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hallicrafters

OPERATING AND SERVICE INSTRUCTIONS

TRANSCEIVER
MODEL CB-11

WARRANTY

"The Hallicrafter's Company warrants each new radio product manufactured by it to be free from defective material and workmanship and agrees to remedy any such defect or to furnish a new part in exchange for any part of any unit of its manufacture which under normal installation, use and service discloses such defect, provided the unit is delivered by the owner to our authorized radio dealer, wholesaler, from whom purchased, or, authorized service center, intact, for examination, with all transportation charges prepaid within ninety days from the date of sale to original purchaser and provided that such examination discloses in our judgment that it is thus defective.

This warranty does not extend to any of our radio products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation, or to use in violation of instructions furnished by us, nor extended to units which have been repaired or altered outside of our factory or authorized service center, nor to cases where the serial number thereof has been removed, defaced or changed, nor to accessories used therewith not of our own manufacture.

Any part of a unit approved for remedy or exchange hereunder will be remedied or exchanged by the authorized radio dealer or wholesaler without charge to the owner.

This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our radio products."

the hallicrafters co.

092-014557

SECTION 1
INTRODUCTION

1-1. DESCRIPTION.

The Hallicrafters Model CB-11 is a compact, battery-operated, completely self-contained, fully-transistorized transmitter-receiver designed for voice communication in the 27-megacycle band. It is capable of operation in an FCC licensed Class D Citizens Band system or can be operated unlicensed by anyone, regardless of age, in conjunction with other units of the same type.

Two of these units will provide convenient, reliable voice communication for business or pleasure at ranges up to two miles. Applications are many — outdoor sports (boating, hunting, fishing), home or business intercommunication, rescue work, fire and police work begin just a few.

It is recommended that you read and become familiar with the operating procedure and rules given in this manual before operation.

1-2. LICENSING

As previously mentioned, no license is required for operation providing communication is between other unlicensed units of the same type.

If it is desired to use the Model CB-11 with a higher power Class D system, it must be licensed in accordance with Part 19 of the Federal Communications Commission Rules and Regulations. The CB-11 meets all Class D technical requirements. Additional information concerning Class D citizens band radio can be obtained from your local Hallicrafters dealer.

1-3. CIRCUIT DESCRIPTION.

The signal received from the antenna is amplified by RF transistor stage Q1. The received signal (27 MC) is then combined in the RF mixer transistor Q2 with the oscillator signal from the crystal oscillator Q9 (27 MC-455 KC) to produce the intermediate frequency of 455 KC. Transistors Q3 and Q4 amplify this relatively small IF signal to a level suitable for detection by 1N60 diode CR1. Through the VOLUME control, the signal is fed to the audio amplifier transistor Q5 and to the AF power output transistor Q6 and Q7 which are arranged in a push-pull configuration. From here the signal is applied to the speaker. An AVC circuit controls the gain of IF amplifier transistor. Q3 and RF amplifier transistor Q1.

When the PUSH-TO-TALK switch is depressed, the speaker, now serving as a microphone, is connected to transistors Q5, Q6 and Q7. Modulating voltage from AF output transistors Q6 and Q7 is supplied to the final amplifier transistor Q8 to produce an amplitude-modulated signal at the crystal frequency of Y1. The output of transistor Q8 is connected to the whip antenna through the transmitter antenna coil, L4.

Figure 1. Hallicrafters Model CB-11.

TECHNICAL DATA

Transmitter	
Power Input to RF Stage	100 MW (FCC maximum).
Modulation	AM, maximum 85%.
Frequency Control	Plug-in quartz crystal
Receiver	
Speaker Output	125 MW.
IF Frequency	455 KC.
Frequency Control	Plug-in quartz crystal (as in transmitter except 455 KC lower in frequency).
Earphone Jack	Low impedance earphone.
General	
Antenna	39 inch (collapsible whip).
Battery	9 volt battery
Dimensions (HxWxD)	6-3/8 x 2-3/4 x 1-1/2 inches.
Weight (Net)	10 oz. (Less Battery)

SECTION II
INSTALLATION

2-1. UNPACKING.

After unpacking your Model CB-11, examine it closely for damage that may have occurred in transit. Should any sign of damage be apparent, immediately file a claim with the carrier stating the extent of the damage. Carefully check the instructions on all shipping labels and tags before removing or destroying them.

2-2. BATTERY INSTALLATION.

Before operation, the Model CB-11 must be equipped with a nine volt battery. The battery (Burgess type 2U6; Ray-O-Vac 1604; Eveready 216; Mallory M1604; or equivalent) can be supplied and installed by your Hallicrafters dealer.

SECTION III
OPERATION

3-1. OPERATION PROCEDURE.

There are two controls associated with operation of the Model CB-11. The VOLUME control, which is also the POWER on/off switch, and the PUSH-TO-TALK button.

Extend the antenna to its full length. Turn the unit on by rotating the VOLUME on/off switch in an upward direction until a click is heard. Adjust the control in the same direction until a slight hissing sound comes from the speaker. The unit is now set to receive incoming calls from your other units.

TO TRANSMIT: Hold the unit in either hand, as convenient, with the speaker (perforated area in front of unit) about four inches away from your mouth. Depress the PUSH-TO-TALK button all the way. Speak clearly in a normal voice. Do not shout. After you have completed your transmission, release the PUSH-TO-TALK button, returning the unit to the receive mode. You must press the button each time you talk and release it in order to listen. Best results will be obtained by holding the unit in a near vertical position, antenna extended upward, clear of any obstructions. To shut the unit off rotate the VOLUME control downward until it clicks off.

3-2. OPERATION SUGGESTIONS.

Since frequencies on which the Model CB-11 is authorized to operate are shared on a party-line basis, common sense and courtesy should be observed while operating.

POINTS TO REMEMBER:

1. Do not transmit if you hear other stations using the frequency. Your transmission may interfere with their communication. Wait until they are finished.
2. Address your call directly to the unit you are calling through some prearranged signal such as "unit one calling unit two, come-in." If other stations are listening they will know you are using the frequency and will stand by until you have finished your communication.
3. Use only language appropriate for radio communications.
4. You may hear Class D Citizens Band stations on your unit. Remember, by law, you are not permitted to talk to them unless your unit is Class D licensed or unless there is an emergency.

SECTION IV
SERVICE DATA

4-1. BATTERY REPLACEMENT.

Under normal conditions of usage and operation, the battery cells recommended for use in your Model CB-11 can be expected to give at least 12 hours of service. Operation in fairly cold temperatures (under 32°F) will require more frequent replacement.

To assure maximum efficiency from your transceiver, replace battery when the battery indicator points to "REPLACE."

The battery recommended is as specified in paragraph 2-2 and are available from your Hallicrafters dealer. Battery replacement in the Model CB-11 is quite simple and requires no special tools. To replace the battery proceed as follows:

1. Be sure the unit is off.

2. Loosen the battery cover screw (at rear of cabinet) with a coin or screwdriver and remove the cover.

3. Lift out the battery.

4. Replace the battery and battery cover by reversing the procedure above.

CAUTION

Do not leave the unit in excessively warm or cold locations such as on the rear deck or in the glove compartment of an automobile, for any length of time. Permanent transistor damage may result because of excess heat. Excessively cold temperatures reduce battery efficiency.

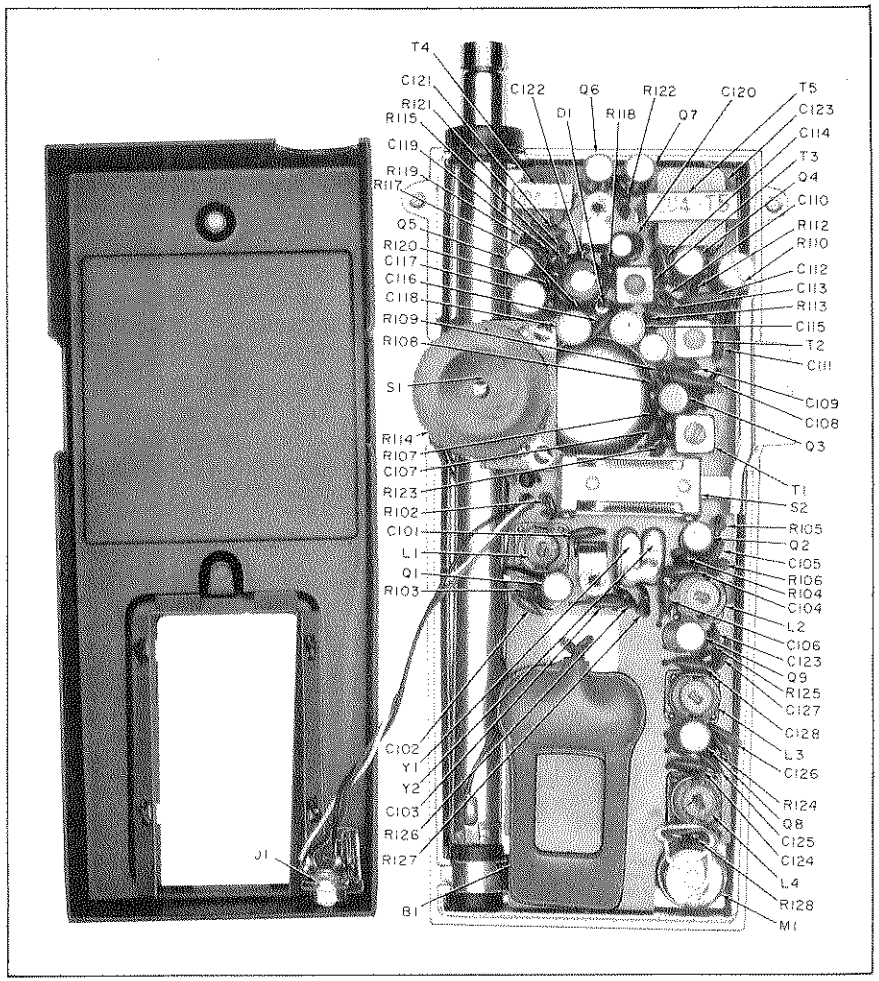

Figure 2. Internal View of Model CB-11

4-2. CHANGING FREQUENCY.

Your Model CB-11 has been equipped and adjusted at the factory for operation on Channel 9 (27.065 MC). This frequency is determined by a quartz crystal, plug-in unit. Two are used: one for transmit, and one for receive. To change channels, both crystals must be replaced. Factory tuning adjustments are adequate for operation on any of the authorized frequencies using Hallicrafters crystals. For your convenience, your Hallicrafters dealer has in stock all Citizen Band channel crystals and is equipped to install them at a nominal charge. Any Citizen Band channel crystal between 2 and 23 may be used in the Model CB-11.

4-3. ADJUSTMENTS.

Changing to any other channel between channels 2 and 23 may be accomplished by merely inserting the proper crystals in the unit without any further adjustments. Adjustments should only be made by qualified persons familiar with FCC Rules and Regulations and transistorized equipment. In the event of damage to or suspected malfunctioning of the receiver or transmitter RF coils, realignment will be necessary.

RECEIVER ADJUSTMENT.

The 455-KC IF amplifier will not normally need readjustment unless an IF transformer is replaced. To align the IF amplifier, use an accurately calibrated signal generator set to 455 KC, with 30% modulation at 1000 CPS. Connect the hot lead from the signal generator to the antenna. Connect the ground lead from the signal generator to the brass stud/spacer located adjacent to T4.

Connect an output power meter, set to 8 ohms, to the earphone jack at the bottom of the unit. Turn the CB-11 on and set the VOLUME control to maximum. Adjust transformers T1, T2, and T3 for maximum output, readjusting signal generator input to maintain an output of approximately 10 milliwatts.

To align the antenna circuit, the whip antenna should be fully collapsed. Connect a signal generator capable of covering the citizens band frequencies to the antenna through a 30 micromicrofarad capacitor. Ground the signal generator to the brass stud/spacer.

Tune the signal generator to the channel frequency and rock it slightly for maximum output. Adjust coil L2 for maximum output, readjusting the signal generator input to maintain an output of approximately 10 milliwatts.

TRANSMITTER ADJUSTMENT.

Connect a calibrated milliammeter with a 0-30 MA full-scale deflection in series with a 9-volt source.

Extend the antenna fully and hold the unit in an upright position with the left hand, making certain that the antenna is clear of all obstructions. Press the PUSH-TO-TALK switch to transmit. Turn the core of oscillator coil, L3, counterclockwise until oscillation stops. At this point the normal reading on the meter will be approximately ten milliamperes.

Slowly adjust the oscillator coil, L3, clockwise while observing the meter. The circuit begins to oscillate when the meter shows a sharp rise in current. Adjust L3 one complete turn clockwise after oscillation begins.

While still observing the meter, adjust the transmitter output coil, L4, for approximately 22 milliamperes.

The transmitter section is now aligned and ready for operation.

4-4. SERVICE AND OPERATING QUESTIONS.

For further information regarding operation or servicing of this equipment, contact the Hallicrafters dealer from whom it was purchased. The Hallicrafters Company maintains an extensive system of Authorized Service Centers where any required service will be performed promptly and efficiently at no charge if this equipment is delivered to the service center within 90 days from date of purchase by the original buyer and the defect falls within the terms of the warranty. It is necessary to present the bill of sale in order to establish warranty status. After the expiration of the warranty, repairs will be made for a nominal charge. All Hallicrafters Authorized Service Centers display the sign shown at right.
For the location of the one nearest you, consult your local telephone directory.

Service shipments should not be made to the factory unless instructed to do so by letter, as The Hallicrafters Company will not accept responsibility for unauthorized shipments.

The Hallicrafters Company reserves the privilege of making revisions in current production of equipment and assumes no obligation to incorporate such revisions in earlier models.

NOTE

When ordering replacement crystals, specify the Hallicrafters, part number 120-002062 (receive crystal) and 120-002061 (transmit crystal) plus the channel required. For example: 120-002062-9 and 120-002061-9 for channel 9 or 120-002062-12 and 120-002061-12 for channel 12.

SERVICE PARTS LIST

Schematic Symbol	Description	Hallicrafters Part Number
	CAPACITORS	
C101,102,105, C106,107,116, C125,126,127, C129	0.01 μF, Ceramic	120-002040
C103,124	30 PF, Ceramic	120-002047
C104,114	0.02 μF, Mylor	120-002049
C108,112	0.05 μF, Ceramic	120-002042
C109	7 PF, Ceramic	120-002045
C110	0.1 μF, Ceramic	120-002043
C111,123	0.02 μF, Ceramic	120-002041
C113	5 PF, Ceramic	120-002044
C115,117	10 μF, 3V, Electrolytic	120-002050
C118	30 μF, 3V, Electrolytic	120-002051
C119	100 PF, Ceramic	120-002048
C120	10 μF, 10V, Electrolytic	120-002052
C121	0.005 μF, Ceramic	120-002039
C122	50 μF, 10V, Electrolytic	120-002053
C128	20 PF, Ceramic	120-002046
	*RESISTORS	
R101,108	150K ohm	120-002038
R102	2.2K ohm	120-002028
R103,112,117	1K ohm	120-002027
R104,115	33K ohm	120-002033
R105,110,116, R126	5.6K ohm	120-002030
R106	3.3K ohm	120-002029
R107	680 ohm	120-002026
R109	1.5K ohm	120-002054
R111	56K ohm	120-002037
R113	6.8K ohm	120-002031
R114	Variable, 5K ohm, OFF-VOLUME (Inc. Switch S1)	120-002055
R118,123,125	220 ohm	120-002024
R119	Thermistor, Type B-2B	120-001198
R120	9K ohm	120-002032
R121	470 ohm	120-002025
R122	5 ohm	120-002023

Schematic Symbol	Description	Hallicrafters Part Number
	*RESISTORS (CONT)	
R124	10 ohm	120-002035
R127	42K ohm	120-002034
R128	34K ohm	120-002036
*All Resistors are carbon type, 10%, 1/8 watt unless otherwise specified.		
	COILS AND TRANSFORMERS	
L1	Coil, RF	120-002019
L2,3,4	Coil, RF	120-002020
T1,2,3	Transformer, 455KC IF	120-002018
T4	Transformer, Audio Driver	120-002021
T5	Transformer, Audio Output	120-002022
	TRANSISTORS AND DIODES	
CR1	Diode, Type 1N60	120-002016
Q1,2,9	Transistor, Type 2SA350	120-001190
Q3,4	Transistor, Type 2SA12	120-002012
Q5	Transistor, Type 2SB75	120-002013
Q6,7	Transistor, Type 2SB77	120-002014
Q8	Transistor, Type 2SA74	120-002015
	MISCELLANEOUS	
	Antenna, Collapsible Whip	120-002064
	Connector, Battery Snap	120-002065
Y1	Crystal, Transmit	120-002061
Y2	Crystal, Receive	120-002062
J1	Jack, Earphone	120-002067
M1	Meter, Battery Voltage	120-002066
	Socket, Crystals	120-002063
SP1	Speaker, 2-1/4", 8 ohms	120-002059
S2	Switch, 6-Circuit, 2-Contact, Push-Type	120-002060

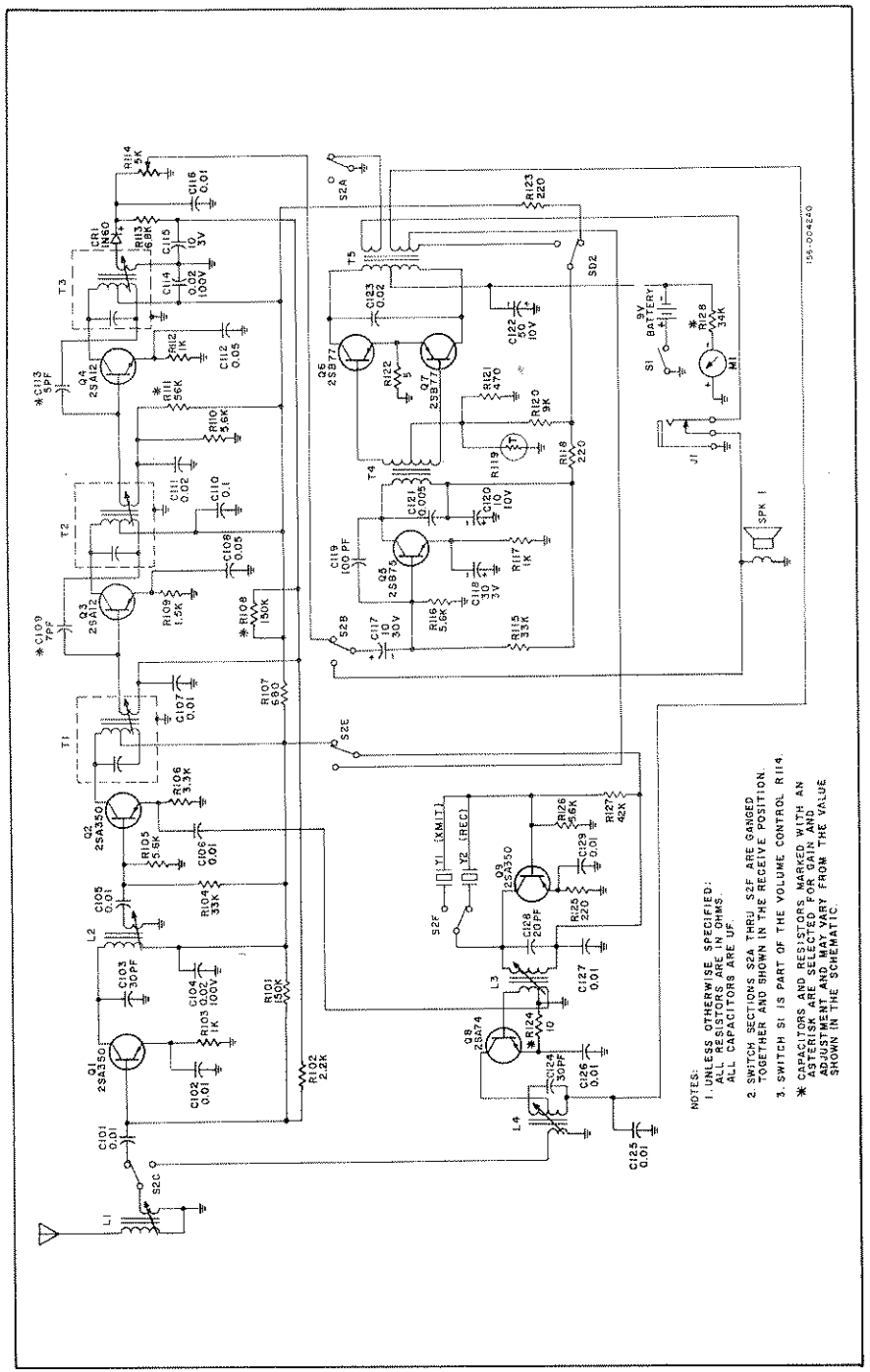

Figure 3. Schematic Diagram of Model CB-11.