OWNER'S MANUAL

DX-394
Communications Receiver

Please read before using this equipment.
INTRODUCTION

Your Radio Shack DX-394 Communications Receiver brings the voices of the world to you. In the 13 international short wave (SW) bands, you can hear news broadcasts and other programs from sources such as Radio Japan, the British Broadcasting Corporation, Radio Moscow, and Radio Peking.

You can get emergency information firsthand by listening to ham radio communication, including single sideband (SSB) voice transmissions and continuous wave (CW) Morse code transmissions.

In the long wave (LW) band, you can hear ship-to-shore calls, other marine and aeronautical services, and sometimes even hurricane reports.

You can tune to local broadcasts in the medium wave (MW) bands. (In the United States, we commonly call the MW band the AM band.)

Your receiver has these special features:

**PLL Synthesized Receiver** — ensures accurate, stable tuning.

**Large, Liquid Crystal Display** — shows the time, band and frequency, signal strength, and other indicators.

**Five Programmable Timers** — let you store frequencies on/off times for automatic listening pleasure.

**Tape Out Jack** — lets you connect an optional tape recorder.

**Dual Time** — includes a primary clock and a secondary clock, so you can set one to your local time, and the other to UTC (Coordinated Universal Time — also known as Greenwich Mean Time) or to the local time of a city in another time zone.

**Search Tuning** — scans up or down the band for the next available station.

**Memory Tuning** — stores up to 160 frequencies so you can quickly select your favorite stations.

**Direct Access Tuning** — tunes to the frequency you enter on the keypad.

**Rotary Tuning Adjustment** — lets you manually tune desired frequencies or channels.

**Lock** — prevents you from accidentally changing the band or frequency, changing the clock settings, or turning on or off the timer.

**MW Step Setting** — lets you easily change the frequency step setting to match MW (AM) broadcast frequencies used by many other countries.

**RF Gain Control** — sets the receiver's sensitivity.

**Headphones Jack** — lets you connect a pair of headphones.

**External Speaker Jack** — lets you connect an external speaker.

**Dual Conversion Upper Superheterodyne** — eliminates any interference from IF (Intermediate Frequency) images, so you only hear the selected frequency.

**Monitor Memory** — lets you temporarily save a frequency.

**Two Antenna Jacks** — lets you use high- and low-impedance antennas.

**ATT Switch** — reduces the receiver's sensitivity to strong local signals when using a low impedance antenna connector.

**Memory Backup** — replacement-free rechargeable lithium battery keeps channels stored in memory for more than 1 month during a power loss.

**Two Power Options** — lets you power the receiver from standard AC power or from your vehicle's battery (with an optional DC cigarette lighter power cable).

For your records, please record your receiver's serial number in the space provided. The serial number is located on the back of the receiver.

Serial Number _______________________

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NOTICE
Your DX-394 receiver is preset to cover the following bands:

<table>
<thead>
<tr>
<th>Band (in meters)</th>
<th>Frequency Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>2.300–2.495 MHz</td>
</tr>
<tr>
<td>90</td>
<td>3.200–3.400 MHz</td>
</tr>
<tr>
<td>75</td>
<td>3.900–4.000 MHz</td>
</tr>
<tr>
<td>60</td>
<td>4.750–5.060 MHz</td>
</tr>
<tr>
<td>49</td>
<td>5.950–6.200 MHz</td>
</tr>
<tr>
<td>41</td>
<td>7.100–7.300 MHz</td>
</tr>
<tr>
<td>31</td>
<td>9.500–9.900 MHz</td>
</tr>
<tr>
<td>25</td>
<td>11.650–12.050 MHz</td>
</tr>
<tr>
<td>21</td>
<td>13.600–13.800 MHz</td>
</tr>
<tr>
<td>19</td>
<td>15.100–15.600 MHz</td>
</tr>
<tr>
<td>16</td>
<td>17.550–17.900 MHz</td>
</tr>
<tr>
<td>13</td>
<td>21.450–21.850 MHz</td>
</tr>
<tr>
<td>11</td>
<td>26.670–26.100 MHz</td>
</tr>
</tbody>
</table>

Your receiver might cause radio or TV interference, even when it is operating properly. To determine whether or not your receiver is causing the interference, turn off your receiver. If the interference goes away, your receiver is causing it. Try to eliminate the interference by:

- Moving your receiver away from the other receiver
- Connecting your receiver to an outlet that is on a different electrical circuit from the other receiver
- Contacting your local Radio Shack/Tandy store for help

If you cannot eliminate the interference, local laws may require you to stop using your receiver.

This device complies with North American regulations. Operation is subject to the following conditions: (1) This device must not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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### PREPARATION

When you are deciding where to set up the receiver, you should consider:

**LOCATION.** You will spend many hours listening to your receiver; be sure it is placed where you can enjoy it at any time. This receiver is primarily designed for use in the home as a base station. You can place it on a desk, shelf, or table.

**ANTENNA.** For maximum performance, you need an optional, external long-wire antenna, such as a short wave antenna that will be mounted outside.

**GROUNDING.** For safety, you should connect a ground wire to the receiver. This requires running a ground wire from the ground screw connection on the back of the receiver to a ground connection, such as a metal cold water pipe or metal pipe driven into the earth.

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

### THE ANTENNA

To attach the supplied telescoping antenna, simply screw it clockwise into the hole on the receiver's top.

For the best reception, fully extend the antenna.

The telescoping antenna is adequate for strong local signals. However, if you use an external antenna, you can receive even stronger signals.

No single antenna covers the entire frequency range of the DX-954 efficiently, but there are many different types of antennas you can use. Your local Radio Shack/Tandy store sells a wide variety of antennas. Choose the one that best suits your needs.

For a simple, all-purpose antenna, use the long-wire type. The horizontal section of the antenna should be more than 10 meters (30 feet). Mount the antenna as high as possible (more than 5 meters (15 feet)) from the ground and away from power lines, buildings, and metal structures. Connect the antenna's phono plug to the ANT HI-Z jack on the back of the receiver.
A dipole antenna is made up of two pieces of wire, each half of the total length. Connect the antenna’s PL-259 plug to the ANT LO-Z jack on the back of the receiver.

**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 fail, 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.

**GROUNDING**

To insure the best reception, you must always connect a heavy gauge ground wire (not supplied) to the GND screw on the back of the receiver. Connect the other end either to a metal cold water pipe (not hot water and not natural gas pipe) or to a metal ground rod (not supplied) driven into the ground. Or, you can bury a copper plate or copper net in the ground and connect to it.

For more information about antennas and grounding, obtain a copy of “The ARRL Amateur Radio Handbook,” available at your local Radio Shack/Tandy store.

**CONNECTING POWER**

**Connecting AC Power**

Plug the receiver’s AC power cord into a standard AC outlet.

**Caution:** To prevent electric shock, the plug’s blades are polarized and fit only one way. If the plug does not fit easily, turn it over and try again. Do not force the plug into the AC outlet.

**Using Your Vehicle’s Battery**

You can also power your receiver from your vehicle’s cigarette lighter socket with an optional DC cigarette lighter power cable (not supplied).

**Caution:** You must use a DC cigarette lighter power cable that supplies 12 volts and delivers at least 500 mA. Its center tip must be set to positive and its plug must correctly fit the DC 13.8 V jack on the back of the receiver. The recommended power cable meets these specifications. Using a power cable that does not meet these specifications could damage the receiver or the power cable.

Insert the DC power cable’s barrel plug into the DC 13.8V jack on the back of the receiver, then plug the power cable into your vehicle’s cigarette lighter socket.

**RESETTING THE RECEIVER**

If the receiver’s display locks up or the receiver does not work properly after you connect power, you might need to reset the receiver.

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

Insert a pointed object, such as a straightened paper clip, into the SET button on the back of the receiver, then remove it. The Clock 1 time display flashes (see "Setting the Clocks.")
CONNECTING HEADPHONES
For private listening, you can connect an optional pair of headphones with a 3.5 mm (¼-inch) plug to the receiver. Use monaural headphones.

Insert the headphones' plug into the HEADPHONE jack on the front of the receiver.

Note: Plugging in headphones automatically disconnects the internal speaker.

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

- Set the volume to its lowest setting before you begin listening. Adjust the volume to a comfortable listening level.
- Do not listen at extremely high-volume levels. Extended high-volume listening can lead to permanent hearing loss.
- Once you establish a comfortable listening level, do not increase the volume.

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 EXTERNAL SPEAKER
You can connect an optional external speaker with a 3.5 mm (¼-inch) plug to the receiver. Use an 8-ohm external speaker capable of handling over 5 watts of power.

Insert the speaker cable's plug into the EXT SPKR jack on the back of the receiver.

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

CONNECTING A TAPE RECORDER
You can connect an optional tape recorder with a microphone jack to your receiver to record transmissions. To connect it, you need a connecting cable (not supplied) with a phono plug at one end.

1. Insert the connecting cable's phono plug into the TAPE OUT jack on the back of the receiver.
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 from the receiver.
UNDERSTANDING YOUR RECEIVER

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

VOLUME — adjusts the sound level.
RF GAIN — adjusts the receiver's sensitivity.
MODE — sets the receiving mode.
FINE TUNE — fine tunes the reception signal, especially when you tune to SSB and CW.
Main Tuning Knob — selects frequencies.
STEP ▲, STEP ▼ — selects the 0.1, 1, 5, or 10 (9) kHz tuning frequency step sequentially.
TIME SET — sets the built-in clocks.
SLEEP — turns off the receiver after 30 or 60 minutes.
DIMMER — selects two levels of display back lighting brightness.
POWER — turns the power on and off.
TIMER — sets the built-in clocks and turns the timer on off.
NB — turns noise blanker on and off.
MON — stores the current frequency into a monitor memory and recalls the frequency from memory.

LOCK — disables the main tuning knob and all buttons except POWER and LOCK to prevent accidental operation.
LIMIT — turns on the limit mode and sets the frequency range.
BAND — selects LW (150-509.9 kHz), MW (510-1729.9 kHz), or SW (1.73-29.9999 MHz) sequentially.
METER — selects one of the 15 International Broadcasting Bands.
FREQ — directly tunes to the frequency with number and decimal keys.
▲ and ▼ — tune up or down, select the higher or lower limit frequency in the limit mode, and the search direction in the limit, band, and meter modes.
CLEAR — clears an incorrect entry.
PGM — turns on the program mode to set a limit frequency, store a frequency or set the timer.

Each number key has a single digit printed on it and a meter band printed above it. Use the digits on the keys to enter the numbers for a frequency, a channel or a time setting. Use the meter band above the key (120m, for example) to select an International Broadcast Frequencies Band.

A LOOK AT THE DISPLAY
The display has several indicators that show the receiver's current operating mode. A quick look at the display will help you understand how to operate your receiver.

- — enters a decimal point when you enter a frequency.
ENT — stores a frequency in a channel.

Frequency Indicator — indicates your tuned frequency — from 150 kHz to 29.9999 MHz.
- — appears when you set a 30- or 60-minute sleep timer.
- — shows the time for two time zones.
TIMER ON OFF — the number from 1 to 5 under this indicator shows the timer condition and which timer is active.

SIGNAL STRENGTH meter — indicates signal strength.
LIMIT — appears when the receiver is in the limit frequency mode.

LW, SW, and MW — shows the band the receiver is currently tuned to: long wave (LW), medium wave (MW), or short wave (SW).
▲ or ▼ — appears when you set a limit frequency range or press ▲ or ▼.

STEP (kHz) — appears with digits to show which frequency step (0.1, 1, 5, 9, or 10) the receiver is set to.
- — appears when you turn on the lock function.
RECEIVER OPERATION

1. Turn VOLUME fully counterclockwise and RF GAIN fully clockwise before you turn on the receiver.

2. Select the operation mode — STANDBY, AM, LSB, USB, CW1, or CW2 (see "Using the Mode Control").

3. Press POWER to turn on the receiver.
   **Note:** If the clock display is flashing, set the time (see "Setting the Clocks").

4. Press BAND until the desired band (LW, MW, or SW) appears on the display (see "Selecting the Band").

5. Tune to the desired station (see "Tuning to a Station").

6. Adjust VOLUME as desired.

7. Press POWER again to turn off the receiver.

USING THE MODE CONTROL

The MODE switch setting determines the type of signal that your receiver receives. For standard broadcast and international short wave signals, use the AM position. For Morse code, use CW1 or CW2. For SSB signals, use the LSB or USB position. To help you decide whether to use USB (upper sideband) or LSB (lower sideband), see the following chart.

This chart shows the normal sideband mode used for the Ham bands.

<table>
<thead>
<tr>
<th>Meters</th>
<th>Frequency (in MHz)</th>
<th>Sideband Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>160</td>
<td>1.8 to 2.0</td>
<td>Lower</td>
</tr>
<tr>
<td>80</td>
<td>3.5 to 4.0</td>
<td>Lower</td>
</tr>
<tr>
<td>40</td>
<td>7.0 to 7.3</td>
<td>Lower</td>
</tr>
<tr>
<td>20</td>
<td>14.0 to 14.35</td>
<td>Upper</td>
</tr>
<tr>
<td>17</td>
<td>18.068 to 18.168</td>
<td>Upper</td>
</tr>
<tr>
<td>15</td>
<td>21.0 to 21.45</td>
<td>Upper</td>
</tr>
<tr>
<td>12</td>
<td>24.89 to 24.99</td>
<td>Upper</td>
</tr>
<tr>
<td>10</td>
<td>28.0 to 29.7</td>
<td>Upper</td>
</tr>
</tbody>
</table>

Notes:
- If you tune through SSB signals while in the AM mode, you hear only fluttering sound. Switch to the LSB or USB mode.
- If you tune through AM signals while using the LSB or USB mode, you hear a very annoying background tone, which varies with the setting of the tuning controls. If this happens, switch to the AM mode.
- Setting MODE to the STANDBY position prevents you from changing the main tuning knob and all buttons, except POWER. This position also turns off the sound.

SELECTING THE BAND

To select the long wave (LW), medium wave (MW), or short wave (SW) band, press BAND until the desired band appears on the display.

Selecting the International Radio Frequency Band

1. Press METER to display the current meter band.

2. Press METER again if you want to change the meter band. The meter band flashes for 10 seconds.

3. While the meter band flashes, press the desired meter band key. For example, to select the 90 meter band, press 90m.

SETTING A LIMIT TUNING RANGE

You can set a frequency range so you can tune to frequencies between lower and upper limits.

1. Press LIMIT. LIMIT appears on the display.

2. Press PGM. ▲ flashes for about 10 seconds.

3. Enter the lower limit of the frequency range including the decimal point.
   - To set 150 kHz, enter 150.
   - To set 1 MHz, enter 1000 or 1.
   - To set 10 MHz, enter 10000 or 10.

   **Notes:**
   - If you try to enter invalid frequency (100, for example), Error appears on the display. Press CLEAR or wait 5 seconds until Error disappears from the display.
   - You cannot use the main tuning knob to set a limit tuning range.

4. Press LIMIT. ▼ flashes for about 10 seconds.

5. Enter the upper limit of the frequency range including the decimal point.

6. Press ENT.

7. Press ▲ or ▼ to search through the frequencies in the selected band.

**Notes:**
- If you make a mistake in Step 3 or 5, press CLEAR to erase the last digit.
- If you wait more than 10 seconds to press a key, you must begin again at Step 2.
- To return to the previous mode, press LIMIT until LIMIT disappears from the display. The limit tuning range is stored in memory until you set a new range.
TUNING TO A STATION

You can tune to a desired broadcast station using the manual, direct access, search, or memory tuning methods. Use the lower keypad or main tuning knob to tune broadcasts.

- Your receiver automatically rounds down the entered frequency to the nearest valid frequency. For example, if you try to enter a frequency of 478 in LW, your receiver accepts it as 470 (when the frequency step is set to 10 kHz — see “Setting the Frequency Step”).

Search Tuning

<table>
<thead>
<tr>
<th>LIMIT</th>
<th>BAND</th>
<th>FILTER</th>
<th>FREQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>120m</td>
<td>90m</td>
<td>75m</td>
<td>55m</td>
</tr>
<tr>
<td>A</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>A</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

To automatically tune up or down to the next frequency in the selected LW, MW, SW band, 13 international broadcast band (meter), or limit frequency band, press and hold down A or V for about 2 seconds. The receiver searches up or down in the selected band and tunes to the first frequency it finds with a strong signal.

Notes:

- To tune to stations with weaker signals, use one of the manual tuning methods.
- If the RF GAIN is set fully clockwise, the receiver might not search up or down when you press A or V. Turn the RF GAIN control counterclockwise.

Press A or V for about 2 seconds to restart the search.

Manual Tuning

To manually tune to a frequency, repeatedly press A or V or rotate the main tuning knob until the display shows the desired frequency.

Direct Access Tuning

1. Press FREQ. The frequency display flashes for about 10 seconds.
2. While the frequency display flashes, press the number keys, including the decimal key, to select the desired station’s frequency.
3. Press ENT.

Notes:

- If you make a mistake, press CLEAR to erase the last digit.
- If you do not press a key for more than 10 seconds, the display stops flashing. Start again from Step 1.
- If you try to enter an invalid frequency, Error appears on the display. Press CLEAR or wait 5 seconds until Error disappears from the display.

Memory Tuning

For easy selection, you can store the frequencies of your favorite stations into memory channels. You can store up to 160 frequencies — 10 frequencies each in the LW, MW, SW bands, and 10 in each of the meter bands.

Follow these steps to store a frequency into memory.

1. Select the band or meter.
2. Use direct access or manual tuning to tune to the frequency you want to store.

Note: When you store frequencies in the SW band and the meter bands, the frequencies are stored in either the SW band’s channel memory or the meter bands’ channel memory depending on the tuning method. When a frequency (for example: 3.2000 MHz, 90m) is tuned by direct tuning (using FREQ), the frequency is stored in the SW band’s channel memory. When the same frequency is tuned by manual tuning (using the tuning control or A or V), the frequency is stored in the 90m band’s channel memory.

3. Press PGM.

5. While PGM CH and the memory channel number flash, press ENT to store the frequency.

Note: If you wait more than 10 seconds to press ENT, you must begin again from Step 3.

6. To store more frequencies in the same band, repeat Steps 2–5. To store a frequency from another band, repeat Steps 1–5.

To tune to the desired memory channel, select the band and then press the channel number.

USING A MONITOR MEMORY

The receiver’s monitor memory is a temporary storage area where you can store a frequency while you decide whether or not to save it in a channel.

1. Press MON while the desired frequency is displayed. MON and any previously stored frequency appear on the display.
2. Press ENT. The new frequency replaces the old one in the monitor memory.

To listen to the monitor memory, press MON.

4. While PGM CH flashes, enter a memory channel number from 1–10 (press 0 for 10).
USING THE RF GAIN CONTROL

When you receive an extremely strong signal, turn RF GAIN to vary the overall volume, instead of using the VOLUME control.

USING THE FINE TUNE CONTROL

To receive SSB clearly, adjust FINE TUNE very slowly and carefully until the voice sounds normal. When improperly tuned, voices have a low guttural sound or sound like “Donald Duck.” SSB signal tuning takes patience and practice.

If you are listening to a morse code signal, adjust FINE TUNE for the pitch of tone which best suits you.

Note: In the Ham bands, most of the activity is in code or SSB.

SETTING THE FREQUENCY STEP

Stallion frequencies are generally assigned in standard tuning increments to reduce broadcast interference. Your receiver is preset to change and search for frequencies in the standard, conventional increments. However, your receiver has the capability to change the frequency step for easier, incremental tuning, or increased search capability. The following table shows the default tuning steps.

<table>
<thead>
<tr>
<th>Band</th>
<th>Tuning Increment</th>
</tr>
</thead>
<tbody>
<tr>
<td>LW</td>
<td>10 kHz</td>
</tr>
<tr>
<td>MW</td>
<td>10 kHz (See “Changing the MW Tuning Increment.”)</td>
</tr>
<tr>
<td>SW</td>
<td>5 kHz</td>
</tr>
<tr>
<td>HAM</td>
<td>1 kHz</td>
</tr>
</tbody>
</table>

Press STEP ▲ or STEP ▼ to select your desired tuning step. As you press STEP ▲ or STEP ▼, the frequency step appears under STEP (kHz) on the display in this order: 0.1, 1.5, 10kHz.

CHANGING THE MW TUNING INCREMENT

In the United States, the MW band frequencies step in 10 kHz increments. In some countries, the MW band frequencies step in 9 kHz increments. Your receiver has the capability to shift between these two step increments. Here is how to change the step.

1. Press POWER to turn off the receiver.
2. While pressing STEP ▲ or STEP ▼, press POWER.

The 10 kHz step is changed to 9 kHz or vice versa. If you want to change it back, repeat the procedure.

USING THE LOCK BUTTON

To prevent accidental frequency changes, press the LOCK button. This prevents you from changing main tuning knob and all buttons, except POWER and LOCK. To unlock the controls, press the LOCK button again.

USING THE ATT SWITCH

To reduce interference or noise caused by signals from a strong local broadcaster, you can reduce the receiver’s sensitivity by setting the ATT (attenuate) switch on the back of the receiver.

Switch ATT to 20 dB to reduce the receiver’s sensitivity, or 0 dB for normal sensitivity.

Notes:
- If you switch ATT to 20 dB, your receiver might not receive weak signals.
- The ATT switch affects only the antenna connected to the ANT LO-Z terminal.
CLOCK RADIO OPERATION

SETTING THE CLOCKS

Your receiver has two clocks. We recommend you set the primary clock to the local time and the secondary clock to the UTC (Coordinated Universal Time — also called Greenwich Mean Time).

Note: The receiver's time display uses the 24-hour format.

1. Press and hold down TIME SET for 2 seconds. The time digits flash on the display.

Note: You only need to enter the hour. For example, enter 4 for 4:30. The minutes change automatically according to the primary clock setting.

2. While the clock display flashes, use the number keys to enter the correct time. For example, enter 930 for 9:30.

Note: You may make a mistake, press CLEAR to erase the last digit.

3. Press TIME SET to select the hour digit. The hour digit flashes.

4. While the hour digit flashes, use the number keys to enter the hour for the second clock.

5. Press ENT to start both clock 1 and clock 2. The colon flashes.

Press TIME SET to alternate between the time on clock 1 and clock 2.

USING THE TIMERS

Your receiver has five programmable timers. You can store a tuning frequency and on/off times into each timer. When you turn on a timer, the receiver automatically turns on and tunes to the programmed frequency when the timer reaches the programmed time. When it reaches the off time, the receiver turns off.

Note: The timers are set to Clock 1.

Programming a Timer

1. Set the frequency that you want the receiver to tune to when it turns on. For example, set 12.345 MHz.

2. Press TIMER.

3. Within 10 seconds, enter the desired timer memory number (1 to 5). (For example, press 1 to select timer memory 1.) The memory number flashes and the previously programmed frequency or 0.0000 appears.

4. Press PGM to select the timer memory. The band indicator and frequency flash.

5. To change the times, press TIMER. The time digits flash on the display.

6. Enter the time when you want the receiver to turn on. For example, enter 15:30.

Note: If you want to set only the off time, press CLEAR.

7. Press TIMER. The time digits flash on the display.

8. Enter the time when you want the receiver to turn off. For example, enter 16:00.

Note: If you do not want to set the off time, press CLEAR.

9. Press ENT to store the settings.
Turning on a Timer

1. Press TIMER.

   ![Timer Display](image)

2. Enter the timer memory number (for example, enter 1). The selected memory number flashes.

   ![Memory Number Display](image)

3. Press ENT.

4. If you want to turn on more timers, repeat Steps 1-3.

5. Press POWER to turn off the receiver.

Clearing a Timer

If the receiver is off:

1. Press POWER to turn on the receiver.

2. Press TIMER.

3. Enter the timer memory number.

4. Press CLEAR.

   If the receiver has already turned on automatically, press POWER. The timer program is canceled and the receiver turns off.

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USING THE SLEEP TIMER

The sleep timer sets the receiver to turn off after a set time (30 or 60 minutes) so you can fall asleep as you listen to the receiver.

Press SLEEP until the desired time appears – 30 min or 60 min.

To turn off the receiver before it automatically turns off, press POWER.

To turn off the sleep timer, press SLEEP until the indicator disappears.

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LISTENING HINTS

Short wave listening is a hobby with millions of participants worldwide. It requires no special knowledge or skills, but your enjoyment increases as you gain experience and develop special listening techniques.

The information in this section can help you make the most of your listening time.

REFERENCE SOURCES

Many books and magazines about short wave listening are available through your local library or newsstand. See sources such as "The World Radio Handbook," "Radio Amateur's Handbook," "Passport to World Band Radio," "Monitoring Times," and "Popular Communications." These publications can help you learn about the conditions that make long-distance reception possible and provide up-to-date listings for short wave broadcasts in English and other languages.

BAND ALLOCATION

Certain portions of the radio spectrum are set aside for specific purposes.

Note: Bands are often referred to by wavelength. For example, the 19-meter band refers to the range of frequencies with waves about 19 meters long.

Ham Frequencies

Tuning to the ham radio frequencies can be interesting and helpful, because ham operators often communicate emergency information when other means of communication break down.

Ham radio operators use the following bands. Portions of these bands are set aside for continuous wave (CW) morse code communication or for single sideband (SSB) voice communication, as shown below.

160 meters:
1,800–2,000 kHz: CW, LSB

80 meters:
3,500–3,750 MHz: CW
3,750–4,000 MHz: LSB

40 meters:
7,000–7,150 MHz: CW
7,150–7,300 MHz: LSB

20 meters:
14,000–14,150 MHz: CW
14,150–14,350 MHz: USB

17 meters:
18,068–18,110 MHz: CW
18,110–18,168 MHz: USB

15 meters:
21,000–21,200 MHz: CW
21,200–21,450 MHz: USB

12 meters:
24,890–24,930 MHz: CW
24,930–24,990 MHz: USB

10 meters:
28,000–28,300 MHz: CW
28,300–28,700 MHz: USB

Note: These ranges are not precisely observed everywhere in the world.
Birdie Frequencies

Every receiver has birdie frequencies. Birdies are operating frequencies created inside the receiver. These operating frequencies might interfere with broadcasts on the same frequencies. If you receive one of these frequencies, you hear only noise on that frequency.

Here are the birdie frequencies to watch for on this receiver:

150 – 180 kHz in all modes.

451.5, 903, and 1354.5 kHz in the LSB and CW1 modes.

458.5, 917, and 1375.5 kHz in the USB and CW2 modes.

International Broadcast Frequencies

International Commercial Broadcasts are found in the following SW bands. These programs (often in English) usually contain news, commentaries, music, and special features reflecting the culture of the broadcasting country. You might find it easiest to hear these broadcasts between 6:00 PM and midnight (your time).

<table>
<thead>
<tr>
<th>Band (in meters)</th>
<th>Frequency Range (in MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>120*</td>
<td>2.300–2.495</td>
</tr>
<tr>
<td>90*</td>
<td>3.200–3.400</td>
</tr>
<tr>
<td>75**</td>
<td>3.900–4.000</td>
</tr>
<tr>
<td>60*</td>
<td>4.750–5.060</td>
</tr>
<tr>
<td>49</td>
<td>5.950–6.200</td>
</tr>
<tr>
<td>41**</td>
<td>7.100–7.300</td>
</tr>
<tr>
<td>31</td>
<td>9.500–9.900</td>
</tr>
<tr>
<td>25</td>
<td>11.650–12.050</td>
</tr>
<tr>
<td>21</td>
<td>13.600–13.800</td>
</tr>
<tr>
<td>19</td>
<td>15.100–15.600</td>
</tr>
<tr>
<td>16</td>
<td>17.550–17.900</td>
</tr>
<tr>
<td>13</td>
<td>21.450–21.850</td>
</tr>
<tr>
<td>11</td>
<td>25.670–26.100</td>
</tr>
</tbody>
</table>

* These bands are reserved for stations in tropical areas.

** Ham operators and international stations share 3.900–4.000 MHz and 7.100–7.300 MHz. Interference is heavy in this range.

Aircraft Frequencies

Most transmissions are in SSB, although you can still hear some AM transmissions. Aircraft on international routes sometimes use SW. Here are some ranges where you might hear aircraft communications.

<table>
<thead>
<tr>
<th>Frequency Range (in MHz)</th>
<th>Band (in meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.650–4.750 MHz</td>
<td>31</td>
</tr>
<tr>
<td>6.545–6.765 MHz</td>
<td>21</td>
</tr>
<tr>
<td>8.815–9.040 MHz</td>
<td>19</td>
</tr>
<tr>
<td>10.000–10.100 MHz</td>
<td>16</td>
</tr>
<tr>
<td>11.175–11.400 MHz</td>
<td>13</td>
</tr>
<tr>
<td>13.200–13.360 MHz</td>
<td>11</td>
</tr>
<tr>
<td>15.010–15.100 MHz</td>
<td>25</td>
</tr>
<tr>
<td>17.900–18.030 MHz</td>
<td>25</td>
</tr>
</tbody>
</table>

Ships and Coastal Stations

Most transmissions from ships and coastal stations are in USB and CW. You can hear these transmissions in the following bands.

<table>
<thead>
<tr>
<th>Frequency Range (in MHz)</th>
<th>Band (in meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.000–2.0 MHz*</td>
<td>11</td>
</tr>
<tr>
<td>4.063–4.139 MHz</td>
<td>13</td>
</tr>
<tr>
<td>4.361–4.438 MHz</td>
<td>13</td>
</tr>
<tr>
<td>8.195–8.181 MHz</td>
<td>13</td>
</tr>
<tr>
<td>12.330–12.420 MHz</td>
<td>13</td>
</tr>
<tr>
<td>16.460–16.585 MHz</td>
<td>13</td>
</tr>
</tbody>
</table>

* The Coast Guard and small boats use this band, with 2.182 MHz set aside as the international distress and emergency channel.

Time Standard Frequencies

The following frequencies announce the exact time of day at specified intervals.

WWV in Fort Collins, Colorado:

2.500 MHz
5.000 MHz
10.000 MHz
15.000 MHz
20.000 MHz

CHU in Canada: 7.335 MHz

VNG in Australia: 4.500 and 12.000 MHz

Long Wave Band

The 150–509.9 kHz range is known as the long wave band. Most stations in this range serve as beacons for aircraft and marine navigation by continuously transmitting their call letters. Through your local library, you can find books on air and marine navigation, which contain lists of the beacon stations and their locations. Reception for this range is best between 6:00 PM and midnight (your time).

Some ships also use this range, with 500 kHz set aside as an international distress and emergency station.

Most stations in this range use CW (Morse code), although some use AM voice transmission for weather broadcasts.
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.

To convert from MHz to kHz, multiply by 1,000. For example:
9.62 x 1,000 = 9,620 kHz

To convert from kHz to MHz, divide by 1,000. For example:
2780 kHz ÷ 1000 = 2.78 MHz

To convert from MHz to meters, divide 300 by the number of MHz. For example:
300 ÷ 7.3 = 41 meters

TROUBLESHOOTING

Your DX-394 Communications Receiver should require very little maintenance. If you have problems, refer to this chart for possible solutions.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Probable Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiver is totally inoperative.</td>
<td>The AC plug is not properly connected.</td>
<td>Check to see that the receiver is plugged into a working AC outlet.</td>
</tr>
<tr>
<td></td>
<td>The optional AC power cable is not properly connected.</td>
<td>Check to be sure the power cable is fully inserted into the AC 120V jack and cigarette lighter.</td>
</tr>
<tr>
<td>Poor or no reception.</td>
<td>Improperly connected antenna.</td>
<td>Check to be sure the antenna is properly connected.</td>
</tr>
<tr>
<td></td>
<td>Poor reception on SW band.</td>
<td>Try to receive between 6:00 PM and midnight.</td>
</tr>
<tr>
<td></td>
<td>Poor reception on LW, MW, and SW band.</td>
<td>Move the receiver to a location with better reception.</td>
</tr>
<tr>
<td></td>
<td>Incorrectly programmed frequencies.</td>
<td>Reprogram the frequencies correctly.</td>
</tr>
<tr>
<td>Error appears on the display.</td>
<td>Programming error.</td>
<td>Reprogram the frequencies.</td>
</tr>
<tr>
<td>Keys do not work or display changes at random.</td>
<td>Undetermined error.</td>
<td>Reset the receiver (see &quot;Resetting the Receiver&quot;).</td>
</tr>
<tr>
<td></td>
<td>The MODE selector is set to STAND BY.</td>
<td>Set the MODE selector to the desired mode.</td>
</tr>
<tr>
<td>Search stops where there is no clear signals.</td>
<td>Birdies.</td>
<td>Using an outdoor antenna might reduce these signals. See &quot;Birdies&quot;.</td>
</tr>
<tr>
<td>ROTARY TUNING and front panel keys do not respond.</td>
<td>The lock function is activated.</td>
<td>Press LOCK to unlock the operation.</td>
</tr>
</tbody>
</table>

If you cannot solve the problem, contact your local Radio Shack/Tandy store for assistance.
CARE AND MAINTENANCE

Your Radio Shack DX-394 Communications Receiver is an example of superior design and craftsmanship. The following suggestions will help you care for your receiver so you can enjoy it for years.

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

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

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

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

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

Modifying or tampering with your receiver's internal components can cause a malfunction and might invalidate the receiver's warranty and void the unit's legal certification to operate. If your receiver is not operating as it should, take it to your local Radio Shack/Tandy store for assistance.

SPECIFICATIONS

Frequency Coverage:
- LW .................................................. 150-509.9 kHz
- MW .................................................. 510-1729.9 kHz
- SW .................................................. 1.75-29.9999 MHz

SW Sub-Bands:
- 2.300-2.495 MHz (120 meters); 3.200-3.400 MHz (90 meters); 3.900-4.000 MHz (75 meters); 4.750-5.060 MHz (60 meters); 5.950-6.200 MHz (49 meters); 7.100-7.300 MHz (41 meters); 9.500-9.900 MHz (31 meters); 11.650-12.050 MHz (25 meters); 13.600-13.800 MHz (21 meters); 15.100-15.600 MHz (19 meters); 17.550-17.900 MHz (16 meters); 21.450-21.650 MHz (13 meters); 25.670-26.100 MHz (11 meters)

Sensitivity: (AM 10 dB (S+N)/N at 30% modulation)
- LW .................................................. 10 uV
- MW .................................................. 7 uV
- SW .................................................. 1 uV
- (SSB 10 dB (S+N)/N) .................................. 0.3 uV
- (CW 10 dB (S+N)/N) .................................. 0.1 uV

Selectivity:
- ±7 kHz (AM) ........................................ 50 dB
- 15 kHz (SSB/CW) .................................... 50 dB

IF Rejection (Lo-Z) .................................... 80 dB

Spurious Rejection (Lo-Z) ................................ 80 dB

IF Frequency:
- 1st .................................................. 45 MHz
- 2nd .................................................. 455 kHz

Antenna Impedance:
- Lo-Z .................................................. 50 ohms
- Hi-Z .................................................. 2 kohms

Audio Output Power (10% THD) .................... 800 mW

Built-In Speaker .................................... 77 mm (3") 8-ohm dynamic type

Power Requirement ................................ AC 120 volts, 60 Hz, 13 watts
- DC 13.8 volts, 8 watts

Operating Temperature ................................ 0 C to 43 C (32 F to 109 F)

Dimensions ........................................... 96 x 233 x 230 mm
(3 11/16 x 9 3/16 x 9 inches)

Weight .................................................. 2.1 kg (4.6 lbs)

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