SONY

CRF-160

INSTRUCTIONS FOR USE

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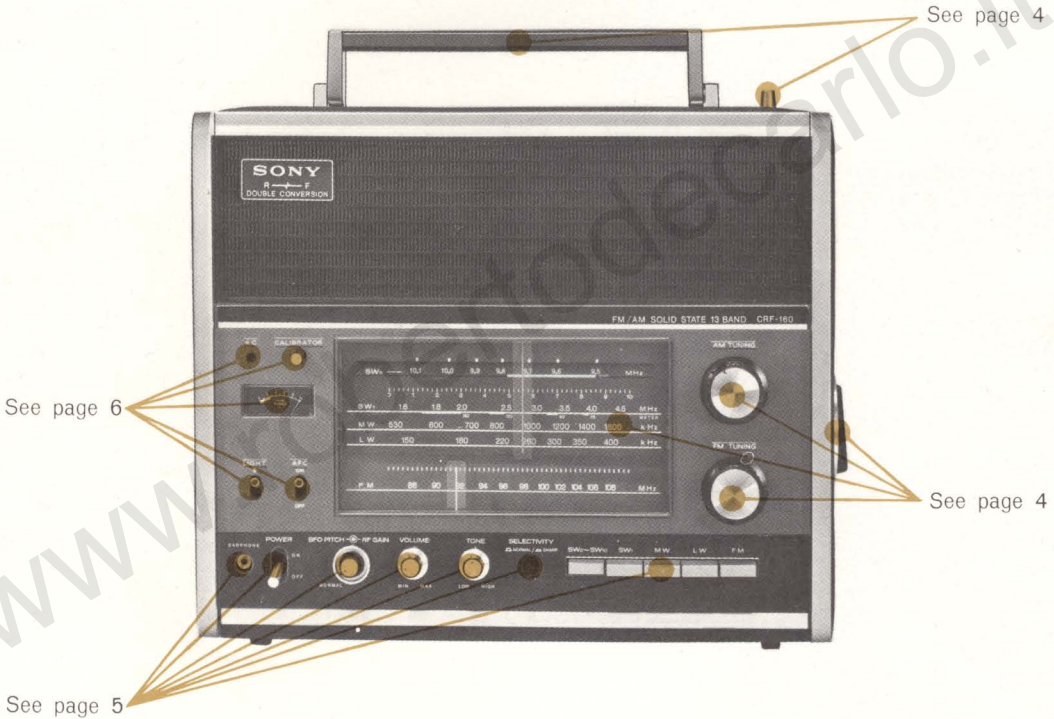
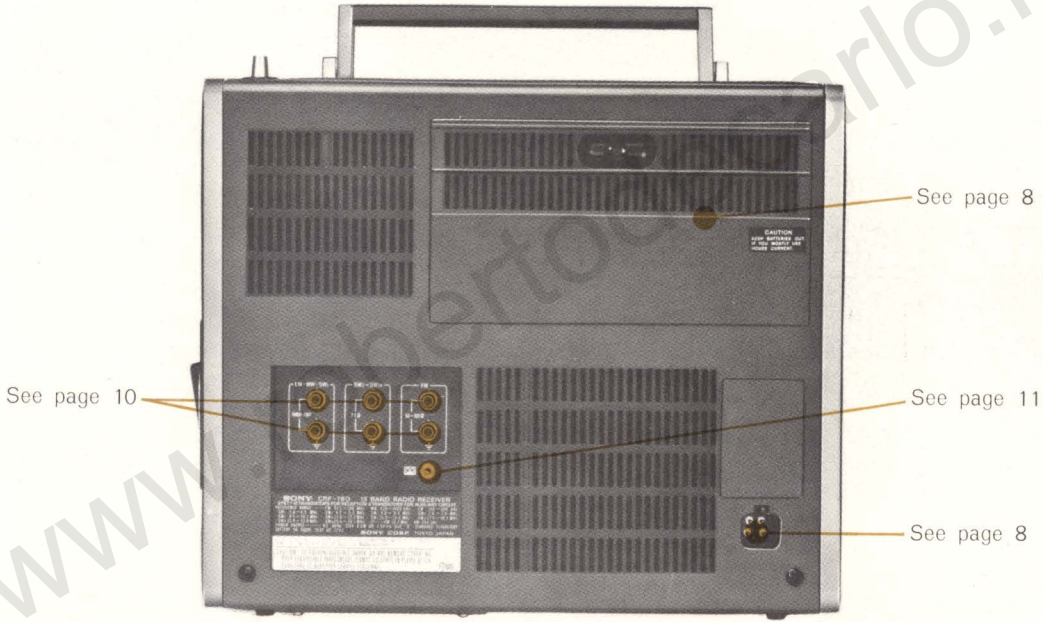
The SONY CRF-160 is a high-performance receiver that presents you with listening enjoyment of a total of 13 bands; FM/AM/LW plus ten short wave bands. Either a drift-free, dynamic FM program or an absorbingly on-the-spot short wave reception, skipping over interval of time and distance—Enjoy to the utmost your CRF-160. Additionally, enjoyment of SSB signal and CW reception is possible. You can also intercept amater radio's communication within the range of SW1 and SW4.

TABLE OF CONTENTS

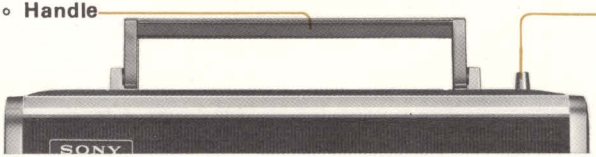
IDENTIFICATION OF EACH PART AND CONTROL





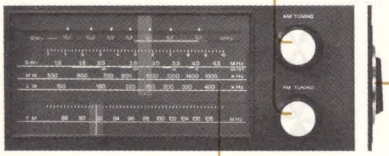
CONTROLS & INDICATORS

- **Handle**



- **Tuning Knobs**

  The upper knob is for tuning in SW, LW and MW the lower knob is for tuning in FM only.



- **Dial Scale**
- **Short Wave Band Selecting Knob**

  Rotate the knob until the desired short wave frequency range indicator appears in the dial scale. Short wave band ranges included in SW_{2-10} are as follows

SW_2	5.3–4.7 MHz	SW_6	12.2–11.6 MHz
SW_3	6.4–5.8 MHz	SW_7	15.6–15.0 MHz
SW_4	7.6–7.0 MHz	SW_8	18.1–17.5 MHz
SW_5	10.1–9.5 MHz	SW_9	22.0–21.4 MHz
		SW_{10}	26.1–25.5 MHz

- **Telescopic Antenna**

  Functions with SW_{1-10} and FM reception.
  For SW_{1-10}, pull out the antenna rod to its full length and stand it vertically.
  For FM, also pull out the antenna rod to its full length like SW_{1-10} reception. Then slant it and vary the length, direction and angle for the best reception.

- **Earphone Jack**

  Plug the supplied earphone into this jack. The built-in speaker will automatically be disconnected.

- **Power Switch**

  Place the switch upward to turn the receiver **ON**. If you use the set from the AC power line, the dial scale lights and the AC Lamp on the upper left hand on the front panel illuminates green. To turn off the set, place the switch down to **OFF**. This switch will automatically be switched OFF, if the front cover is correctly settled into the cabinet.

◦ Volume Control

Clockwise rotation of the knob increases the sound volume.

◦ Band Selecting Buttons

Depress one of the five buttons, SW_{2-10}, SW_1, MW, LW, FM and select a band. Press another button and the button depressed previously pops up.

◦ Selectivity Button

By depressing the button, you restrict more narrowly the received signal width thereby getting sound distinctivity. When you want to tune in a considerably far-away SW station where noise interferences exist and what you want is articulation rather than sound quality, depress the button to SHARP. In FM reception, this switch does not function.

◦ Tone Control

Turn to HIGH to accentuate the treble sound.
Turn to LOW to accentuate the bass sound.

◦ BFO Pitch Control

After setting RF Gain Control on, place the pointer of this control at the center position. Then turn clockwise for USB (upper side band) or counterclockwise for LSB (lower side band) precisely to get the clearest signal of SSB/CW.

◦ RF Gain Control

When SSB/CW reception, turn this control clockwise with a click.

- Make sure that this control is Off [NORMAL] position except for SSB/CW reception.

AC Lamp
Illuminates when used on AC power line.

Calibrator Reset Knob
Calibrations just above the Short Wave Band Indicating Window can be shifted slightly by turning this knob. In case any of the dial calibrations for SW_{2-10} does not agree with the frequency of a known signal, turn the knob to meet with the exact positioning of the frequency of a known signal.

Tuning/Battery Check Meter
When tuning in, the pointer swings to the right. To check the battery condition, turn the Tuning Knob where there is no broadcasting (detune) and watch the meter. When the pointer stays out of the white zone, replace the batteries with all new ones.
While SSB/CW reception, this meter has no affect on its reception condition.

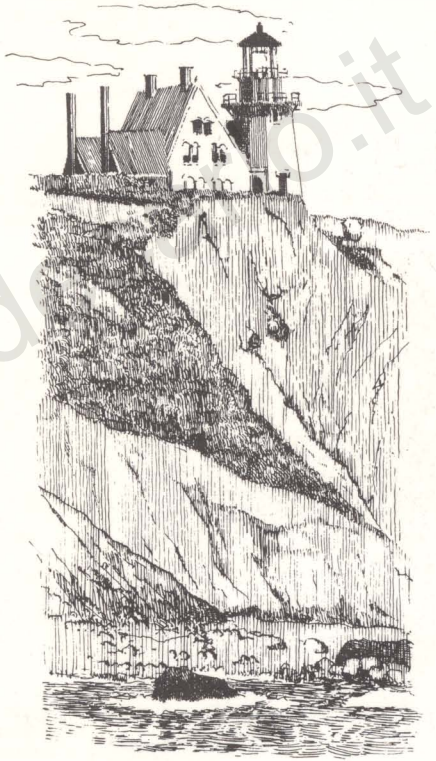
AFC Switch
Automatic Frequency Control is effective for stable FM reception. Keep this switch usually **ON** (up position), but if the reception of the desired FM station is still unsatisfactory, signals of this station may be weak or its frequency may be adjacent (within 1 MHz) to a strong signal station. In such case, depress the AFC Switch to cut off the automatic frequency control and tune in the station.

Dial Light Switch
When you operate the set with batteries, press down this switch to illuminate the Tuning Meter and the Dial Scale for easy reading.

◦ Front Cover

Place your forefingers in the catches on the left and right sides of the cover and slightly press the metallic sash with the thums and pull outward to remove the cover.

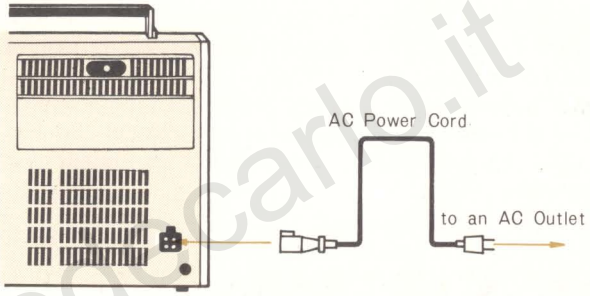
To place the front cover, first place the upper part of the cover into the groove on the cabinet top and then press the lower part of the cover till you hear a slight click.

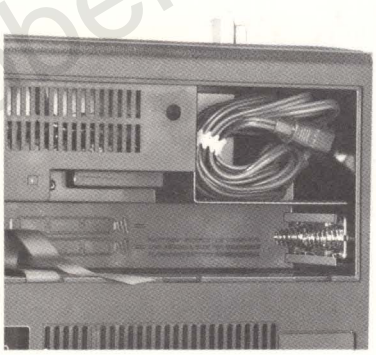


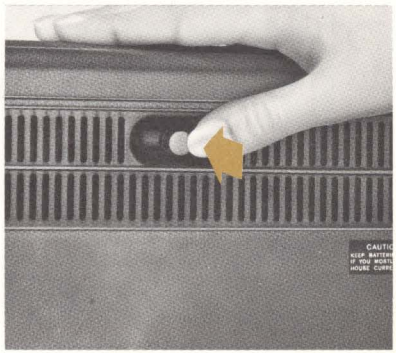
POWER SOURCE

On House Current

Pull the tiny projection on the cover of the rear panel and remove the cover. The AC power cord is stored in the upper compartment. The lower compartment is for installing batteries. Insert the four-hole plug of the AC power cord into the AC power socket located at the lower right of the rear panel, and connect the other end to an AC house current outlet. **The AC power line voltage of this receiver is preadjusted to 120-Volt for use in the United States.**

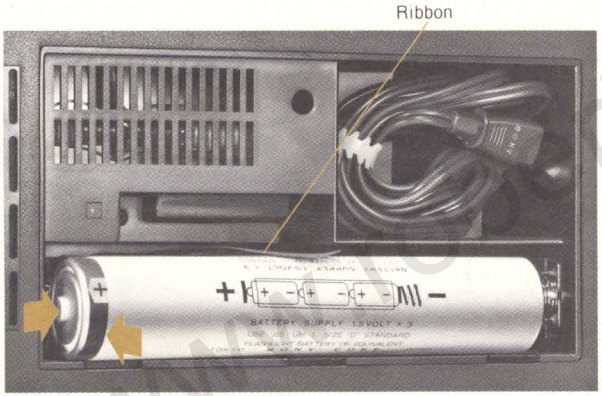






With Standard Batteries

Insert three batteries (size D), supplied, into each cylinder with the correct polarity. Observe polarity instruction on the cylinder. Place two cylinders containing the batteries on the ribbon in the compartment. Press the negative end (flat side) of the battery against the spring contact and push the other end of the cylinder slightly. Pull the ribbon when you remove the batteries from the set.

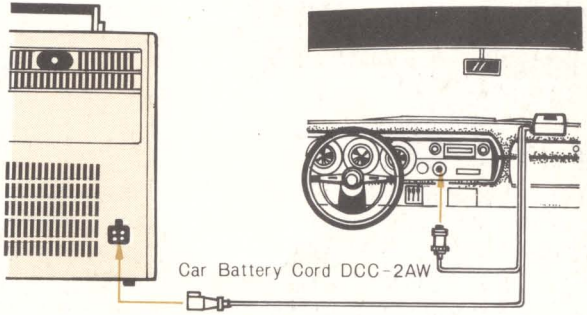


Battery Life Checking

To know when to replace the batteries, watch the Tuning/Battery Check Meter in a detuned condition. If the pointer does not return to the left (white zone) but remains to the right, the batteries are exhausted. In such case, replace the batteries with all new ones.

On Auto/Boat Battery

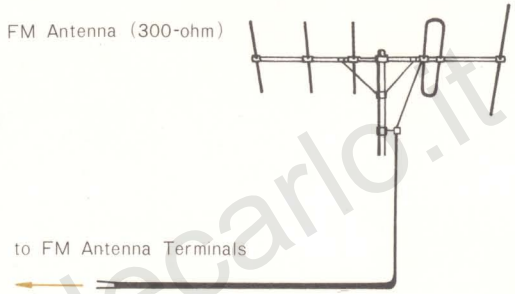
Use SONY Car Battery Cord DCC-2AW, optional accessory. Round plug of the car battery cord is to be inserted into the cigarette lighter socket of the 12-volt car or boat.



OUTDOOR ANTENNA

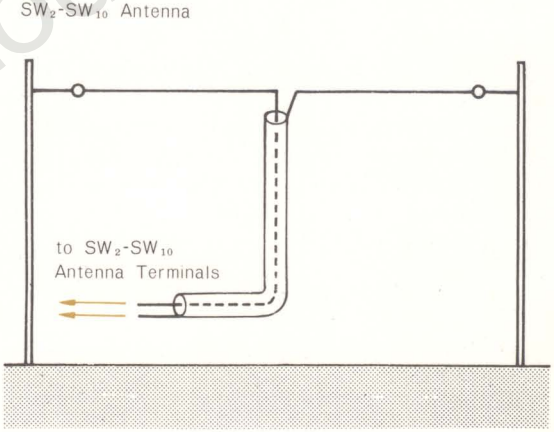
FM

Use the 50-300-ohm balanced antenna. Loosen the FM antenna terminal screws and connect the feeder wire to the terminals behind the washer.



SW_2-SW_{10}

Use the popular dipole antenna with a 75-ohm coaxial antenna cable. Connect the lead-in wires of the coaxial antenna cable to the SW_2-SW_{10} Antenna Terminals.



SW_1, LW, MW

Connect the antenna wire of more than 16-feet long to these terminals and extend it outdoors as high as possible.

Grounding

When outdoor antennas are used, simultaneous use of a ground wire will eliminate hum and noise and greatly improve reception. Connect the end of the ground wire to a ground terminal and the other end to a convenient external ground.

WITH YOUR TAPE RECORDER

Recording [⏺]

Connect the recording jack to a microphone input jack of a tape recorder with the use of proper connecting cord for recording radio program. The position of the Volume and Tone Controls does not affect the recording level.
For more detail, refer to the instruction manual of your tape recorder.

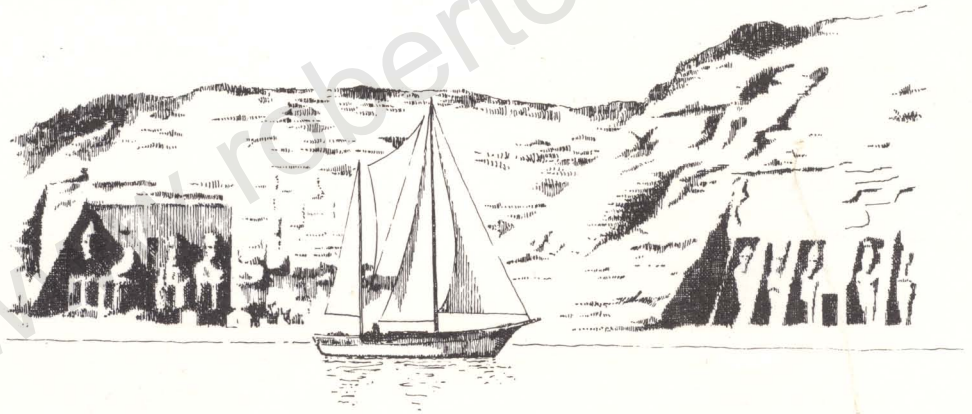
SSB/CW RECEPTION

This receiver is designed to receive SSB (single sideband) signal and CW (continuous wave) signal. Generally SSB signal is used for communications of radio hams, ships or planes. CW signal is transmitted by means of Morse Code, therefore, the understanding of the Morse Code is required for CW reception. The receiver covers ham bands transmitted by SSB signal on SW_1 and SW_4 bands.

OPERATING CHART

	FM	SW_1-SW_{10}	MW, LW
1.	**Antenna** Telescopic Antenna Pull its full length and slant. Adjust the direction and angle.	Telescopic Antenna—Pull its full length and stand vertically.	Built-in Ferrite Bar Antenna—Rotate the set horizontally.
2.	**Power ON**		
3.	**Band Selecting** Push FM Button.	Push SW_1 or SW_2-SW_{10} Button. Rotate the Short Wave Band Selector Knob until the desired short wave band frequency range appears on the Dial Scale.	Push either of ' MW or LW Button
4.	**Tuning** Tuning with FM Tuning Knob.	Tuning with AM Tuning Knob.	Tuning with AM Tuning Knob.
5.	**AFC Switch Setting** ON↔OFF		
6.	**Selectivity Switch**	NORMAL↔SHARP	NORMAL
7.	**Volume & Tone Adjustment**		

	FM	SW_1-SW_{10}	LW, MW
8.	**RF Gain Control** Off (NORMAL)	AM reception....Off (NORMAL) SSB/CW reception.....On	Off (NORMAL)
9.	**BFO Pitch Control**	For SSB/CW..Place the pointer of this control at the center position. Then turn clockwise or counterclockwise until the clearest signal is received.	



BRIEF NOTES ON SHORT WAVE

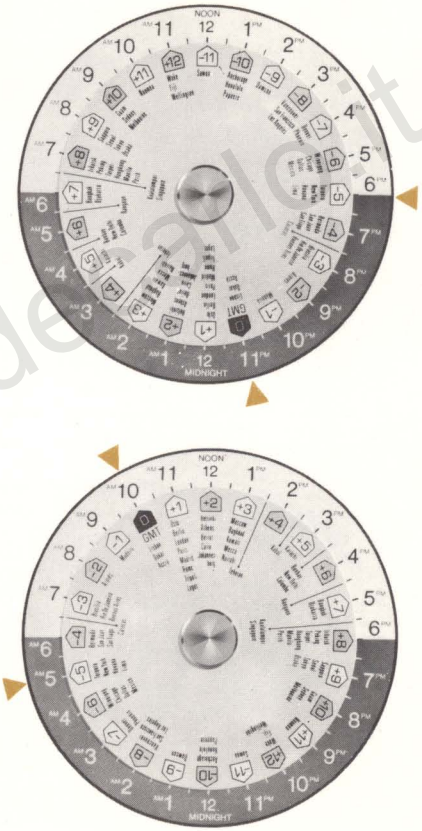
Most radio waves are transmitted on long wave or medium wave and they are usually used in local broadcasts. Short wave broadcasting is, however, transmitted over longer distances and it is used for international radio service, amateur radio, ships or planes.

Greenwich Mean Time (GMT)

Because of its world-wide characteristics, short wave broadcasting times are indicated by Greenwich Mean Time, the standard time throughout the world. The World Time Dial and the Map attached inside the Front Cover of the set will help you to convert the GMT into your local time or vice versa.

To change the GMT to your local time, turn the World Time Dial and fit the GMT to the outside time and read your local time. For example, 11 p.m. at GMT is 6 p.m. in New York.

To change your local time that of the GMT, fit your locations on the Time Dial to the present time on the outside of the Time Dial and read the time at GMT. For example, 5 a.m. in New York is 10 a.m. at GMT.

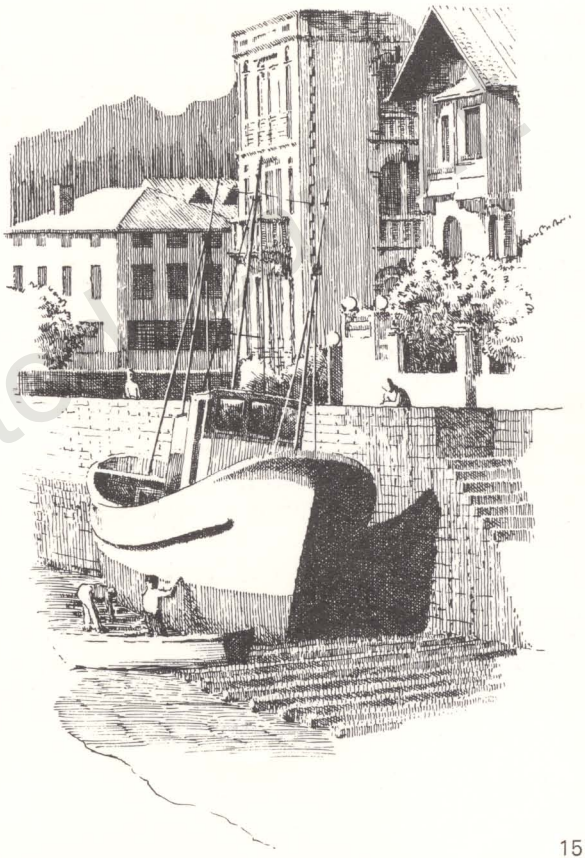


Changes of Transmission by Seasons and Time

The short waves are transmitted bouncing several times off the ionosphere which is a layer of electric field encompassing the earth. The state of the ionosphere is mostly affected by the position of the sun. Therefore, the way in which short waves are transmitted changes according to the time of the day, the season of the year, the eleven year cycle of the sun or other aerial conditions. The short wave broadcasting stations in the world consider these conditions and some stations transmit the same program on more than one frequency or transmit in another frequency according to the season. You may choose the frequency which you think can be received most clearly.

Discrimination of Stations

- By announcement during broadcasting—Usually the station name or call sign of the station is announced every 15 minutes or 30 minutes.
- By interval signal—Most of the short wave radio stations broadcast their native music, cry of some animal or bird before starting the program.
- By signal frequency—See the receiving signal frequency by the Dial Scale or by the announcement and referring to the list about the station and its signal frequency, find sure the name of the station.



Verification Card

Collection of an attractive verification cards issued by each short wave broadcasting station will add another interest. To obtain these cards, send an accurate possible information about the broadcast you received. This information is normally written in English and the following points should be put down :
name of the station / date and time of the broadcast/ receiving signal frequency or meter band/detailed contents of the program / receiving condition, i.e. signal strength, interference, etc./the place where you received the broadcast/listener's name and address.

SINPO Code

For explaining the receiving condition, usually SINPO code for SW and RST code for amateur radio are used. Refer to the following tables. Instead of writing report, sending the recorded tape of the received programs will please the station very much and in return they will send you an interesting recorded tape.

SINPO CODE

	Signal Strength	Interference	Noise	Propagation Disturbance	Overall Rating
	S	I	N	P	O
5	excellent	nil	nil	nil	excellent
4	good	slight	slight	slight	good
3	fair	moderate	moderate	moderate	fair
2	poor	severe	severe	severe	poor
1	barely audible	extreme	extreme	extreme	unusable

RST CODE

	Readability	Signal Strength	Tone
	R	S	T
1	Unreadable	Faint signals, barely perceptible	Extremely rough hissing note
2	Barely readable, some words distinguishable	Very weak signals	Very rough a.c. note, no trace of musicality
3	Readable with considerable difficulty	Weak signals	Rough low-pitched a.c. note, slightly musical
4	Readable with practically no difficulty	Fair signals	Rather rough a.c. note, moderately musical
5	Perfectly readable	Fairly good signals	Musically-modulated note
6		Good signals	Modulated note, slight trace of whistle
7		Moderately strong signals	Near d.c. note, smooth ripple
8		Strong signals	Good d.c. note, just a trace of ripple
9		Extremely strong signals	Purest d.c. note

SPECIFICATIONS

Circuitry:	Superheterodyne (FM, SW_1, MW, LW) Double superhetrodyne (SW_{2-10}) 22 transistors 18 for reception (incl. 2 FET) 4 for auxiliary circuit 13 diodes, 4 thermistor
Frequency range:	FM 87.5–108 MHz (3.43–2.75m) MW 530–1,605 kHz (560–187m) LW 150–400 kHz (2000–750m) SW-1 1.6–4.5 MHz (187–67m) SW-2 4.7–5.3 MHz (60m) SW-3 5.8–6.4 MHz (49m) SW-4 7.0–7.6 MHz (41m) SW-5 9.5–10.1 MHz (31m) SW-6 11.6–12.2 MHz (25m) SW-7 15.0–15.6 MHz (19m) SW-8 17.5–18.1 MHz (16m) SW-9 21.4–22.0 MHz (13m) SW-10 25.5–26.1 MHz (11m)
Antenna:	FM: Telescopic Antenna 3 ft. 11 in. external antenna terminals (50–300 ohm) are provided MW/LW: built-in ferrite bar antenna external antenna terminals SW-1–SW-10: Telescopic Antenna external antenna terminals (75-ohm) are provided
Speaker:	3×6″ impedance 4 ohms
Power output:	AC 2.3 W (undistorted) 3.8 W (maximum) DC 1.1 W (undistorted) 1.7 W (maximum)
Current drain:	AC 84 mA DC 350 mA
Maximum sensitivity: (at 50mW output, S/N 6dB)	FM 0 dB (1 μV) MW 28 dB (25.1 μV) LW 32 dB (39.8 μV) SW 0 dB (1 μV)
Power source:	DC 9 V Flashlight battery, size 'D'×6 AC 100V 120V, 220V, 240V 120V for USA and Canada
Dimensions:	$13\frac{1}{8}$″×$10\frac{3}{16}$″×$5\frac{11}{16}$″ (w/h/d) (340×275×144mm)
Weight:	15 lb 7 oz (7 kg)
Supplied accessories:	Earphone, AC Power Cord Polishing cloth Battery size ''D''×6
Optional accessories;	Car Battery Cord DCC-2AW
Hz (Hertz);	cycles per second

Design and specifications are subject to change without notice.

APPLICATION OF EACH BAND

Band	Frequency range	Meter band	Main application
LW	150-400 kHz	2000-750m	Radio Beacon FAA Weather band (200-400 kHz)
MW	530-1,605 kHz	560-187m	MW bands in the world
SW1	1.6-4.5 MHz	187-67m	Marine band, Ham band (160m, 75m) MW and SW bands in the tropicals (120m, 90m) SW bands in the world
SW2	4.7-5.3 MHz	60m	MW and SW bands in the tropicals
SW3	5.8-6.4 MHz	49m	SW bands in the world
SW4	7.0-7.6 MHz	41m	SW bands in the world, Ham band
SW5	9.5-10.1 MHz	31m	SW bands in the world
SW6	11.6-12.2 MHz	25m	SW bands in the world
SW7	15.0-15.6 MHz	19m	SW bands in the world
SW8	17.5-18.1 MHz	16m	SW bands in the world
SW9	21.4-22.0 MHz	13m	SW bands in the world
SW10	25.5-26.1 MHz	11m	SW bands in the world
FM	87.5-108 MHz	3.43-2.75m	FM bands

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