

CONNECTING HEADPHONES

WARNING: To prevent possible hearing loss, set VOLUME to 0 before you put on the headphones. After you put on the headphones, adjust VOLUME.

For private listening and for stereo sound during FM stereo broadcasts, connect optional stereo headphones with a 1/8-inch plug. Your local Radio Shack store sells a wide selection of stereo headphones.

Insert the headphones' plug into the receiver's headphone jack. This disconnects the receiver's internal speaker.

When you connect stereo headphones and tune to a stereo broadcast, ST appears on the display. For best reception, fine tune the receiver until ST remains steady.

Hearing Comfort and Your Health

Do not listen to your receiver at extremely high volume levels, especially when listening through headphones. Extended high-volume listening can cause permanent hearing loss.

LIGHTING THE DISPLAY

Press LIGHT to light the display. The display light automatically turns off about 15 seconds after you release LIGHT.

LOCKING THE CONTROLS

The lock feature helps prevent you from accidentally turning the receiver on or off, changing the band or frequency, or changing other front-panel controls.

Set the lock switch to LOCK to lock the front-panel buttons. Set the switch to the other position to unlock the buttons.

NOTE: This locks the ROTARY TUNING dial and the front-panel buttons. You can still adjust VOLUME, TONE, and other controls.

USING THE TIME ZONE MAP

Most shortwave stations announce broadcast times in UTC (universal time coordinate). The time zone map on the back of the receiver shows the difference between UTC and each time zone.

To determine your local time, add or subtract the specified number from UTC. During daylight savings time, subtract 1 more hour.

USING THE FOLDING STAND

You can position the receiver more securely and possibly improve the sound by resting the receiver on its stand. Lift the latch on the back of the receiver to open the stand.

LISTENING HINTS

Shortwave listening is a hobby with thousands 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 shortwave listening are available through your local library or newsstand. Consult sources such as the World Radio Handbook, Radio Amateur's Handbook, Passport to World Band Radio, Monitoring Time, 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 shortwave broadcasts in English and in foreign languages.

BAND ALLOCATIONS

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 whose waves are about 19 meters long.

Ham Frequencies

Tuning to the ham radio frequencies can be interesting and helpful, because ham operators often broadcast 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: SSB

80 meters: 3,500 - 3,800 kHz: CW
3,800 - 4,000 kHz: SSB

40 meters: 7,000 - 7,150 kHz: CW
7,150 - 7,300 kHz: SSB

20 meters: 14,000 - 14,200 kHz: CW
14,200 - 14,350 kHz: SSB

15 meters: 21,000 - 21,250 kHz: CW
21,250 - 21,450 kHz: SSB

10 meters: 28,000 - 28,500 kHz: CW
28,500 - 29,700 kHz: SSB

NOTE: These ranges are not precisely observed everywhere in the world.

International Frequencies

International commercial broadcasts are found in the following SW bands. These programs (often in English) usually contains 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 p.m. and midnight (your time).

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

* These bands are reversed for stations in tropical areas.

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

Aircraft Frequencies

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

4,650 - 4,750 kHz
6,545 - 6,765 kHz
8,815 - 9,040 kHz
10,000 - 10,100 kHz
11,175 - 11,400 kHz
13,200 - 13,360 kHz
15,010 - 15,100 kHz
17,900 - 18,030 kHz

Ships and Coastal Stations

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

2,000 - 2,300 kHz *
4,063 - 4,139 kHz
4,361 - 4,438 kHz
8,195 - 8,181 kHz
12,330 - 12,420 kHz
13,107 - 13,200 kHz
16,460 - 16,565 kHz

* The Coast Guard and small boats use this band, with 2,182 kHz 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 kHz
5,000 kHz
10,000 kHz
15,000 kHz
20,000 kHz

CHU in Canada: 7,335 kHz

VNG in Australia: 4,500 and 12,000 kHz

Longwave Band

The 150 - 540 kHz range is known as the longwave band. Reception for this range is best between 6:00 p.m. and midnight (your time). 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.

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:

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

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

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

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

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

7.1 MHz

LISTENING GUIDE

The following list contains some of the more frequently heard stations. All stations operate in English unless otherwise specified.

You can hear these stations, throughout North America. However, reception varies based on the season, time of day, and a number of other conditions.

This information can change at any time. For sources of yearly, up-to-date listings, see "Reference Sources" under "Listening Hints."

kHz	Station	Location	Remarks
3,223	Radio SR	Swaziland	
3,265	Radio Mozambique	Maputo, Mozambique	
3,300	Radio Cultural	Guatemala City, Guatemala	Religious Programs
3,380	Radio Iris	Esmeraldas, Ecuador	Programs in Spanish
3,385	FR3	Cayenne, French Guiana	Programs in French
3,396	Radio Kaduna	Kaduna, Nigeria	
4,750	Radio Bertoua	Bertoua, Cameroon	
4,755	Imo Regional Radio	Imo, Nigeria	
4,777	Radio-TV Gabon	Liberville, Gabon	Programs in French
4,795	Radio Nueva America	La Paz, Bolivia	Programs in Spanish
4,820	Radio Paz y Bien	Ambala, Ecuador	Programs in Spanish
4,832	Radio Reloj	San Jose, Costa Rica	Programs in Spanish
kHz	Station	Location	Remarks
4,855	Radio Clube do Para	Belem, Brazil	Programs in Portuguese
4,890	National Broad- ing Commission	Papua, New Guinea	
4,915	Voice Kenya	Nairobi, Kenya	
4,920	Australian Broad- casting Commission	Brisbane, Australia	
4,945	Radio Colosal	Neiva, Colombia	Programs in Spanish

4,965	Radio Santa Fe	Bogota, Colombia	Programs in Spanish
4,980	Ecos del Torbes	San Cristobal, Venezuela	Programs in Spanish
5,020	Solomon Islands Broadcasting Service	Honiara, Solomon Islands	
5,057	Radio Gjirokaster	Gjirokaster, Albania	Programs in Albanian
5,950	Guyana Broadcasting Service	Georgetown, Guyana	
5,954	Radio Casino	Puerto Limon, Costa Rica	
5,960	Radio Canada International	Montreal, Canada	
5,980	Radio RSA	Johannesburg, South Africa	
6,005	CFCX	Montreal, Canada	
6,025	Radio Malaysia	Kuala Lumpur, Malaysia	Programs in Chinese
6,045	Radio Australia	Lyndhurst, Australia	
6,055	Nihon Shortwave Broadcasting Company	Tokyo, Japan	Programs in Japanese
6,060	Radio Nacional	Buenos Aires, Argentina	Programs in Spanish
6,075	Radio Satatenza	Bogota, Colombia	Programs in Spanish
6,090	Radio Luxembourg	Ville Louvigny, Luxembourg	
kHz	Station	Location	Remarks
6,095	Polskie Radio	Warsaw, Poland	
6,105	Radio New Zealand	Wellington, New Zealand	
7,140	Trans World Radio	Monte Carlo, Monaco	
7,170	Radio Noumea	Noumea, New Caledonia	Programs in French
7,300	Radio Tirana	Tirana, Albania	
9,475	Radio Cairo	Cairo, Egypt	
9,515	Voice of Greece	Athens, Greece	
9,525	Radio Korea	Seoul, South Korea	

9,530	Spanish Foreign Radio	Madrid, Spain	
9,535	Swiss Radio International	Berne, Switzerland	
9,540	Radio Prague	Prague, Czechoslovakia	
9,570	Radio Bucharest	Bucharest, Rumania	
9,575	Italian Radio and Television Service	Rome, Italy	
9,610	Radio-TV Algeria	Algiers, Algeria	Programs in Arabic
9,620	Radio Berlin International	Berlin, Germany	
9,645	Radio Norway	Oslo, Norway	
9,720	Radio Iran	Tehran, Iran	Programs in Farsi
9,745	HCJB	Quito, Ecuador	
9,770	Austrian Radio	Vienna, Austria	
9,800	Radio Kiev	Kiev, USSR	
9,835	Radio Budapest	Budapest, Hungary	
10,040	Voice of Vietnam	Hanoi, Vietnam	
11,655	Israel Radio	Jerusalem, Israel	
11,690	Radio Kuwait	Kuwait, Kuwait	
kHz	Station	Location	Remarks
11,705	Radio Sweden	Stockholm, Sweden	
11,720	Radio Moscow	Moscow, USSR	
11,735	Radio Sofia	Sofia, Bulgaria	
11,745	Voice of Free China	Taipei, China	
11,815	Radio Japan	Tokyo, Japan	
11,825	Radio Tahiti	Papeete, Tahiti	Programs in Tahitian
11,835	4VEH	Cap Haitien, Haiti	
11,845	Radio Canada International	Montreal, Canada	
11,850	Deutsche Welle	Cologne, Germany	

11,890	Voice of Chile	Santiago, Chile	
11,900	Radio RSA	Johannesburg, South Africa	
11,910	BBC	London, England	
11,930	Radio Havana Cuba	Havana, Cuba	
11,935	Radio Portugal	Lisbon, Portugal	
11,945	Radio Peking	Peking, China	
11,955	Voice of Turkey	Ankara, Turkey	
11,980	Radio Moscow	Moscow, USSR	
15,038	Saudi Arabian Broadcasting Service	Riyadh, Saudi Arabia	Programs in Arabic
15,135	Radio Moscow	Moscow, USSR	
15,165	HCJB	Quito, Ecuador	
15,190	ORU	Brussels, Belgium	
15,205	All India Radio	New Delhi, India	
15,260	BBC	London, England	
15,265	Finnish Radio	Helsinki, Finland	
15,275 kHz	Radio Sweden Station	Stockholm, Sweden Location	Remarks
15,305	Swiss Radio International	Berne, Switzerland	
15,310	Radio Japan	Tokyo, Japan	
15,320	Radio Australia	Melbourne, Australia	
15,400	BBC	London, England	
15,430	Radio Mexico	Mexico City, Mexico	Programs in Spanish
15,465	Radio Pakistan	Islamad, Pakistan	Programs in Urdu
17,720	Radio France International	Paris, France	
17,825	Vatican Radio	Vatican City	
17,860	Austrian Radio	Vienna, Austria	
21,495	Israel Radio	Jerusalem, Israel	

21,525	Radio Australia	Melbourne, Australia	
21,625	Israel Radio	Jerusalem, Israel	
21,645	Radio France International	Paris, France	
21,735	Radio-TV Morocco	Rabat, Morocco	Programs in Arabic
25,790	Radio RSA	Johannesburg, South Africa	

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