hallicrafters

OPERATING AND SERVICE INSTRUCTIONS

littlefone

TRANSCEIVER

MODEL CB-6

WARRANTY

"The Hallicrafters Company warrants its products 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 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 product."

the hallicrafters co.

SECTION I
INTRODUCTION

1-1. DESCRIPTION.

The Hallicrafters Model CB-6 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-6 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-6 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.

Transistor Q2 is an RF mixer which combines the signals received from the antenna (27 MC) and the receiver crystal oscillator Q2 (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 the type 1N34A diode CR1. Through the VOLUME control, the signal is fed to the audio amplifier transistor Q5 and to the AF power output transistors Q6 and Q7 which are arranged in a push-pull configuration. From here the signal is applied to the speaker. An AGC circuit controls the gain of IF amplifier transistor Q3.

When the PUSH-TO-TALK switch is depressed, the speaker, now serving as a microphone, is connected to the transistors in the audio circuitry, Q7, Q6, and Q5. Modulating voltage is supplied to the final amplifier transistor Q9 to produce an amplitude-modulated signal at the crystal frequency. The output of transistor Q9 is connected to the whip antenna through the transmitter antenna coil, L4.

Figure 1. Hallicrafters Model CB-6.

Transmitter

Power Input to RF Stage	100 MW (FCC maximum).
Modulation	AM, maximum 85%.
Frequency Control	Plug-in quartz crystal, 0.005% tolerance.

Receiver

Speaker Output	190 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	55 inch (collapsible whip).
Battery	1.5 volt standard penlite cells (8 used).
Dimensions (H x W x D)	6-1/2 x 3-1/4 x 1-3/4 inches.
Weight (Net)	1-1/4 pounds (less battery).
Weight (Shipping)	2-1/2 pounds.

SECTION II
INSTALLATION

2-1. UNPACKING.

After unpacking your Model CB-6, 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-6 must be equipped with eight 1-1/2-volt penlite cells (not supplied). The battery cells (Burgess type Z, Ray-O-Vac type 7LP, Eveready type 915, Mallory type M15F, or equivalent) can be supplied and installed by your Hallicrafters dealer. Refer to the battery pack diagram in the unit for instructions on battery replacement.

SECTION III
OPERATION

3-1. OPERATION PROCEDURE.

There are two controls associated with operation of the Model CB-6. The VOLUME control, which is also the POWER on/off switch, and the PUSH-TO-TALK button. Both controls are on the left side of the cabinet.

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 and the word OFF appears in the window on the front of the unit.

3-2. OPERATING SUGGESTIONS.

Since frequencies on which the Model CB-6 is authorized to operate are shared on a party-line basis, common sense and courtesy should be observed while operating.

POINTS TO REMEMBER ARE:

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-6 can be expected to give at least 50 hours of service. Operation in fairly cold temperatures (under 32°F) will require more frequent replacement.

Replacement of the cells within the battery pack may be necessary when any or all of the following symptoms are present: 1) the hissing heard in the speaker when no station is being received, is less then usual; 2) received signals are low in volume; 3) the voltage across the battery terminals with the unit in the transmit condition measures less than 9 volts.

The battery cells recommended are as specified in paragraph 2-2 and are available from your Hallicrafters dealer. Battery replacement in the Model CB-6 is quite simple and requires no special tools. To replace the battery cells proceed as follows:

1. Be sure the unit is off.
2. Loosen the screw on the cabinet rear cover with a coin or screwdriver and remove the cover.
3. Lift out the battery pack and replace the battery cells as shown in the diagram inside the battery pack.
4. Replace the battery pack and rear 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.

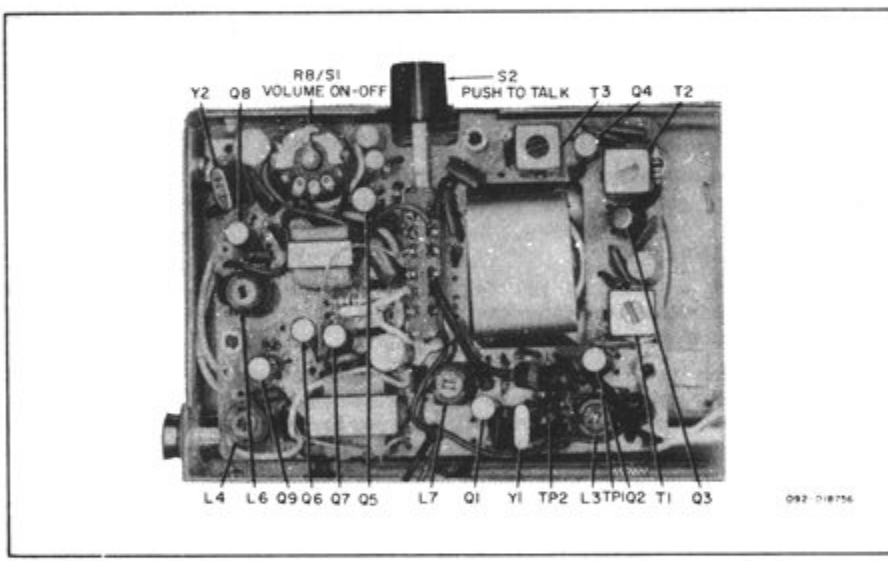

Figure 2. Internal View of Model CB-6.

4-2. CHANGING FREQUENCY.

Your model CB-6 has been equipped and adjusted at the factory for operation on the channel marked on the nameplate located on the rear of your CB-6 Transceiver. 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-6.

NOTE

When ordering replacement crystals, specify the Hallicrafters part number 120-001242 (receive crystal) and 120-001243 (transmit crystal) plus the channel required. For example: 120-001242-12 and 120-001243-12 for channel 12 or 120-001242-13 and 120-001243-13 for channel 13.

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.

For proper alignment, a supply of 12 volts DC ±2%, an accurate 0-30 DC milliammeter, an RF VTVM, and a signal generator will be required. To gain access, remove the back cover by removing the captive screw and remove the plastic protective inner cover by removing the three screws holding it in place.

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 through a 0.1 microfarad capacitor to test point TP-1 at the base of the RF mixer transistor Q2. Connect the ground lead from the signal generator to the brass stud/spacer located adjacent to TP-1.

Connect an output power meter, set to ten ohms, to the earphone jack at the top of the unit. Turn the CB-6 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 50 milliwatts.

For proper alignment of the crystal oscillator circuit. connect an RF VTVM to test point TP-2 at the emitter of the RF mixer transistor Q1. Adjust oscillator coil L7 for approximately 150 millivolts at TP-2.

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 antenna coil L3 for maximum output, readjusting the signal generator input to maintain an output of approximately 50 milliwatts.

TRANSMITTER ADJUSTMENT

Connect a calibrated milliammeter with a 0-30 MA full-scale deflection in series with a 12-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, L6, counterclockwise until oscillation stops. At this point the normal reading on the meter will be approximately five milliamperes.

Slowly adjust the oscillator coil, L6, clockwise while observing the meter. The circuit begins to oscillate when the meter shows a sharp rise in current. Adjust L6 one complete turn clockwise after oscillation begins.

While still observing the meter, adjust the transmitter output coil, L4, for minimum current; that is, until a dip in the current reading is seen as L4 is adjusted back and forth. Normal current reading will be between 12 and 14 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.

SERVICE PARTS LIST

Schematic Symbol	Description	Hallicrafters Part Number
	CAPACITORS	
C1,18	20 μμF, Ceramic	120-001224
C2	0.01 μF, Mylar	120-001239
C3,19	0.005 μF, Ceramic Disc	047-001139
C4	8 μμF, Ceramic	120-001223
C5,8,9	0.04 μF, Ceramic Disc	120-001228
C6	30 μF, 3V, Electrolytic	120-001232
C7	4.5 μμF, Ceramic	120-001222
C10	5 μF, 3V, Electrolytic	120-001229
C11	0.1 μF, Mylar	120-001241
C12	10 μF, 3V, Electrolytic	120-001230
C13,14	10 μF, 15V, Electrolytic	120-001231
C15	0.04 μF, Mylar	120-001240
C16,	30 μμF, Ceramic	120-001225
C17,21	0.01 μF, Ceramic Disc	047-001140
C20	40 μμF, Ceramic	120-001511
	RESISTORS	
R1,6,11, 21,22	5K Ohms, Carbon	120-001213
R2,5,12	50K Ohms, Carbon	120-001217
R3,9,13	1K Ohm, Carbon	120-001211
R4	100K Ohms, Carbon	120-001218
R7	1.5K Ohms, Carbon	120-001220
R8	Variable, 5K Ohms, VOLUME, 8V-729 (Inc. Switch S1)	120-001202
R10,19	3K Ohms, Carbon	120-001212
R14	200 Ohms, Carbon	120-001209
R15	15K Ohms, Carbon	120-001214
R16	10 Ohms, Carbon	120-001219
R17	330 Ohms, Carbon	120-001210
R18	Thermistor, B-2B	120-001198
R20	20K Ohms, Carbon	120-001215
R23	40K Ohms, Carbon	451-252403
	PRINTED CIRCUIT NETWORKS	
PC1	Type PRC-306	120-001235
PC2	Type PRC-304	120-001237
PC3	Type PRC-307	120-001236
PC4	Type PRC-303	120-001238
PC5	Type PRC-319	120-001233
PC6	Type PRC-318	120-001234

Schematic Symbol	Description	Hallicrafters Part Number
	COILS AND TRANSFORMERS	
L1	Coil, Peaking (7L-907)	120-001182
L2	Coil, Peaking (7L-909)	120-001184
L3	Coil, Receiver Antenna (7L-206A)	120-001178
L4	Coil, Transmitter Antenna (7L-516)	120-001181
L5	Coil, Peaking (7L-908)	120-001183
L6	Coil, Transmitter Oscillator (7L-416B)	120-001180
L7	Coil, Receiver Oscillator (7L-415B)	120-001179
T1	Transformer, IF (7IF-711)	120-001185
T2	Transformer, IF (7IF-719)	120-001186
T3	Transformer, IF (7IF-708)	120-001187
T4	Transformer, Audio Input (6T-762)	120-001188
T5	Transformer, Audio Output (7T-763)	120-001189
	TRANSISTORS AND DIODES	
Q1,8	Transistor, Type 2SA350	120-001190
Q2	Transistor, Type 2SA352	120-001191
Q3	Transistor, Type 2SA12A	120-001192
Q4	Transistor, Type 2SA12C	120-001193
Q5	Transistor, Type 2SB75B	120-001194
Q6,7	Transistor, Type 2SB77B	120-001195
Q9	Transistor, Type 2SA246	120-001196
CR1	Diode, Germanium, 1N34A	019-001918
	MISCELLANEOUS	
	Antenna, Collapsible Whip	120-001204
	Battery Case	120-001170
	Battery Snap, SN-25	120-001171
	Cabinet Front	120-001151
	Cabinet Rear	120-001152
	Cover, Battery Case	120-001173
Y1	Crystal, Receiving	120-001242
Y2	Crystal, Transmitting	120-001243
	Earphone (MR1A)	120-001205
J1	Jack, Earphone (J-104)	120-001200
	Knob, PUSH-TO-TALK (9K-123S)	120-001154
	Knob, VOLUME (9K-122V)	120-001153
	Plate, Perforated	120-001156
SP1	Speaker	120-001203
S2	Switch, Four-Section Slide (9S-27)	120-001201

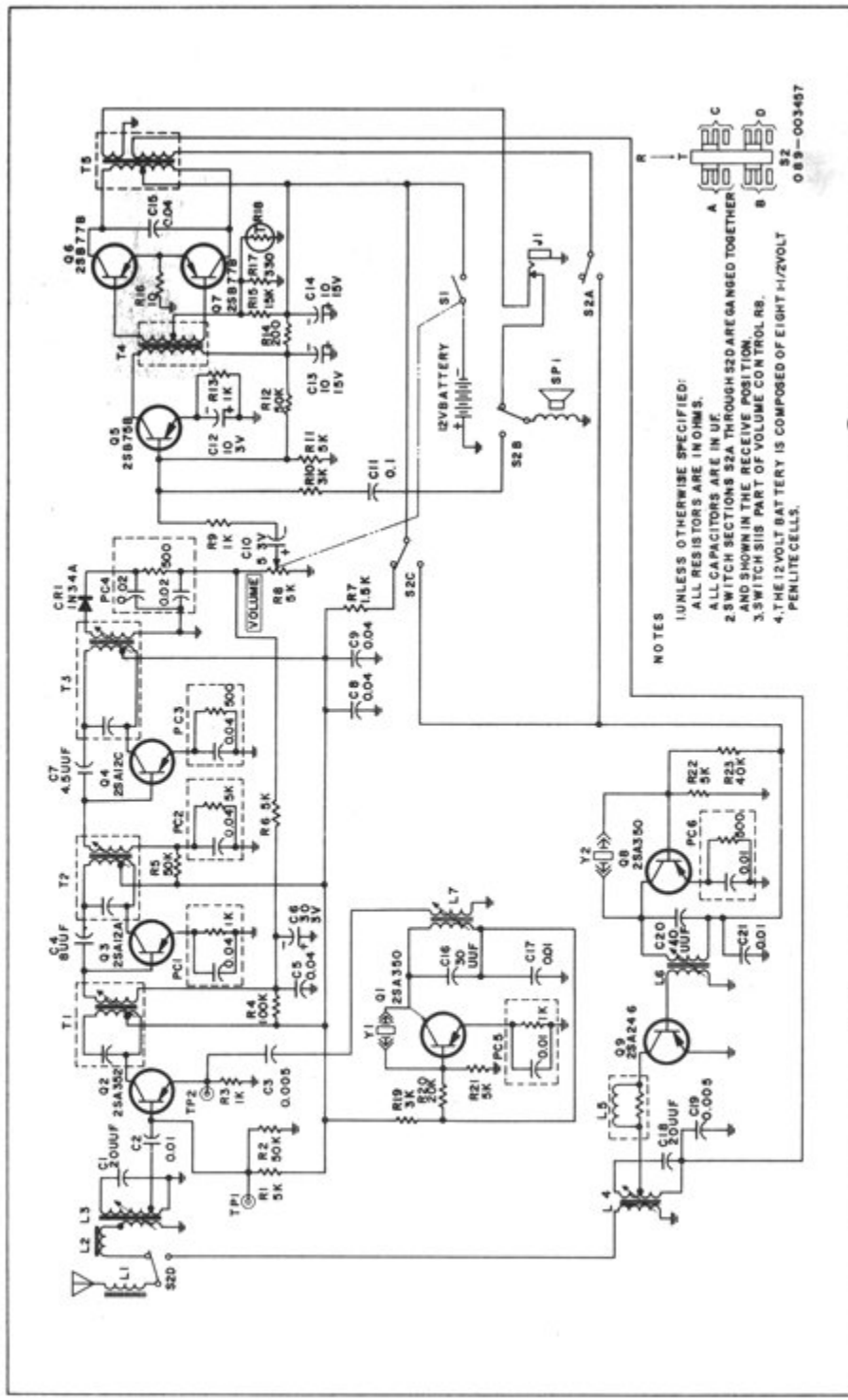

Figure 3. Schematic Diagram of Model CB-6.

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