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The chassis and front panel assembly can be easily withdrawn from the cabinet as a unit after removing the three slotted flat head screws from the cabinet bottom and the three phillips head screws from the top of the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 counterclockwise ("OFF") position. Then, with no signal being received, rotate the Squelch Control clockwise until background noise is barely audible.

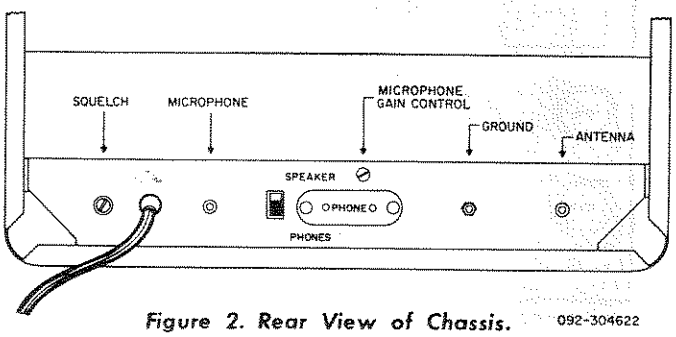

Figure 2. Rear View of Chassis. 092-304622

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 occassional 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.

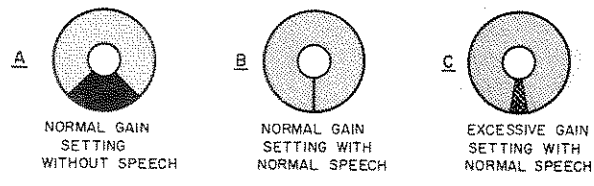

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Figure 3. Microphone Gain Setting Indications.

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ALIGNMENT PROCEDURE

Step	Signal Generator Connections	Signal Generator Frequency	Adjust	Instructions
		RECEIVER IF ALIGNMENT		
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.				

		RECEIVER RF ALIGNMENT		
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
		TRANSMITTER RF ALIGNMENT		
1			L104	***Adjust osc. tuning slug for maximum negative voltage indication.
***Terminate the antenna jack with a wattmeter and connect a voltmeter to test point TP1. (Connect voltmeter leads to read a negative voltage.)			L101	Adjust amplifier tuning slug for a maximum indication on the wattmeter.
2	Connect across wattmeter with the vertical gain controls set in the maximum gain position.		C105	****Adjust neutralizing capacitor for minimum vertical deflection on scope.
****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".
		MODULATION INDICATION CALIBRATION		
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 Tektronix 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.

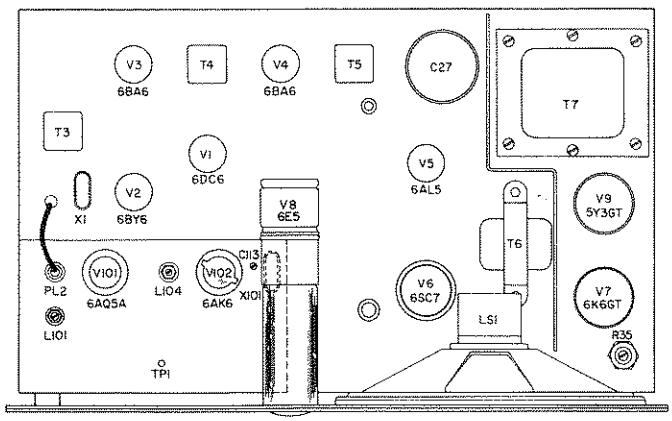

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Figure 4. Top View of Chassis.

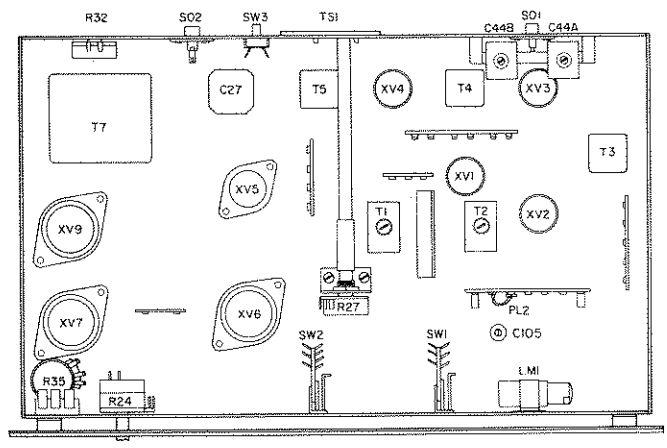

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Figure 5. Bottom View of Chassis.

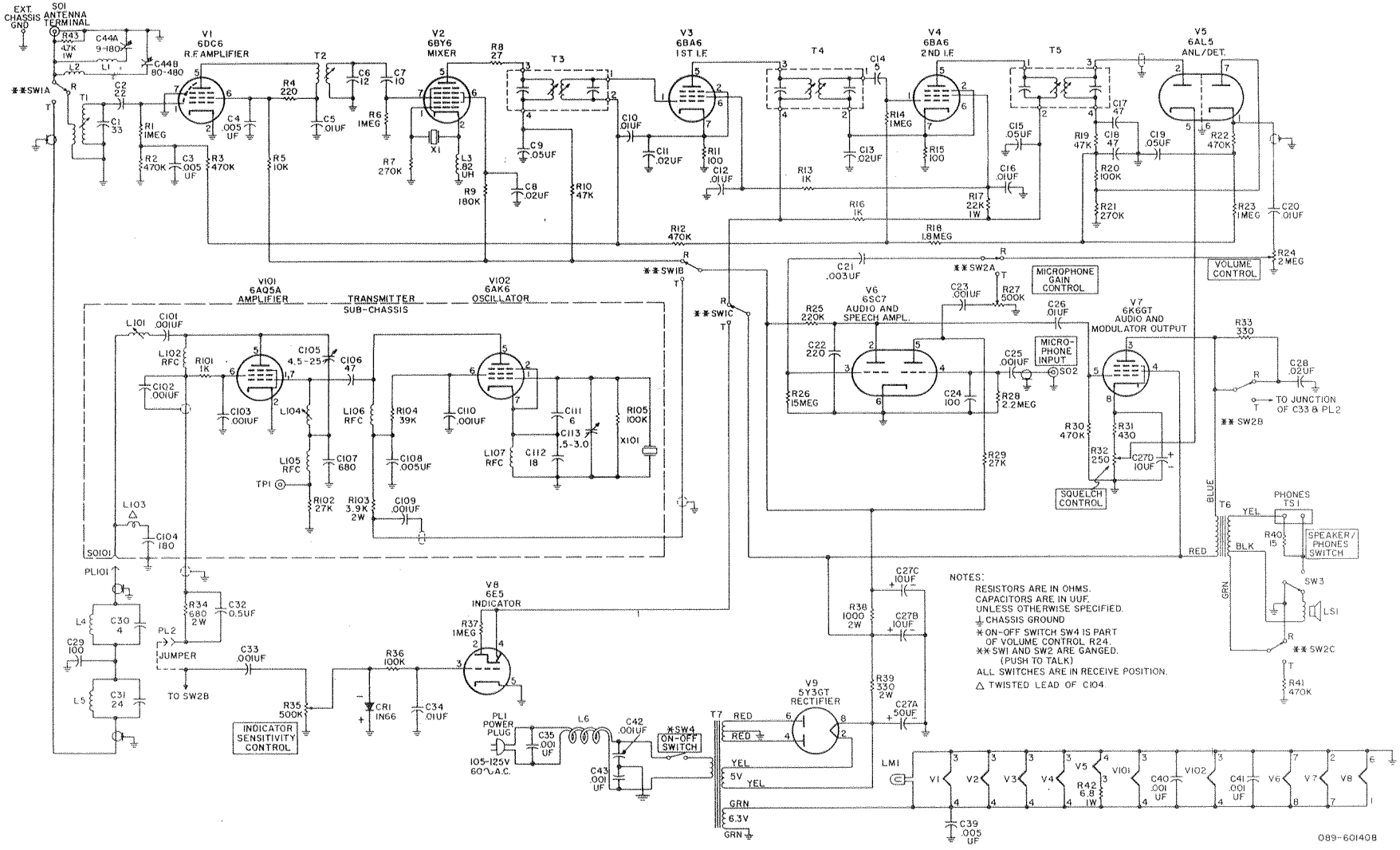

Figure 6. Model CB-1 Schematic Diagram.

SERVICE PARTS LIST

Schematic Symbol	Description	Hallicrafters Part Number
	CAPACITORS	
C1	33 mmf., 2%, NPO; Cer. Tub.	491-104330-22
C2	22 mmf., NPO; Cer. Tub.	491-106220-22
C3, 4, 39, 108	.005 mfd., 500V.; Cer. Disc	047-100442
C5, 34	.01 mfd., +80-20%, 500V.; Cer. Disc	047-100217
C6	12 mmf., 2%, NPO; Cer. Tub.	491-104120-22
C7	10 mmf., NPO; Cer. Tub.	491-106100-22
C8	.02 mfd., +80-20%, 500V.; Cer. Disc	047-100242
C9, 15, 19	.05 mfd., 600V.; Molded Paper	499-032503
C10, 12, 16, 20, 26	.01 mfd., 600V.; Molded Paper	499-032103
C11, 28	.02 mfd., 600V.; Molded Paper	499-032203
C13	.02 mfd., 200V.; Molded Paper	499-012203
C14	5 mmf., N750; Cer. Tub.	491-106050-95
C17, 18, 106	47 mmf., NPO; Cer. Tub.	491-146470-22
C21	.003 mfd., 600V.; Molded Paper	499-032302
C22	220 mmf., 500V.; Mica	470-213221
C23, 25, 33	.001 mfd., +20-10%, 600V.; Molded Paper	499-032102
C24, 29	100 mmf., 500V.; Cer. Disc	047-100086
C27A, B, C, D	50-10-10 mfd., 450V., 10 mfd., 25V.; Electrolytic	045-200122
C30	4 mmf., ±0.5 mmf., NPO; Cer. Tub.	491-102040-23
C31	24 mmf., NPO; Cer. Tub.	491-106240-22
C32	0.5 mfd., 200V.; Molded Paper	499-013504
C35, 42, 43	.001 mfd., 1400V., GMV; Cer. Disc	047-201198
C40, 41, 101, 102, 103, 109, 110	.001 mfd., 500V., GMV; Cer. Disc	047-200230
C44A, B	9-180, 80-480 mmf.; Trimmer Assy., Mica	044-300517
C104	180 mmf., N330; Cer. Tub.	491-156181-73
C105	4.5-25 mmf., NPO	044-100516
C107	680 mmf., 10%, 500V.; Mica	470-213681
C111	6 mmf., ±0.25 mmf., NPO; Cer. Tub.	491-101060-23
C112	18 mmf., 2%, NPO; Cer. Tub.	491-104180-22
C113	0.5-3.0 mmf.; Trimmer	047-100559
	***RESISTORS**	
R1, 5, 14, 23, 37	1 megohm	451-252105
R2, 3, 12, 22, 30, 41	470K ohm, 20%	451-253474
R4	220 ohm, 20%	451-253221
R5	10K ohm, 20%	451-253103
R7, 21	270K ohm	451-252274
R8	27 ohm, 20%	451-253270
R9	180K ohm	451-252184
R10, 19	47K ohm, 20%	451-253473
R11, 15	100 ohm, 20%	451-253101
R13, 16, 101	1K ohm	451-252102
R17	22K ohm, 1W	451-352223
R18	1.8 megohm, 20%	451-253185
R20, 36, 105	100K ohm	451-252104
R24	2 megohm, variable; VOLUME control	025-201742
R25	220K ohm	451-252224
R26	15 megohm	451-252156
R27	500K ohm, variable; MICROPHONE GAIN control	025-201728
R28	2.2 megohm, 20%	451-253225
R29, 102	27K ohm	451-252273
R31	430 ohm, 5%	451-251431
R32	250 ohm, variable; SQUELCH control	025-101752
R33	330 ohm	451-252331
R34	680 ohm, 2W	451-652681
R35	500K ohm, variable; INDICATOR SENSITIVITY control	025-201719
R38	1K ohm, 2W	451-652102
R39	330 ohm, 2W	451-652331
R40	15 ohm, 20%	451-253150
R42	6.8 ohm, 1W	451-352068
R43	4.7K ohm, 20%, 1W	451-353472
R103	3.9K ohm, 2W	451-652392
R104	39K ohm	451-252393

*All resistors are 10%, 1/2 watt, carbon type, unless otherwise specified.

Schematic Symbol	Description	Hallicrafters Part Number
	TRANSFORMERS AND COILS	
T1	Transformer, Antenna Input	051-202568
T2	Transformer, Mixer Coupling	051-202567
T3, 4	Transformer, 1st and 2nd IF	050-300241
T5	Transformer, 3rd IF	050-300242
T6	Transformer, Audio Output	005-200406
T7	Transformer, Power	052-300680
L1, 2	Coil, Series Trap	053-200546
L3	Choke, RF	053-100552
L4, 5	Coil, RF Filter	051-202598
L6	Choke, AC Line Filter	053-200540
L101	Coil, Output Tank	051-202571
L102, 105, 106	Choke, RF	053-100552
L103	Coil, Gimmick (Twisted Lead of C104)	----------
L104	Coil, Transmitter Osc.	051-202570
L107	Choke, RF	053-200538
	SWITCHES	
SW1A, B, C	Switch; Receive-Transmit (PUSH-TO-TALK)	060-202079
SW2A, B, C	Switch; Receive-Transmit (PUSH-TO-TALK)	060-202079
SW3	Switch, SPDT: SPEAKER-PHONES	060-200477
SW4	Switch, ON-OFF: Part of VOLUME control (R24)	----------

Schematic Symbol	Description	Hallicrafters Part Number
	JACKS, PLUGS AND SOCKETS	
TP1	Jack, Test Point	----------
SO1, 2, 101	Jack; Antenna Input and Output, Microphone Input, and Transmitter Output	036-100041
PL101	Connector, Transmitter Output Jack	010-100231
PL1	Plug, Power and Line Cord	087-100078
PL2	Plug, Jumper	010-101514
	Socket, Tube; Octal (V6, V7, V9)	006-200296
	Socket, Tube; 7 Pin Min. (V1)	006-200297
	Socket, Xtals (X1, X101)	006-100320
	Socket, Tube; 7 Pin Min. (V5)	006-100656
	Socket, Tube; 7 Pin Min. (V101, V102)	006-200759
	Socket, Tube; 7 Pin Min. (V2, V3, V4)	006-100861
	Socket, Tube (V8)	006-100862
	Socket, Dial Lamp	086-100473
	TUBES AND DIAL LAMPS	
V1	6DC6; RF Amplifier Stage	090-901328
V2	6BY6; Mixer Stage	090-901114
V3, 4	6BA6; 1st IF and 2nd IF Amplifier Stages	090-901112
V5	6AL5; ANL and Detector Stages	090-901163
V6	6AQ5A; Power Amplifier Stage	090-901331
V7	6AK6; Transmitter Oscillator Stage	090-900797
V8	6SC7; Audio and Speech Amplifier Stage	090-900874
V9	6K6/GT; Audio and Modulator Output Stage	090-900856
V10	6E5; Indicator Eye Stage	090-900840
V11	5Y3/GT; Rectifier	090-901111
LM1	Lamp, Pilot; Type 44	039-100003
	MISCELLANEOUS CHASSIS PARTS	
	Bar, Switch (PUSH-TO-TALK)	073-202921
	Cabinet Weld Assem.	066-402492
	Core, Coil	077-100068
	Cover, Transmitter Chassis	066-302464
X1	Crystal (26.630 MC)	019-302308-11
X101	Crystal (9.028333 MC)	019-302309-11
CR1	Diode, 1N66	019-102311
	Front Panel Weld Assem.	068-400897
	Insulated Coupling	029-200564
	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	007-300752
TS1	Terminal Strip, Phones Jack	088-100071

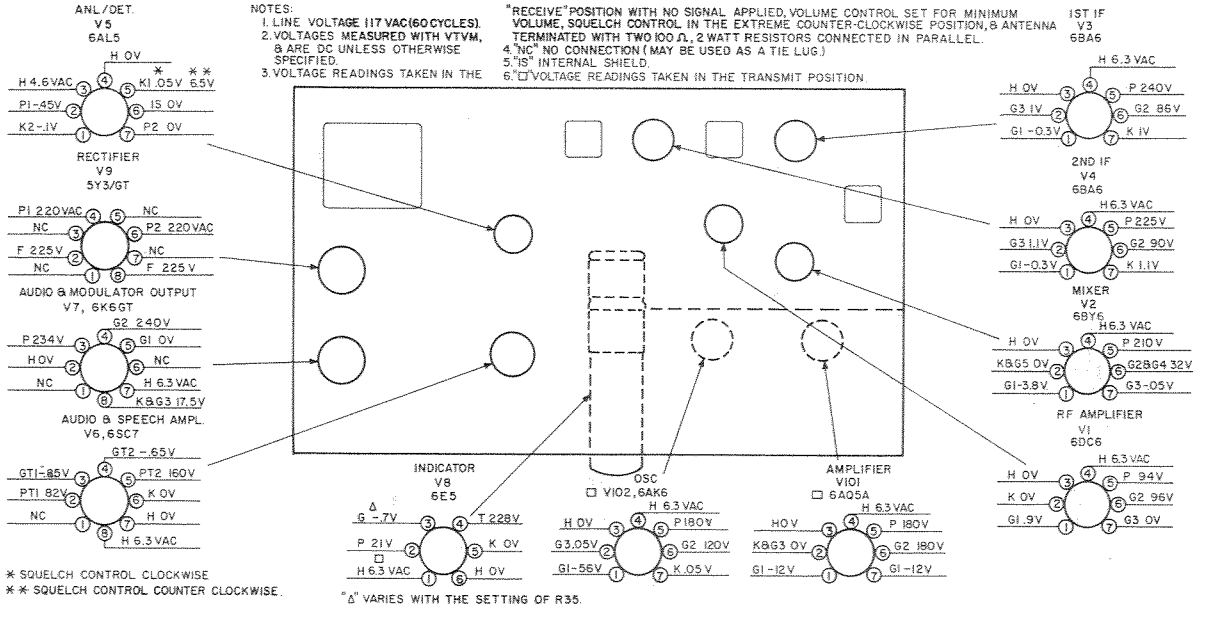

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Figure 7. Model CB-1 Voltage Chart.