

# SERVICE DATA FOR MODEL CB-1



Figure 1. Hallicrafters Model CB-1.

## TECHNICAL SPECIFICATIONS.

TUBES ..... 11 including rectifier  
 SPEAKER ..... 4" x 6" PM, 3.2 ohm voice coil  
 HEADPHONE OUTPUT IMPEDANCE ..... 15 ohms  
 ANTENNA INPUT IMPEDANCE ..... 51.5 ohms  
 INTERMEDIATE FREQUENCY ..... 455 KC  
 POWER INPUT..... 117 volts, 60 cycles AC  
 POWER CONSUMPTION ..... 65 watts  
 FREQUENCY COVERAGE ..... \*Established by the crystals employed.

WEIGHT ..... Net 15 lbs., Shipping 18 1/2 lbs.  
 DIMENSIONS ... 6 1/2" x 13 1/4" x 8 1/4" (H. W. D.)  
 \*The tuning range of the Oscillator and Amplifier is adequate to properly tune through any frequency between the limits of 26.965 MC and 27.255 MC.

## TUBE AND DIAL LAMP REPLACEMENT.

For complete access to the tubes and the dial lamp, remove the Transmitter/Receiver from the cabinet. See "CHASSIS REMOVAL". The tube and lamp locations are shown in Fig. 4.

## CHASSIS REMOVAL.

The chassis and front panel assembly can be easily withdrawn from the cabinet as a unit after removing the three slotted flat head screws from the cabinet bottom and the three phillips head screws from the top of the cabinet front panel. When removing the chassis, exercise care to prevent damaging the speaker.

## SQUELCH CONTROL ADJUSTMENT.

The SQUELCH control is a screw-driver operated adjustment located on the rear of the chassis; its purpose is to quiet background noise in the absence of a signal. (See Fig. 2.) Before attempting any squelch adjustment, rotate the Squelch Control to its extreme

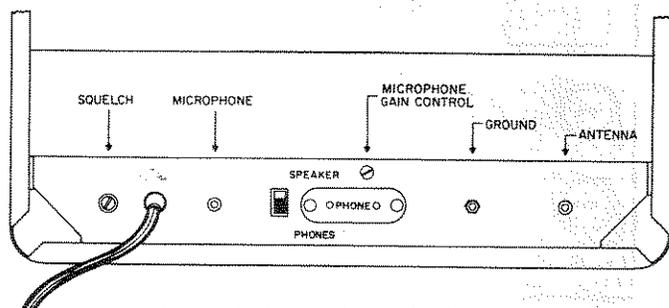


Figure 2. Rear View of Chassis. 092-304622

counterclockwise ("OFF") position. Then, with no signal being received, rotate the Squelch Control clockwise until background noise is barely audible.

## MICROPHONE GAIN CONTROL ADJUSTMENT.

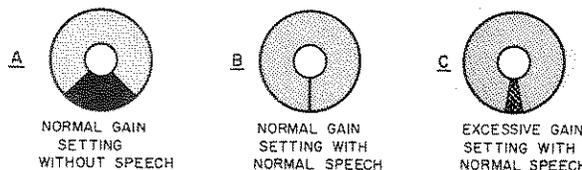
The MICROPHONE GAIN control is a screw-driver operated adjustment located on the rear of the chassis; its purpose is to establish a gain level setting for proper voice modulation. (See Fig. 3.)

Before attempting any adjustment, be sure the antenna and microphone are connected to the Transmitter/Receiver and that the Transmitter/Receiver is turned on and the PUSH-TO-TALK bar is depressed. Then, with the microphone in either a hand-held or fixed position, speak into the microphone at a normal voice level. Rotate the MICROPHONE GAIN control until the wedge-shaped, dark portion on the indicator eye is completely illuminated on voice peaks. (See Fig. 3A.) With this setting established, it is only necessary to speak at a level which will permit closure of the eye tube on voice peaks.

When operating the transmitter properly, the leading edges of the illuminated area converge; they should not overlap. (See Fig. 3B.) Under no conditions should the MICROPHONE GAIN control setting be advanced beyond the position, or the voice level increased to a point, that causes a bright foldover area to appear where the two leading edges come together, as this will create unnecessary interference and distortion. (See Fig. 3C.) This condition can be eliminated by monitoring the indicator while speaking. On the other hand, do not speak with such a low voice level that causes only an occasional complete illumination of the dark area, as this will result in an under-modulated and possibly unintelligible signal.

If excessive hum develops in the audio section of the transmitter, the leading edges of the illuminated area will become fuzzy. Should this fuzziness occur, discontinue transmission until the fault has been corrected.

**IMPORTANT:** Under no conditions shall any adjustments be made to the CRYSTAL and TUNING controls located on the transmitter box. Tampering with these controls could effect a change in the transmitter carrier. This, in turn, could cause the FCC to take action and terminate the authority to operate this equipment. Only personnel, properly licensed by the FCC and having specialized test equipment capable of measuring the transmitter carrier frequency to an accuracy of 0.005%, can effect repairs. The transmitter and receiver crystals are not interchangeable. See Par. 19.24, Subpart B (Applications and Licenses), Part 19 (Citizens Radio Service) of FCC Rules and Regulations.



A NORMAL GAIN SETTING WITHOUT SPEECH

B NORMAL GAIN SETTING WITH NORMAL SPEECH

C EXCESSIVE GAIN SETTING WITH NORMAL SPEECH

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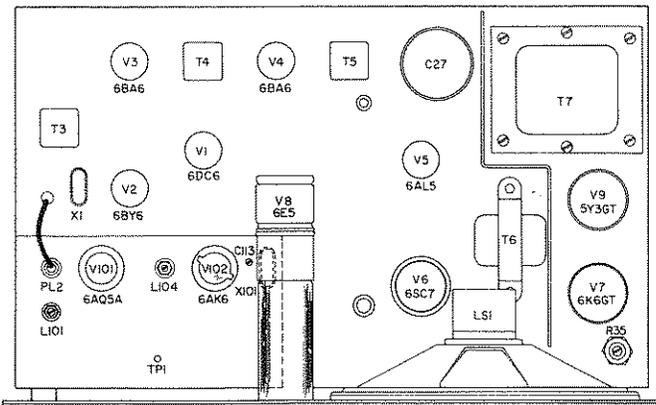
Figure 3. Microphone Gain Setting Indications.

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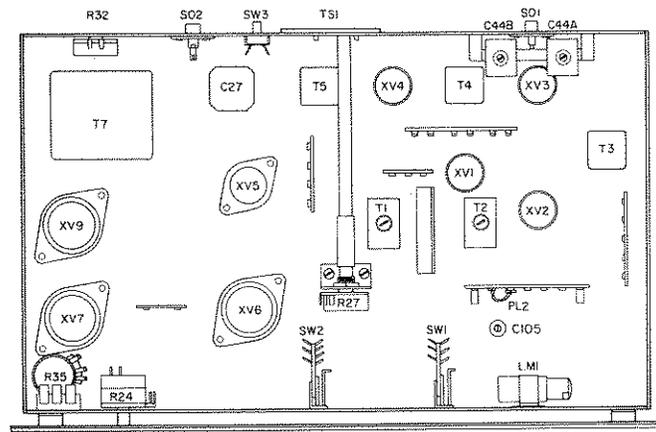
Step	Signal Generator Connections	Signal Generator Frequency	Adjust	Instructions
<b>RECEIVER IF ALIGNMENT</b>				
1	High side through a .01 mfd capacitor to pin 7 of V2 (6BY6). Low side to chassis.	455 KC	Top and bottom of T3, T4, and T5	*Adjust for maximum audio output at the speaker voice coil. Use just enough signal gen. output to obtain under a 0.05 watt indication on the output meter.
*Connect an output meter to the speaker leads.				
<b>RECEIVER RF ALIGNMENT</b>				
1	High side through a resistive 50 ohm termination to antenna jack (SO-1). Low side to chassis.	**Xtal frequency plus 455 KC.	T1 and T2	Same as step 1 under "Receiver IF Alignment".
**The signal generator output must be set to peak at the crystal plus IF frequency.				
Step	Tektronic Oscilloscope and RF Probe	Audio Oscilloscope	Adjust	Instructions
<b>TRANSMITTER RF ALIGNMENT</b>				
1			L104	***Adjust osc. tuning slug for maximum negative voltage indication.
			L101	Adjust amplifier tuning slug for a maximum indication on the wattmeter.
			C105	****Adjust neutralizing capacitor for minimum vertical deflection on scope.
2	Connect across wattmeter with the vertical gain controls set in the maximum gain position.			
****Remove jumper lead plug (PL2) from terminal lug on chassis bottom.				
3				Replace jumper lead plug (PL2) and repeat step 1 of "Transmitter RF Alignment".
<b>MODULATION INDICATION CALIBRATION</b>				
4	Connect to antenna jack (SO1).	Connect through a 100K ohm resistor and a shielded lead to the Microphone Input jack (SO2). Set output for 500 CPS.	Audio Osc. output (0.03V) and R27	Adjust gain controls (while observing RF output envelope on oscilloscope) to provide 85% modulation at 500 CPS.
5			R35	Adjust Indicator Sensitivity control for a complete closure of the indicator eye at 85% modulation without foldover or bright area.

- Remove chassis from cabinet (See "CHASSIS REMOVAL").
- Use signal generator with modulated output covering 455 KC and 26.965 through 27.255 MC. (HP Model 608D or equivalent.)
- Use a 51.5 ohm termination pad (HP Type 608A-16D or equivalent).
- Use a frequency standard (HP Model 524A frequency counter and HP Model 512A frequency convertor) or equivalent which will measure within .005% accuracy.
- Use an output meter (GR Type 583-A or equivalent).
- Use a 51.5 ohm non-reactive load to 30 MC (BIRD Termaline Model 61 Wattmeter or equivalent).
- Use a Tektronic oscilloscope (Model 545 and RF probe or equivalent).
- Use an audio oscillator (HP Model 200AB or equivalent).
- Use a 20,000 ohms per volt meter or VTVM.
- Use a non-metallic alignment tool.
- Control Settings: VOLUME control fully clockwise; SQUELCH, MICROPHONE GAIN and INDICATOR SENSITIVITY controls fully counterclockwise.
- See Figs. 4 and 5 for location of alignment adjustments.



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Figure 4. Top View of Chassis.



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Figure 5. Bottom View of Chassis.



# SERVICE PARTS LIST

Schematic Symbol	Description	Hallcrafters Part Number	Schematic Symbol	Description	Hallcrafters Part Number	Schematic Symbol	Description	Hallcrafters Part Number
<b>CAPACITORS</b>			<b>*RESISTORS (CONT)</b>			<b>JACKS, PLUGS AND SOCKETS</b>		
C1	33 mmf., 2%, NPO; Cer. Tub.	491-104330-22	R11, 15	100 ohm, 20%	451-253101	TF1	Jack, Test Point	-----
C2	22 mmf., NPO; Cer. Tub.	491-106220-22	R13, 16, 101	1K ohm	451-252102	SO1, 2, 101	Jack; Antenna Input and Output, Microphone Input, and Transmitter Output	036-100041
C3, 4, 39, 108	.005 mfd., 500V.; Cer. Disc	047-100442	R17	22K ohm, 1W	451-352223	PL101	Connector, Transmitter Output Jack	010-100231
C5, 34	.01 mfd., +80-20%, 500V.; Cer. Disc	047-100217	R18	1.8 megohm, 20%	451-253185	PL1	Plug, Power and Line Cord	087-100078
C6	12 mmf., 2%, NPO; Cer. Tub.	491-104120-22	R20, 36, 105	100K ohm	451-252104	PL2	Plug, Jumper and Line Socket, Tube; Octal (V6, V7, V9)	010-101514
C7	10 mmf., NPO; Cer. Tub.	491-106100-22	R24	2 megohm, variable; VOLUME control	025-201742			
C8	.02 mfd., +80-20%, 500V.; Cer. Disc	047-100242	R25	220K ohm	451-252224			
C9, 15, 19	.05 mfd., 600V.; Molded Paper	499-032503	R26	15 megohm	451-252150			
C10, 12, 16, 20, 26	.01 mfd., 600V.; Molded Paper	499-032103	R27	500K ohm, variable; MICROPHONE GAIN control	025-201728			
C11, 28	.02 mfd., 600V.; Molded Paper	499-032203	R28	2.2 megohm, 20%	451-253225			
C13	.02 mfd., 200V.; Molded Paper	499-012203	R29, 102	27K ohm	451-252273			
C14	5 mmf., N750; Cer. Tub.	491-106050-95	R31	430 ohm, 5%	451-251431			
C17, 18, 106	.47 mmf., NPO; Cer. Tub.	491-146470-22	R32	250 ohm, variable; SQUELCH control	025-101752			
C21	.003 mfd., 600V.; Molded Paper	499-032302	R33	330 ohm, 2W	451-253231			
C22	220 mmf., 500V.; Mica	470-213221	R34	680 ohm, 2W	451-652681			
C23, 25, 33	.001 mfd., +20-10%, 500V.; Molded Paper	499-032102	R35	500K ohm, variable; INDICATOR SENSITIVITY control	025-201719			
C24, 29	100 mmf., 500V.; Cer. Disc	047-100086	R38	1K ohm, 2W	451-652102			
C27A, B, C, D	50-10-10 mfd., 450V., 10 mfd., 25V.; Electrolytic	045-200122	R39	330 ohm, 2W	451-652331			
C30	4 mmf., ±0.5 mmf., NPO; Cer. Tub.	491-102040-23	R40	15 ohm, 20%	451-253150			
C31	24 mmf., NPO; Cer. Tub.	491-106240-22	R42	6.8 ohm, 1W	451-352068			
C32	0.5 mfd., 200V.; Molded Paper	499-013504	R43	4.7K ohm, 20%, 1W	451-353472			
C35, 42, 43	.001 mfd., 1400V., GMV; Cer. Disc	047-201198	R103	3.9K ohm, 2W	451-652392			
C40, 41, 101, 102, 103, 109, 110	.001 mfd., 500V., GMV; Cer. Disc	047-200230	R104	39K ohm	451-252393			
C44A, B	9-160, 80-480 mmf.; Trimmer Assy., Mica	044-300517	<b>*All resistors are 10%, 1/2 watt, carbon type, unless otherwise specified.</b>			V1	6DC6; RF Amplifier Stage	090-901328
C104	180 mmf., N330; Cer. Tub.	491-156181-73	<b>TRANSFORMERS AND COILS</b>			V2	6BY6; Mixer Stage	090-901114
C105	4.5-25 mmf., NPO	044-100516	T1	Transformer, Antenna Input	051-202568	V3, 4	6BA6; 1st IF and 2nd IF Amplifier Stages	090-901112
C107	680 mmf., 10%, 500V.; Mica	470-213681	T2	Transformer, Mixer Coupling	051-202567	V5	6AL5; ANL and Detector Stages	090-901163
C111	6 mmf., ±0.25 mmf., NPO; Cer. Tub.	491-101060-23	T3, 4	Transformer, 1st and 2nd IF	050-300241	V6	6AQ5A; Power Amplifier Stage	090-901331
C112	18 mmf., 2%, NPO; Cer. Tub.	491-104180-22	T5	Transformer, 3rd IF	050-300242	V7	6AK5; Transmitter Oscillator Stage	090-900797
C113	0.5-3.0 mmf.; Trimmer	047-100559	T6	Transformer, Audio Output	095-200406	V8	6SC7; Audio and Speech Amplifier Stage	090-900874
			L1, 2	Coil, Series Trap	052-300890	V9	6K5/GT; Audio and Modulator Output Stage	090-900840
			L3	Choke, RF	053-200546	V10	6E5; Indicator Eye Stage	090-900856
			L4, 5	Coil, RF Filter	051-202598	V11	5Y3/GT; Rectifier	090-901111
			L6	Choke, AC Line Filter	053-200540	LM1	Lamp, Pilot; Type 44	039-100003
			L101	Coil, Output Tank	051-202571	<b>MISCELLANEOUS CHASSIS PARTS</b>		
			L102, 105, 106	Choke, RF	053-100552		Bar, Switch (PUSH-TO-TALK)	073-202921
			L103	Coil, Gimnick (Twisted Lead of C104)	-----		Cabinet Weld Assem.	066-402492
			L104	Coil, Transmitter Osc.	051-202570		Core, Coil	077-100068
			L107	Choke, RF	053-200538		Cover, Transmitter Chassis	066-302464
						X1	Crystal (26.630 MC)	019-302308-11
						X101	Crystal (9.028333 MC)	019-302309-11
						CR1	Diode, 1N65	019-102311
							Front Panel Weld Assem.	058-400897
							Insulated Coupling	029-200364
							Jewel, Dial Lamp	086-100470
							Knob, OFF/ON-VOLUME	015-201358
							Line Cord Lock, Female	076-100397-02
							Line Cord Lock, Male	076-100397-01
							Microphone	081-100101
							Mounting Feet	016-200983
							Plate, Panel (Perforated) Assem.	063-304096
						LS1	Speaker, PM, 3.2 ohm	085-400203
							Shield, Indicator Light (Fibre)	008-101249
							Strip, Trim	007-306732
						TS1	Terminal Strip, Phones	088-100071
							Jack	

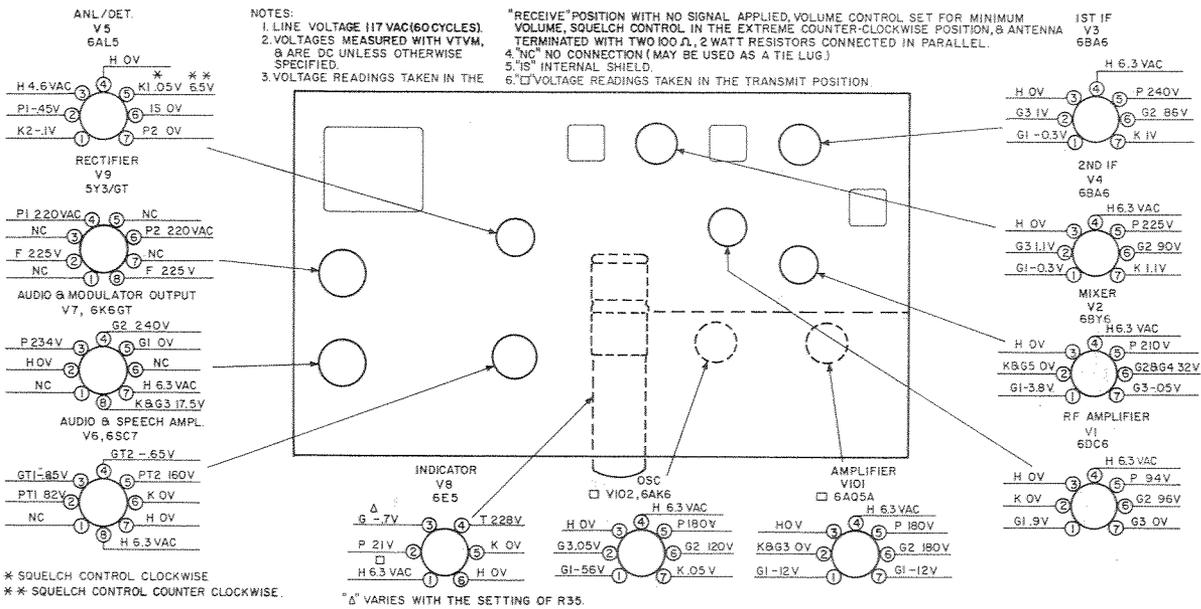


Figure 7. Model CB-1 Voltage Chart.