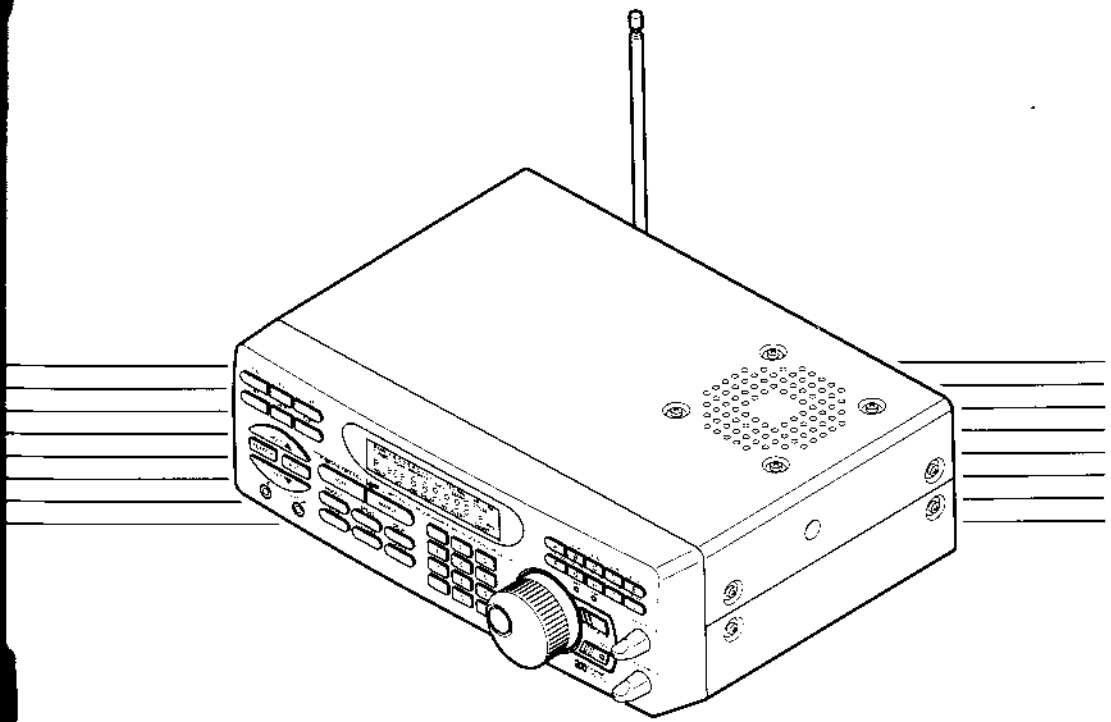
OWNER'S MANUAL

PRO-2036
200-Channel
Base Scanner

Please read before using this equipment.



REALISTIC®

20-412 (available in Canada only)
20-9412 (available in Europe/Australia only)

UBZZ01228CZ

INTRODUCTION

Your new Realistic PRO-2036 200-Channel Base Scanner lets you in on all the action! With its convenient rotary tuner and keypad, you can quickly tune to multiple frequencies. You can select up to 200 channels to scan and you can change your selections at any time.

The secret to your scanner's ability to scan so many frequencies is its custom-designed microprocessor—a tiny, built-in computer.

Your scanner has *all* these special features.

Hyperscan—lets you scan and search up to 100 channels per second or 100 steps per second.

Weather Alert—sounds an alarm to warn you of dangerous weather conditions. (Canada only)

Weather Band Key—scans nine preprogrammed weather frequencies to keep you informed of current weather conditions. (Canada only)

Ten Channel-Storage Banks—you can store 20 channels in each bank to group channels so calls are easier to identify.

Dynamic Frequency Storage—lets you easily move stored frequencies to other channels to help you group channels within selected banks.

Auto Store—quickly finds and automatically stores active frequencies in channels within selected banks, then searches for more active frequencies while skipping previously stored channels.

Auto Sort—sorts programmed frequencies in channels within a bank for maximum scan speed.

CTCSS—you can use the Continuous Tone Coded Squelch System (CTCSS) to select transmissions used with business band and amateur radio.

Auto Recording Option—lets you record transmissions with an optional tape recorder.

Large Rotary Tuner—lets you manually scan and select desired frequencies or channels.

Two-Second Channel Scan Delay—delays scanning for 2 seconds before moving to another channel so you can hear more replies.

Memory Backup—keeps channel frequencies stored in memory for up to 5 years during a power loss.

Lock-Out Function—keeps selected channels from being scanned, so you can skip over busy channels.

Ten Priority Channels—you can set the scanner to check one channel in each bank every 2 seconds so you do not miss important calls.

Limit Search—lets you scan for new and unlisted frequencies.

Large Backlit Display—makes it easy to view and change programming information.

Adjustable Backlight—lets you change the display's brightness so you can easily see it at any time.

The PRO-2036 (20-412 available in Canada only) receives all of these bands:

- 29-29.7 MHz (10-Meter Amateur Radio)
- 29.7-50 MHz (VHF Lo)
- 50-54 MHz (6-Meter Amateur Radio)
- 108-136.995 MHz (Aircraft)
- 137-144 MHz (Government)
- 144-148 MHz (2-Meter Amateur Radio)
- 148-174 MHz (VHF Hi)
- 216-224.9875 MHz (VHF Hi)
- 225-399.9875 MHz (Military Aircraft)
- 400-450 MHz (UHF Lo, Amateur Radio, Government)
- 450-470 MHz (UHF Lo)
- 470-512 MHz (UHF "T" Band)
- 806-823.9875 MHz (UHF Public Service)
- 849.0125-868.9875 MHz (UHF Hi)
- 894.0125-956 MHz (UHF Hi)

The PRO-2036 (20-9412 available in Europe/Australia only) receives all of these bands:

66-88 MHz (VHF Lo)
108-136.9950 MHz (Aircraft)
137-144 MHz (VHF Hi)
144-148 MHz (2-Meter Amateur Radio)
148-174 MHz (VHF Hi)
216-224.9875 MHz (VHF Hi)
225-399.9875 MHz (VHF Hi / UHF Lo)
400-450 MHz (UHF Lo, Amateur Radio)
450-470 MHz (UHF Lo)
470-512 MHz (UHF Hi)
806-823.9875 MHz (UHF Hi)
824.0100-849 MHz (UHF Hi)
849.0125-868.9875 MHz (UHF Hi)
869.0100-894 MHz (UHF Hi)
894.0125-956 MHz (UHF Hi)

Your scanner can receive the following preprogrammed weather channels: (Can be received in Canada only)

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

For your permanent records, we urge you to record your scanner's serial number in the space below. The serial number is located on the scanner's back panel.

[redacted]

Your scanner might cause TV or radio interference even when it is operating properly. To determine whether or not 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 Tandy/Radio Shack store for help

If you cannot eliminate the interference, local regulations may require that you stop using your scanner.

For U.K. Users Only

The supplied AC adapter is fitted with an approved 13 Amp standard UK type plug. If this plug is not compatible with your mains socket outlets it should be cut off and disposed of immediately as it is a shock hazard if inserted into a live socket outlet. An approved type plug that is compatible with your socket outlets must then be fitted.

IMPORTANT

The wires in the mains lead are coloured in accordance with the following code:

Blue . . . . . Neutral
Brown . . . . . Live

The wires in the mains lead must be connected to the terminals in the plug as follows:

Mains lead
Wire colour . Plug terminal marking
Blue . . . . . N or Black or Blue
Brown . . . . . L or Red or Brown

Do not connect either wire to the earth terminal marked by the letter E or by the safety earth symbol ⏚ or coloured green or green-and-yellow.

If the plug required for your socket outlets is fitted with a fuse, this must be a 3 Amp type and should carry BSI Kite or ASTA mark. Never use the plug without the fuse cover fitted.

If the plug is not a fusible type, then the master fuse for the mains outlet sockets should not be greater than 5 Amps.

If AC cord becomes damaged, discard adapter immediately. If in doubt refer to a qualified electrician.

Warning: The AC adapter should be disconnected when not in use for an extended period.

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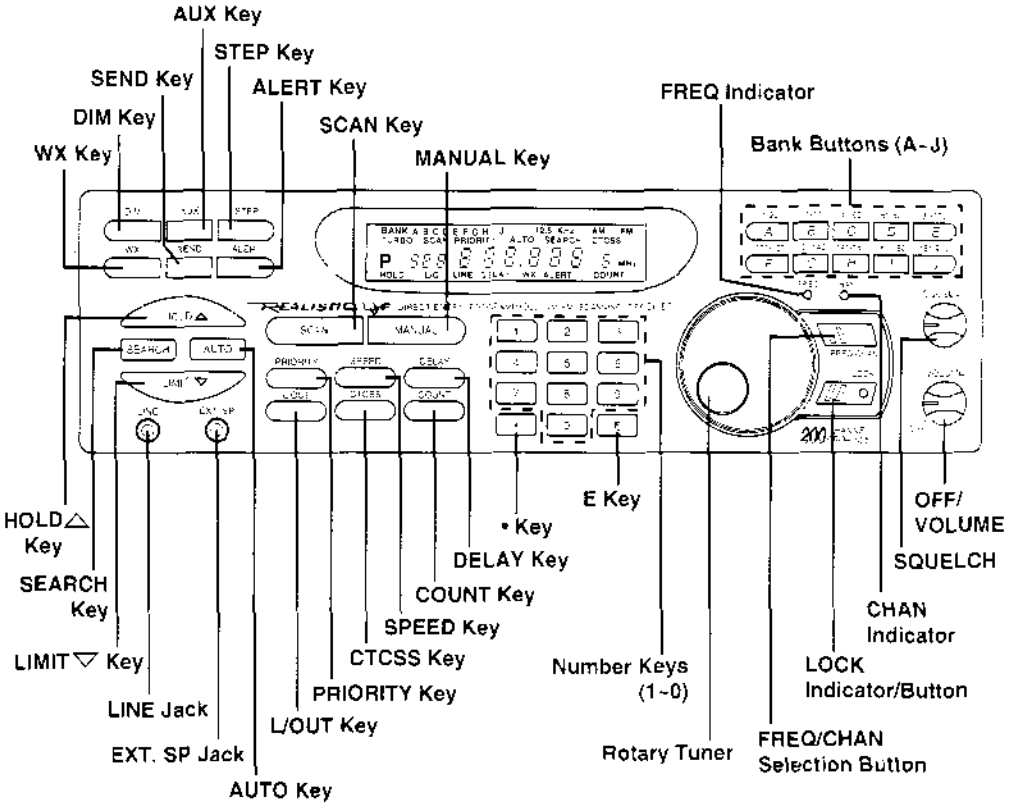
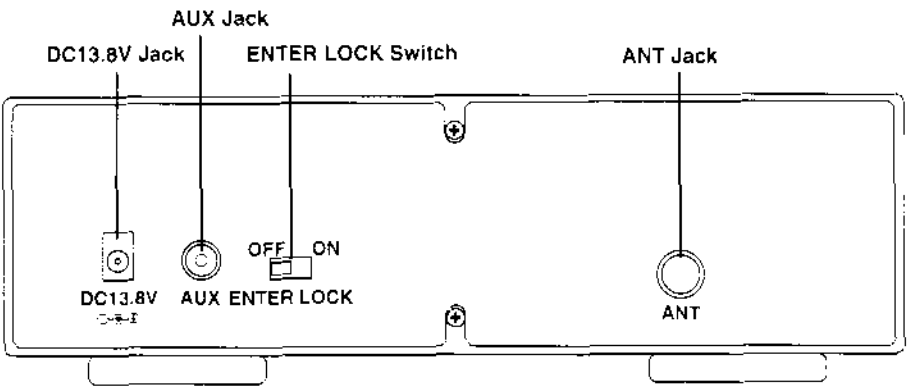
A QUICK LOOK AT YOUR SCANNER

FRONT VIEW



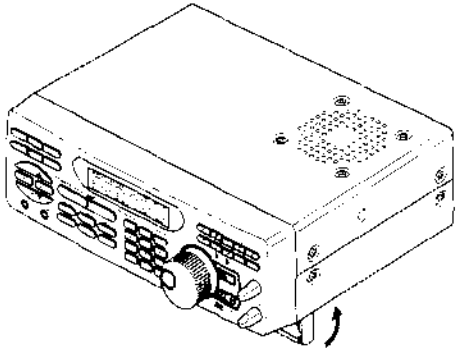
BACK VIEW



PREPARATION

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

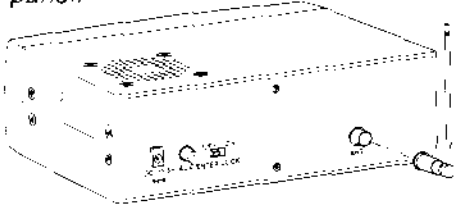
Your scanner's front feet fold up or down. Adjust them to give you the best view of the display.



CONNECTING THE ANTENNA

The supplied telescoping antenna helps your scanner receive strong local signals. Follow these steps to install the supplied antenna.

1. Hold the antenna so it stands straight up.
2. Gently push the antenna's plug onto the ANT jack on the scanner's back panel.



Adjust the length of the telescoping antenna for the best reception. 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, use the following table.

Frequency	Antenna Length
Below 150 MHz	Extend fully
150-174 MHz	Push in one segment
216-330 MHz	Push in two segments
330-956 MHz	Push in three segments

Connecting an Optional Antenna

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

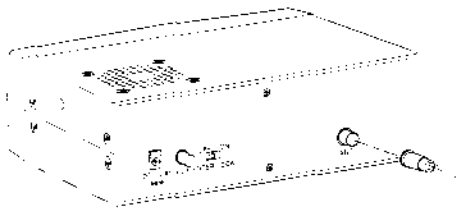
When deciding on an outdoor base antenna and its location, consider the following:

* The location of the antenna should be as high as possible.
* The antenna and antenna cable should be as far as possible from sources of electrical noise (appliances, other radios, and so on).

* The antenna should be vertical for the best performance.

To connect an optional antenna, always use 50-ohm coaxial cable, such as RG-58 or RG-8. For lengths over 15m (50 feet), use RG-8 low-loss dielectric coaxial cable. If the coaxial cable's connector does not fit in the ANT jack, you might also need a PL-259-to-BNC antenna plug adapter (not supplied). Your local Tandy/Radio Shack store carries a wide variety of coaxial antenna cable and connectors.

Follow the mounting instructions supplied with the antenna. Then route the antenna cable to the scanner, and connect it to the ANT jack on the back of the scanner.



Caution: Do not run the cable over sharp edges or moving objects.

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 POWER

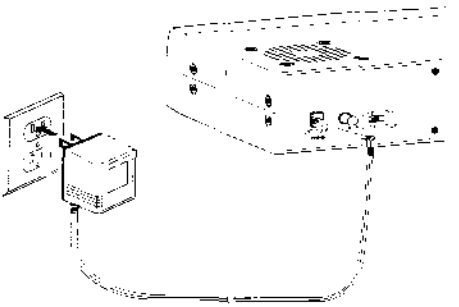
Your scanner uses standard AC power (with the supplied AC adapter).

The memory backup circuit begins to function a few minutes after you plug in the scanner. During a power loss, the memory backup circuit maintains the channels stored in memory for up to 5 years.

Cautions:

- Use only the supplied AC adapter. Using a different adapter can damage your scanner and could present a safety hazard.
- Always unplug the AC adapter from the AC outlet before you unplug its barrel plug from the scanner.

Insert the AC adapter's barrel plug into the DC 13.8V jack on the back of the scanner, then plug the AC adapter into a standard AC outlet.



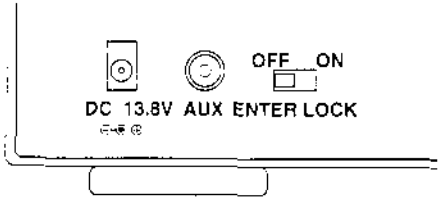
RESETTING THE SCANNER

If the scanner's display locks up or does not work properly after you connect power, you might have to reset the scanner.

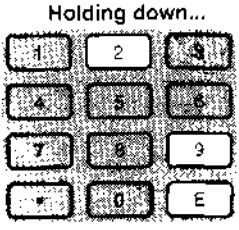
Caution: This procedure clears all the information you have programmed into the scanner. Use this procedure only when you are sure your scanner is not working properly.

1. Turn off the scanner.

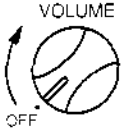
2. Set ENTER LOCK to OFF.



3. While you press and hold down 2, 9, and E,



turn on the scanner.



CONNECTING OPTIONAL EQUIPMENT

You can connect the following items of optional equipment to your scanner:

- External speaker or headphones
- Tape recorder

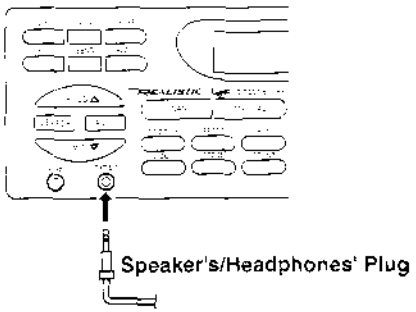
The instructions in this section explain how to connect optional equipment.

CONNECTING AN EXTERNAL SPEAKER OR HEADPHONES

You can connect an optional external speaker or pair of headphones with a 3.5mm (1/8-inch) plug to the scanner. If you use an external speaker, use an 8-ohm speaker capable of handling 3 watts of power. If you use headphones, use monaural headphones. Your local Tandy/Radio Shack store has a wide selection of speakers and headphones.

Warning: To protect your hearing, set VOLUME to its lowest level before you connect headphones. While using headphones, do not set VOLUME to a high level. You could damage your hearing or the headphones.

Insert the speaker's or headphones' plug into the EXT. SP jack on the front of the scanner.



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

Listening Safely

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

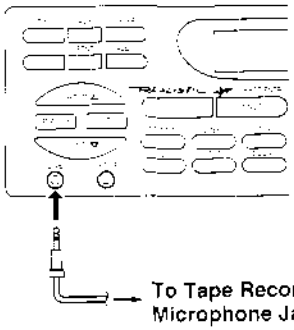
- Set the volume to the lowest setting before you begin listening. After you put on the headphones, adjust the volume to a comfortable level.
- Do not listen at extremely high volume levels. Extended high-volume listening can lead to permanent hearing loss.
- Once you set the volume, do not increase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

CONNECTING AN OPTIONAL TAPE RECORDER

You can connect an optional tape recorder to your scanner to record transmissions continuously. Or, if you use the scanner's auto recording feature, you can automatically record transmissions when the scanner stops on the channels you specify as priority channels. See "Using the Auto Recording Feature."

Connections for Continuous Recording

To record from the scanner, you need a tape recorder with a microphone jack and a cable with a 3.5mm (⅛-inch) plug to connect the scanner's LINE jack to the tape recorder's microphone jack. Your local Tandy/Radio Shack store has a wide selection of tape recorders and connecting cables.

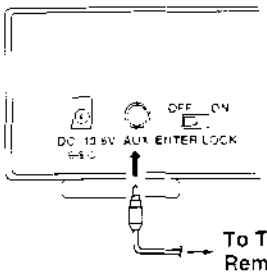


1. Insert the connecting cable's 3.5mm (⅛-inch) plug into the LINE jack on the front of the scanner.
2. Connect the other end of the connecting cable to your tape recorder's microphone jack.

Follow the instructions provided with your tape recorder to record transmissions while the scanner is on.

Connections for Auto Recording

To use your scanner's auto recording feature, you need a tape recorder with a microphone jack and a remote jack. Also, you need two cables to connect the scanner to the tape recorder. One cable must have 3.5mm (⅛-inch) plugs to connect the scanner's LINE jack to the tape recorder's microphone jack. The other cable must have a phono plug and a 2.5mm (3/32-inch) plug to connect the scanner's AUX jack to the tape recorder's remote jack. Your local Tandy/Radio Shack store has a wide selection of cables.



1. Insert one connecting cable's 3.5mm (⅛-inch) plug into the LINE jack on the front of the scanner.

2. Connect the other end of the connecting cable to your tape recorder's microphone jack.

3. Insert the other connecting cable's phono plug into the AUX jack on the back of the scanner.

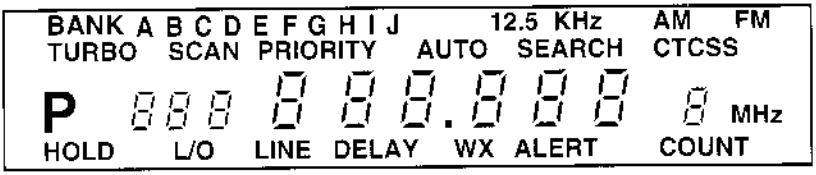
4. Connect the other end of the connecting cable to your tape recorder's remote jack.

See "Using the Auto Recording Feature" and follow the instructions provided with your tape recorder to record transmissions from selected channels.

UNDERSTANDING YOUR SCANNER

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.



BANK—appears with letters (A-J) to show which channel-storage banks are turned on for scanning. See "Understanding Channel-Storage Banks."

KHz—appears with digits to show which frequency step (5, 12.5, or 25) the scanner is set to. See "Setting the Frequency Step."

AM—appears with a frequency in one of the AM bands.

FM—appears with a frequency in one of the FM bands.

TURBO—appears when you select high-speed scanning. See "Setting the Scan Speed."

SCAN—appears when you scan channels.

PRIORITY—appears when priority is turned on for a particular channel. See "Priority."

AUTO—appears when the scanner is in the automatic store mode. See "Automatically Storing Frequencies."

SEARCH—appears during a limit search. See "Storing and Searching for Active Frequencies."

CTCSS—appears when you listen to CTCSS frequencies using the CTCSS feature. See "Using CTCSS."

P—appears when the scanner is set to one of the 10 priority channels. See "Priority."

Channel Number—shows which of the scanner's 200 channels it is tuned to.

Error—appears when you make an incorrect entry.

E-Loc—appears when you try to enter a frequency while ENTER LOCK is set to ON.

MHz—appears with digits to show which frequency your scanner is currently tuned to.

HOLD—appears when you press HOLD △—while the scanner is in limit search, or when you manually tune through weather channels. See "Limit Search," and "Listening to the Weather Band."

L/O—appears when you lock out a channel or manually select a locked-out channel. See "Locking Out Channels."

LINE—appears when you record scanner transmissions with an optional tape recorder. See "Using the Auto Recording Feature."

DELAY—appears when scanning stops at a channel you have programmed for a 2-second delay. See "Delay."

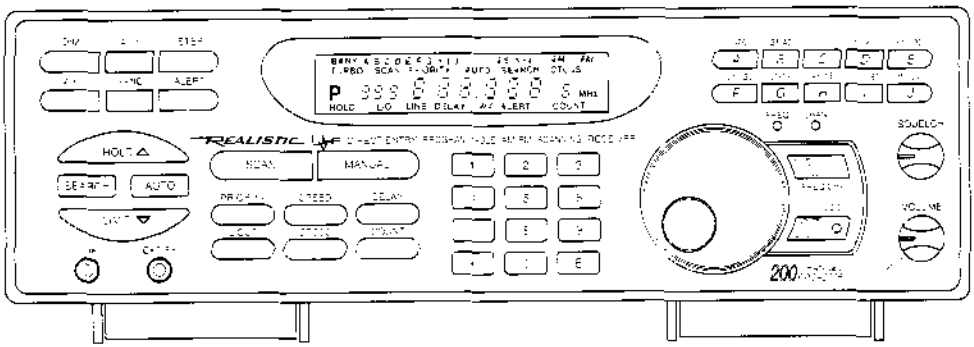
WX—appears when you scan the nine preprogrammed weather band channels. See "Listening to the Weather Band."

ALERT—appears when you set the weather alert mode. See "Turning the Weather Alert On and Off."

COUNT—appears when you use the scanner's count feature. See "Using the Count Feature."

A LOOK AT THE KEYBOARD

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



DIM—sets the display's backlight intensity (low, off, or high).

AUX—starts the scanner's auto recording feature. See "Using the Auto Recording Feature."

STEP—changes the frequency step rate (5 kHz, 12.5 kHz, or 25 kHz).

WX—scans through the nine preprogrammed weather channels.

SEND—transfers a stored frequency to another channel within any bank.

ALERT—sets the scanner to the weather alert mode.

HOLD△—stops a search. Press HOLD△ again to step up one channel or frequency. Press and hold HOLD△ for more than 1 second to rapidly move through the channels or frequencies.

SEARCH—searches for active frequencies within a selected range, starting from the lowest frequency.

AUTO—stores active frequencies into empty channels within selected banks.

LIMIT▽—lets you set the channel or frequency range to search.

SCAN—scans through the channels.

MANUAL—stops scanning to let you select a channel number or frequency.

PRIORITY—sets and turns on and off priority for a particular channel.

SPEED—changes the scanning/search speed (normal or HYPERSCAN).

DELAY—programs a 2-second delay for the selected mode.

L/OUT—lets you lock out selected channels.

CTCSS—lets you use CTCSS mode.

COUNT—displays the number of times the scanner detected a transmission on a channel since you turned the scanner on.

Number Keys—use to enter the number of a channel or a frequency.

•—enters the decimal point when you enter a frequency, or clears an incorrect entry.

E—enters frequencies into channels.

Bank Keys (A-J)—activates or deactivates the banks. Each bank contains 20 channels into which you can store frequencies.

FREQ/CHAN—selects the rotary tuner's display mode. See "Changing the Rotary Tuner's Display Mode."

LOCK—locks and unlocks the rotary tuner and FREQ/CHAN.

SQUELCH—lets you adjust the scanner's squelch.

VOLUME—lets you turn the scanner on or off and adjust the volume.

UNDERSTANDING CHANNEL-STORAGE BANKS

You can store up to 200 frequencies in your scanner's memory. You store each frequency into a memory location called a channel.

CHANNEL-STORAGE BANKS

To make it easier to identify and select the channels you want to listen to, channels are divided into 10 channel-storage banks of 20 channels each. Use each channel-storage bank to group frequencies (see "Guide to the Action Bands").

For example, suppose you want to monitor frequencies in four different bands; several frequencies in each band. To make it easier to quickly determine which band you are listening to, you could program the frequencies of the first band starting with channel 1 (Bank A). Then, start the 2nd band on channel 21 (Bank B), the third band on channel 41 (Bank C) and the last band on channel 61 (Bank D).

Now when you want to listen to only the 2nd band in Bank B, you can turn off all of the other banks. You could also use this feature to group channels by city or by local area.

ACTIVATING/ DEACTIVATING BANKS

When you press SCAN the first time, the scanner scans only Bank A. To scan the rest of the scanner's banks, press the bank's letter keys until the bank's letter is displayed.

When you automatically store a frequency in a channel, the bank containing the channel is automatically activated, and the scanner scans each channel within the bank unless the channel is locked out. See "Automatically Storing Frequencies."

To deactivate the bank, press the bank's letter key until the bank's letter disappears from the display. The scanner will not scan any of the stored channels within deactivated banks.

Note: You cannot deactivate all banks. There must be at least one active bank.

OPERATION

TURNING ON THE SCANNER/SETTING VOLUME AND SQUELCH

1. Turn SQUELCH fully counterclockwise.

2. Turn VOLUME clockwise until you hear a hissing sound.

3. Turn SQUELCH clockwise, then leave it set to a point just after the hissing sound stops.

Note: If the scanner picks up unwanted, partial, or very weak transmissions, turn SQUELCH clockwise to decrease the scanner's sensitivity to these signals. Turn SQUELCH counterclockwise if you want to listen to a weak or distant station.

SCANNING THE CHANNELS

To begin scanning the channels or to reactivate scanning after monitoring a specific channel, press SCAN. The scanner scans through all non-locked channels in the activated banks (see "Activating/Deactivating Banks" and "Locking Out Channels"), and the bank letter flashes.

SETTING THE SCAN/ SEARCH SPEED

The normal scan or search speed lets your scanner search for frequencies at up to 20 channels per second. The hyperscan scan or search speed lets your scanner search for frequencies at up to 100 channels per second.

Repeatedly press SPEED until TURBO is displayed to change the scan or search speed to hyperscan. Press SPEED until TURBO disappears to change the scan or search speed to normal.

SETTING THE FREQUENCY STEP

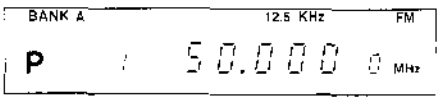
Your scanner scans at the preset frequency step (5, 12.5 or 25 kHz) when you use the rotary tuner or during search. You can manually change the frequency step.

Note: You cannot change the frequency step while the scanner is scanning.

Follow these steps to change the frequency step.

1. If SCAN is displayed or the scanner is scanning, press MANUAL.

2. Repeatedly press STEP until the scanner displays the desired frequency step.



3. Use the rotary tuner or press SEARCH to search at the new frequency step.

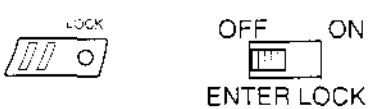
Note: For more information about the frequency steps your scanner uses, see "Specifications."

CHANGING THE DISPLAY'S BRIGHTNESS

Repeatedly press DIM to change the display's brightness (low, off, or high).

Note: When you change the display's brightness, the brightness of the FREQ, CHAN, and LOCK indicators also changes.

USING LOCK AND ENTER LOCK



To keep from changing displayed information by accidentally turning the scanner's rotary tuner or pressing FREQ/CHAN, you can lock them. Press LOCK until the LOCK indicator turns on to lock them. Press LOCK until the LOCK indicator turns off to unlock them.

To keep from accidentally changing the scanner's programming, you can lock the scanner's memory by setting the ENTER LOCK switch on the back of the scanner to ON. If you try to change the scanner's programming, E-Loc appears on the display, and the programming does not change. Set the ENTER LOCK switch to OFF to add or change information in the scanner's memory.

CHANGING THE ROTARY TUNER'S DISPLAY MODE

1. If SCAN is displayed or the scanner is scanning, press MANUAL.

2. If the LOCK indicator is on, press LOCK. The scanner beeps softly and LOCK turns off.

3. Press FREQ/CHAN. Depending on the display you choose, either the FREQ (frequency) indicator or the CHAN (channel) indicator turns on.

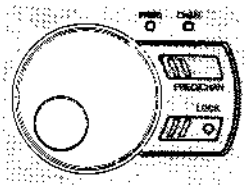
If the FREQ indicator is on, you can use the rotary tuner to tune through the frequencies. A channel number flashes on the display.

If the CHAN indicator is on, you can use the rotary tuner to select channels. The scanner displays the frequencies assigned to the channels (if any). See "Using the Rotary Tuner."

USING THE ROTARY TUNER

The scanner's rotary tuner lets you quickly select frequencies and channels.

Follow these steps to use the rotary tuner



1. If the LOCK indicator is on, press LOCK. The scanner beeps softly and LOCK turns off.

2. Turn the rotary tuner in either direction.

If the FREQ indicator is on, turn the rotary tuner clockwise to tune to higher frequencies, or counterclockwise to tune to lower frequencies.

If the CHAN indicator is on, turn the rotary tuner clockwise to tune to higher channel numbers, or counterclockwise to tune to lower channel numbers.

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 do not want to miss any details (even though there might be periods of silence) or if you just want to monitor a specific channel.

Follow these steps to manually select a channel.

1. If SCAN is displayed or the scanner is scanning, press MANUAL.

2. If the LOCK indicator is on, press LOCK. The scanner beeps softly and the LOCK indicator turns off.

3. Enter the channel number using the number keys.

4. Press MANUAL again.

Note: After you enter a channel number using the number keys, you can step through channels by turning the scanner's rotary tuner.

STORING AND SEARCHING FOR ACTIVE FREQUENCIES

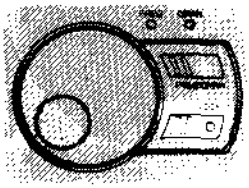
You can store frequencies in the scanner's channels using any of the following methods:

- Manual storage
- Auto storage
- Limit search (within a range of frequencies you select)

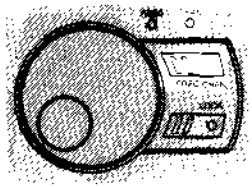
If you do not have a reference to frequencies in your area, follow the steps in "Automatically Storing Frequencies" or "Limit Search" to search for transmissions.

Manually Storing Frequencies

1. If ENTER LOCK is ON, set it to OFF.
2. If SCAN is displayed or the scanner is scanning, press MANUAL.
3. If the LOCK indicator is on, press LOCK. The scanner beeps softly and LOCK turns off.



4. Press FREQ/CHAN until the CHAN indicator turns on. The scanner beeps softly.



5. Turn the rotary tuner until the display shows the channel you want to program.
6. Using the number keys, enter the frequency you want to store in that channel.
7. Press E to store the frequency. The display shows the frequency and the channel it is stored in.

Notes:

- If you entered an invalid frequency in Step 6, the scanner displays the channel number and Error. After a few seconds, Error disappears and the previously stored frequency is displayed. Simply repeat Steps 6 and 7.

- If you try to enter a frequency you already entered in another channel, CH and the channel number where the frequency is already stored flash on the display. Simply choose another frequency and repeat Steps 6 and 7.

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

8. Press MANUAL, then repeat Steps 5 through 7 to store more frequencies into channels.

   Note: If you are storing frequencies in sequential channel numbers, you do not have to turn the scanner's rotary tuner to select the next channel.

9. When you finish storing frequencies, set ENTER LOCK to ON to prevent accidentally changing them (see "Using Lock and Enter Lock)".

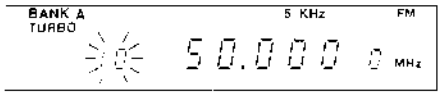
Automatically Storing Frequencies

Your scanner's auto store feature automatically stores active frequencies into empty channels within banks you specify.

1. If ENTER LOCK is ON, set it to OFF.

2. If SCAN is displayed or the scanner is scanning, press MANUAL.

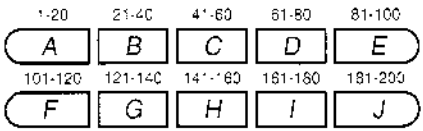
3. Use the number keys to enter the lower limit of the frequency range you want to search, then press LIMIT▽. The displayed channel flashes.



4. Use the number keys to enter the upper limit of the frequency range you want to search, then press LIMIT△. The displayed channel flashes.

5. Press AUTO. All bank letters and the displayed channel flash on the display, and the scanner displays AUTO.

6. Using the bank buttons, select the letters for the banks where you want to store frequencies.



Notes:

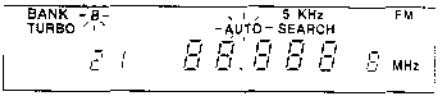
- If you select a bank that contains an empty channel, its corresponding bank letter stops flashing.

- If you select a bank that does not contain any empty channels, the scanner beeps twice softly, FULL flashes on the display, and the selected bank letter continues to flash. To enter new frequencies into this bank, you must either:

  - Move one or more frequencies from the full bank to a channel in another bank, then repeat Step 6. See "Moving Stored Frequencies to Other Channels."

  - Delete one or more frequencies stored in the full bank, then repeat Step 6. See "Deleting Frequencies."

7. Press SEARCH. AUTO and the bank where you are storing frequencies flash on the display, and the scanner displays SEARCH.



When the scanner finds an active frequency, it stores the frequency in the displayed channel, then continues searching for more active frequencies and stores them in the subsequent empty channels, if any. When the scanner fills all channels within the selected banks, the scanner displays End and the number of the last channel where a frequency was stored.

Notes:

- During auto store, you can manually change the frequency step. To change the step, press STEP until the scanner displays the desired frequency step. See also "Setting the Frequency Step."

- To manually stop auto store, press HOLD△ or MANUAL. The scanner displays End and the number of the last channel where a frequency was stored.

- If you stopped auto store to change the frequency step, you must repeat Steps 3 through 7 to continue automatically storing frequencies. If you manually stopped auto store, you must press MANUAL, then repeat Steps 3 through 7 to continue automatically storing frequencies.

8. When you finish storing the frequencies, press MANUAL, then set ENTER LOCK to ON to prevent accidentally changing them (see "Using Lock and Enter Lock").

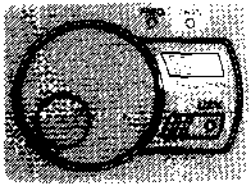
Limit Search

Limit search lets you search for transmissions within a range of frequencies you select. SEARCH, the channel number, and the frequency appear on the display during a limit search.

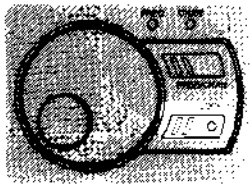
1. If ENTER LOCK is ON, set it to OFF.

2. If SCAN is displayed or the scanner is scanning, press MANUAL.

3. If the LOCK indicator is on, press LOCK. The scanner beeps softly and LOCK turns off.

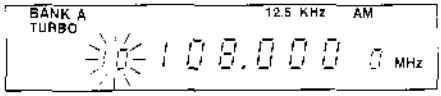


4. Press FREQ/CHAN until the CHAN indicator turns on. The scanner beeps softly.

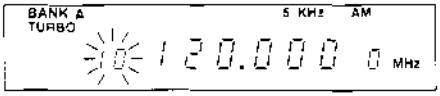


5. Turn the rotary tuner until the display shows the channel into which you want to store a frequency.

6. Use the number keys to enter the lower limit of the frequency range you want to search, then press LIMIT▽. The displayed channel flashes.



7. Use the number keys to enter the upper limit of the frequency range you want to search, then press LIMIT▽.



Note: If you entered an invalid frequency in Step 6 or 7, the scanner displays Error. Simply repeat the step.

8. Press SEARCH to search from the lower to the upper limit.

When the scanner stops on a transmission, and you do not want to store the frequency, you can do any of the following:

- To continue the search without storing the displayed frequency, press SEARCH again.
- To interrupt the search and manually step up to the upper limit, repeatedly press HOLD△.
- To interrupt the search and listen to the frequency, press HOLD△ once.
- To interrupt the search and go back through frequencies to search them again, repeatedly press LIMIT▽. To quickly go back through frequencies, press and hold down LIMIT▽.
- To interrupt the search and change the frequency step, press HOLD△, then repeatedly press STEP until the scanner displays the desired frequency step. See also "Setting the Frequency Step."

9. To store the displayed frequency in the selected channel, press E. The displayed channel stops flashing and the scanner stores the frequency.

10. After you store a frequency, repeat Step 5 to select another channel to store a frequency in, then repeat Step 8.

11. When you finish storing the frequencies, set ENTER LOCK to ON to prevent accidentally changing them.

MOVING STORED FREQUENCIES TO OTHER CHANNELS

You can move frequencies you have already stored in one channel to another channel. For example, if you wanted to store all police department frequencies in Bank A, but the scanner automatically stored four police department frequencies in Bank E during auto store, you could move those frequencies to channels in Bank A.

Moving a Frequency to an Empty Channel

This procedure lets you move a frequency from one channel to an empty channel. You can move a frequency to an empty channel within the same bank or in a different bank.

Note: You cannot move a frequency into or out of a channel designated as a priority channel (see "Priority").

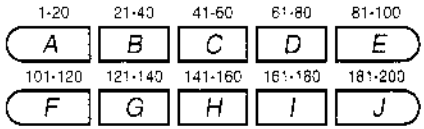
1. Press MANUAL.

2. Press FREQ/CHAN until the CHAN indicator turns on. The scanner beeps softly.

3. Turn the rotary tuner until the display shows the channel containing the frequency you want to move.

4. Press SEND. All bank letters flash.

5. Press the button for the bank you want to store the frequency in.



Notes:

- If you press a button for a bank that contains an empty channel, its corresponding bank letter stops flashing and the other bank letters disappear. Also, the lowest empty channel number within the bank flashes.

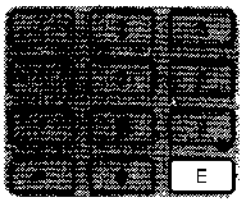
- If you press a bank button that does not contain any empty channels, the scanner beeps twice, FULL flashes, and the selected bank letter continues to flash. To enter new frequencies into this bank, you must either:

  - Move one or more frequencies from the bank to a channel in another bank, then start again.

  - Delete one or more frequencies already stored within the bank, then start again. See "Deleting Frequencies."

  - If you decide not to move the frequency, press SEND or MANUAL to stop the move.

6. Press E.



The scanner stores the frequency in the new channel. The channel that previously contained the frequency is left empty.

Moving a Frequency to a Previously Stored Channel

This procedure lets you move a frequency from one channel to another that already contains a frequency. The scanner replaces the frequency in the channel with the new frequency.

Note: You cannot move a frequency into or out of a channel designated as a priority channel (see "Priority").

1. Press MANUAL.

2. Press FREQ/CHAN until the CHAN indicator turns on. The scanner beeps softly.

3. Turn the rotary tuner until the display shows the channel containing the frequency you want to move.

4. Press SEND. All bank letters flash.

5. Use the number keys to enter the number of the channel where you want to move the frequency.

6. Press HOLD △. The display alternates between the frequency you want to move and the frequency in the new channel.

   Note: If you decide not to move the frequency, press SEND or MANUAL to stop the move.

7. Press E.

The scanner stores the frequency in the new channel. The channel that previously contained the frequency is left empty.

DELETING FREQUENCIES

1. If ENTER LOCK is ON, set it to OFF.

2. Select the channel number that contains the frequency you want to delete.

3. Press 0, then press E. The frequency is deleted from the channel.

To delete all frequencies in all banks, you must reset the scanner. See "Resetting the Scanner."

DELAY

Many agencies use a two-way radio system that might have a pause of several seconds between a query and a reply.

When you turn on the delay feature, your scanner waits for 2 seconds after the completion of each transmission on the channel before it resumes scanning.

To turn on the delay feature, press DELAY. The scanner displays DELAY.

LOCKING OUT CHANNELS

You can have the scanner scan existing channels faster by locking out channels that have a continuous transmission, such as a weather channel. The scanner automatically locks out empty channels.

To lock out a channel, manually select the channel and press L/OUT until L/O shows on the display.

To remove the lockout from a channel, manually select the channel and press L/OUT until L/O disappears from the display.

Notes:

- You can still manually select locked-out channels.
- You cannot remove a lockout from an empty channel. When you enter a frequency in an empty channel, the scanner automatically removes the lockout.

Removing a Lockout from All Channels Within a Bank

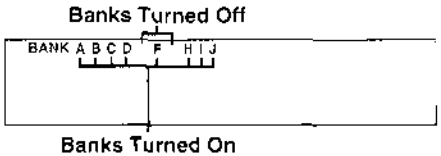
You can remove a lockout from all non-empty channels in a bank.

1. If the scanner is not already scanning, press SCAN.
2. Using the bank buttons, select the bank you want to remove lockout from. The scanner stops scanning, and the corresponding bank letter is displayed.
3. Press and hold down L/OUT until the scanner beeps softly twice. The scanner removes the lockout from all channels within the selected bank.

Note: You cannot remove a lockout from an empty channel. When you enter a frequency in an empty channel, the scanner automatically removes the lockout.

TURNING CHANNEL-STORAGE BANKS ON AND OFF

You can turn each of the 10 channel-storage banks on or off while scanning.



While scanning, select the bank you want to turn on or off. If a bank is on, the scanner displays BANK and the bank letter and scans all channels within that bank that are not locked out. If a bank is off, the scanner displays BANK, but not the bank letter, and does not scan any of the channels within that bank.

Notes:

- You can manually select any channel in a bank, even if the bank is turned off.
- You cannot turn off all banks. There must be at least one active bank.

PRIORITY

This feature means you can scan through programmed channels and still not miss an important or interesting call on a specific channel.

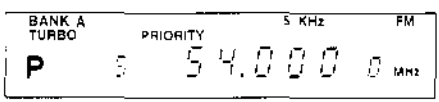
You can program one stored channel in each bank as a priority channel.

Notes:

- Before you first program your scanner, it automatically designates the first channel in each bank as the priority channel.
- If you program more than one priority channel, the lowest channel number has the highest priority. For example, if you designated Channel 1 (in Bank A) and Channel 21 (in Bank B) as priority channels, the scanner will automatically stop on Channel 1 first before it stops on Channel 21.

Follow these steps to program a channel as a priority channel.

1. If SCAN is displayed or the scanner is scanning, press MANUAL.
2. If the LOCK indicator is on, press LOCK. LOCK turns off.
3. Press FREQ/CHAN until the CHAN indicator turns on. The scanner beeps softly.
4. Turn the rotary tuner until the display shows the channel you want to designate as the priority channel.
5. Press and hold down PRIORITY until P appears on the display to the left of the channel number.



Note: The scanner displays Pch Loc. Out if only one bank is turned on and the current priority channel in the bank is empty. The scanner still designates the channel you selected as the new priority channel.

To turn on the priority feature, press PRIORITY. The scanner checks each priority channel (from lowest to highest channel number) every 2 seconds, and stays on the channel if there is activity. PRIORITY appears above the frequency.

To turn off the priority feature, press PRIORITY. PRIORITY disappears from the display.

LISTENING TO THE WEATHER BAND
(Can be received in Canada only)

To scan the preprogrammed weather channels, simply press WX.

To manually tune through the preprogrammed weather channels:

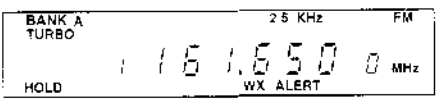
1. Press MANUAL, then press WX.
2. Press FREQ/CHAN until the FREQ indicator turns on. The scanner beeps softly.
3. Repeatedly press (or press and hold down) HOLD△, or turn the rotary tuner to scan through the preprogrammed weather band frequencies.

Note: You can still tune and scan weather channels that are not preprogrammed.

Turning the Weather Alert On and Off

You can use your scanner's weather alert feature to warn you when your local weather station broadcasts a severe weather emergency signal.

1. Press WX. The scanner stops on the clearest weather broadcasting station.
2. Press ALERT. The scanner displays WX ALERT.



When weather stations broadcast a severe weather emergency signal, the scanner sounds a loud alarm.

3. To turn off the alarm, turn the scanner off or press any of these keys:

   - **ALERT**
   - **WX**
   - **HOLD** △
   - **SEARCH**
   - **LIMIT** ▽
   - **SCAN**
   - **MANUAL**
   - **AUTO**

Testing the Weather Alert

1. Press WX.

2. When the scanner stops on any weather channel, press HOLD △.

3. Press ALERT. The display shows WX ALERT and the scanner mutes.

4. Press and hold down PRIORITY for about 3 seconds until the scanner sounds a loud alarm.

5. To turn off the alarm, turn the scanner off or press any of these keys:

   - **ALERT**
   - **WX**
   - **HOLD** △
   - **SEARCH**
   - **LIMIT** ▽
   - **SCAN**
   - **MANUAL**
   - **AUTO**

USING THE COUNT FEATURE

You can count the number of times the scanner detected a transmission on a specific channel since you turned the scanner on or cleared the count.

1. While the scanner is scanning, press MANUAL.

2. Press COUNT. The display shows COUNT, the current channel number, and the count number.

3. Repeatedly press MANUAL to display each channel and the number of times the scanner detected a transmission on that channel, or press and hold down MANUAL to scroll through the channels and see the count for each.

Note: If the CHAN indicator is on, you can use the rotary tuner instead of pressing MANUAL to display the channel count.

While you view the count for a channel, you can clear the count by pressing . (period) twice.

To turn off the count display, press COUNT until COUNT disappears from the display.

USING THE AUTO RECORDING FEATURE

The auto recording feature automatically records transmissions when the scanner stops on channels you specify as priority channels.

Note: You must connect a tape recorder before you can use this feature. See "Connections for Auto Recording."

Follow these steps to use the auto record feature.

1. Follow the instructions provided with your tape recorder to set it to record.

2. Program any channel you want to record as a priority channel (see "Priority").

   Note: You can program only one priority channel per bank.

3. Press AUX. LINE appears on the display.

4. Adjust VOLUME to a comfortable listening level.

   Note: The level at which you set VOLUME is the level at which your tape recorder will record transmissions.

5. Press PRIORITY.

6. To continue scanning channels, press SCAN.

When the scanner stops on a priority channel, the tape recorder automatically records the transmission.

To turn off the auto recording feature:

1. Press AUX until LINE disappears from the display.

2. To continue scanning channels, press SCAN.

USING CTCSS

The CTCSS (Continuous Tone Coded Squelch System) feature allows you to identify transmissions from groups of broadcasters that transmit any of the 38 standard low-frequency CTCSS tones. CTCSS is used by some amateur radio and business band user groups called nets to lock out unwanted transmissions from non-CTCSS users who might share the same frequency.

In some radio services, facilities called repeaters receive weak transmissions, then rebroadcast the transmissions at a higher power level. To restrict access to a specific repeater only to net members, the repeater can be set up to require that broadcasters send a sub-audible CTCSS tone frequency simultaneously with their transmission to activate the repeater and rebroadcast the transmission. This allows other net members to hear and communicate with the broadcaster, while keeping non-CTCSS broadcasters on the same frequency from activating the repeater and interfering with the net's transmissions.

You can use the CTCSS feature to lock out undesired broadcasters and monitor only those who transmit a CTCSS tone.

Note: In the Australian version, the CTCSS feature is not available since the CTCSS board is not provided. To install the CTCSS board, please consult with your local Tandy store.

Assigning a CTCSS Tone Frequency to a Channel

You can specify the CTCSS tone frequency you want the scanner to scan for on a specific preprogrammed channel.

1. Press CTCSS. The scanner displays CTCSS.

2. Select the channel number or frequency you want to assign a CTCSS tone frequency to.

3. If the scanner is scanning, press MANUAL. If the CHAN indicator is on, press FREQ/CHAN until the FREQ indicator turns on.

4. Press E. The scanner displays the channel number and 000.0. CTCSS flashes.

5. Enter the CTCSS tone frequency using the number keys, or select the frequency with the rotary tuner. See "CTCSS Tone Frequencies (Hz)."

   Note: Turn the rotary tuner clockwise to step up the displayed tone frequency. Turn the rotary tuner counterclockwise to step down the displayed tone frequency.

6. Press E. CTCSS stops flashing.

Note: When you tune to a frequency programmed for CTCSS, the scanner's display alternates between the frequency and the CTCSS tone frequency.

Changing or Deleting a CTCSS Tone Frequency for a Channel

1. If CTCSS is not displayed, press CTCSS. The scanner displays CTCSS.

2. Select the channel number or frequency containing the CTCSS tone frequency you want to change or delete.

3. If the scanner is scanning, press MANUAL. If the CHAN indicator is on, press FREQ/CHAN until the FREQ indicator turns on.

4. Press E. The scanner displays the channel number and CTCSS tone frequency assigned to the channel. CTCSS flashes.

5 To change a CTCSS tone frequency, enter the new frequency using the number keys, or select the new frequency with the rotary tuner.

   To delete a CTCSS tone frequency, enter 0 using the number keys, or select 000.0 with the rotary tuner. See "CTCSS Tone Frequencies (Hz)."

   Note: Turn the rotary tuner clockwise to step up the displayed tone frequency. Turn the rotary tuner counterclockwise to step down the displayed tone frequency.

6. Press E. CTCSS stops flashing.

Note: When you tune to a frequency programmed for CTCSS, the scanner's display alternates between the frequency and the CTCSS tone frequency assigned to it.

CTCSS Tone Frequencies (Hz)

The following table shows the available CTCSS tone frequencies and their associated letter codes:

Code	Freq (Hz)	Code	Freq (Hz)	Code	Freq (Hz)	Code	Freq (Hz)	Code	Freq (Hz)
XZ	67.0	ZZ	91.5	2B	118.8	5A	156.7	M2	210.7
XA	71.9	ZA	94.8	3Z	123.0	5B	162.2	M3	218.1
WA	74.4	ZB	97.4	3A	127.3	6Z	167.9	M4	225.7
XB	77.0	1Z	100.0	3B	131.8	6A	173.8	M5	233.6
WB	79.7	1A	103.5	4Z	136.5	6B	179.9	M6	241.8
YZ	82.5	1B	107.2	4A	141.3	7Z	186.2	M7	250.3
YA	85.4	2E	110.9	4B	146.2	7A	192.8	— —	— — — —
YB	88.5	2A	114.8	5Z	151.4	M1	203.5	— —	— — — —

A GENERAL GUIDE TO SCANNING

The following sections of this manual are applicable specifically to North America Due to band restrictions and assignments, information given here may not apply to other continents.

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.

During the summer months, you might be able to hear stations in the 30-50 MHz range located several hundred or even thousands of miles away. This is because of summer atmospheric conditions. This type of reception is unpredictable but often very interesting!

GUIDE TO FREQUENCIES

Ham Radio Frequencies

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

The following chart shows the Morse Code (continuous wave) and single sideband frequencies that you can monitor:

Wavelength (meters)	Continuous Wave (MHz)	Single Sideband (MHz)
10-meter	29.000-29.700	29.000-29.700
6-meter	50.000-54.000	
2-meter	144.000-148.000	
70-cm	420.000-450.000	

Birdie Frequencies

Birdies are frequencies your scanner uses when it operates. 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 counterclockwise to cut out the birdie. These are the most common birdies to watch for:

For 20-412

31.05 MHz	224.0 MHz	312.0 MHz	416 MHz
41.4 MHz	232.0 MHz	316.0 MHz	424 MHz
46.575 MHz	239.4 MHz	412.0 MHz	

For 20-9412

72.45 MHz	224.0 MHz	312.0 MHz	416 MHz
82.8 MHz	232.0 MHz	316.0 MHz	424 MHz
	239.4 MHz	412.0 MHz	

GUIDE TO THE ACTION BANDS

Typical Band Usage (For Canada only)

HF Band (3.00-30.0 MHz)	
10-Meter Amateur Band	(29.00-29.70 MHz)
High Range	(29.70-29.90 MHz)
VHF Band (30.00-300.0 MHz)	
Low Range	(30.00-50.00 MHz)
6-Meter Amateur	(50.00-54.00 MHz)
Aircraft	(108.00-136.00 MHz)
U.S. Government	(137.00-144.00 MHz)
2-Meter Amateur	(144.00-148.00 MHz)
High Range	(148.00-174.00 MHz)
New Mobile Narrow Band	(220.00-222.00 MHz)
1.3-Meter Amateur	(222.00-224.9875 MHz)
Military Aircraft	(225.00-287.80 MHz)
UHF Band (300.00 MHz-3.0 GHz)	
Military Aircraft	(311.00-384.00 MHz)
U. S. Government	(406.00-450.00 MHz)
0.6-Meter Amateur	(420.00-450.00 MHz)
Low Range	(450.00-470.00 MHz)
FM-TV Audio Broadcast, Wide Band	(470.00-512.00 MHz)
UHF Public Service	(806.00-823.9375 MHz)
Conventional Systems	(851.00-856.00 MHz)
Conventional/Trunked Systems	(856.00-861.00 MHz)

Trunked Systems	(861.00-866.00 MHz)
Public Safety	(866.00-868.9375 MHz)
Private Trunked	(935.00-940.00 MHz)
General Trunked	(940.00-941.00 MHz)

Primary Usage

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

VHF Band

Activities	Frequencies
Government, Police, and Fire Emergency Services	153.785-155.980 MHz 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 Mobile Units Relay Repeater Units Remote Control Stations	451.025-454.950 MHz 456.025-459.950 MHz 460.025-464.975 MHz 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.

Specified Intervals

Frequencies in different bands are accessible only at specific intervals. For example:

Band Type	Specified Interval
VHF, HAM and Government	5.0 kHz steps
All Others	12.5 MHz steps
Aircraft	25.0 kHz steps

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.

Abbreviations

AIR . . . . . Aircraft
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-30 MHz)
10-Meter Amateur Band—(28.0-29.7 MHz)
29.000-29.700 . . . . . HAM

Very High Frequency (VHF)
(30 MHz-300 MHz)

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
36.250 . . . . . Oil Spill Clean up
36.270-36.990 . . . . . 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

Aircraft Band (108-136 MHz)—
108.000-121.490 . . . . . AIR
121.500 . . . . . AIR Emergency
121.510-136.000 . . . . . 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-Hi BAND (148-174 MHz)
148.050-150.345 . . . . . CAP, MAR, MIL
150.775-150.790 . . . . . MED
150.815-150.965 . . . . . TOW
150.980 . . . . . Oil Spill Clean up
150.995-151.130 . . . . . ROAD
151.145-151.475 . . . . . POL
151.490-151.955 . . . . . IND, BUS
151.985 . . . . . TELM
152.0075 . . . . . MED
152.030-152.240 . . . . . TELB
152.270-152.465 . . . . . IND, TAXI
152.480 . . . . . 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 Clean up
154.600-154.625 . . . . . BUS
154.655-156.240 . . . . . MED, ROAD POL, PUB
156.255 . . . . . OIL
156.275-157.425 . . . . . 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 . . . . . OIL
161.600-162.000 . . . . . 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 . . . . . Wireless Mikes
169.500 . . . . . GOVT
169.505 . . . . . Wireless Mikes
169.55-169.9875 . . . . GOVT, MIL, USXX
170.000 . . . . . BIFC
170.025-170.150 . . . . 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
173.225-173.375 . . . . MOV, NEWS, UTIL
173.3875-173.5375 . . . . . MIL
173.5625-173.5875 . . MIL Medical/Crash Crews
173.60-173.9875 . . . . . GOVT

New Mobile Narrow Band (220-222 MHz)
220.000-222.000 . . . . . NEW

1.3-Meter Amateur Band (222-225 MHz)
222.000-225.000 . . . . . HAM

Military Aircraft Band (237.9-287.8 MHz)
237.900 . . Coast Guard Search & Rescue
239.800 . . . . . FAA Weather
241.000 . . . . . Army
243.000 . . . . . Emergency
255.400 . . . . . FAA Flight Service
257.800 . . . . . Civilian Towers
287.800 . . . . . Coast Guard Air/Sea Rescue

Ultra High Frequency (UHF)
(300 MHz-3 GHz)

Military Aircraft Band (319.1-383.9 MHz)
319.100 . . . . . FAA Air Traffic Control
321.000-336.600 . . . . . Air Force
342.500-344.600 . . . . . FAA Weather
346.400-364.200 . . . . Air Force Air Traffic Control
381.800-383.900 . . . . . Coast Guard

U. S. Government Band (406-450 MHz)
406.125-419.975 . . . . . GOVT, USXX

70-cm 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
453.0125-453.9875 . . . . . PUB
454.000 . . . . . 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
462.550-462.725 . . . . . GMR
462.750-462.925 . . . . . 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 Systems Band - Locally Assigned
861.0125-865.9875 . . . . . TSB

Public Safety Band - Locally Assigned
866.0125-868.9875 . . . . . PSB

Private Trunked
935.0125-939.9875 . . . . . PTR

General Trunked
940.0125-940.9875 . . . . . GTR

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 834.075 also on 855.675.

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

1. Note the new frequency 855.675
2. Double the intermediate frequency of 10.80 MHz (21.600) and subtract it from the new frequency . . . . . − 21.600
3. Write the answer down 834.075
4. Note the new frequency again 855.675
5. Double the intermediate frequency of 10.80 MHz (21.600) and add it to the new frequency . . . . . + 21.600
6. Write the answer down 877.275

If the service's regular frequency is one of the frequencies you wrote down in Steps 3 or 6, then you have tuned to an image.

Occasionally you might get interference on a weak or distant signal from a strong broadcast 21.6 MHz below or above 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 MHz (million) = 1,000 kHz (thousand)

To convert MHz to kHz, multiply by 1,000:
9.62 MHz × 1000 = 9620 kHz

To convert from kHz to MHz, divide by 1,000.

$$\frac{2780\ \text{kHz}}{1000} = 2.780\ \text{MHz}$$

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

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

TROUBLESHOOTING

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

Symptom	Suggestion
Scanner is on but will not scan.	• Be sure **SQUELCH** is adjusted properly. • Be sure **SCAN** is displayed. See "Scanning the Channels".
Scanner does not work at all.	Check the AC adapter and AC outlet.
Scanner locks on frequencies that have an unclear transmission.	Be sure "birdie" frequencies are not programmed, or listen to "birdie" frequencies manually. See "Birdie Frequencies" in "Guide to Frequencies."

Warning: Modifying or tampering with the scanner's internal components, except as instructed in this owner's manual, can cause a malfunction and might invalidate its warranty. If your scanner is not operating as it should, take it to your local Tandy/Radio Shack store for assistance.

SPECIFICATIONS

Frequency Coverage for 20-412 (available in Canada only):

HF Band	29.00-29.995 MHz (in 5/12.5/25 kHz steps)
VHF Lo	30-50 MHz (in 5/12.5/25 kHz steps)
Amateur Radio	50-54 MHz (in 5/12.5/25 kHz steps)
	144-148 MHz (in 5/12.5/25 kHz steps)
	225-399.9875 MHz (in 12.5/25 kHz steps)
Amateur Radio	406-450 MHz (in 12.5/25 kHz steps)
Aircraft	108-136.995 MHz (in 5/12.5/25 kHz steps)
	137-144 MHz (in 5/12.5/25 kHz steps)
VHF Hi	148-174 MHz (in 5/12.5/25 kHz steps)
	216-224.9875 MHz (in 12.5/25 kHz steps)
UHF Lo	400-450 MHz (in 12.5/25 kHz steps)
UHF Standard	450-470 MHz (in 12.5/25 kHz steps)
UHF "T"	470-512 MHz (in 12.5/25 kHz steps)
UHF Hi	806-823.9875 MHz (in 12.5/25 kHz steps)
UHF Hi	849.0125-868.9875 MHz (in 12.5/25 kHz steps)
	894.0125-956 MHz (in 12.5/25 kHz steps)

Frequency Coverage for 20-9412 (available in Europe/Australia only):

VHF Lo	66-88 MHz (in 5/12.5/25 kHz steps)
Amateur Radio	144-148 MHz (in 5/12.5/25 kHz steps)
VHF/UHF	225-406 MHz (in 12.5/25 kHz steps)
Amateur Radio/UHF Lo	400-450 MHz (in 12.5/25 kHz steps)
Aircraft	108-136.9950 MHz (in 5/12.5/25 kHz steps)
VHF	137-144 MHz (in 5/12.5/25 kHz steps)
VHF Hi	148-174 MHz (in 5/12.5/25 kHz steps)
	216-224.9875 MHz (in 12.5/25 kHz steps)
UHF	450-470 MHz (in 12.5/25 kHz steps)
	470-512 MHz (in 12.5/25 kHz steps)
	806-823.9875 MHz (in 12.5/25 kHz steps)
	824.0100-849.0000 MHz (in 12.5/25/30 kHz steps)
	849.0125-868.9875 MHz (in 12.5/25 kHz steps)
	869.0100-894.0000 MHz (in 12.5/25/30 kHz steps)
	894.0125-956.0000 MHz (in 12.5/25 kHz steps)

General:

Channels of Operation	200 Channels in Any Band Combinations (20 channels per bank, 10 banks)

Sensitivity
AM: 20 dB (S+N)/N at 60% modulation
108-136.995 MHz 3μV
225-399.9875 MHz 1.3μV
FM: 20 dB (S+N)/N at 3 kHz deviation
29-54 MHz . . . . . 0.6μV (Canadian model)
68-88 MHz . . . . . 0.6μV (U.K./Australian model)
137-174 MHz 0.7μV
216-224.9875 MHz 0.5μV
400-512 MHz 0.5μV
806-956 MHz 0.7μV
Scanning Rate:
High (Hyperscan Mode) . . . . . Up to 100 channels/second
Low (Normal Mode) . . . . . Up to 20 channels/second
Search Speed
High (Hyperscan Mode) . . . . . Up to 100 steps/second
Low (Normal Mode) . . . . . Up to 20 steps/second
Delay Time . . . . . 2 seconds
Intermediate Frequencies:
1st . . . . . 10.80 MHz
2nd . . . . . 450 kHz
Squelch Sensitivity:
AM
Threshold . . . . . Less than 0.5μV
Tight . . . . . 17 dB (S+N)/N
FM
Threshold . . . . . Less than 0.4μV
Tight . . . . . 25 dB (S+N)/N
Antenna Impedance . . . . . 50 Ohms
Audio Power:
Maximum . . . . . 1.7 Watts
Nominal . . . . . 1.4 Watts
Built-In Speaker . . . . . 77mm (3"), 8 Ohms, dynamic type
Power Requirements . . . . . Standard AC Power
AC Adapter . . . . . 13.8 Volts DC
Dimensions:
Folding feet up (HWD) . . . . . 98.4×265.1×217.5mm
(3⅞×10⁷⁄₁₆×8⁹⁄₁₆ Inches)
Folding feet down (HWD) . . . . . 115.9×265.1×220.7mm
(4⁹⁄₁₆×10⁷⁄₁₆×8¹¹⁄₁₆ Inches)
Weight . . . . . 1.68 kg (3.70 Pounds)

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