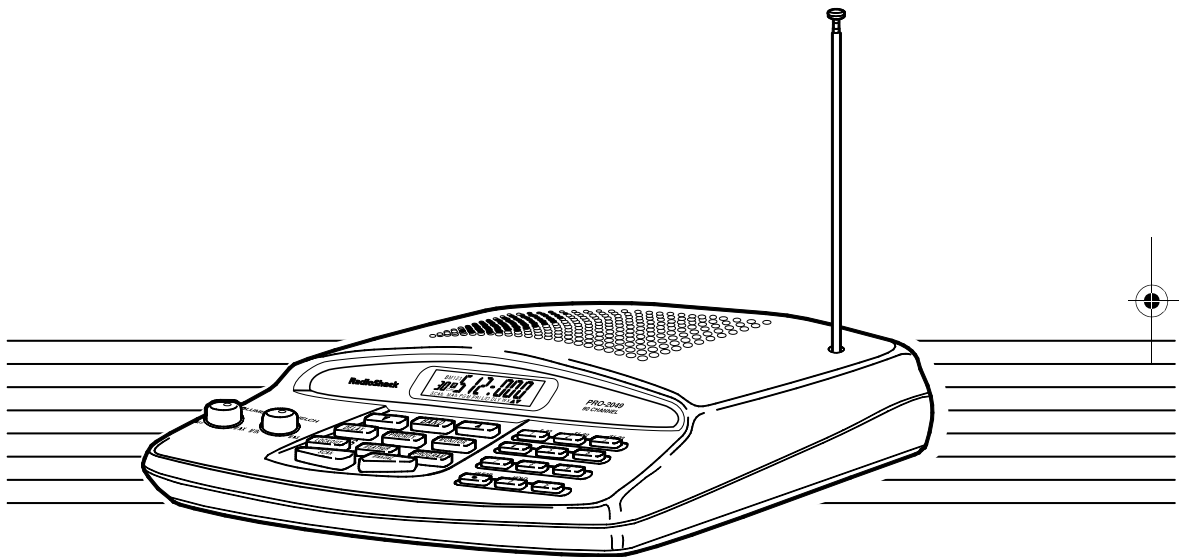


Cat. No. 20-419

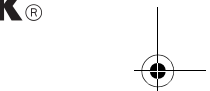
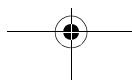
OWNER'S MANUAL

PRO-2049 90-Channel Direct Entry Programmable Scanner

Please read before using this equipment.



RadioShack®





FEATURES

Your RadioShack PRO-2049 90-Channel Direct Entry Programmable Scanner lets you in on all the action! This scanner gives you direct access to over 23,000 frequencies, including those used by police and fire departments, ambulance and transportation services, government agencies, and amateur radio services. You can select up to 90 channels to scan and you can change selections at any time.

The scanner's frequency bands let you search specific, preset ranges of frequencies quickly and easily.

Your scanner has all these special features:

Weather Band Key — scans seven preprogrammed weather channels to keep you informed about current weather conditions.

Three 30-Channel Storage Banks — let you store 30 channels in each of three banks to group channels so calls are easier to identify.

Three Monitor Memories — let you temporarily save three frequencies located during a frequency search, so you can decide if you want to move them to permanent channel storage.

Priority Channels — let you set the scanner to check up to three channels every 2 seconds so you do not miss important calls.

Band Search — lets you quickly and easily search preset frequency ranges, so you can find new and unlisted broadcasts.

Direct Search — lets you search for a transmission starting from a specified frequency.

Search Skip — lets you select up to 20 frequencies for the scanner to skip during a search, so you can search more efficiently.

Two-Second Channel Scan/Search Delay — lets you set the scanner so it delays scanning or searching for 2 seconds before moving to another channel/frequency, so you can hear more replies.

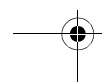
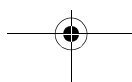
Lock-Out — keeps channels you select from being scanned, so you can skip over busy channels such as those with a continuous transmission.

Key Confirmation Tones — the scanner sounds a tone when you perform an operation correctly and sounds an error tone if you make an error.

Memory Backup — keeps channel frequencies stored in memory for 3 days or more during a power loss.

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External Speaker Jack — lets you connect an external speaker, or an earphone or headphones for private listening.

External Antenna Terminal — lets you connect an external antenna (not supplied) for improved reception.

Your PRO-2049 scanner can receive all of these frequencies:

- 29–54 MHz (10-Meter Amateur Radio, VHF Lo, 6-Meter Amateur)
- 108–136.975 MHz (Aircraft)
- 137–174 MHz (Government, 2-Meter Amateur Radio, VHF Hi)
- 406–512 MHz (UHF Lo, 70-Centimeter Amateur Radio, Government, UHF “T” Band)

This table shows the preset frequency steps your scanner uses for each frequency range.

Freq. Range (MHz)	Freq. Step (kHz)
29.000–54.000	5
108.000–136.975	12.5
137.000–144.000	5
144.000–148.000	5
148.000–174.000	5
406.000–450.000	12.5
450.000–470.000	12.5
470.000–512.000	12.5

Note: The frequency steps are preset. You cannot change them.

Your scanner can also receive these preprogrammed weather channel frequencies:

- 162.400 MHz
- 162.425 MHz
- 162.450 MHz
- 162.475 MHz
- 162.500 MHz
- 162.525 MHz
- 162.550 MHz

We recommend you record your scanner's serial number here. The number is on the scanner's bottom panel.

Serial Number _____

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.

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 so could subject you to legal penalties.

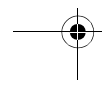
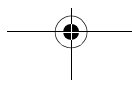
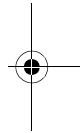
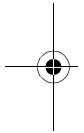
We encourage responsible, legal scanner use.

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PREPARATION

This scanner is designed for use in the home as a base station. You can place it on any flat surface such as a desk, shelf, or table.

REMOVING THE DISPLAY PROTECTOR

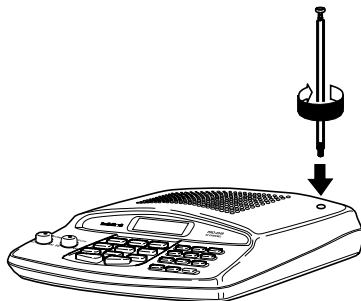
Your scanner's display is protected during shipment by a piece of film. Peel off this film before you use the scanner.

CONNECTING AN ANTENNA

Connecting the Supplied Antenna

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

The supplied telescoping antenna helps your scanner receive strong local signals. To install the antenna, thread it clockwise into the hole on the scanner's top.



The scanner's sensitivity depends on the antenna's length and various environmental conditions. For the best reception of the transmissions you want to hear, adjust the antenna's length.

Frequency	Antenna Length
29–54 MHz	Extend fully
108–174 MHz	Collapse one segment
406–512 MHz	Collapse both segments

Connecting an Outdoor Antenna

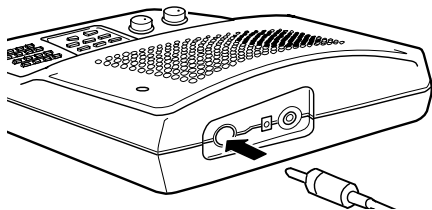
Instead of the supplied antenna, you can connect an outdoor base-station antenna (not supplied) to your scanner. Your local RadioShack store sells a variety of antennas. Choose the one that best meets your needs.

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

- The antenna should be as high as possible on the house.
- The antenna and its cable should be as far as possible from sources of electrical noise (appliances, other radios, etc.).
- The antenna should be vertical for the best performance.

To connect an optional base-station antenna, first remove the supplied antenna from the scanner. Always use 50-ohm coaxial cable, such as RG-58 or RG-8, to connect the base-station 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 **ANT.** jack, you might also need an antenna plug adapter such as RadioShack Cat. No. 278-208. 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. Then route the antenna's cable to the scanner and connect the cable to the **ANT** jack on the back of the scanner.

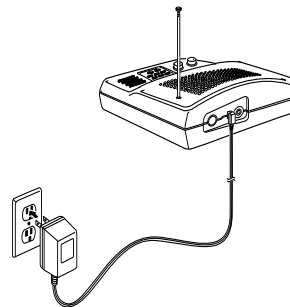


Cautions:

- 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.
- Follow all cautions and warnings included with your antenna.

CONNECTING POWER

The scanner's supplied AC adapter lets you power the scanner from a standard AC outlet. To connect power to the scanner, insert the AC adapter's barrel plug into the **AC 10V** jack on the back of the scanner, then plug the AC adapter into a standard AC outlet.



Warning: Do not use the AC adapter's polarized plug with an extension cord receptacle unless the blades can be fully inserted to prevent blade exposure.

Cautions:



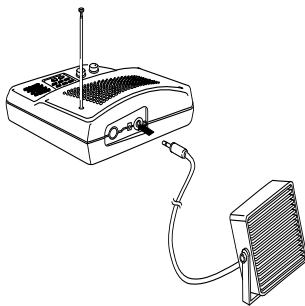
You must use a Class 2 power source that supplies 10 volts AC and delivers at least 300 mA. Its plug must fit the scanner's **AC 10V** jack. The supplied adapter meets these specifications. Using an adapter that does not meet these specifications could damage the scanner or the adapter.

- Use only the supplied AC adapter to power your scanner. Using another adapter could damage your scanner. A replacement adapter is available by special order through your local RadioShack store.
- Be sure to connect the AC adapter to the scanner before you connect it to an AC outlet, and disconnect the AC adapter from the AC outlet before you disconnect it from the scanner.

CONNECTING AN EXTERNAL SPEAKER

You can connect an optional external speaker with a 1/8-inch (3.5-mm) plug to the scanner. Use an 8-ohm external speaker that can handle at least 2.5 watts of power. Your local RadioShack store sells scanner accessories, including external speakers.

Insert the speaker's plug into the **EXT. SP.** jack on the back of the scanner.

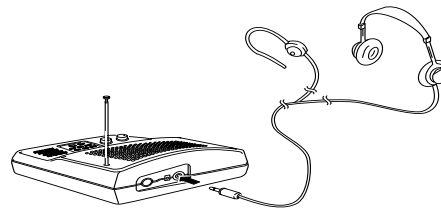


Note: Plugging in an external speaker disconnects the scanner's internal speaker.

CONNECTING AN EARPHONE/ HEADPHONES

You can connect an optional earphone or pair of monaural headphones with a 1/8-inch (3.5-mm) plug to the scanner. Your local RadioShack store sells a complete line of earphones and headphones.

Insert the earphone's or headphones' plug into the **EXT. SP.** jack on the back of the scanner.



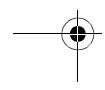
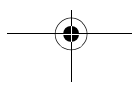
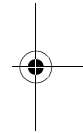
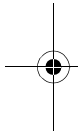
Note: Plugging in an earphone or headphones disconnects the scanner's internal speaker.



Listening Safely

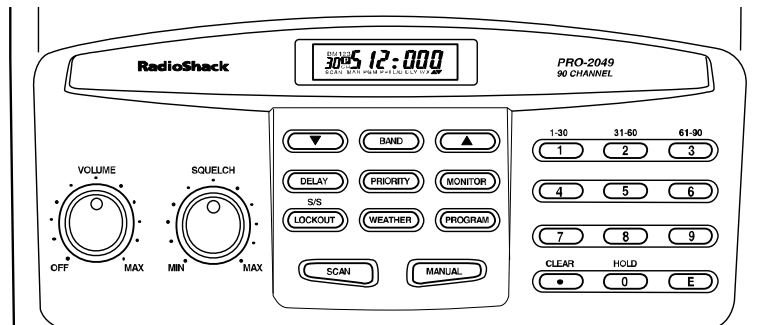
To protect your hearing, follow these guidelines when you use an earphone or headphones.

- Set **OFF/VOLUME** to the lowest setting before you begin listening. After you put on the earphone or headphones, adjust **OFF/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 **OFF/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.



UNDERSTANDING YOUR SCANNER

A LOOK AT THE FRONT PANEL



A quick glance at this section should help you understand each control's function.

- | | |
|---|--|
| VOLUME | Turns the scanner on or off and adjusts the volume. |
| SQUELCH | Adjusts the scanner's squelch. See "Turning On the Scanner/Setting Volume and Squelch" on Page 17. |
| ▲ / ▼ | Enters the search direction. |
| BAND | Searches a band you select. See "Frequency Bands" on Page 15. |
| DELAY | Programs a 2-second delay for the selected channel. |
| PRIORITY | Sets and turns on or off priority for a particular channel. |
| MONITOR | Stores frequencies into and accesses the three monitor memories. See "Monitor Memories" on Page 15. |
| S/S-LOCKOUT
(search/skip/lockout) | Skips a specified frequency during a band or direct search or locks out selected channels during scanning. |
| WEATHER | Scans the seven preprogrammed weather channels. |
| PROGRAM | Programs frequencies into channels. |
| SCAN | Scans through the channels. |



MANUAL

Stops scanning to let you listen to a monitor memory or directly enter a channel number.

1-9, HOLD/0

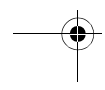
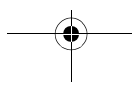
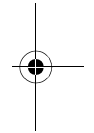
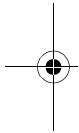
Each key has a single-digit label, and the 1-3 keys also have a range of numbers. Use the digits on the keys to enter the numbers for a channel or a frequency. Use the range of numbers above the key (61-90, for example) to select the channels in a channel-storage bank. See "Channel-Storage Banks" on Page 15. Also, pressing **HOLD (0)** during a search pauses the scanner.

CLEAR/.

Clears an incorrect entry, or enters the decimal point when you enter a frequency.

E (Enter)

Stores frequencies into channels. See "Manually Storing Frequencies into Channels" on Page 18.



A LOOK AT THE DISPLAY

The display has indicators that show the scanner's current operating mode. A good look at the display will help you understand your scanner.



- | | |
|----------------------|--|
| B | Appears with a number (1–3) to its right to show which channel-storage banks are turned on for scanning. See “Understanding Banks and Bands” on Page 15. |
| M | Appears with a number (1–3) to its right to show which monitor memory you are listening to. |
| P | Appears when you tune to a priority channel. |
| CH | Appears with a number (1–90) to its left to show which channel the scanner is tuned to. |
| SCAN | Appears when you scan channels. |
| MAN | Appears when you manually select a channel. |
| PGM | Appears when you program the scanner. |
| PRI | Appears when the priority feature is turned on. |
| L/O (lockout) | Appears when you skip a channel or frequency, when you manually select a channel or frequency that is locked out or skipped, or when a frequency is stored in search skip memory during a direct search or band search hold. |
| DLY | Appears when the scanner is scanning and stops at a channel, or during a search when you have programmed a 2-second delay. |



WX (weather)

Appears when the scanner is searching the weather band.



Indicates the search direction during a search.

b

Appears instead of the channel number during a band search.

d

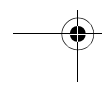
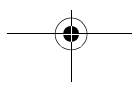
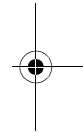
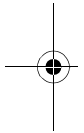
Appears instead of the channel number during a direct search.

H

Appears during a band search hold.

h

Appears during a direct search hold.





UNDERSTANDING BANKS AND BANDS

You can store frequencies into either a permanent memory location called a channel, or a temporary memory location called a monitor memory. You can store up to 90 channels and up to 3 monitor memories.

Your scanner also has eight frequency bands, each covering a specific range of frequencies you can search.

CHANNEL-STORAGE BANKS

To make it easier to identify and select the frequencies you want to listen to, the scanner's channels are divided into 3 channel-storage banks (1–3) of 30 channels each. You can use each channel-storage bank to group frequencies, such as those used by the police department, fire department, ambulance services, and amateur radio operators (see "Guide to the Action Bands" on Page 28).

For example, there might be three or four police departments in your area, each using several different frequencies. Additionally, there might be other law enforcement agencies such as state police, county sheriffs, or SWAT teams that use their own frequencies. You could program all law enforcement frequencies starting with Channel 1 (the first channel in Bank 1), then program the fire department, paramedic, and other public safety frequencies starting with Channel 31 (the first channel in Bank 2).

MONITOR MEMORIES

Monitor memories are temporary storage areas where you can store up to three frequencies during a search while you decide whether to save them into channels. You can manually select and listen to monitor memories.

FREQUENCY BANDS

Your scanner has eight frequency bands, each covering a specific range of frequencies. You can search these bands for specific broadcasts by repeatedly pressing **BAND** until the scanner displays the band you want.

For example, you can search through all frequencies between 29.000 and 54.000 MHz for specific broadcasts by repeatedly pressing **BAND** until **29-54** appears on the display. The scanner then automatically searches the frequencies in that band.

This table shows the frequency band ranges displayed by the scanner and the typical usage, frequency coverage, and step for each.

Displayed Frequency Band Range	Typical Usage	Frequency Coverage (MHz)	Step (kHz)
29-54	10-Meter Amateur Radio, VHF Lo, 6-Meter Amateur Radio	29.000 to 54.000	5.0
108-137	Aircraft	108.000 to 136.975	12.5
137-144	Government	137.000 to 144.000	5.0
144-148	2-Meter Amateur Radio	144.000 to 148.000	5.0
148-174	VHF Hi	148.000 to 174.000	5.0
406-450	Government, 70-Centimeter Amateur Radio	406.000 to 450.000	12.5
450-470	UHF Lo	450.000 to 470.000	12.5
470-512	UHF "T" Band	470.000 to 512.000	12.5

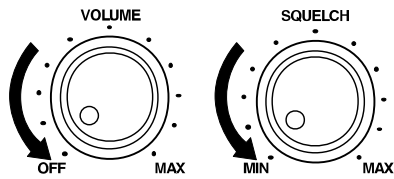
Notes:

- Your scanner searches at the preset frequency step rate (5 or 12.5 kHz) for each frequency. You cannot change the frequency step rate.
- The scanner displays the nearest 1 kHz step. For example, if you tune to 406.1125, the scanner displays **406.112**.
- While searching through a frequency band, you might hear a frequency you want to store. You can store any frequency into a monitor memory.
- You cannot change or delete any of the frequencies in the frequency bands.

OPERATION

TURNING ON THE SCANNER/SETTING VOLUME AND SQUELCH

1. Turn **OFF/VOLUME** and **SQUELCH** fully counterclockwise.



2. Turn **VOLUME** clockwise until you hear a hissing sound. Set it to the desired volume level.
3. Turn **SQUELCH** clockwise, then leave it set to a point just after the hissing sound stops.

Notes:

- If the scanner picks up unwanted, partial, or very weak transmissions, turn **SQUELCH** clockwise to decrease the scanner's sensitivity to these signals.
- If you want to listen to a weak or distant station, turn **SQUELCH** counterclockwise.
- If the scanner will not scan, turn **SQUELCH** further clockwise.

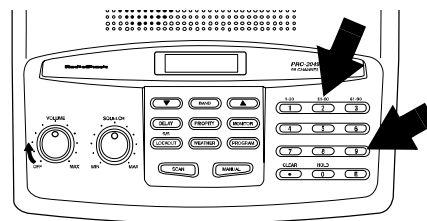
RESETTING THE SCANNER

You might need to reset the scanner in any of the following conditions.

- before you use it for the first time (to clear anything that might already have been stored in memory)
- if the scanner's display locks up
- if the scanner does not work properly after you connect power
- if the scanner is dropped or subjected to a physical or electrical shock

Caution: This procedure clears all the information you have programmed into the scanner. Use this procedure only when you are sure your scanner is not working properly.

1. Turn off the scanner.
2. While you hold down **2** and **9**, turn on the scanner.



MANUALLY STORING FREQUENCIES INTO CHANNELS

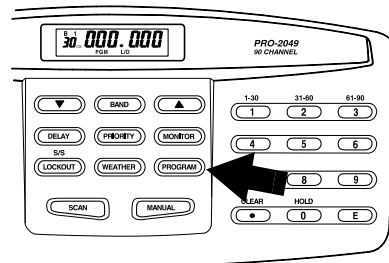
If you know a frequency you want to store, you can store it manually into a channel.

Good references for active frequencies are RadioShack's "Police Call Radio Guide Including Fire and Emergency Services," "Aeronautical Frequency Directory," and "Maritime Frequency Directory." We update these directories every year, so be sure to get a current copy. See also "Guide to the Action Bands" on Page 28 in this manual.

Note: If you do not have a reference to frequencies in your area, follow the steps in "Searching For and Temporarily Storing Active Frequencies" on Page 19 to search for transmissions.

Follow these steps to manually store a frequency into a channel.

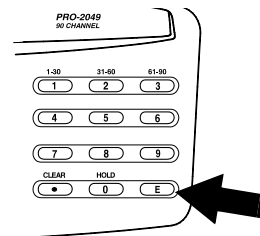
1. If the scanner is scanning, press **MANUAL**.
2. Using the number keys, enter the channel number where you want to store a frequency.
3. Press **PROGRAM**. **B** and the bank number, the selected channel number and **CH**, **PGM**, **L/O** (if the selected channel number is empty), and **000.000** (or the previously programmed frequency) appear on the display.



4. Using the number keys, enter the frequency you want to store into that channel, including the decimal point.

Note: Your scanner automatically rounds the entered frequency up to the closest valid frequency. For example, if you try to enter a frequency of 151.473, your scanner accepts it as 151.475.

5. Press **E** to store the frequency. If the channel was locked out, the lockout is removed.



Note: If you entered an invalid frequency in Step 4, the scanner displays **Error**. Press **CLEAR**, then repeat Steps 4 and 5.

6. To program the next channel in sequence, repeat Steps 3–5. To program another channel (not in sequence), repeat Steps 2–5.

SEARCHING FOR AND TEMPORARILY STORING ACTIVE FREQUENCIES

You can search for transmissions using either a band or direct search, then temporarily store the frequencies for those transmissions into monitor memories.

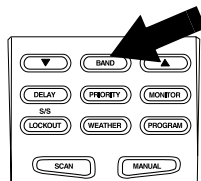
Notes:

- If you manually tune to a search skip frequency, the display shows L/O (see “Skipping Frequencies/Channels” on Page 23).
- You can use the scanner’s delay feature while using band or direct search. See “Delay” on Page 23.

Band Search

Using band search, you can select a frequency band and search for transmissions within only that band.

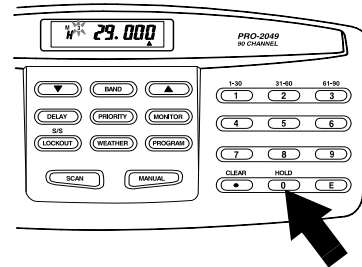
1. Repeatedly press **BAND** until you see the frequency band you want to search.



The scanner displays ▲ or ▼, the range for each frequency band, and the number of the current monitor memory blinks on the display. Then the scanner starts to search the frequencies in the

band. When the scanner finds a transmission, it stops and displays the frequency’s number until the transmission stops, then it starts searching again.

2. To manually search the band, press **HOLD** after the scanner starts automatically searching the frequencies. The scanner displays H (hold), ▲ or ▼, and a frequency within the band you selected.



3. Repeatedly press ▲ to step from the lower to the upper range, or ▼ to step from the upper to the lower range.

Hold down ▲ or ▼ or press **HOLD** to return to automatic search.

4. When the scanner finds an active frequency, you can do any of the following:

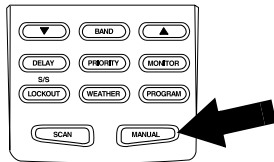
- save the frequency into the current monitor memory by pressing **MONITOR**.
- continue searching by pressing ▲ or ▼.
- stop searching and listen to the frequency by pressing **HOLD**. H (hold) appears.

Note: You can change the direction of either an automatic or manual search by pressing ▲ or ▼ once.

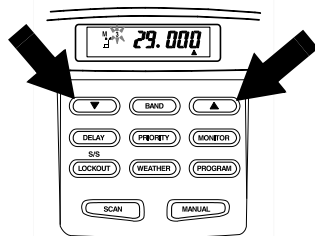
Direct Search

Using direct search, you can enter a frequency, then search for transmissions above or below that frequency within all of the frequency bands.

1. Press **MANUAL**.



2. Use the number keys to enter the frequency where you want to start the search. Press • to enter the decimal point.
3. Press ▲ or ▼ to search up or down from the selected frequency. d (direct) and ▲ or ▼ appear, and the next available monitor memory number flashes.



Note: If you entered an invalid frequency in Step 2, the scanner displays **Error**. Press **CLEAR**, then repeat Steps 2 and 3.

4. When the scanner finds an active frequency, you can do any of the following:

- save the frequency into the current monitor memory by pressing **MONITOR**.
- continue searching or change the search direction by pressing ▲ or ▼.
- stop searching and listen to the frequency by pressing **HOLD**. H (hold) appears.

To manually step through frequencies one at a time after you stop a search, repeatedly press ▲ or ▼. To continue searching, either press **HOLD** or press and hold down ▲ or ▼ for about 1 second.

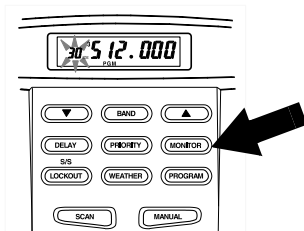
LISTENING TO MONITOR MEMORIES

After you store frequencies into the scanner's monitor memories, you can listen to them by pressing **MANUAL**, **MONITOR** then the number for the desired monitor memory.

Note: To listen to the monitor memories, the priority channel feature must be turned off (see "Priority" on Page 24).

MOVING A FREQUENCY FROM A MONITOR MEMORY TO A CHANNEL

1. If the scanner is scanning, press **MANUAL**.
2. Use the number keys to enter the channel number where you want to store the monitor frequency, then press **PROGRAM**. **PGM** appears on the display.
3. Press **MONITOR**. The channel number flashes.

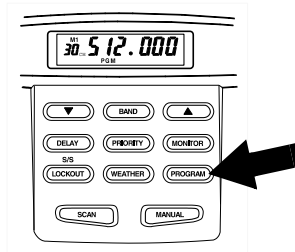


4. Use the number keys to enter the monitor memory number that has the frequency you want to store into the channel. The frequency appears.
5. Press **E**. The scanner stores the frequency in the selected channel.

DELETING A FREQUENCY FROM A CHANNEL

1. If the scanner is scanning, press **MANUAL**.

2. Use the number keys to enter the channel number containing the frequency you want to delete.
3. Press **PROGRAM**.



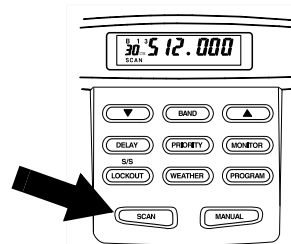
4. Press **0** then **E**. The frequency is deleted from the channel.

To delete a frequency from a monitor memory, store a new frequency in that monitor memory.

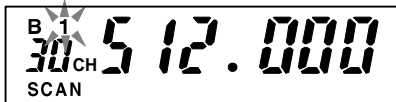
SCANNING CHANNELS

Note: You cannot scan channels until you have stored frequencies in them.

To scan channels stored in the channel-storage banks, press **SCAN**. The scanner scans through all channels in the active banks.



To select one or more channel-storage banks while scanning, select each bank you want to scan by pressing its number key so the bank's number appears on the display.



To turn off channel-storage banks, press the number key for the bank(s) so the bank's number disappears. The scanner does not scan any of the stored channels within banks you have turned off.

Notes:

- You can manually select any channel in a bank, even if the bank is turned off.
- You cannot turn off all three banks.
- The scanner skips channels that have been locked out (see "Skipping Frequencies/Channels" on Page 23).

MANUALLY SELECTING A CHANNEL

You can continuously monitor a specific channel without scanning. This is useful if you hear an emergency broadcast on a channel and want to hear all the details (even though there might be periods of silence) or if you want to monitor only a specific channel or a locked-out channel.

Follow these steps to manually select a channel.

1. Press **MANUAL**.
2. Use the number keys to enter the channel number you want to hear, then press **MANUAL** again.

Notes:

- If your scanner is scanning and stops at the channel you want, simply press **MANUAL** to manually select the channel.
- If you repeatedly press **MANUAL**, the scanner steps through the channels.

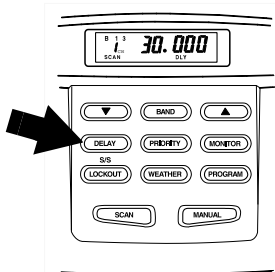
SPECIAL FEATURES

DELAY

Many agencies use a two-way radio system that might have a pause of several seconds between a query and a reply. To avoid missing a reply, you can program a 2-second delay into any of your scanner's channels or frequencies. Then, when the scanner stops on the channel or frequency, **DLY** appears on the display and the scanner continues to monitor the channel/frequency for 2 seconds after the transmission stops before it resumes scanning or searching.

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

- If the scanner is scanning and stops on an active channel, quickly press **DELAY** before it starts to scan again.



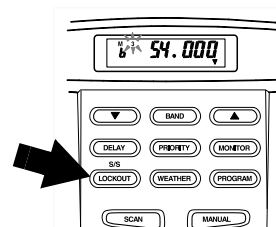
- If the desired channel is not selected, manually select the channel then press **DELAY**.
- If the scanner is searching, press **DELAY** during the search. **DLY** appears on the display and the scanner automatically adds a 2-second delay to every transmission it stops on.

To turn off delay on any channel or frequency, select that channel or frequency then press **DELAY**. **DLY** disappears.

SKIPPING FREQUENCIES/ CHANNELS

You can scan channels and search for frequencies faster by skipping ones that have a continuous transmission, such as a weather channel. You can skip up to all 90 channels while scanning or up to 20 frequencies during a band or direct search.

To skip a channel/frequency while scanning or searching, press **S/S-LOCKOUT** when the scanner stops on it.



Notes:

- If you skip more than 20 search frequencies, each new frequency replaces an earlier one, starting from the first stored frequency.
- You can manually select skipped frequencies after you press **HOLD** to stop a search. The scanner displays **L/O** when you select a skipped frequency.

Removing Skip from Frequencies

To remove the skip from a frequency while searching, press **HOLD** to stop the search, press **▲** or **▼** to select the skipped frequency, then press **S/S** until **L/O** disappears.

To remove the skip from all frequencies at once while searching, hold down **S/S-LOCKOUT** until the scanner beeps twice.

Note: If you turned the key tone off (see "Turning the Key Tone On or Off" on Page 25), the scanner does not beep when you hold down **S/S-LOCKOUT**.

Removing Skip from Channels

Follow these steps to remove the skip from a channel while scanning.

1. Press **MANUAL** to stop scanning.
2. Use the number keys to enter the channel number you want to delete.
3. Press **MANUAL**.
4. Hold down **LOCKOUT** until **L/O** disappears.

To remove skip from all channels while scanning, select the banks containing the skipped channels, press **MANUAL**, then hold down **LOCKOUT** until the scanner beeps twice.

Note: If you turned the key tone off (see "Turning the Key Tone On or Off" on Page 24

on Page 25), the scanner does not beep when you hold down **LOCKOUT**.

PRIORITY

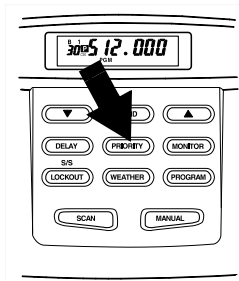
The priority feature lets you scan through programmed channels and still not miss important or interesting calls on specific channels. You can program one stored channel in each bank as a priority channel (up to 3 total). As the scanner scans, it checks the priority channels in each selected bank for activity every 2 seconds.

Notes:

- You can skip priority channels. If you skip all priority channels, the scanner displays **P CH LOC OUT** when you turn on the priority feature. See "Skipping Frequencies/Channels" on Page 23.
- The priority feature must be turned off to listen to monitor memories.

The scanner automatically designates the first channel in each bank as that bank's priority channel. Follow these steps to program a different channel as the priority channel.

1. Press **PROGRAM**.
2. Use the number keys to enter the channel number you want to program as the priority channel, then press **PRIORITY**. **P** appears to the right of the channel number.



3. Repeat Steps 1 and 2 for each channel you want to program as a priority channel.

To confirm priority channel numbers for all banks, press **PROGRAM** then repeatedly press **PRIORITY**.

To turn on priority, press **PRIORITY** during scanning. **PRI** appears, and the scanner checks the priority channel in each selected bank every 2 seconds. It stays on the channel if there is activity, and **P** appears.

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

Note: If you are scanning more than one bank in which a priority channel has been programmed, the scanner stops on the lowest-numbered priority channel first while scanning.

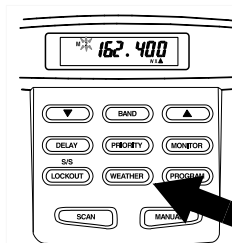
LISTENING TO THE WEATHER BAND

The National Oceanic and Atmospheric Administration (NOAA) uses 7 frequencies to broadcast local forecasts

and regional weather information. We have preprogrammed your scanner with these frequencies.

Note: For a list of all 7 national weather frequencies, see "National Weather Frequencies" on Page 26.

To scan the preprogrammed weather channels, press **WEATHER**. **WX** appears, and the scanner searches the weather channels and stops on an active broadcast. If a broadcast is weak, press **WEATHER** again to continue searching through the weather channels.

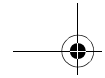


TURNING THE KEY TONE ON OR OFF

The scanner is preset to sound a tone each time you press any of its keys.

Follow these steps to turn the scanner's key tone on or off.

1. If the scanner is turned on, turn **VOLUME** counterclockwise until it clicks to turn it off.
2. Hold down **S/S-LOCKOUT** while you turn on the scanner. **no bEEP** (if the key tone is off) or **On bEEP** (if the key tone is on) appears for about 3 seconds.



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.

HAM RADIO FREQUENCIES

Ham radio operators often broadcast emergency information when other means of communication break down.

The following chart shows the voice frequencies that you can monitor:

Wavelength (Meters)	Voice (MHz)
10-meter	29.000-29.700
6-meter	50.100-54.000
2-meter	144.100-148.000
70-cm	420.000-450.000

NATIONAL WEATHER FREQUENCIES

162.400	162.425	162.450	162.475
162.500	162.525	162.550	

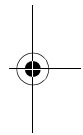
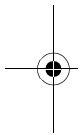


BIRDIE FREQUENCIES

Every scanner has birdie frequencies. Birdies are signals created inside the scanner's receiver. These operating frequencies might interfere with broadcasts 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.

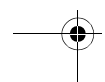
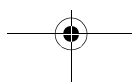
The birdie frequency to watch for with this scanner is 489.25 MHz.

To find the birdies in your 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.



UNITED STATES BROADCAST BAND

In the United States, there are several broadcast bands. The standard AM and FM bands are probably the most well known. There are also four television audio broadcast bands — the lower three transmit on the VHF band and the fourth transmits on the UHF band. You can use your scanner to monitor the 470–512 MHz range of the UHF band.





GUIDE TO THE ACTION BANDS

Typical Band Usage

VHF Band (29.00–300.0 MHz)

Low Range	29.00–50.00 MHz
6-Meter Amateur	50.00–54.00 MHz
U.S. Government	137.00–144.00 MHz
2-Meter Amateur	144.00–148.00 MHz
High Range	148.00–174.00 MHz

UHF Band (300.00 MHz–3.0 GHz)

U.S. Government	406.00–420.00 MHz
70-Centimeter Amateur	420.00–450.00 MHz
Low Range	450.00–470.00 MHz
FM-TV Audio Broadcast, Wide Band	470.00–512.00 MHz

Primary Usage

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

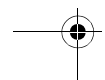
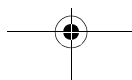
VHF Band

Activities	Frequencies
Government, Police, and Fire	153.785–155.980 MHz
Emergency Services	158.730–159.460 MHz
Railroad	160.000–161.900 MHz

UHF Band

Activities	Frequencies
Land-Mobile “Paired” Frequencies	450.000–470.000 MHz
Base Stations	451.025–454.950 MHz
Mobile Units	456.025–459.950 MHz
Repeater Units	460.025–464.975 MHz
Control Stations	465.025–469.975 MHz

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



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

BIFC	Boise (ID) Interagency Fire Cache
BUS	Business
CAP	Civil Air Patrol
CB	Citizens Band
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, Forestry Conservation)
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)
TELC	Cordless Phones
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–29.7 MHz)

10-Meter Amateur Band (28.0–29.7 MHz)

29.000–29.700 HAM

VERY HIGH FREQUENCY (VHF) — (29.7 MHz–54 MHz, 137 MHz–174 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, TELC
 47.020–47.400 PUB
 47.420 American Red Cross
 47.440–49.580 IND, PUB
 49.610–49.990 MIL, TELC

6-Meter Amateur Band (50–54 MHz)

50.00–54.00 HAM

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–512 MHz)

U. S. Government Band (406–450 MHz)

406.125–419.975 GOVT, USXX

70-Centimeter Amateur Band (420–450 MHz)

420.000–450.000 HAM

Low Band (450–470 MHz)

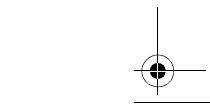
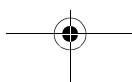
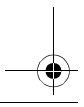
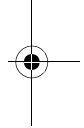
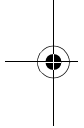
450.050–450.925 RTV
 451.025–452.025 IND, OIL, TELM, UTIL
 452.0375–453.00 IND, TAXI, TRAN TOW, NEWS
 453.0125–454.000 PUB, OIL
 454.025–454.975 TELB
 455.050–455.925 RTV
 457.525–457.600 BUS
 458.025–458.175 MED
 460.0125–460.6375 FIRE, POL, PUB
 460.650–462.175 BUS
 462.1875–462.450 BUS, IND
 462.4625–462.525 IND, OIL, TELM, UTIL
 462.550–462.925 GMR, BUS
 462.9375–463.1875 MED
 463.200–467.925 BUS

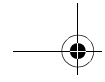
**FM-TV Audio Broadcast, UHF Wide Band (470–512 MHz)
(Channels 14 through 20 in 6 MHz steps)**

475.750 Channel 14
 481.750 Channel 15
 487.750 Channel 16

 512.000 Channel 20

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





AVOIDING IMAGE FREQUENCIES

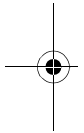
You might discover one of your regular stations on another frequency that is not listed. It might be what is known as an image frequency. For example, you might find a service that regularly uses a frequency of 431.975 also on 474.775.

To see if it is an image, do a little math.

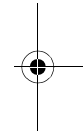
Note the new frequency.	474.775
Double the intermediate frequency of 21.4 MHz (42.800) and subtract it from the new frequency.	<u>-42.800</u>

If the answer is the regular frequency, then you have tuned to an image.	431.975
---	---------

Occasionally, you might get interference on a weak or distant channel from a strong broadcast 42.8 MHz below the tuned frequency. This is rare, and the image signal is usually cleared whenever there is a broadcast on the actual frequency.



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.

$$1 \text{ MHz (million)} = 1,000 \text{ kHz (thousand)}$$

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

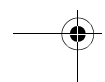
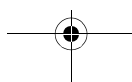
$$9.62 \text{ (MHz)} \times 1000 = 9620 \text{ kHz}$$

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

$$2780 \text{ (kHz)} \div 1000 = 2.780 \text{ MHz}$$

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

$$300 \div 7.1 \text{ MHz} = 42.25 \text{ meters}$$



TROUBLESHOOTING

If your scanner is not working as it should, these suggestions might help you eliminate the problem. If the scan-

ner still does not operate properly, take it to your local RadioShack store for assistance.

SYMPTOM	SUGGESTION
Scanner is on, but will not scan.	Be sure SQUELCH is adjusted properly. See "Turning On the Scanner/Setting Volume and Squelch" on Page 17.
Scanner receives stations poorly or not at all.	Check the antenna (indoor or outdoor). Signals may be blocked from being received by the scanner due to metal frames or material in the building. Change the scanner's location and try again.
<ul style="list-style-type: none"> • The scanner's keys do not work. • The display shows random segments. 	The scanner might be locked. Reset the scanner. See "Resetting the Scanner" on Page 17.
Scanner does not work at all.	Check that the power supply is working. The scanner might be locked. Reset the scanner. See "Resetting the Scanner" on Page 17.
Scanner locks on frequencies that have an unclear transmission.	Be sure SQUELCH is adjusted properly. See "Turning On the Scanner/Setting Volume and Squelch" on Page 17. Be sure birdie frequencies are not programmed, or listen to birdie frequencies manually. See "Birdie Frequencies" on Page 27.

CARE AND MAINTENANCE

Your RadioShack PRO-2049 90-Channel Programmable Home Scanner is an example of superior design and craftsmanship. The following suggestions will help you care for your scanner so you can enjoy it for years.



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



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



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

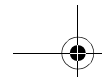


Handle the scanner gently and carefully. Dropping it can damage circuit boards and cases and can cause the scanner to work improperly.



Wipe the scanner with a damp cloth occasionally to keep it looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the scanner.

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. If your scanner is not performing as it should, take it to your local RadioShack store for assistance.



SPECIFICATIONS

Frequency Coverage:

VHF Lo	29.7–50 MHz (in 5 kHz steps)
Amateur Radio	29–29.7 MHz (in 5 kHz steps) 50–54 MHz (in 5 kHz steps) 144–148 MHz (in 5 kHz steps) 420–450 MHz (in 12.5 kHz steps)
Aircraft	108–136.975 MHz (in 12.5 kHz steps)
Government	137–144 MHz (in 5 kHz steps) 406–420 MHz (in 12.5 kHz steps)
VHF Hi	148–174 MHz (in 5 kHz steps)
UHF Lo	450–470 MHz (in 12.5 kHz steps)
UHF “T”	470–512 MHz (in 12.5 kHz steps)

Channels of Operation Any 90 channels in any band combinations
(30 channels × 3 banks) and 3 monitor channels

Sensitivity (20 dB S/N with 3 kHz deviation for FM, 60% modulation for AM):

29–54 MHz	0.5 μV
108–136.975 MHz	1.8 μV
137–174 MHz	0.6 μV
406–512 MHz	0.6 μV

Selectivity:

±10 kHz	–6 dB
±16 kHz	–50 dB

Direct Search Speed/Band Search Speed 20 Steps/Sec (Max)

Scan Speed 20 Channels/Sec. (Nominal)

Priority Sampling 2 Seconds

Delay Time 2 Seconds

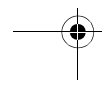
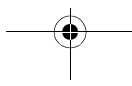
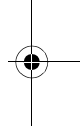
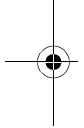
IF Frequencies 21.4 MHz and 450 kHz



Squelch Sensitivity:

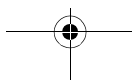
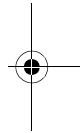
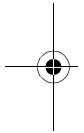
Threshold	Less than 0.4 μ V
Tight	(S + N)/N 25 dB
Air	(S + N)/N 17 dB
Antenna Impedance	50 Ohms
Audio Power	850 mW Maximum
Memory Backup	3 Days (Nominal)
Built-In Speaker	2 ¹ / ₄ Inch (57 mm) 8-Ohm, Dynamic Type
AC Adapter	10 Volts AC
Dimensions (HWD)	2 ¹ / ₄ × 9 ¹ / ₄ × 6 ¹¹ / ₁₆ Inches (57 × 235 × 170 mm)
Weight (without AC Adapter)	1 lb, 0.6 oz. (470 g)

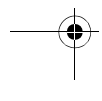
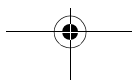
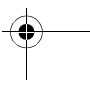
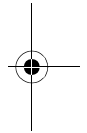
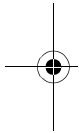
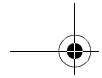
Specifications are typical; individual units might vary. Specifications are subject to change and improvement without notice.





NOTES







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 the limitations on how long an implied warranty lasts or the exclusion 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.

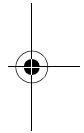
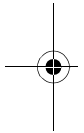
This warranty does not cover: (a) damage or failure caused by or attributable to acts of God, abuse, accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation or maintenance, alteration, lightning or other incidence of excess voltage or current; (b) any repairs 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.

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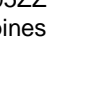
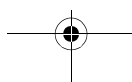
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