frequency is already stored appears, and **-dUPL-** then the frequency flash. To store the frequency anyway, press **ENT** again. Press **MON/CL** to clear it.
- Press **DELAY** if you want the scanner to pause 2 seconds on a channel before it proceeds to the next channel after a transmission ends. The scanner also stores this setting in the channel.

want to store a frequency, then press **PGM**.

2. Use the number keys and **.** to enter the frequency (including the decimal point) you want to store.

3. Press **ENT** to store the frequency into the channel.

4. To program the next channel in sequence, press **PGM** and repeat Steps 2 and 3.

Finding and Storing Active Frequencies

Searching the Service Banks

Your scanner contains groups of preset frequencies called service banks. Each service bank is associated with a specific activity (see “Service Banks” on Page 19). You can search for fire/police, air, ham, auto race, and marine transmissions even if you do not know the specific frequencies that are used in your area. Then you can store the frequencies you found into the scanner’s channels or monitor memories.

1. Press **BAND**. The last selected band name (such as **HAM**), **SRCH**, **-b-**, frequency and the group number (if any) appear.

2. To select a different band, repeatedly press **BAND** until the desired band name appears on the display. After about 2 seconds, the scanner begins searching rapidly in

that band for an active frequency.

3. If necessary, select a search group from the list with “Service Banks” on Page 19 then use the number keys to enter the desired search group. The scanner searches for an active frequency.

4. When the scanner finds an active frequency, it stops searching and displays the frequency’s number. To store the displayed frequency in the lowest available channel, press **PGM** then **ENT**. The channel and frequency flash twice, and the scanner stores the displayed frequency. The scanner then continues to search for frequencies.

   Or, to store the displayed frequency in a channel you select, press **PGM**, use the number keys to enter the channel number you want to use to store the frequency, then press **PGM** again. The channel number flashes.

   If a channel number you entered is already programmed with a frequency, the channel number and the programmed frequency appear for about 2 seconds. Then the channel number flashes and the new frequency appears.

   Press **ENT** to program the new frequency or press **CL/ MON** to cancel. If you press

NOTE

- You can use the scanner’s delay feature while searching the service banks. See “Delay” on Page 41.
- To listen to the MRN bank, see “Listening to the Marine Bank” on Page 33.
- **-b-** does not appear if the CAR bank is selected.
- To reverse the search direction at any time, hold down ▲ or ▼ for about 1 second.
- To search up or down the band in small increments, repeatedly press ▲ or ▼. ▲ or ▼ disappears. (See “Service Banks” on Page 19 for frequency steps).
- To pause the search while receiving a signal, press ▲ or ▼. ▲ or ▼ disappears. To resume searching, hold down ▲ or ▼.
- To quickly move up or down through the frequencies, hold down ▲ or ▼. The scanner tunes through the frequencies until you release ▲ or ▼.

NOTE

- If there is no empty channel, **Ch-FULL** appears after you press **PGM**. To store more frequencies, clear some channels. See “Clearing a Stored Channel” on Page 32. To continue searching after **Ch-FULL** appears, hold down ▲ or ▼. To remain on the frequency after **Ch-FULL** appears, press **MON/CL**. **Ch-FULL** disappears.
- If you enter a frequency that is stored in another channel, the scanner beeps three times, the lowest channel number where the frequency is already stored appears, **-dUPL-**, then the frequency flash. To store the frequency anyway, press **ENT**. Press **MON/CL** to clear it.

Using Direct Search

- You can use the scanner’s delay feature while using direct search.

ENT, the channel and frequency flash twice, and the scanner stores the displayed frequency. The scanner then continues to search for frequencies.

5. To store the displayed frequency in a monitor memory, press **MON/CL**. The monitor memory number, **M**, and the frequency flash twice.

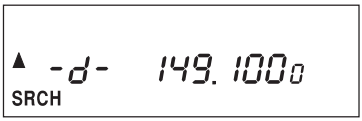
6. To search for another active frequency in the selected band, hold down ▲ or ▼ for about 1 second. To select a different band and search for another active frequency, repeat Steps 2–5.

Using Direct Search

During a direct search, the scanner searches up or down, starting from a frequency you specify. Follow these steps to use direct search.

1. Press **MAN** then enter the frequency (including the decimal point) you want to use as a starting point for the search.

2. Hold down ▲ or ▼ for about 1 second to search up or down. **–d–**, **SRCH**, and ▲ or ▼ appear.



Operation

3. When the scanner finds an active frequency, it stops searching and displays the frequency's number. To store the displayed frequency in the lowest available channel, press **PGM** then **ENT**. The channel and frequency flash twice, and the scanner stores the displayed frequency. The scanner continues to search for frequencies.

   Or, to store the displayed frequency in a channel you select, press **PGM**, use the number keys to enter the channel number you want to use to store the frequency, then press **PGM** again. The channel number flashes.

   If a channel number you entered is already programmed with a frequency, the channel number and the programmed frequency appear for about 2 seconds. Then the channel number flashes and the new frequency appears.

   Press **ENT** to program the new frequency, or press **CL/ MON** to cancel. If you press **ENT**, the channel and frequency flash twice and the scanner stores the displayed frequency. The scanner then continues to search for frequencies.

4. To store the displayed frequency in a monitor memory, press **MON/CL**. **M**, the monitor memory

NOTE

- To start from a frequency already stored in one of your scanner's channels, press **MAN**, enter the desired channel number, then press **MAN** again.
- To reverse the search direction at any time, hold down ▲ or ▼ for about 1 second.
- To search up or down the selected band in small increments (5 or 12.5 kHz steps), repeatedly press ▲ or ▼.
- To pause the search, press ▲ or ▼. To resume, hold down ▲ or ▼.
- To quickly move up or down through frequencies, hold down ▲ or ▼. The scanner scans all frequencies until ▲ or ▼ is released.
- If there is no empty channel, Ch-FULL appears after you press **PGM**. To store more frequencies, clear some channels. See "Clearing a Stored Channel" on Page 32. To continue searching after Ch-FULL appears, hold down ▲ or ▼. To remain on the frequency after Ch-FULL appears, press **MON/CL**. Ch-FULL disappears.

NOTE

- If you entered a frequency that is already stored in another channel, **-dUPL-** (duplicate) and the lowest-numbered channel containing the duplicate frequency flash on the display for about 3 seconds. Then the lowest-available channel number and frequency flashes. If you want to store the frequency anyway, press **ENT** again. If you do not want to store the frequency, press **MON/CL**. The scanner continues to search.

Listening to a Monitor Memory

- See Step 5 under "Searching the Service Banks" on Page 26 for more information about storing a frequency in a monitor memory.

number, and the frequency flash twice.

5. To search for another active frequency, hold down ▲ or ▼ for about 1 second.

Using Monitor Memory

Listening to a Monitor Memory

To recall a frequency stored in a monitor memory, press **MAN** then **MON/CL**. **M**, the monitor memory number, and **CH** flash and the stored frequency appears.

To select other monitor memories, enter the desired monitor memory's number (1–20), then press **MON/CL** again or repeatedly press **MON/CL**.

Moving a Frequency from a Monitor Memory to a Channel

1. Press **MAN**, enter the channel number where you want to store the frequency, then press **PGM**.

2. Press **MON/CL**. **M**, a monitor memory number, and **CH** flash, and the frequency in the selected monitor memory appears.

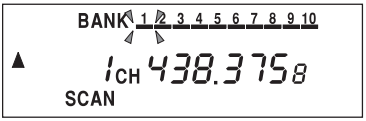
3. Enter the desired monitor memory's number (1–20), then press **MON/CL** again. The selected monitor memory's frequency appears.

4. Press **ENT**. The scanner stores the frequency in the selected channel.

5. To move another monitor memory frequency to the next channel, press **PGM** and repeat Steps 2–4.

Scanning the Stored Channels

To set the scanner to continuously scan through all channels with stored frequencies, simply press **SCAN**. **SCAN** and ▲ appear, the scanner begins to rapidly scan until it finds an active frequency, and a bar flashes beneath the bank being scanned.



If the scanner finds an active frequency, it stops and displays that channel and frequency number, then it automatically begins scanning again when the transmission on that frequency ends.

Turning Channel-Storage Banks Off and On

Channel-storage banks (1–10) are on when they have a bar underneath them and off when no bar appears underneath them. To turn off a channel-storage bank, press that bank's number key during scanning. The bar under the bank's number disappears.

NOTE

- To reverse the scanning direction, press ▲ or ▼.
- To set the scanner to remain on the current channel for 2 seconds after the transmission ends, see "Delay" on Page 41.
- To set the scanner to remain on the current channel, even after the transmission stops, press **MAN** at any time during the transmission so **MAN** appears and **SCAN** disappears (see "Monitoring a Stored Channel" on Page 32).
- To lock out channels so the scanner does not stop for a transmission on those channels, see "Locking Out Channels or Frequencies" on Page 42.

Turning Channel Storage Banks Off and On

The scanner does not scan any of the channels within the banks you have turned off.

NOTE

Turning Channel Storage Banks Off and On

- You cannot turn off all banks. There must be at least one active bank.
- You can manually select any channel in a bank, even if the bank is turned off.
- When you turn on a bank during scanning, the scanner moves to the selected bank and scans it. If no transmission is found, the scanner continues to scan through all selected banks.

To turn on a channel-storage bank (1–10) during scanning, press the bank's number key. A bar appears under the bank's number.

Monitoring a Stored Channel

You can continuously monitor a specific channel without scanning. This is useful if you hear an emergency transmission on a channel and do not want to miss any details — even though there might be periods of silence — or if you simply want to monitor that channel.

1. Press **MAN**.
2. Enter the channel number (1–200).
3. Press **MAN** again.

Clearing a Stored Channel

If you no longer want a frequency stored in a channel (and you do not want to replace that frequency with a different one), follow these steps to clear the stored frequency.

1. Press **MAN** to stop searching or scanning.
2. To select the desired channel number, use the number keys to enter that channel number (1–200).
3. Press **PGM**. **PGM** appears.
4. Press **0** then **ENT**. The frequency number changes to

000.0000 to indicate the channel is cleared.

5. To clear another channel, use the number keys to enter that channel number (1–200), then press **PGM** again. Or repeatedly press **PGM** until the desired channel number appears. Then repeat Step 4.

Clearing all Stored Channels

1. Press **PGM**. **PGM** appears.
2. While holding down **MON/CL**, press **0**. **ALL Ch0000** appears.
3. Press **ENT**. The scanner clears all channels. Or, if you do not want to clear all channels, press **MON/CL**.

Clearing all Locked-Out Channels

1. Press **PGM**. **PGM** appears.
2. While holding down **MON/CL**, press **L/O RVW/L/O**. **L-O Ch0000** appears.
3. Press **ENT**. The scanner clears all locked-out channels. Or, if you do not want to clear the channels, press **MON/CL**.

Listening to the Marine Bank

To listen to the marine bank, repeatedly press **BAND** until **MRN** appears.

To change the channel manually, press ▲ or ▼.

To scan through the marine bank, hold down ▲ or ▼ for about 2 seconds. **MAN** disappears and **SCAN** and ▲ or ▼ appear. To change the scanning direction, press ▲ or ▼.

To stop scanning the channels, hold down ▲ or ▼ for about 2 seconds. **SCAN** disappears and **MAN** appears.

You can select a marine channel directly when the scanner is not scanning the marine bank. Use the number keys to enter the two-digit channel number.

Listening to the Weather Band

To hear your local forecast and regional weather information, press **WX**. Your scanner begins to scan through the weather band. It should stop within a few seconds on your local weather broadcast. If the broadcast is weak, press **WX** again to resume scanning.

Channel	Frequency (MHz)
1	162.400
2	162.425
3	162.450
4	162.475
5	162.500
6	162.525
7	162.550

WX Alert

Your scanner's WX alert warns you of serious weather conditions by sounding an alarm if a National Weather Service broadcaster in your area broadcasts a weather alert tone.

To set the scanner so it sounds an alarm when a weather alert tone is broadcast, press **PRI/ALERT** while you are listening to the WX channel. **ALErt** appears. If the scanner detects the weather alert, it sounds an alarm. Press any key to turn off the alarm. To cancel the weather alert operation, press **PRI/ALERT** again.

SCANNING AT THE RACES

Your scanner is specially designed to help you listen to communications at auto races. Drivers and their pit crews and corner watchers, pace car drivers, security officers, emergency personnel, track officials, and representatives of governing organizations such as NASCAR, SCCA, and NHRA all use radios to communicate with each other during a race. You might also hear transmissions from the news media and reporters, local police departments, and paramedics and doctors at the local hospital. You can even listen to transmissions by parking lot employees at the track, so you can find the best possible parking place when you arrive.

You can store a car number and frequency in each of the scanner's channels, associate one or more frequencies stored in channels with a car number, and recall any frequencies associated with that car number by simply entering the number. You can store one car number and frequency, or one frequency by itself, in each channel (for up to 200 car numbers and frequencies).

For example, if you want to listen to communications between the driver of car number 24 and that driver's pit crew, you find all the frequencies used by the driver's team by using any of the following options:

- the steps in "Searching the Service Banks" on Page 26
- the supplied frequency guide
- "Using Direct Search" on Page 28
- frequencies you already know

Then, you store a car number and the frequencies associated with that car number in the scanner's channels and display the car number as you scan those frequencies by using the information in "Scanning by Car Number" on Page 40.

Storing a Car Number and Frequency

You can store a car number and frequency in each of the scanner's channels, and you can recall any frequencies associated with the car number by entering the

number. You can store one car number in each channel (for up to 200 car numbers).

1. Press **CAR**. **CAR#** and **CAr No.** appear and _ _ _ flashes.

2. Enter the car number. If the number is one or two digits, enter the number then press **CAR**. If the number is three digits, enter the number only. The car number and _ _ _ . _ _ _ appear.

3. Enter the frequency (including the decimal point) you want to associate with the car number by using the number keys and **DELAY/.**.

4. Press **ENT** to store the frequency. The car number and frequency are stored in the first available channel.

Adding Frequencies to a Car Number

1. Press **CAR**. **CAR#** and **CAr No.** appear and _ _ _ flashes.

2. Use the number keys to enter the car number if the number is three digits. If the car number is less than three digits, enter the car number then press **CAR**. The car number and the first frequency associated with that number appear.

3. Repeatedly press ▲ or ▼ until _ _ _ . _ _ _ appears.

NOTE

- After you store a car number and a frequency, you can store additional frequencies then associate those frequencies with the same car number. See "Adding Frequencies to a Car Number."
- If you add one or more leading zeros to a single-digit car number, your scanner recognizes them as different car numbers. For example, you can enter 5 for one car number, 05 for another car number, and 005 for another car number.
- To clear the display (if you make a mistake), press **CL/MON** before you press **CAR**.

4. Enter the frequency (including the decimal point) you want to associate with the displayed car number by using the number keys and **DELAY/.**.

5. Press **ENT** to store the frequency. The frequency is associated with the car number you entered.

Adding a Car Number to the Channel

You can assign the car number after you program the frequency into the channel.

1. If a car number appears on the display, press **CAR** twice. A channel number appears.

2. Select the channel you want to use to store the car number by using the number keys and **MAN**.

3. Press **CAR** twice. **CAR#** appears.

4. While holding down **PGM**, press **CAR**. **- - -** flashes.

5. Enter the car number by using the number keys.

6. Press **ENT** to store the new car number.

Changing the Stored Car Number

1. Press **CAR** then use the number keys to enter the car number. If necessary, repeatedly press ▲ or ▼ to select the frequency.

2. Hold down **PGM** then hold down **CAR**. The car number flashes.

3. Enter the car number by using the number keys, then press **ENT** to store the car number.

Viewing Frequencies Associated with a Car Number

1. Press **MAN** then **CAR**. **CAR#** and **CAr No.** appear and _ _ _ flashes.

2. Enter the car number. If the number is one or two digits, enter the number then press **CAR**. If the number is three digits, enter the number only. One of the car number's frequencies appears.

3. Repeatedly press ▲ or ▼ to view each of the car numbers you entered. As you press ▲ or ▼, you see all associated frequencies and _ _ _._ _ _.

Deleting a Frequency from a Car Number

1. Recall the car number.

2. Repeatedly press ▲ or ▼ until the frequency you want to delete appears.

3. Press **PGM**.

4. Press **0** then **ENT**.

NOTE

- If no car number is assigned to a channel, _ _ _ appears instead of the car number.
- If **SQUELCH** is adjusted so you always hear a hissing sound, the scanner does not scan properly.

Scanning by Car Number

Once you store car numbers into channels, you can set the scanner so it displays the car numbers you assigned to the channels as it scans them.

To scan by car number, repeatedly press **CAR** until **BANK** and **CAR#** appear, then press **SCAN**. As the scanner scans channels, the car numbers you stored appear in channel order, from the lowest to the highest channel.

When you finish scanning by car number, repeatedly press **CAR** until **CAR#** disappears.

Finding Car Numbers Associated With Channels

If you are listening to a channel and want to know what car number you are hearing, simply press **CAR** twice. If a car number has been associated with this frequency, the car number and frequency appear. Press **CAR** twice again to return to normal channel listening.

To see what car numbers are stored, press **CAR** twice, then repeatedly press **ENT**. The car numbers (from lowest channel number to highest) appear.

SPECIAL FEATURES

DELAY

Many agencies use a two-way radio system that has a period of several seconds between a query and a reply. To avoid missing a reply, you can program a 2-second delay into any channel or frequency. When your scanner stops on a channel or frequency with a programmed delay, **DLY** appears and the scanner continues to monitor that frequency for 2 seconds after the transmission stops before resuming scanning or searching.

You can program a 2-second delay in any of these ways:

- If the scanner is scanning and stops on an active channel, quickly press **DELAY/.** before it resumes scanning.
- If the desired channel is not selected, manually select the channel, then press **DELAY/.**.
- If the scanner is searching, press **DELAY/.**. **DLY** appears and the scanner automatically adds a 2-second delay to every transmission it stops on in that band.

To turn off the 2-second delay in a channel or frequency, press **DELAY/.** while the scanner is monitoring that channel or frequency. **DLY** disappears.

Locking Out Channels or Frequencies

You can increase the effective scanning or search speed by locking out individual channels or frequencies that have a continuous transmission, such as a weather channel (see “National Weather Frequencies” on Page 52) or a birdie frequency (see “Birdie Frequencies” on Page 52).

NOTE

- Your scanner automatically locks out empty channels.
- You can still manually select locked-out channels.

Locking Out Channels

To lock out a channel during scanning, press **L/O/L/O RVW** when the scanner stops on the channel.

To manually lock out a channel, select the channel then press **L/O/L/O RVW**. **L/O** appears.

To remove the lockout from a channel, manually select that channel again, then press **L/O/L/O RVW**. **L/O** disappears.

Clearing All Lockouts from Channels

1. Press **MAN**. **MAN** appears.
2. While holding down **MON/CL**, press **L/O RVW/L/O**. **LO ALL-CL** appears.
3. Press **ENT**. The scanner clears all locked-out tags from channels. Or, if you do not want to clear, press **MON/CL**.

Locking Out Frequencies

To lock out a frequency during a service bank or direct search,

press **L/O/L/O RVW** when the scanner stops on that frequency. The scanner locks out the frequency then continues searching. You can lock out frequencies in both direct search and service bank searches.

Reviewing Locked-Out Frequencies

To review the frequencies you locked out, hold down **L/O/L/O RVW** for about 2 seconds during a search, then repeatedly press ▲ or ▼. The scanner beeps if there are no locked-out frequencies, or **L-r** appears and the scanner displays all locked out frequencies as you press ▲ or ▼. When you reach the highest locked-out frequency, the scanner beeps twice and returns to the lowest locked-out frequency.

Removing a Lockout From a Frequency

1. Start a service bank or direct search.
2. Hold down **L/O/L/O RVW** for about 2 seconds. **L-r** appears.
3. Repeatedly press ▲ or ▼ until the desired frequency appears.
4. Press **L/O/L/O RVW**. The frequency disappears. If there is another locked-out frequency, it appears instead. Or, if there are no more locked-out frequencies, **L-r** **000.0000** appears.

NOTE

You can lock out as many as 50 frequencies during a search. If you try to lock out more, **FLo -FULL** appears (see "Reviewing Locked-Out Frequencies" and "Removing Lockouts From All Frequencies" on Page 44).

Removing Lockouts From All Frequencies

1. Hold down **L/O/L/O RVW** for about 2 seconds during a service bank or direct search. **L-r** appears.

2. While holding down **MON/CL**, hold down **L/O/L/O RVW**. **Flo ALL-CL** appears.

3. Press **ENT**. The scanner clears any lockouts from all frequencies (except in the marine service bank). Or, if you do not want to clear the lockouts, press **MON/CL**.

Removing Lockouts From All Frequencies in All Service Banks

1. Hold down **L/O/L/O RVW** for about 2 seconds during a service bank or direct search. **L-r** appears.

2. While holding down **MON/CL**, press **BAND**. **dEFAULt** and each of the service bands (except **MRN**) appears.

3. Press **ENT**. The scanner clears any lockouts from all frequencies in all service banks. Or, if you do not want to clear the lockouts, press **MON/CL**.

NOTE

- These steps do not clear any lockouts in the marine service bank.
- If you locked out frequencies within the range of any of the service banks during a direct search, the scanner also removes those locked-out frequencies when you use these steps. For example, if you lock out 29.000 MHz during direct search, the scanner removes it since 29.000 MHz is one of the frequencies in the ham radio service bank.

Using Priority

The priority feature lets you scan through channels and still not miss important or interesting calls on a frequency you select. You can program one frequency into the priority channel. As the scanner scans, if the priority feature is

turned on, the scanner checks the priority channel for activity every 2 seconds.

1. Press **PGM**, then press **PRI/ALERT**. **PCH** and **000.000** or the previously-stored frequency appear.

2. Enter the frequency you want to enter into the priority channel, then press **ENT**. The display flashes twice.

If you listen to a channel or frequency and you want to move this frequency to the priority channel, hold down **ENT** then press **PRI**. **PCH** and the frequency flash twice.

To turn on the priority feature, press **PRI/ALERT** during scanning. **PRI** appears. The scanner checks the priority channel every 2 seconds and stays on the channel if there is activity. **PCH** and the frequency appear whenever the scanner is set to the priority channel.

To turn off the priority feature, press **PRI/ALERT**. **PRI** disappears.

Using Power Save

If the scanner does not detect a signal within 5 seconds after you manually select a channel, the scanner enters the power-saving standby mode and **P.-SA** appears. In the standby mode, the scanner rests for 1 second then checks for a signal for 1/2 second, using only 40 percent of the power normally consumed. The scanner

NOTE

- You cannot move a frequency to the priority channel while the scanner is in its programming mode.
- Wait until **PCH** and the frequency stop flashing before pressing additional keys.
- If you program a weather frequency into the priority channel and the scanner detects a WX alert tone on that frequency (see “WX Alert” on Page 35), the scanner sounds the alert tone and **ALErt** flashes. Press any key to turn off the alarm.

continues this until you press any button or it receives a signal.

on P.-SA appears if power save is on. **oFF P.-SA** appears if power save is off.

1. If the scanner is on, turn **VOLUME** counterclockwise until it clicks to turn it off.
2. While you hold down **3** and **ENT**, turn on the scanner.
3. Release **3** and **ENT**.

Using the Display Backlight

You can turn on the display's backlight for easy viewing in the dark. Press **LIGHT** to turn on the light for 5 seconds. To turn off the light sooner, press **LIGHT** again.

Press both **PGM** and **LIGHT** to turn on the display's backlight for an extended period of time. To turn it off, press both **PGM** and **LIGHT**, or press **LIGHT**.

Turning the Key Tone On and Off

The scanner is preset to sound a tone each time you press one of its keys (except **LIGHT**). You can turn the key tone off or back on.

1. If the scanner is on, turn **VOLUME** counterclockwise until it clicks to turn it off.
2. While you hold down **2** and **ENT**, turn on the scanner.

3. When **oFF tonE** or **on tonE** appear, release **2** and **ENT**.

Using the Key Lock

Once you program your scanner, you can protect it from accidental program changes by turning on the keylock feature. When the keypad is locked, the only controls that operate are **SCAN**, **MAN**, **LIGHT**, **PGM**, **VOLUME**, and **SQUELCH**.

To turn on the keylock, hold down until the scanner beeps three times and appears. To turn it off, hold down until the scanner beeps three times and disappears.

NOTE

The keylock does not prevent the scanner from scanning channels or monitoring a single channel, whichever feature you last selected.

Resetting/Initializing the Scanner

If the scanner's display locks up or does not work properly after you connect a power source, you might need to reset or initialize the scanner. **!**

! IMPORTANT !

If you have problems, first try to reset the scanner (see "Resetting the Scanner" on Page 47). If that does not work, you can initialize the scanner (see "Initializing the Scanner" on Page 48); however, this clears all information stored in your scanner's memory.

Resetting the Scanner

1. Turn off the scanner, then turn it on again.

2. Insert a pointed object such as a straightened paper clip into the reset opening on the side of the scanner (as shown), then gently press the

NOTE

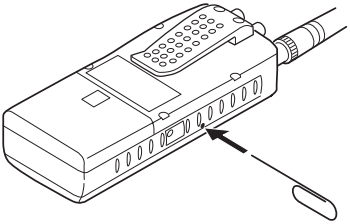
Resetting the Scanner
If the scanner still does not work properly, you might need to initialize the scanner (see "Initializing the Scanner").

Initializing the Scanner
You must release the reset button before releasing **MON/CL**; otherwise the memory might not clear.

! IMPORTANT !

This procedure clears all information you stored in the scanner's memory. Initialize the scanner only when you are sure the scanner is not working properly.

reset button inside the opening.



Initializing the Scanner

1. Turn off the scanner, then turn it on again. **!**
2. Hold down **MON/CL**.
3. While holding down **MON/CL**, insert a pointed object (such as a straightened paper clip) into the reset opening on the side of the scanner, then gently press the reset button inside the opening. The display should turn off.
4. When the display turns on again, release **MON/CL**.

WIRED/ON-AIR PROGRAMMING

You can program your scanner using data you transfer from your personal computer to the scanner using an optional PC cable (called *wired programming*). You can also program your scanner by receiving data transmitted on a frequency your scanner can receive (called *on-air programming*).

You can use wired or on-air programming to store the following data into the scanner:

- Channel number (from 1 to 200)
- Frequency (any frequency the scanner can receive)
- Car number (from 0 to 999, including 00, 000, 01, and 001)
- Channel lockout setting (ON or OFF)
- Channel delay setting (ON or OFF)

Using Wired Programming

1. Turn off the scanner.
2. Connect the scanner to the PC using a PC cable.
3. While pressing **ENT** and **9**, turn on the scanner. **PGM** and **WirEd** appear. Then send the data from the PC. **StArt** and the data being received by the scanner appears in the order it is received.
4. When the scanner successfully receives all data, **End** and **FiniSh** appear. If the scanner received an error while receiving data, **End** and **d-Err** appear. If the scanner received a checksum error while receiving data, **C-Err** and a number appear. The number shown next to **C-Err** indicates the packet number where the error occurred.

NOTE

- The scanner receives only the data shown above during wired/on-air programming.
- **d-Err** (data error) appears if the scanner receives a channel number equal to 0 or frequency data which is out of the range of frequencies the scanner can receive.

Using Wired Programming

- Wired programming stops if the scanner receives an empty channel number.
- If the scanner receives no data from the PC for more than 20 seconds or if you press any key, wired programming stops.
- If the scanner did not receive a start bit from the PC, **StArt** does not appear.
- If the scanner did not receive an end bit from the PC, **End** does not appear.

Wired Programming Specifications

Interface	RS-232C
Data Format	Asynchronous
Data Length	8-bit
Parity	None
Stop Bit	2-bit
Baud Rate	4800 bps
Data Transmission Direction	One Way (Receive Only)
Flow Control	None (2 Lines, RXD and GND)

Using On-Air Programming

1. Turn off the scanner.
2. While pressing **ENT** and **8**, turn on the scanner. **On Air** and **PGM** appear and the scanner automatically receives 154.600 MHz in FM mode. Then **On Air** and the frequency alternate.
3. Send the data from the PC. **StArt** and the data being received by the scanner appears in the order it is received.
4. If you do not want to use 154.600 MHz to receive programming, press **PGM**. **PGM** flashes. Then use the number keys to enter the frequency you want to receive and press **ENT**.

NOTE

- If the scanner did not receive a start bit from the PC, **StArt** does not appear.

To change the frequency back to the default (154.600 MHz), hold down **ENT** then press **CL**.

5. When the scanner successfully receives all data, **End** and **FiniSh** appear. If the scanner received an error while receiving data, **End** and **d-Err** appear. If the scanner received a checksum error while receiving data, **C-Err** and a number appear. The number shown next to **C-Err** indicates the packet number where the error occurred.

NOTE

- You cannot use an AM frequency during on-air programming. Do not enter a frequency between 108.000 and 136.9875 MHz in Step 4.
- If the scanner did not receive an end bit from the PC, **End** does not appear.

On-Air Programming Specifications

Interface	AFSK (Audio Frequency Shift Keying)
Modulation	MSK (Minimum Shift Keying)
Mark Frequency	1200 Hz
Space Frequency	1800 Hz
Data Format	Asynchronous
Data Length	8-bit
Parity	None
Stop Bit	2-bit
Baud Rate	1200 bps
Data Transmission Direction	One Way (Receive Only)

A GENERAL GUIDE TO SCANNING

Reception of the frequencies covered by your scanner is mainly “line-of-sight.” That means you usually cannot hear stations that are beyond the horizon.

GUIDE TO FREQUENCIES

National Weather Frequencies

162.400	162.425	162.450	162.475
162.500	162.525	162.550	

Birdie Frequencies

Every scanner has birdie frequencies. Birdies are signals created inside the scanner’s receiver. These operating frequencies might interfere with transmissions on the same frequencies. If you program one of these frequencies, you hear only noise on that frequency. If the interference is not severe, you might be able to turn **SQUELCH** clockwise to cut out the birdie. This scanner’s birdie frequencies (in MHz) are:

32.035	32.100	40.040	41.890
48.050	112.625	120.125	128.1375
136.1375	144.150	150.150	152.150
160.165	166.200	171.550	384.400
392.4125	400.4125	416.4375	424.4375
429.050	432.450	440.4625	448.4625
464.4875	473.0375	480.500	488.500

496.5125	504.525	808.8375	816.850
822.950	849.8625	856.8875	864.900
897.9625	904.9375	912.950	920.9625
930.0375	944.050	953.000	

To find the birdies in your individual scanner, begin by disconnecting the antenna and moving it away from the scanner. Make sure that no other nearby radio or TV sets are turned on near the scanner. Use the search function and search every frequency range from its lowest frequency to the highest. Occasionally, the searching will stop as if it had found a signal, often without any sound. That is a birdie. Make a list of all the birdies in your scanner for future reference.

Guide to the Action Bands

Typical Band Usage (MHz)

VHF Band	
Low Range	29.00–50.00
6-Meter Amateur	50.00–54.00
Aircraft	108.00–136.00
U.S. Government	137.00–144.00
2-Meter Amateur	144.00–148.00
High Range	148.00–174.00
UHF Band	
Military Aircraft	380.00–384.00
U.S. Government	406.00–420.00
70-Centimeter Amateur	420.00–450.00
Low Range	450.00–470.00
FM-TV Audio Broadcast, Wide Band	470.00–512.00
800 Band Law Enforcement	806.00–824.00
Conventional Systems	851.00–856.00
Conventional/ Trunked Systems	856.00–861.00
Public Safety	866.00–869.00
Trunked Private/ General	894.00–960.00

NOTE

Remote control stations and mobile units operate at 5 MHz higher than their associated base stations and relay repeater units.

Primary Usage

As a general rule, most of the radio activity is concentrated on the following frequencies.

VHF Band

2-Meter Amateur Band	144.000–148.000
Government, Police, and Fire	153.785–155.980
Emergency Services	158.730–159.460
Railroad	160.000–161.900

UHF Band

70-Centimeter Amateur Band FM Repeaters	420.000–450.000
Land-Mobile "Paired" Frequencies	450.000–470.000
Base Stations	451.025–454.950
Mobile Units	456.025–459.950
Repeater Units	460.025–464.975
Control Stations	465.025–469.975

Band Allocation

To help decide which frequency ranges to scan, use the following listing of the typical services that use the frequencies your scanner receives. These frequencies are subject to change, and might vary from area to area. For a more complete listing, refer to the *Police Call Radio Guide including Fire and Emergency Services*, available at your local RadioShack store.

Abbreviations	Services
AIR	Aircraft
BIFC	Boise (ID) Interagency Fire Cache
BUS	Business
CAP	Civil Air Patrol
CCA	Common Carrier
CSB	Conventional Systems
CTSB	Conventional/Trunked Systems
FIRE	Fire Department
HAM	Amateur (Ham) Radio
GOVT	Federal Government
GMR	General Mobile Radio
GTR	General Trunked
IND	Industrial Services (Manufacturing, Construction, Farming, Forest Products)
MAR	Military Amateur Radio
MARI	Maritime Limited Coast (Coast Guard, Marine Telephone, Shipboard Radio, Private Stations)
MARS	Military Affiliate Radio System
MED	Emergency/Medical Services
MIL	U.S. Military
MOV	Motion Picture/Video Industry
NEW	New Mobile Narrow
NEWS	Relay Press (Newspaper Reporters)
OIL	Oil/Petroleum Industry
POL	Police Department
PUB	Public Services (Public Safety, Local Government, Forest Conservation)

Abbreviations	Services
PSB	Public Safety
PTR	Private Trunked
ROAD	Road & Highway Maintenance
RTV	Radio/TV Remote Broadcast Pickup
TAXI	Taxi Services
TELB	Mobile Telephone (Aircraft, Radio Common Carrier, Landline Companies)
TELM	Telephone Maintenance
TOW	Tow Trucks
TRAN	Transportation Services (Trucks, Tow Trucks, Buses, Railroad, Other)
TSB	Trunked Systems
TVn	FM-TV Audio Broadcast
USXX	Government Classified
UTIL	Power & Water Utilities
WTHR	Weather

HIGH FREQUENCY (HF) — (3 MHz–30 MHz)

10-Meter Amateur Band (28.0–29.7 MHz)

29.000–29.700 . . . . . .HAM

VERY HIGH FREQUENCY (VHF) — (30 MHz–300 MHz)

VHF Low Band (29.7–50 MHz—in 5 kHz steps)

29.700–29.790 . . . . IND

29.900–30.550 . . . . . GOVT, MIL

30.580–31.980 . . . . IND, PUB

32.000–32.990 . . . . . GOVT, MIL

33.020–33.980. . . BUS, IND, PUB

34.010–34.990 . . . . . GOVT, MIL

35.020–35.980 . . . . BUS, PUB, IND, TELM

36.000–36.230 . . . . . GOVT, MIL

36.230–36.990 . . . . . Oil Spill Cleanup, GOVT, MIL

37.020–37.980 .. . . . . PUB, IND

38.000–39.000 . . . . . GOVT, MIL

39.020–39.980 . . . . PUB

40.000–42.000 .GOVT, MIL, MARI

42.020–42.940 . . . . . POL

42.960–43.180 . . . . . IND

43.220–43.680 . . . . . TELM,

IND, PUB

43.700–44.600 . . . . . .TRAN

44.620–46.580 . . . . . POL, PUB

46.600–46.990 . . . . . GOVT

47.020–47.400 . . . . . PUB

47.420 . . . . . American Red Cross

47.440–49.580 . . . . IND, PUB

49.610–49.990 . . . . MIL

6-Meter Amateur Band (50–54 MHz)

50.00–54.00 . . . . HAM

Aircraft Band (108–136.975 MHz)

108.000–121.490 . . .. AIR

121.500 . . . . . AIR Emergency

121.510–136.975. . . . . AIR

U.S. Government Band (137–144 MHz)

137.000–144.000 . . . . GOVT, MIL

2-Meter Amateur Band (144–148 MHz)

144.000–148.000 . . . . . HAM

VHF High Band (148–174 MHz)

148.050–150.345 . . . . CAP, MAR, MIL

150.775–150.790 . . . . MED

150.815–150.980 . .. . TOW, Oil Spill Cleanup

150.995–151.475 . . . ROAD, POL

151.490–151.955 . . . . . .IND, BUS

151.985 . . . . TELM

152.0075 . . . . . MED

152.030–152.240 . . . . . TELB

152.270–152.480 . . . . IND, TAXI, BUS

152.510–152.840 . . . . . TELB

152.870–153.020 . . . .. IND, MOV

153.035–153.725. . . IND, OIL, UTIL

153.740–154.445 .. . . . PUB, FIRE

154.490–154.570 . . .. . . IND, BUS

154.585 . . . . . Oil Spill Cleanup

154.600–154.625 . . .. BUS

154.655–156.240 . . .MED, ROAD, POL, PUB

156.255–157.425 . . . . OIL, MARI

157.450 . . . . MED

157.470–157.515 . . . . . TOW

157.530–157.725 . . . . . IND, TAXI

157.740 . . . . BUS

157.770–158.100 . .. . TELB

158.130–158.460 . . . . . BUS, IND, OIL, TELM, UTIL

158.490–158.700 . . . . . TELB

158.730–159.465 . . . . POL, PUB,

ROAD

159.480 . . . . OIL

159.495–161.565. . . . . TRAN

161.580–162.000 . . . . OIL, MARI, RTV

162.0125–162.35 . . . GOVT, MIL, USXX

162.400–162.550 . . . . . WTHR

162.5625–162.6375. . . . . GOVT, MIL, USXX

162.6625 . . . . . MED

162.6875–163.225. . . GOVT, MIL, USXX

163.250 . . . . . MED

163.275–166.225 . . . . . .GOVT, MIL, USXX

166.250 . . . . . GOVT, RTV, FIRE

166.275–169.400 . . . GOVT, BIFC

169.445–169.505. . . . . Wireless Mikes, GOVT

169.55–169.9875 . . . GOVT, MIL, USXX

170.000–170.150. . . BIFC, GOVT, RTV, FIRE

170.175–170.225 . . . . . GOVT

170.245–170.305 . . . . . Wireless

Mikes

170.350–170.400 . . . . GOVT, MIL

170.425–170.450 . . . . . BIFC

170.475 . . . . . PUB

170.4875–173.175 . . GOVT,

PUB, Wireless Mikes

173.225–173.5375 . MOV, NEWS,

UTIL, MIL

173.5625–173.5875 .. . . . . MIL

Medical/Crash Crews

173.60–173.9875 . . . . . GOVT

ULTRA HIGH FREQUENCY (UHF) — (300 MHz–3 GHz)

U. S. Government Band (406–420 MHz)

406.125–419.975 . . GOVT, USXX

70-Centimeter Amateur Band (420–450 MHz)

420.000–450.000 . . . . . HAM

Low Band (450–470 MHz)

450.050–450.925 . . . . . RTV

451.025–452.025. . . . . IND, OIL,

TELM, UTIL

452.0375–453.00 . . . . .IND, TAXI,

TRAN TOW, NEWS

453.0125–454.000 . . . . PUB, OIL

454.025–454.975 .... TELB

455.050–455.925 . . . . . RTV

457.525–457.600. . . . . BUS

458.025–458.175 . . . . . MED

460.0125–460.6375 . . . . . FIRE, POL, PUB

460.650–462.175 . . . . . BUS

462.1875–462.450 . . . . BUS, IND

462.4625–462.525 . . . . IND, OIL, TELM, UTIL

462.550–462.925 . . . . GMR, BUS

462.9375–463.1875 . . . . . MED

463.200–467.925 . . . . . BUS

FM-TV Audio Broadcast, UHF Wide Band (470–512 MHz)

(Channels 14 through 20 in 6 MHz steps)

475.750 . . . . . Channel 14

481.750 . . . . . Channel 15

487.750 . . . . . Channel 16

493.750 . . . . . Channel 17

499.750 . . . . . Channel 18

505.750 . . . . . Channel 19

511.750 . . . . . Channel 20

NOTE

Some cities use the 470–512 MHz band for land/mobile service.

Conventional Systems Band — Locally Assigned

851.0125–855.9875 .. . . . . CSB

Conventional/Trunked Systems Band — Locally Assigned
856.0125–860.9875 . . . . . CTSB

Trunked System Band — Locally Assigned
861.0125–865.9875 . . . . . TSB

Public Safety Band — Locally Assigned
866.0125–868.9875. . . . . PSB

33-Centimeter Amateur Band (902–928 MHz)
902.000–928.000 . . . . . HAM

Private Trunked Band
935.0125–939.9875 .. . . . . PTR

General Trunked Band
940.0125–940.9875 . . . . . GTR

FREQUENCY CONVERSION

The tuning location of a station can be expressed in frequency (kHz or MHz) or in wavelength (meters). The following information can help you make the necessary conversions.

1 MHz (million) = 1,000 kHz (thousand)

- To convert MHz to kHz, multiply the number of megahertz by 1,000:

  30.62 (MHz) × 1000 = 30,620 kHz

- To convert from kHz to MHz, divide the number of kilohertz by 1,000:

127,800 (kHz) ÷ 1000 = 127.8 MHz

- To convert MHz to meters, divide 300 by the number of megahertz:

  300 ÷ 50 MHz = 6 meters

CARE

Keep the scanner dry; if it gets wet, wipe it dry immediately. Use and store the scanner only in normal temperature environments. Handle the scanner carefully; do not drop it. Keep the scanner away from dust and dirt, and wipe it with a damp cloth occasionally to keep it looking new.

SERVICE AND REPAIR

If your scanner is not performing as it should, take it to your local RadioShack store for assistance. To locate your nearest RadioShack, use the store locator feature on RadioShack's website (www.radioshack.com), or call 1-800-The Shack (843-7422) and follow the menu options. Modifying or tampering with the scanner's internal components can cause a malfunction and might invalidate its warranty and void your FCC authorization to operate it.

TROUBLESHOOTING

If your scanner is not working as it should, these suggestions might help you eliminate the problem. If the scanner still does not operate properly, take it to your local RadioShack store for assistance.

Problem	Cause / Solution
Scanner is totally inoperative.	The AC or DC adapter is not connected. Be sure the adapter's barrel plug is fully inserted into the jack. The batteries are dead. Replace the batteries with fresh ones, or recharge the rechargeable batteries.
Poor or no reception.	An antenna is not connected or is connected incorrectly. Make sure an antenna is properly connected to the scanner. Programmed frequencies are the same as "birdie" frequencies. Avoid programming frequencies listed under "Birdie Frequencies" on Page 52 or only listen to them manually.
Keypad does not work.	Keylock is turned on. Turn off the keylock. The scanner might need to be reset or initialized. Turn the scanner off then on again, or reset/initialize the scanner .
Scanner is on but will not scan.	**SQUELCH** is not correctly adjusted. Adjust **SQUELCH** clockwise. Only one channel is (or no channels are) stored. Store frequencies into more than one channel.

During scanning, the scanner locks on frequencies that have an unclear transmission. Program frequencies listed under "Birdie Frequencies" on Page 52 or listen to them manually.

SPECIFICATIONS

Frequency Coverage (MHz):

10 Meter Amateur Radio ..... 29–29.7 (in 5 kHz steps)

VHF Lo ..... 29.7–50 (in 5 kHz steps)

6 Meter Amateur Radio ..... 50–54 (in 5 kHz steps)

Aircraft ..... 108–136.9875 (in 12.5 kHz steps)

Government ..... 137–144 (in 5 kHz steps)

2 Meter Amateur Radio ..... 144–148 (in 5 kHz steps)

VHF Hi ..... 148–174 (in 5 kHz steps)

Amateur Radio/Government ..... 380–450 (in 12.5 kHz steps)

UHF Standard ..... 450–470 (in 12.5 kHz steps)

UHF "T" ..... 470–512 (in 12.5 kHz steps)

UHF Hi ..... 806–823.9875 (in 12.5 kHz steps)
849–868.9875 (in 12.5 kHz steps)
894–960 (in 12.5 kHz steps)

Channels of Operation ..... 200 channels/20 monitor memories

Sensitivity (20 dB S/N):

29–54 MHz .....0.3 µV

108–136.9875 MHz ..... 1.0 µV

137–174 MHz ..... 0.5 µV

380–512 MHz ..... 0.5 µV

806-960 MHz ..... 0.5 µV

Spurious Rejection (FM @154 MHz) ..... 40 dB

Selectivity:

–6 dB ..... ±10 kHz

–50 dB..... ±18 kHz

Search Speed ..... Up to 50 Steps/Sec

Scan Speed ..... Up to 25 Channels/Sec

Delay Time ..... 2 Seconds

IF Frequencies:

1st IF ..... 257.5 MHz

2nd IF ..... 21.4 MHz

3rd IF ..... 455 kHz

IF Rejection (257.5 MHz) ..... 60 dB at 154 MHz

Priority Sampling ..... 2 Seconds

Squelch Sensitivity:

Threshold ..... 0.3 µV

Tight (FM) .....(S + N)/N=30 dB

Tight (AM) ..... (S + N)/N=20 dB

Antenna Impedance .....50 Ohms

Audio Output Power (10% THD) ..... 190 mW Nominal (using batteries, 240 mW using external power (DC 9V))

Built-In Speaker .....$1^3/_8$ Inches (36 mm), 8 Ohms

Operating Temperature ..... 14° to 140°F (–10° to 60°C)

Power Requirements ..... 6 Volts DC, 4 AA Batteries

AC Adapter ..... 9V, 300-mA/size B Adaptaplug adapter

DC Adapter ..... 9V, 300-mA/size B (when charging: 10V, 300 mA/size B Adaptaplug adapter)

Current Drain (Squelched) ..... 75 mA

Dimensions (HWD) ..... $5^{11}/_{16} \times 2^1/_2 \times 1^3/_8$ Inches ($145 \times 63 \times 34$ mm)

Weight (without antenna and belt clip) ..... 7.4 oz (210 g)

Supplied Accessories ..... Antennas (2), Battery Holder, Rechargeable Battery Holder, Frequency Guide, Removable Belt Clip

Specifications are typical; individual units might vary. Specifications are subject to change and improvement without notice.

Limited One-Year Warranty

This product is warranted by RadioShack against manufacturing defects in material and workmanship under normal use for one (1) year 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, LOSS OF TIME, DATA, PROPERTY, REVENUE, OR PROFIT OR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, EVEN IF RadioShack HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions 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 without charge for parts and labor; (b) replace the product with one of the same or similar design; or (c) refund the purchase price. All replaced 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 replaced 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 not cover: (a) damage or failure caused 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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