



INSTRUCTION BOOK

SN-969, ~~1-1-1~~

**MODEL 210FA
AUDIO OSCILLATOR**

**BARKER & WILLIAMSON, INC.
BRISTOL, PENNSYLVANIA**

COPY

August 17, 1961
Sheet 2 of 2

Add the following chart after page 14:

VOLTAGE CHART - $\pm 20\%$

6AN8(V1)	
<u>Pin</u>	<u>Voltage</u>
1	90
2	-3
3	0
4	FIL
5	FIL
6	65
7	43
8	0
9	1.4

6CG7(V2)	
<u>Pin</u>	<u>Voltage</u>
1	110
2	0
3	3
4	FIL
5	FIL
6	110
7	0
8	3
9	NC

6BX7(V3)	
<u>Pin</u>	<u>Voltage</u>
1	0
2	205
3	17
4	0
5	205
6	17
7	FIL
8	FIL

Voltage at junction of diodes CR2 and CR4: 330V

Conditions:

1. Measured with VTVM from designated point to ground
2. OUTPUT control fully CCW
3. INPUT: 115V RMS 60 cps AC

SPECIFICATIONS

FREQUENCY RANGE:	20 cps to 40 kc.		
BANDS:	X1	20 cps	200 cps
	X10	200 cps	2 kc
	X100	2 kc	20 kc
	X200	4 kc	40 kc
CALIBRATION ACCURACY:	±2% including calibration error, warm-up and changes due to aging of tubes and components.		
FREQUENCY DIAL:	Six-inch diameter calibrated over 328° of arc. 88 divisions. Total scale length: 76 inches. Vernier control for precise setting.		
FREQUENCY RESPONSE:	±1 db over entire range when working into rated load (reference 1 kc).		
FREQUENCY STABILITY:	Line voltage variations of ±10% cause negligible shift in output frequency.		
POWER OUTPUT:	1 watt or 24.5 volts into a 600-ohm load.		
DISTORTION:	Less than 1%, 20 cps to 20 kc; less than 2%, 20 kc to 40 kc when working into rated load or higher impedance.		
INTERNAL IMPEDANCE:	Approximately 75 ohms from 20 cps to 20 kc. Output is balanced to ground over entire frequency range (may be operated one side grounded, if desired).		
HUM AND NOISE:	At least 66 db below rated output (less than .05% of rated output).		
POWER SUPPLY:	115/230 volts, 50/1000 cps, 60 watts.		
DIMENSIONS:	Cabinet: 11¼" wide, 8½" high, 8½" deep.		
WEIGHT:	12 lbs.		

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SECTION I GENERAL DESCRIPTION

1.1 GENERAL

The Model 210FA audio oscillator is designed for general purpose audio testing and measurements. The resistance-capacity oscillator incorporated in this instrument will retain its high degree of accuracy for long periods of time with no adjustment. The push-pull output amplifier used in the Model 210FA has a large amount of over-all negative feedback for maximum stability and low distortion. The output impedance of the instrument is 600 ohms balanced or unbalanced. Output voltage is adjustable from 0 to 24.5 volts (1 watt) across a 600-ohm resistive load over the entire range of 20 to 40,000 cycles per second.

1.2 INSPECTION

Unpack the instrument and check it carefully for damage in transit. If any shipping damage is found, follow the procedure outlined in the "Claim for Damage in Shipment" in this instruction book.

1.3 POWER SOURCE VOLTAGE

Model 210FA is shipped from the factory with the power transformer dual primary windings connected for operation from a 115-volt ac source. If operation from a 230-volt source is desired, the transformer primary windings can be quickly reconnected. Refer to Section IV, paragraph 4.4 for details.

1.4 POWER CABLE AND ADAPTER

The three-conductor power cable supplied with this instrument is terminated in a polarized three-prong male connector. The third contact is an offset round pin which grounds the instrument chassis when used with an appropriate receptacle. An adapter is furnished to permit use of this connector with a standard two-contact receptacle. When the adapter is used, connect the short lead on the adapter to a suitable ground.

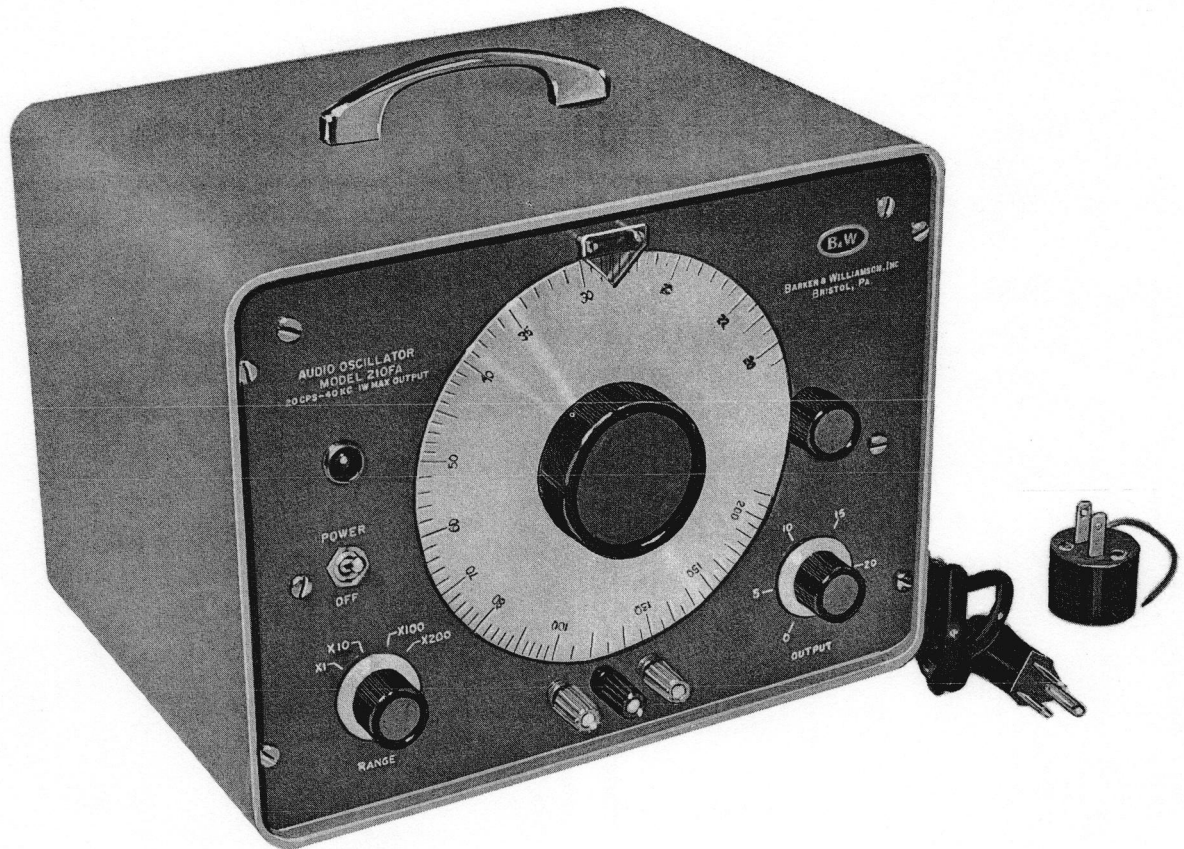


Figure 1. Model 210FA Audio Oscillator

SECTION II OPERATING INSTRUCTIONS

2.1 CONTROLS AND CONNECTIONS

POWER

This toggle switch controls the power supplied to the instrument from the power line. When the instrument is turned on, the pilot light over the switch will light.

RANGE

This rotary switch changes resistance values in the frequency determining sections of the instrument. The position of this switch determines the multiplying factor that must be used to convert the frequency dial indication to the actual output frequency of the instrument.

OUTPUT

This control is a potentiometer which varies the amount of oscillator voltage applied to the amplifier section and this determines the amplitude of the output voltage.

FREQUENCY DIAL

The dial is calibrated from 20 to 200. Multiplying its indication by the factor indicated by the RANGE switch will give the actual output frequency of the oscillator. The small knob on the right side of the frequency dial is a vernier control.

BINDING POSTS

The two red terminals are the 600-ohm output. The black terminal in the center is grounded. The output may be operated as ungrounded or either side may be grounded to center with the link supplied.

FUSE

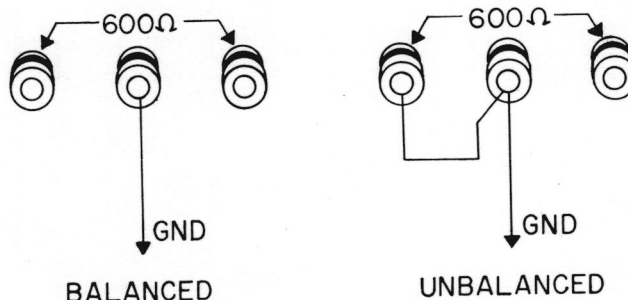
The fuseholder, located on the back of the instrument, contains a 1 ampere fuse. For 230-volt operation, a fuse rated at .5 ampere should be substituted.

2.2 OPERATION

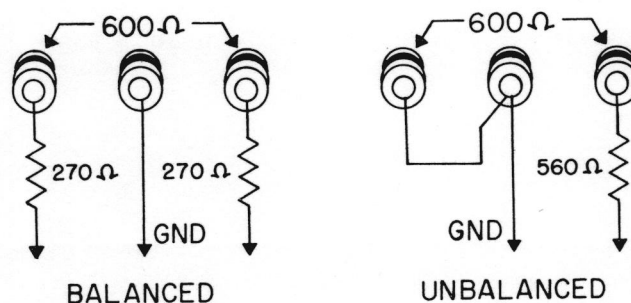
- Connect the power cable to a suitable power source.
- Turn the power switch on and allow about five minutes warm-up time.
- Set the frequency dial and the RANGE switch for the desired frequency. For example, if the desired frequency is 30,000 cps, set frequency dial to 150 and RANGE to X200 (150 x 200 is 30,000).
- Connect the instrument to the equipment under test.

The types of output available from this instrument are as follows:

- 600-ohm balanced or unbalanced output may be obtained as follows:



- If a generator with an *internal* impedance of 600 ohms is desired, the 210FA may be connected as follows:



Under these conditions the output will be one-half of the rated voltage and one-quarter of the rated power.

- Set the OUTPUT control so the Model 210FA is delivering the desired voltage to the equipment under test. If a small output voltage with minimum noise is desired, best results will be obtained by externally attenuating the output rather than by decreasing the OUTPUT control.

SECTION III CIRCUIT DESCRIPTION

3.1 GENERAL

The circuit of Model 210FA consists of an oscillator section, a push-pull amplifier section and a conventional power supply.

The oscillator section consists of a pentode and triode combination in one envelope, the 6AN8, in a two-stage, resistance coupled amplifier circuit. Positive feedback is used around the amplifier to cause oscillation and negative feedback to reduce distortion and stabilize output. The tuning device, consisting of variable condenser and switchable resistance, is in the positive feedback section.

Since the input and output signals of a two-stage amplifier are in phase, oscillations occur when the phase shift between the voltage applied to the network and the voltage at the grid of the first stage is zero. The zero phase shift point is determined by the capacity-resistance values in the tuning device.

Incandescent lamp DS1 in the negative feedback loop of the oscillator, is used as a cathode resistor for the first tube. It is not bypassed and resistance increases with current, thus automatically increasing the negative feedback, tending to stabilize the output of the oscillator. The thermal inertia of the lamp precludes its following the sine wave voltage at the lowest frequency.

The amplifier section consists of a feedback amplifier containing a push-pull output amplifier. The first tube drives the grid of one section of the output amplifier and also is stepped down in a self-balancing grid circuit to feed the grid of another triode which, in turn, feeds the other output tube. The output transformer contains a tertiary winding for overall negative feedback and, in addition, the cathodes of both driver tubes are not by-passed, thus providing further negative feedback.

The power supply consists of a standard full-wave rectifier and pi-section filter.

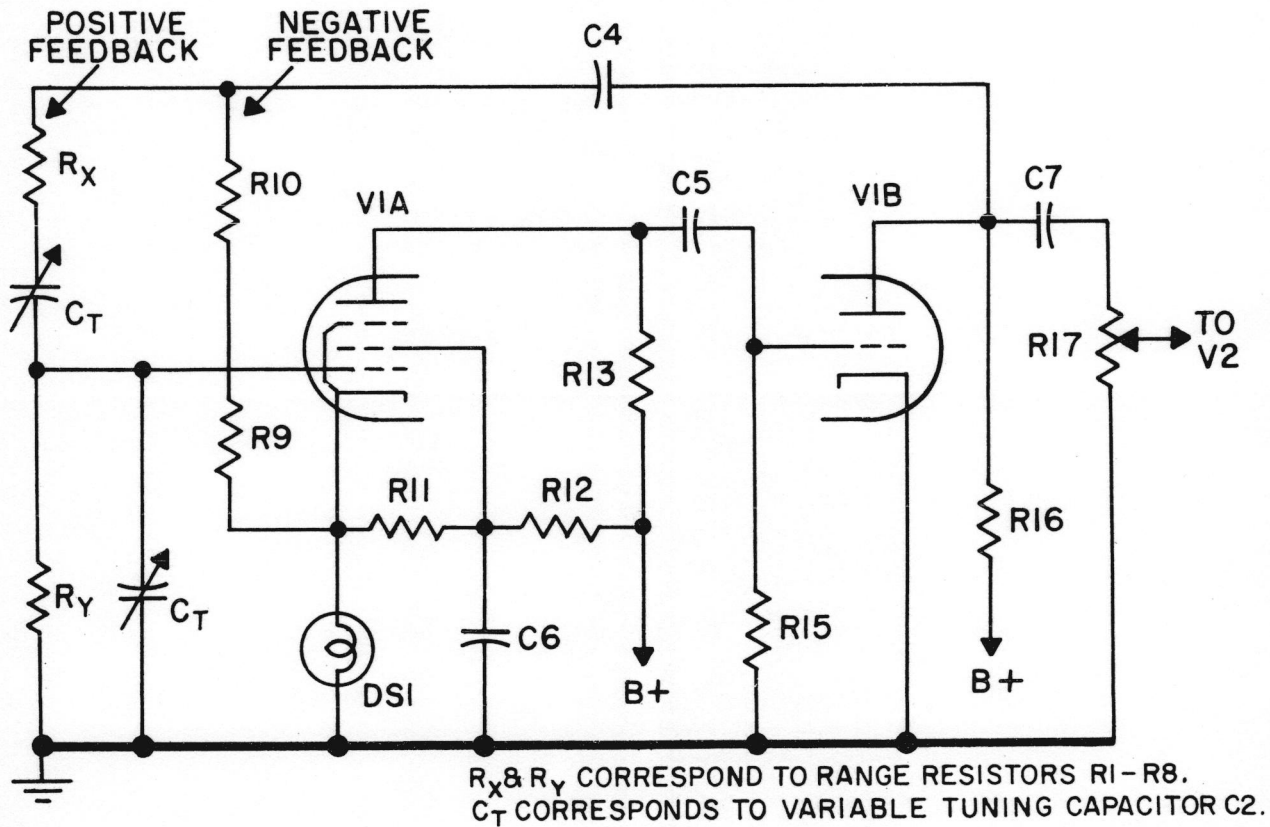


Figure 2. Simplified Oscillator Circuit

SECTION IV MAINTENANCE

CAUTION

The trimmers on the main tuning capacitor affect calibration and frequency response. Their settings should not be changed unless recalibration is needed.

4.1 REMOVAL OF CASE

Remove two screws from rear of case and four screws on side edges of panel. Chassis will slide out front.

4.2 TUBE REPLACEMENT

Distortion measurements should be made after tube changes to verify the specifications given earlier in this manual. Poor tubes can cause severe distortion and noise.

4.3 REPLACEMENT OF LAMP

The lamp operates at a very low level and should give no trouble. If damaged by shock or broken, it should be replaced by the same type and meas-

urements made of the output voltage. With the OUTPUT control at 10 and with a 600-ohm load, the screwdriver control (R9) adjacent to the lamp should be adjusted for an output of 24.5 volts RMS at 1000 cycles.

4.4 230-VOLT POWER TRANSFORMER CONVERSION

Model 210FA is shipped from the factory with the dual 115-volt primary windings of the power transformer connected in parallel for operation from a 115-volt ac source. For operation on 230-volts ac remove the jumper between 1 and 2 and between 3 and 4. Connect jumper between 2 and 3. Replace 1 ampere fuse with .5 ampere fuse. See schematic diagram.

4.5 TROUBLE SHOOTING CHART

Use the following chart as a guide in locating the trouble in a defective unit.

SYMPTOMS	POSSIBLE CAUSE	TEST PROCEDURE	REMEDIES
Instrument NOT operating, pilot light NOT on.	Line fuse blown due to overload in power supply section or defective fuse.	<p>Replace fuse. If this fuse blows, disconnect wires to 6 and 8 on power transformer and again replace fuse. If this fuse blows, it indicates:</p> <ol style="list-style-type: none"> 1. Short circuit in wiring from fuse to power transformer. 2. Defective power transformer. 3. Short circuit in filament wiring. <p>If fuse does not blow, it indicates:</p> <ol style="list-style-type: none"> 1. Defective rectifier diodes CR1 through CR4. 	<ol style="list-style-type: none"> 1. Locate and clear short circuit. 2. Replace transformer. 3. Locate and clear short circuit. <ol style="list-style-type: none"> 1. Replace diodes.

TROUBLE SHOOTING CHART (Cont'd.)

SYMPTOMS	POSSIBLE CAUSE	TEST PROCEDURE	REMEDIES
Instrument NOT operating, pilot light ON.	Oscillator section not operating properly.	<p>2. Defective capacitor C6 or C10. With instrument disconnected from line, measure resistance from junction of diodes and capacitor C10. Resistance should be over 50,000 ohms. If shorted, continue through circuit to smallest resistance to ground.</p> <p>1. Defective 6AN8 tube (VI). 2. Range resistor open.</p> <p>3. Short circuit in tuning capacitor. Tune capacitor through range with scope connected to top of output control. At some points of rotation, scope will show signal.</p> <p>4. Range switch defective. Check visually for broken contacts or shorts.</p> <p>5. Lamp DS1 loose in socket or open.</p>	<p>2. Replace shorted capacitor.</p> <p>1. Replace tube. 2. Try on all ranges, isolate and replace bad resistor.</p> <p>3. Carefully straighten bent plates.</p> <p>4. Replace range switch.</p> <p>5. Tighten or replace.</p>
<p>Instrument operating, high amount of distortion in output.</p> <p>Intermittent operation of instrument.</p>	Amplifier section not operating properly.	<p>1. Defective tube V2 or V3.</p> <p>2. Leakage in coupling capacitors C8 or C9. Check with high range ohmmeter.</p> <p>3. Change in value of resistors R30 or R31. Check with ohmmeter.</p>	<p>1. Check tubes and replace.</p> <p>2. Replace capacitor.</p> <p>3. Replace incorrect resistor.</p>
Instrument operating, high amount of distortion in output.	Defective Lamp DS1.	Distorted wave shape on oscilloscope.	Replace lamp. Adjustment of R9 will be necessary.
Intermittent operation of instrument.	Usually caused by intermittent capacitor or tube.	Using oscilloscope, start at oscillator and check toward output transformer at various points. Isolate section in which trouble occurs.	Replace intermittent component.
Output control rotation causes unstable output amplitude variation.	<p>1. Output control dirty or worn.</p> <p>2. C7 defective.</p>	<p>1. Check with ohmmeter from ground to center as control is varied. Dirty or worn control will not vary ohmmeter reading smoothly.</p> <p>2. With output control full on, measure DC voltage at center. Measurable DC voltage (+) at this point indicates leakage in capacitor.</p>	<p>1. Replace control.</p> <p>2. Replace C7.</p>

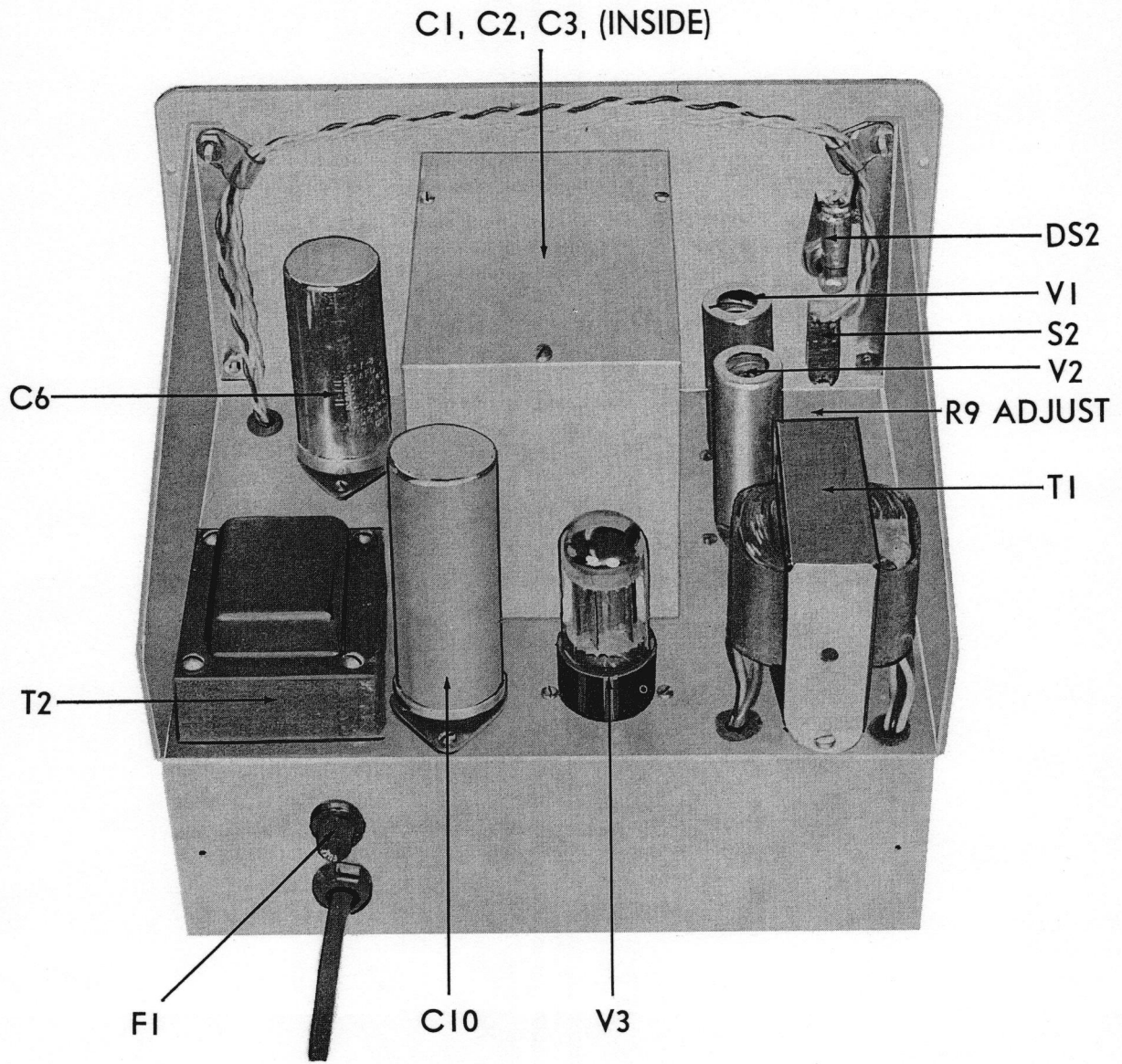


Figure 3. Top of Chassis

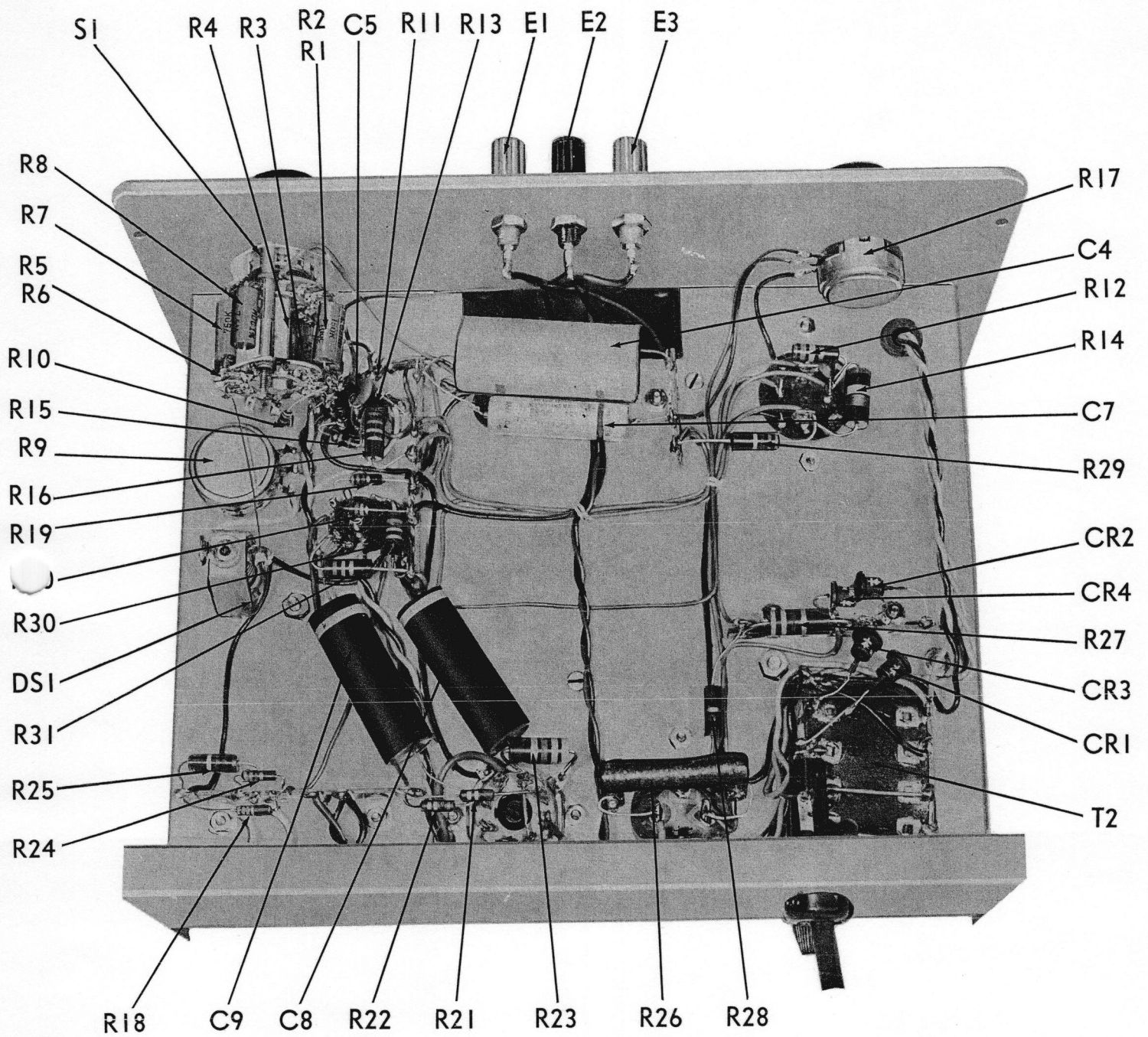


Figure 4. Bottom of Chassis

SECTION V TABLE OF REPLACEABLE PARTS

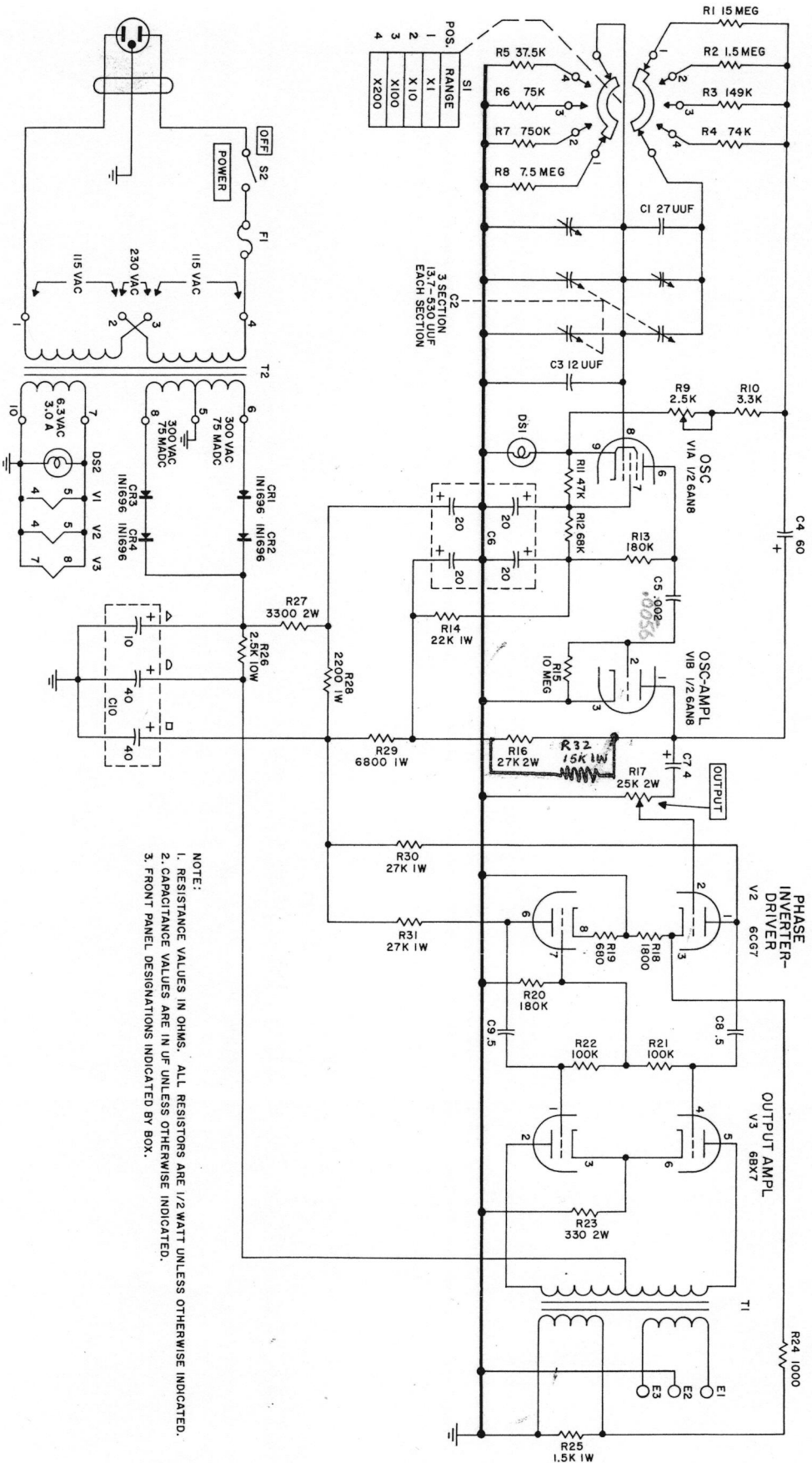
REFERENCE SYMBOL	DESCRIPTION	MANUFACTURER		B & W PART NO.	TOTAL QUANTITY
		CODE	PART NUMBER		
C1	CAPACITOR, FIXED, MICA DIELECTRIC; 27 uuf $\pm 5\%$; 300 VDCW	16	CM15	4500-163	1
C2	CAPACITOR, VARIABLE, AIR DIELECTRIC; 3 sections each 530 uuf 14 uuf to 54 uuf INCLUDES 2 TRIMMERS, EACH 2 uuf to 25 uuf	13	824345	51631	1
C3	CAPACITOR, FIXED, MICA DIELECTRIC; 12 uuf $\pm 2\%$; 300 VDCW	16	CM15	4500-142	1
C4	CAPACITOR, FIXED, ELECTROLYTIC; 60 uf, 250 VDCW	12	TD	4553-23	1
C5	CAPACITOR, FIXED, CERAMIC DIELECTRIC; 002 uf $\pm 20\%$; 1000 VDCW <i>0056</i>	3	DA140-048CB DD-562	4525-27 4525-29	1
C6	CAPACITOR, FIXED, ELECTROLYTIC; 4 sections, each 20 uf, 450 VDCW	12	TM 7M	4517-8	1
C7	CAPACITOR, FIXED, ELECTROLYTIC; 4 uf, 250 VDCW	12	TD	4553-25	1
C8	CAPACITOR, FIXED, PAPER DIELECTRIC; .5 uf $\pm 20\%$, 400 VDCW	1	V161-446A	4559-24	2
C9	Same as C8				
C10	CAPACITOR, FIXED, ELECTROLYTIC; 4 sections 40-40-10-100 uf, 450-450-450-100 v	12	TM	4556-5	1
CP1	ADAPTER, CONNECTOR; 3 contact to 2 contact; with ground lead	15	578SL	4932	1
CR1	SEMICONDUCTOR DEVICE, DIODE; type 1N1696	8	1N1696	1N1696	4
CR2	Same as CR1				
CR3	Same as CR1				
CR4	Same as CR1				
DS1	LAMP, INCANDESCENT; 120 volts; 3 watts	8	3S6-5	4716-19	1
DS2	LAMP, INCANDESCENT; 6-8 volts; $\frac{1}{4}$ amp	8	51	4716-16	1
E1	POST, BINDING; 6-way; red	9	111-102	5215-2	2
E2	POST, BINDING; 6-way; black	9	111-103	5215-3	1
E3	Same as E1				
F1	FUSE, CARTRIDGE; 1 ampere, 250 v	11	312001	5200-24	1
R1	RESISTOR, FIXED, FILM; 15 megohms $\pm 1\%$; 1 watt	10	C1C	4425-119	1
R2	RESISTOR, FIXED, FILM; 1.5 megohms $\pm 1\%$; $\frac{1}{2}$ watt	10	C $\frac{1}{2}$ C	4425-123	1
R3	RESISTOR, FIXED, FILM; 149,000 ohms $\pm 1\%$; $\frac{1}{2}$ watt	10	C $\frac{1}{2}$ C	4425-124	1

TROUBLE SHOOTING CHART (Cont'd.)

REFERENCE SYMBOL	DESCRIPTION	MANUFACTURER		B & W P PART NO.	TOTAL QUANTITY
		CODE	PART NUMBER		
R4	RESISTOR, FIXED, FILM; 74,000 ohms $\pm 1\%$; $\frac{1}{2}$ watt	10	C $\frac{1}{2}$ C	4425-126	1
R5	RESISTOR, FIXED, FILM; 37,500 ohms $\pm 1\%$; $\frac{1}{2}$ watt	10	C $\frac{1}{2}$ C	4425-129	1
R6	RESISTOR, FIXED, FILM; 75,000 ohms $\pm 1\%$; $\frac{1}{2}$ watt	10	C $\frac{1}{2}$ C	4425-128	1
R7	RESISTOR, FIXED, FILM; 750,000 ohms $\pm 1\%$; $\frac{1}{2}$ watt	10	C $\frac{1}{2}$ C	4425-127	1
R8	RESISTOR, FIXED, FILM; 7.5 megohms $\pm 1\%$; $\frac{1}{2}$ watt	10	C $\frac{1}{2}$ CXL	4425-122	1
R9	RESISTOR, VARIABLE; composition; 2,500 ohms $\pm 20\%$, linear "U" taper	2	JAIL040S252UC	4417-64	1
R10	RESISTOR, FIXED, COMPOSITION; 3,300 ohms $\pm 10\%$; $\frac{1}{2}$ watt		RC20GF332K	4401-332K	1
R11	RESISTOR, FIXED, COMPOSITION; 47,000 ohms $\pm 10\%$; $\frac{1}{2}$ watt		RC20GF473K	4401-473K	1
R12	RESISTOR, FIXED, COMPOSITION; 68,000 ohms $\pm 10\%$; $\frac{1}{2}$ watt		RC20GF683K	4401-683K	1
R13	RESISTOR, FIXED, COMPOSITION; 180,000 ohms $\pm 10\%$; $\frac{1}{2}$ watt		RC20GF184K	4401-184K	2
R14	RESISTOR, FIXED, COMPOSITION; 22,000 ohms $\pm 10\%$; 1 watt		RC32GF223K	4402-223K	1
R15	RESISTOR, FIXED, COMPOSITION; 10 megohms $\pm 10\%$; $\frac{1}{2}$ watt		RC20GF106K	4401-106K	1
R16	RESISTOR, FIXED, COMPOSITION; 27,000 ohms $\pm 5\%$; 2 watts		RC42GF273J	4403-273J	1
R17	RESISTOR, VARIABLE; composition; 25,000 ohms $\pm 20\%$, linear "U" taper	2	J48359	4417-5	1
R18	RESISTOR, FIXED, COMPOSITION; 1,800 ohms $\pm 10\%$; $\frac{1}{2}$ watt		RC20GF182K	4401-182K	1
R19	RESISTOR, FIXED, COMPOSITION; 680 ohms $\pm 5\%$; $\frac{1}{2}$ watt		RC20GF681J	4401-681J	1
R20	Same as R13				
R21	RESISTOR, FIXED, COMPOSITION; 100,000 ohms $\pm 10\%$; $\frac{1}{2}$ watt		RC20GF104K	4401-104K	2
R22	Same as R21				
R23	RESISTOR, FIXED, COMPOSITION; 330 ohms $\pm 10\%$; 2 watt		RC42GF331K	4403-331K	1
R24	RESISTOR, FIXED, COMPOSITION; 1,000 ohms $\pm 10\%$; $\frac{1}{2}$ watt		RC20GF102K	4401-102K	1
R25	RESISTOR, FIXED, COMPOSITION; 1,500 ohms $\pm 10\%$; 1 watt		RC32GF152K	4402-152K	1

TROUBLE SHOOTING CHART (Cont'd.)

REFERENCE SYMBOL	DESCRIPTION	MANUFACTURER		B & W PART NO.	TOTAL QUANTITY
		CODE	PART NUMBER		
R26	RESISTOR, FIXED, WIRE WOUND; 2,500 ohms; 10 watts	17	KT	4408-26	1
R27	RESISTOR, FIXED, COMPOSITION; 3,300 ohms $\pm 10\%$; 2 watt		RC42GF332K	4403-332K	1
R28	RESISTOR, FIXED, COMPOSITION; 2,200 ohms $\pm 10\%$; 1 watt		RC32GF222K	4402-222K	1
R29	RESISTOR, FIXED, COMPOSITION; 6,800 ohms $\pm 10\%$; 1 watt		RC32GF682K	4402-682K	1
R30	RESISTOR, FIXED, COMPOSITION; 27,000 ohms $\pm 5\%$; 1 watt		RC32GF273J	4402-273J	2
R31 R32	Same as R30 <i>RESISTOR, FIX, Comp 15,000 OHMS $\pm 10\%$, 1 WATT</i>		<i>RC32GF153K</i>	<i>4402-153K</i>	<i>1</i>
S1	SWITCH, ROTARY; 2 pole, 4 position; 30° indexing; shorting contacts	3	PA022-2222	A-51652	1
S2	SWITCH, TOGGLE; SPST; 3 amp, 125 v	4	1887-X	4616	1
T1	TRANSFORMER, AUDIO FREQUENCY; primary impedance: push-pull, 2,500 ohms/ plate; 2 identical secondaries: 600 ohms impedance	6	X-7201	A-51653	1
T2	TRANSFORMER, POWER; primary: 115/230 v ac, 50/1000 cps; secondary #1: center tapped, each 300 v ac, 75 ma dc: secondary #2: 6.3 v ac 3.0 amp	7	393RF-903	A-51656	1
V1	ELECTRON TUBE; type 6AN8	14	6AN8	6AN8	1
V2	ELECTRON TUBE; type 6CG7	14	6CG7	6CG7	1
V3	ELECTRON TUBE; type 6BX7	18	6BX7	6BX7	1
W1	CABLE ASSEMBLY, POWER, ELECTRICAL; 5 ft lg overall; 3-conductor No. 18 AWG cable, terminated with molded plug (3-contacts, pol- arized).	5	BW-51657	A-51657	1



NOTE:
 1. RESISTANCE VALUES IN OHMS. ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE INDICATED.
 2. CAPACITANCE VALUES ARE IN UF UNLESS OTHERWISE INDICATED.
 3. FRONT PANEL DESIGNATIONS INDICATED BY BOX.

Figure 5. Schematic Diagram

LIST OF MANUFACTURERS

CODE	MANUFACTURER	CODE	MANUFACTURER
1	Aerovox Corporation 740 Belleville Avenue New Bedford, Massachusetts	10	Kidco, Incorporated Post Office Box 178 Medford, New Jersey
2	Allen-Bradley Company 130 West Greenfield Avenue Milwaukee 4, Wisconsin	11	Littelfuse Incorporated 1865 Miner Street Des Plaines, Illinois
3	Centralab Division Globe-Union, Incorporated 900 East Keefe Avenue Milwaukee 1, Wisconsin	12	Pyramid Electric Company Orange Street Darlington, South Carolina
4	Circle F Manufacturing Company 720 Monmouth Street Trenton 4, New Jersey	13	Radio Condenser Company Camden 3, New Jersey
5	Columbia Wire & Supply Company 2852 Irving Park Road Chicago 18, Illinois	14	Radio Corporation of America 415 South Fifth Street Harrison, New Jersey
6	Columbus Process Company, Inc. 2851 Southeastern Avenue Columbus, Indiana	15	Rodale Manufacturing Company, Inc. M Street Emmaus, Pennsylvania
7	Crest Transformer Corporation 1834 West North Avenue Chicago 22, Illinois	16	Sangamo Electric Company 11th Street & Converse Avenue Springfield, Illinois
8	General Electric Supply Company 401-421 E. Hunting Park Avenue Philadelphia 24, Pennsylvania	17	Sprague Electric Company 91 Marshall Street North Adams, Massachusetts
9	Johnson Company, E. F. 206 Second Avenue, South West Waseca, Minnesota	18	Tung-Sol Electric, Incorporated 1 Summer Avenue Newark 4, New Jersey

GUARANTEE

Each unit of each item and each part thereof is guaranteed by the Contractor against all defects in material and/or workmanship. Each unit of each item and each part thereof is guaranteed by the Contractor against damage resulting from improper application by the Contractor of any component in the design or fabrication of the equipment. This guarantee extends for a period of one year from the date of installation or use, provided that this period shall not exceed 2 years from the date of delivery.

Upon notice in writing the Contractor shall promptly repair or replace all defective or damaged units or parts f.o.b. any point within the continental United States (this means the forty-eight contiguous states and the District of Columbia) as designated by the Government, at no expense to the Government.

The Contractor may elect to have any replaced unit or part returned to his plant at his expense. If, upon examination of the unit or part, it can be shown to the satisfaction of the Government that the unit or part is not defective or damaged within the meaning of this guarantee, the Contractor may bill the Government for the cost of repair or replacement, including transportation costs.

This guarantee shall exclude electron tubes, batteries, natural rubber and material normally consumed in operation unless such excepted items fail as a result of improper application by the Contractor, in which case the guarantee shall be equally applicable to these items; provided that the Contractor shall guarantee such excepted items to the extent of the guarantee received by the Contractor from his supplier.

CLAIM FOR DAMAGE IN SHIPMENT

INSPECT AND TEST THE INSTRUMENT AS SOON AS IT IS RECEIVED. WHERE EQUIPMENT HAS BEEN DAMAGED IN SHIPMENT, AN IMMEDIATE CLAIM SHOULD BE FILED WITH THE CARRIER WHO MADE DELIVERY TO YOUR PREMISES.

OUR COMPANY IS NOT RESPONSIBLE FOR SHIPPING DAMAGE.

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