

OPERATING INSTRUCTIONS

FOR



RADIO TEST EQUIPMENT

MODEL 198



THE HICKOK ELECTRICAL INSTRUMENT COMPANY
CLEVELAND, OHIO, U. S. A.

OPERATING INSTRUCTIONS
MODEL 198 AUDIO FREQUENCY SIGNAL GENERATOR.

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1. Connect the line cord to a suitable source of 110 Volt A.C. Power 50 to 60 cycles.
2. Turn the power switch on. The Neon lamp should light up immediately.
3. After the signal generator has had an opportunity to warm up, turn the range selector switch to the 20 to 200 cycle position and adjust the frequency to approximately 60 cycles on this range. (Assuming 60 cycle line supply)
4. Advance the Output Control to maximum output and press the test button.
5. Adjust the frequency control knob slowly either side of 60 cycles until the neon lamp glows steadily or consistently stays partially dark. Either side of the exact 60 cycles, a flickering will be noticed in the lamp, the rate of which flickering will be equal to the cycles per second above or below 60 of the frequency being generated. If the calibration is exact, the dial will read exactly 60 when the light consistently stays lit or is partially dark.

If this check is made as soon as the signal generator is turned on and before it has come up to operating temperature, 60 cycles will indicate slightly high - probably closer to 61 cycles.

6. A similar check can be made at 30 cycles, 120 cycles or 180 cycles although at these frequencies the decrease in brilliancy of the lamp at exact tuning will not be as great as the decrease in brilliancy found at 60 cycles.
7. This test will establish: -
First - That the signal generator is operating properly.
Second - Give a check on any error of calibration at the 60 cycle reference point. If the calibration is essentially correct at the 60 cycle point, it can be quite safely assumed that no greater percent error would exist at other frequencies.
8. If an error in frequency is found, after operating temperature is reached, be sure to check the dial adjustment first. Rotate the dial past the low frequency and (below 20 cycles) as far as it will go; the hairline on the dial lens should line up with the red printed line on the scale.
9. ADJUSTMENT: It is not wise to make any adjustment to correct errors in calibration, if the calibration is found to be within 2% or within 1 cycle. If, however, an error in excess of this amount is found, it is possible to compensate for this by setting to 180 cycles exactly on the dial and adjusting the correction control which is readily accessible through an opening in the side of the case, and which should be adjusted by means of a screw driver until the correct calibration is effected at exactly 180 cycles. This adjustment should be made while checking the frequency in accordance with paragraphs 5 and 6.

10. SPECIAL CALIBRATION POINTS: - 621 cycles and 4098 cycles.

The exact calibration of the above points is indicated by a red line drawn in on the printed scale, and will be found very close to the printed indication of these frequencies.

11. OUTPUT VOLTAGE: Output voltage can be taken at any of the output impedances of 10, 250, 500 or 5000 ohms at the output binding posts and the output voltage adjusted by the output control.

12. OUTPUT LOADING: While frequency check of the main tuning dial can be effected without proper loading on the output amplifier, when actually in use, and where wave form is important, it is imperative that the output be properly terminated in the correct load. In the cases where the loading of the circuit under test will not match the output impedance, which is the case when feeding directly into the grid of the amplifier tube operating in Class "A" it is essential that an external resistance of proper value be applied. For example: - A 500 ohm resistor could be connected between ground and the 500 ohm terminal, or 5000 ohm resistor connected between ground and the 5000 ohm terminal. This, of course, is not necessary where the device being fed from the signal generator has the proper input impedance.

13. MAINTENANCE: The signal generator is extremely ruggedly built and will withstand very rough usage. Therefore, any mechanical failure is very unlikely.

The most likely failure of any part of this equipment would be the tubes, and any tubes can be replaced without affecting the calibration, frequency or voltage characteristics, although it would be wise to check the frequency calibration if a new type 6SJ7 tube were inserted. The procedure for checking this has already been explained and trimmer readjustment, if necessary, should be made.

14. The 6 watt biasing lamps (VT-6) can be tested with an ohmmeter and should indicate about 300 ohms each, or a measurement from the cathode of the 6SJ7 (VT-2) to ground should be slightly over 600 ohms.

15. PRECAUTIONS TO BE OBSERVED IN USING THE SIGNAL GENERATOR:

Do not operate the signal generator on any D.C. Voltage Supply,

Do not apply any excessive D.C. voltage across any of the output terminals as there is no blocking condenser in this circuit, and a D.C. voltage might damage the output transformer.

16. Be sure that the cover is in place when the signal generator is not in use.

17. TUBE COMPLEMENT: Tube complement of the signal generator is -
1 - Type 6SJ7, and 1 - Type 6V6G oscillator.

1 - Type 6SN7 phase inversion output tube.

1 - Type 6X5GT full wave rectifier tube.

MODEL 198

CONDENSERS:

Item No.	Stock No.	Description	Part No.
1	OS-1726	Special Three Gang Condenser	C-1
2	OS-1833	6.5 - 35 mmf. Trimmer	C-2
3	OS-1834	50 mmf plus-minus 1/2 mmf. 0 Temp.Coef.	C-3
4	OS-1578	.05 mfd. 400 volts	C-4
5	OS-1240	.5 mfd. 600 volts	C-5
6	OS-1022	.5 mfd. 200 volts	C-6
7	OS-1599	.1 mfd. 400 volts	C-7
8	OS-1796	20-15-10 mfd. 450-300-300 V.	C-8
9	OS-1797	15-15 mfd. 350-350 volts	C-9
10	OS-1798	15 mfd. 300 volts	C-10

POTENTIOMETERS, TRANSFORMERS, SWITCHES, TUBES.

1	OS-1835	15 K ohms Linear Pot.	P-1
2	OS-1862	2 pole, 3 position switch	S-1
3	OS-1782	S.P.S.T. toggle switch	S-2
4	OS-1882	S.P.D.T. Push Button	S-3
5	OS-1672	Power Transformer	T-1
6	OS-1861	Output Transformer	T-2
7	OS-1771	Type 6 SN7 tube	VT-1
8	OS-1688	Type 6SJ7 Tube	VT-2
9	OS-1720	Type 6V6GT tube	VT-3
10	OS-1656	Type 6X5GT tube	VT-4
11	OS-1856	1/4 watt, neon lamp	VT-5
12	OS-1725	6 W. 115 V. S-6 Lamp	UT-6
13	OS-1167	10 H. 300 ohms Choke	T-3

RESISTORS: (K = Thousand, M = Million)

1	OS-1836	1750 ohms, plus-minus 5%	R-1
2	OS-1837	500 ohms, plus-minus 5%, 1/2 watt	R-2
3	OS-1838	820 K ohms, 10%, 1/2 watt	R-3
4	OS-1839	100 K ohms, 5%, 1/2 watt	R-4
5	OS-1840	7500 ohms, 5%, 1/2 watt	R-5
6	OS-1566	.5 meg. 10%, 1/2 watt	R-6
7	OS-1841	910 ohms, 5%, 1/2 watt	R-7
8	OS-1842	50 K ohms, 10%, 1/2 watt	R-8
9	OS-1306	10 K ohms, 10%, 1 watt	R-9
10	OS-1843	1200 ohms, 10%, 1/2 watt	R-10
11	OS-1847	95 K ohms, 1%, BT-1/2	R-11
12	OS-1846	950 K ohms, 1% BT-1/2	R-12
13	OS-1845	9.9 meg. 1%, BT-1/2	R-13
14	OS-1870	15 K ohms, 10%, BTS	R-14
15	OS-1335	300 K ohms	R-15

HARDWARE AND FITTINGS - MODEL 198

Item No.	Stock No.	Description
1	OS-1657	Octal Sockets
2	OS-1858	Candalabra Socket
3	OS-1857	Binding Post
4	OS-1893	Rubber Handle Cap and Plug
5	OS-1400	Dial Bearing
6	OS-1824	Rubber Grommet
7	OS-1849	Terminal Strip, 8 contact
8	OS-1487	Terminal Strip, 6 contact
9	OS-1682	Terminal Strip, 5 contact
10	OS-1883	Rubber handle for case
11	OS-1884	Bakelite handle clamps
12	OS-1463	Rubber feet
13	OS-1827	2" skirt knob
14	OS-1825	2" bar knob

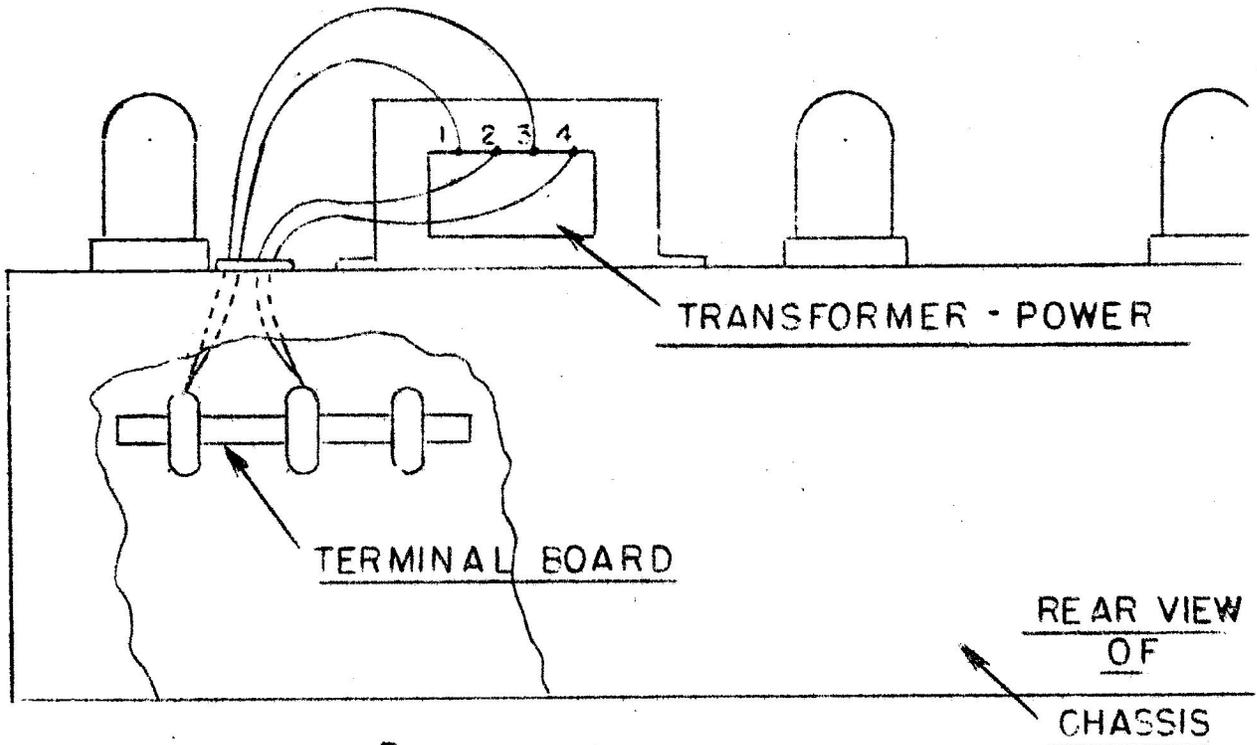
CONDENSER AND DIAL ASSEMBLY - Modvl 198

Item No.	Stock No.	Description
1	OS-1887	Condenser Mnt. Plate (Bakelite)
2	OS-1362	Flexible Coupling
3	OS-1888	Condenser Shield
4	OS-1889	Dials Lens and Frame
5	OS-1134	Dials Drum and Scale
6	OS-1425	Drive Drum
7	OS-1890	Friction Drive
8	OS-1891	Dial Shaft
9	OS-1892	Bearing Retainer Washer 3/8" x 1/2" x 1/4" brass
10	OS-1202	Dial Shaft Bushing
11	OS-1860	Dial Shaft Support Collar
12	OS-1894	Drive shaft Bushing

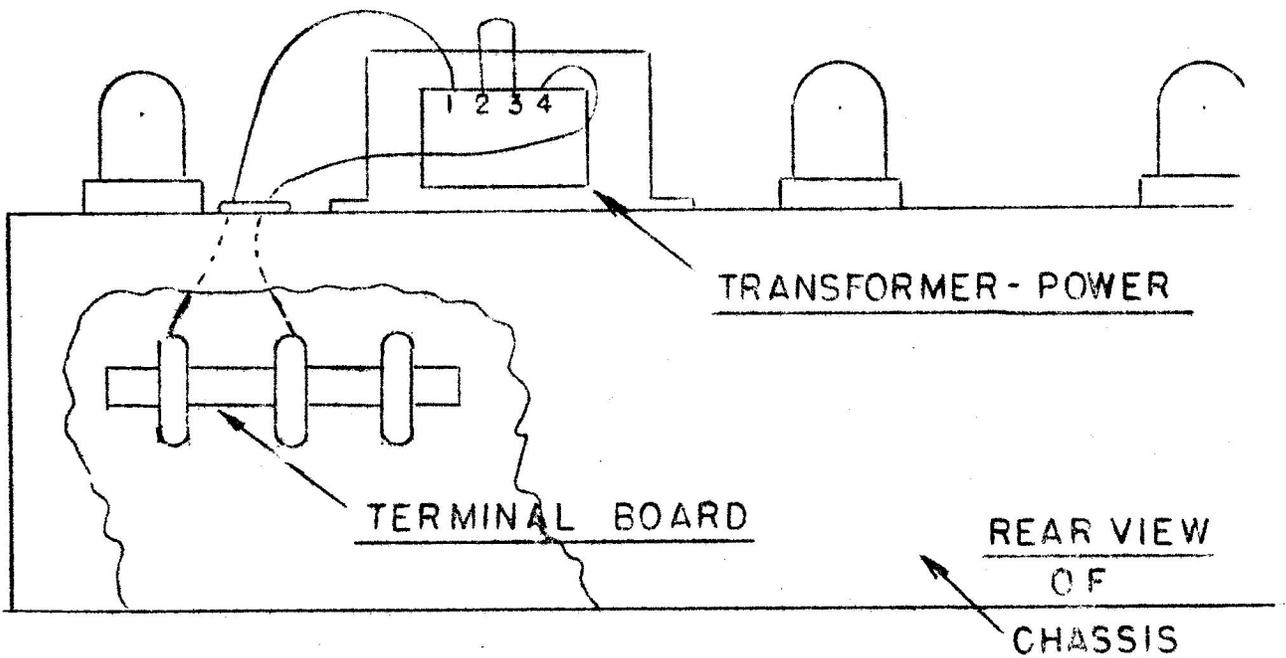
PANELS AND MISCELLANEOUS

Item No.	Stock No.	Description
1	OS-1844	Lithographed Panel
2	OS-1885	Steel Under-Panel
3	OS-1886	Case

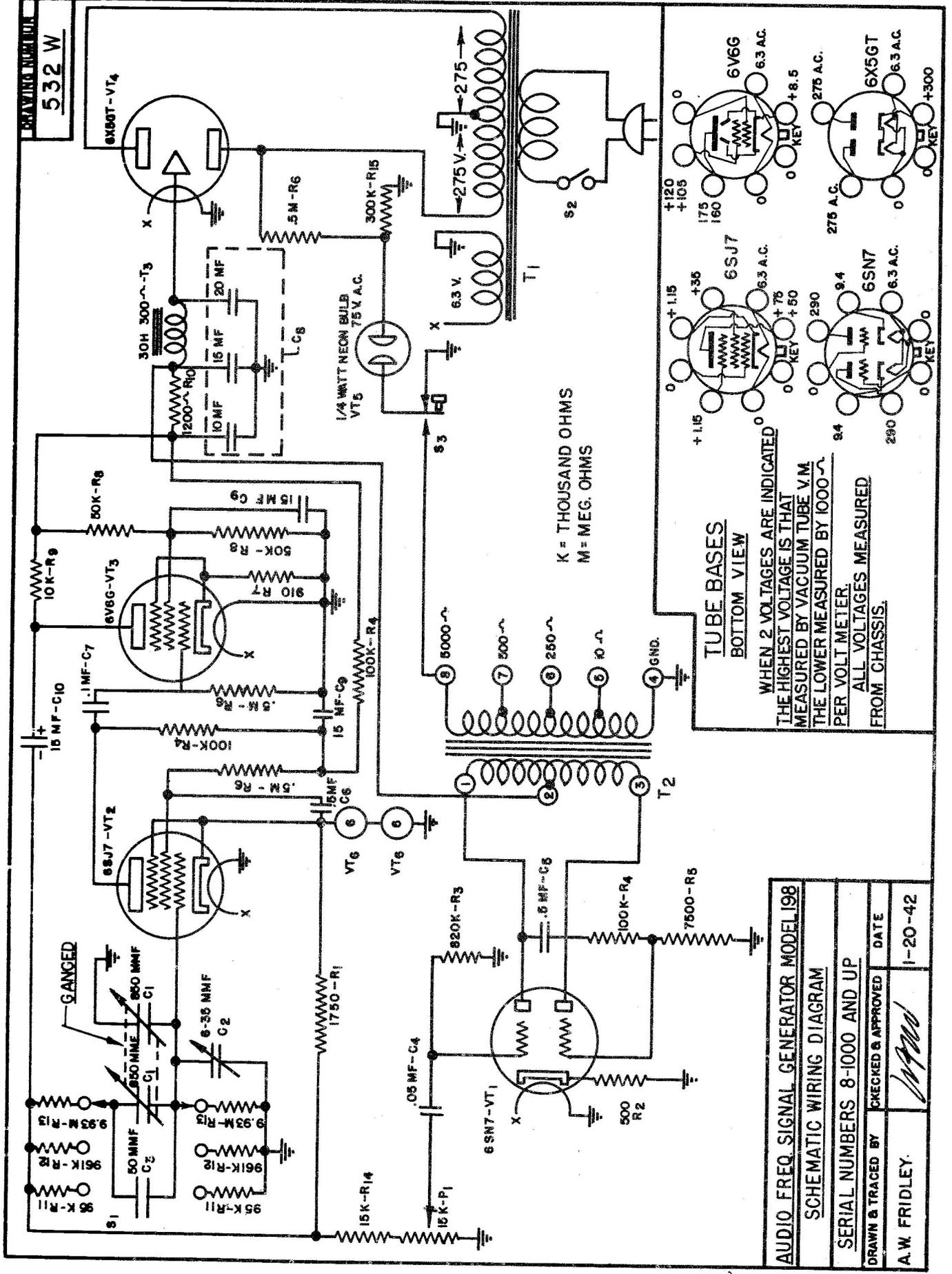
POWER CONNECTIONS FOR 110 VOLTS
OR 220 VOLTS - MODEL 198



FOR 110V. WIRES # 1-3 & 2-4 ARE CONNECTED
TOGETHER AT THE TERMINAL BOARD

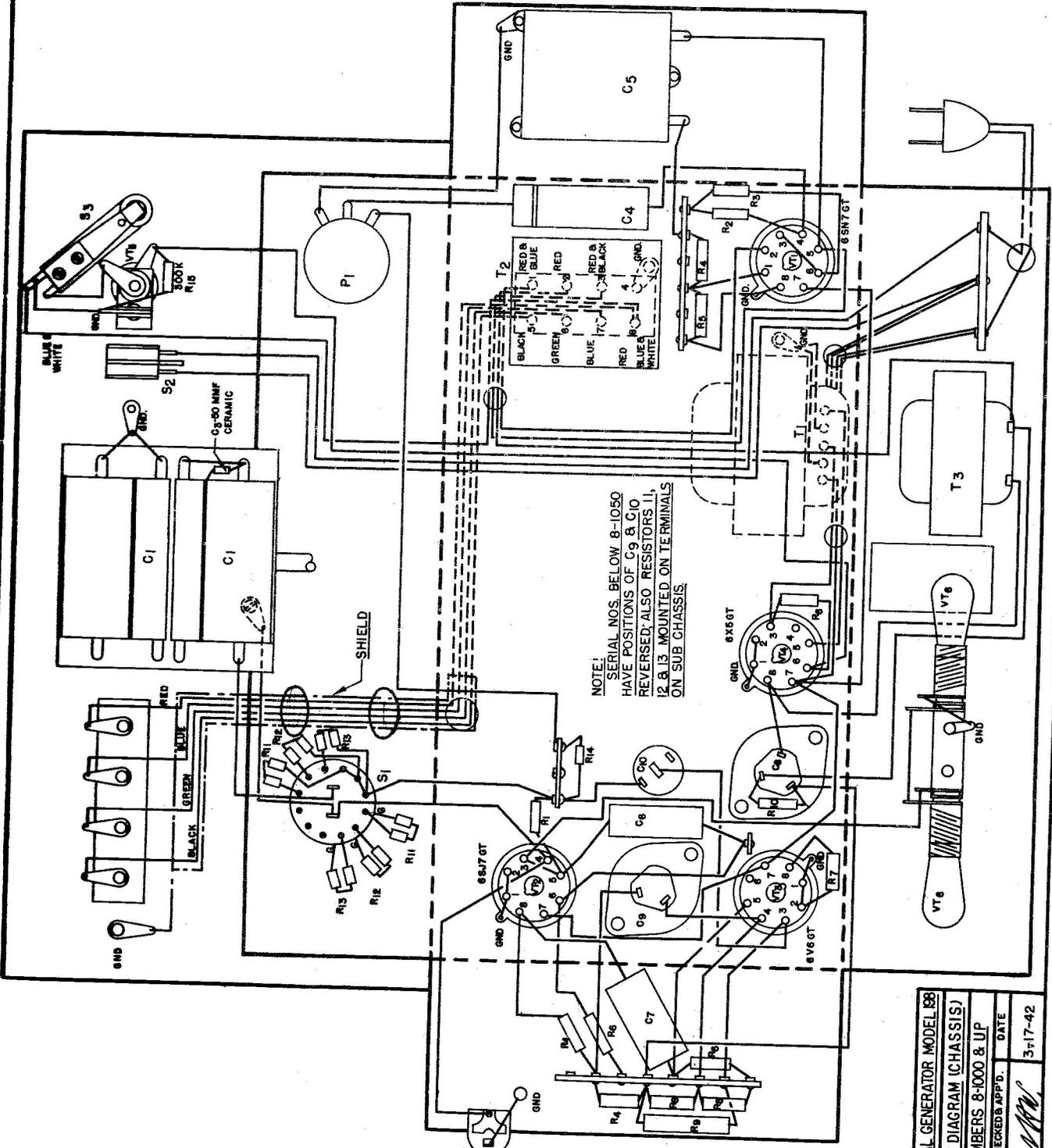


FOR 220 VOLTS DISCONNECT WIRE # 2 & 3 FROM TERMINAL
BOARD & CONNECT TOGETHER, 1-4 ARE PRIMARY



AUDIO FREQ. SIGNAL GENERATOR MODEL 198
SCHEMATIC WIRING DIAGRAM
SERIAL NUMBERS 8-1000 AND UP
 DRAWN & TRACED BY *Checked & Approved* DATE
 A. W. FRIDLEY. *1-20-42*

339W



NOTE!
 SERIAL NOS. BELOW 8-1050
 HAVE POSITIONS OF C9 & C10
 REVERSED; ALSO RESISTORS 11,
 12 & 13 MOUNTED ON TERMINALS
 ON SUB CHASSIS.

AUDIO FREQ. SIGNAL GENERATOR MODEL 188	
WIRING DIAGRAM (CHASSIS)	
SERIAL NUMBERS 8-1000 & UP	
DRAWN & TRACED	CHECKED & APP'D.
A. W. FRIDLEY	<i>[Signature]</i>
DATE	3-17-42

Scans provided by John Petzold - Houston, Tx

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