

SECTION 5

MAINTENANCE

1. INSPECTION.

a. GENERAL. - This radio equipment has been constructed of materials considered to be the best obtainable for the purpose and has been carefully inspected and adjusted at the factory to reduce maintenance to a minimum. However, a certain amount of checking and servicing will be necessary to maintain efficient and dependable operation. The following section has been written to aid in checking the equipment.

b. ROUTINE INSPECTION. - Routine inspection schedules should be set up for periodic checks of this equipment. This inspection should include examination of the mechanical system for excessive wear or binding and of the electrical system for electrical defects and deterioration of components.

If the routine inspection of the equipment is carried out faithfully, the chances of improper operation of the equipment are greatly minimized. It is, therefore, important that this inspection be made as frequently as possible and it should be sufficiently thorough to include all major electrical circuits of the equipment as well as the mechanical portion.

(1) CLEANING. - The greatest enemy to uninterrupted service in equipment of this type is corrosion and dirt. Corrosion itself is accelerated by the presence of dust and moisture on the component parts of the assembly. It is impossible to keep moisture out of the equipment in certain localities, but foreign particles and dust can be periodically removed by means of a soft brush and a dry, oil-free jet of air. Remove the dust as often as a perceptible quantity accumulates in any part of the equipment. It is very important that rotating equipment such as variable condensers and tap switches be kept free from dust to prevent undue wear. Likewise, variable condenser plates should be kept free from dirt to avoid flashover on modulation peaks.

One of the greatest sources of trouble in equipment located in a salt atmosphere is corrosion. Corrosion resulting from salt spray or salt laden atmosphere may cause failure of the equipment for no apparent reason. In general it will be found that contacts such as tap switches, tube prongs, cable plug connectors, and relay contacts are most affected by corrosion. When it is necessary to operate the equipment in localities subject to such corrosive atmosphere, inspection of wiping contacts, cable plugs, relays etc., should be made more frequently in order to keep the equipment in good condition.

(2) VACUUM TUBES. - Make a check of emission characteristics of all tubes. After the emission check, examine the prongs on all tubes to make sure that they are free from corrosion. See that all tubes are replaced correctly and fully in their sockets, and a good electrical contact is made between the prong of the tube and the socket. Use caution in removing and replacing grid or plate caps

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on tubes so equipped. Before a tube is discarded, make certain that the tube is at fault and the trouble is not a loose or broken connection within the equipment. A complete set of tested tubes of the same type specified should be kept on hand at all times. If faulty operation of the transmitter is observed and tube failure suspected, each tube may be checked by replacing it with a tube known to be in good condition. Defective tubes causing an overload in power circuits may usually be located by inspection. It will be found that excessive heating or sputtering within the vacuum tubes is a good indication of a fault in the tube circuit.

If tubes have been in use for a period of time equal to or exceeding the manufacturers tube life rating, it is suggested that they be replaced. A marked improvement in the performance of the equipment is usually noticeable after the weak tubes have been replaced.

(a) PRECAUTIONS FOR SATISFACTORY TUBE LIFE.

1. Before any tube is removed from the equipment, make certain the primary power is disconnected from the equipment.
2. Operate all tubes within $\pm 5\%$ of rated filament voltage.
3. Do not exceed the rated plate current of any tube during normal operation of the equipment.

(b) TUBE REPLACEMENT PRECAUTIONS.

1. All tubes are removed by pulling straight up on them.
2. Remove plate cap connectors, from tubes so equipped, with great care to prevent breaking the seal around the plate cap. Grid and plate cap adaptors are used on the modulator tubes. To prevent glass breakage when changing tubes, lay the tube on its side on a table, grasp the adaptor with a pair of pliers, and loosen the set screws with a Bristo wrench. When tightening the set screws on the new tube be sure and hold the adaptor with the pliers.
3. Before a tube is inserted, make certain that the type of tube is correct for the socket into which it is being placed.

NOTE

Changing master oscillator tubes (V001) may cause a slight change in master oscillator calibration.

(c) TUBE TABLE.

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1. 310A EXCITER UNIT.

<u>SYMBOL</u>	<u>TYPE</u>	<u>FUNCTION</u>	<u>RATED FIL. VOLTAGE</u>
V001	6SJ7	Master oscillator	6.3
V601	6AG7	Isolation buffer	6.3
V602	6AG7	Frequency doubler	6.3
V603	807	Frequency multiplier	6.3
V604	807	Frequency doubler	6.3
V605	VR105	Voltage regulator	
V606	VR105	Voltage regulator	
V607	6X5GT	Rectifier	6.3
V608	5R4GY	Rectifier	5.0

2. 30K TRANSMITTER UNIT.

<u>SYMBOL</u>	<u>TYPE</u>	<u>FUNCTION</u>	<u>RATED FIL. VOLTAGE</u>
V201	4-125A	Power amplifier	5.0
V301	6SJ7	Audio amplifier	6.3
V302	6SN7	Dual audio amplifier	6.3
V303	6H6	Speech clipper	6.3
V304	6B4G	Audio driver	6.3
V305	75TH	Modulator	5.0
V306	75TH	Modulator	5.0
V401	5R4GY	Bias rectifier	5.0
V402	5R4GY	LV rectifier	5.0
V501	866A	HV rectifier	2.5
V502	866A	HV rectifier	2.5

3. RELAYS. - All relays should be inspected at regular intervals. Check the contacts for proper alignment, pitting and corrosion. Use a burnishing tool to clean contacts - never use sandpaper or emery cloth.

2. TROUBLE SHOOTING.

a. GENERAL. - The most general cause of improper operation of radio equipment is tube failure. Refer to paragraph 1. b. (2) in this section for comments concerning vacuum tube replacement. Defective tubes causing an overload in power circuits may usually be located by inspection. High voltage arcs may be caused by bent condenser plates, corrosion or dust. Corrosion resulting from operating the equipment in a salt laden atmosphere may cause failure of the equipment for no apparent reason.

In general, trouble encountered in radio apparatus may be isolated by means of various tests and measurements, and the section of the transmitter determined

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in which the trouble is located. If this is done, the components in the associated circuit may be checked and the trouble located. Refer to the tables of meter readings and resistance measurements in Section 6 of this book.

No one but an authorized and competent service man equipped with proper test facilities should be permitted to service this equipment.

b. FUSES.

(1) GENERAL. - This equipment is supplied with fuses of the correct rating in each position. Fuse failures should be replaced with spares only after the circuit in question has been carefully examined to make certain that no permanent fault exists. Always replace a fuse with the rating specified in the following table.

FUSE TABLE

<u>SYMBOL</u>	<u>LOCATION</u>	<u>TYPE</u>	<u>RATING</u>
F601	Exciter unit filament transformer primary.	Cartridge (3AG)	2 amp.
F602	Exciter unit plate transformer primary.	Cartridge (3AG)	2 amp.
F301	Transmitter audio amplifier tubes filament transformer primary.	Cartridge (3AG)	1/2 amp.
F401	Transmitter bias supply primary.	Cartridge (3AG)	1/2 amp.
F402	Transmitter LV power supply primary.	Cartridge (3AG)	3 amp.
F403	Transmitter modulator and PA filament transformer primary.	Cartridge (3AG)	2 amp.
F501	Transmitter HV rectifier filament primary.	Cartridge (3AG)	1 amp.
F101	Transmitter power line.	Plug	15 amp.
F102	Transmitter power line.	Plug	15 amp.

13. ALIGNMENT.

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a. GENERAL. - Should, for any reason, the Model 310A exciter unit get out of alignment, it is recommended that the unit be realigned at once. Improper operation might result in damage to valuable equipment.

b. HIGH FREQUENCY OSCILLATOR. - Should trouble develop in the high frequency master oscillator, the unit should be returned to the factory for servicing, however, the unit can be serviced and realigned by persons understanding such techniques providing accurate test equipment is at hand. A crystal controlled frequency standard with outputs at 1700 and 2000 kc with an accuracy of better than .015 percent, must be used for setting the band edges.

(1) PROCEDURE.

(a) Apply power to the exciter unit and check the oscillator frequency on a good receiver.

(b) Turn on the 1700 kc oscillator and tune the receiver to 1700 kc.

(c) Rotate the exciter TUNING control in the right direction as determined by step (a) until the Master oscillator and the 1700 kc check oscillator produce a zero beat in the receiver output.

(d) Note the reading on the vernier dial and then rotate the dial in the clockwise direction for exactly 12 turns. The Master oscillator should zero beat with the 2000 kc oscillator at this point.

(e) If zero beat is obtained at the 2000 kc point, the set screws in one end of a flexible coupler connecting the dial to the master oscillator can be loosened and the dial turned to exactly 4 mc while holding zero beat between the 2000 kc oscillator and the master oscillator after which the set screws should again be tightened.

(f) Check the alignment of the stages following the oscillator and realign if necessary as outlined in paragraph 3. g.

(g) If the 1700 and the 2000 kc ends of the master oscillator tuning are not exactly 12 turns of the oscillator shaft apart, the oscillator will have to be removed entirely from the exciter unit and the variable padding capacitor C003 adjusted until the end points do fall exactly 12 turns apart.

To remove the oscillator, disconnect the tuning shaft and remove the four screws which hold the bracket on which the oscillator is mounted and remove the oscillator and bracket together. Power is supplied the oscillator by a four wire cable. The variable padding capacitor C003 is accessible through a hole near the power connector. A metal snap plug is inserted in the hole and must be removed. Be sure to replace this snap plug before installing the oscillator in the exciter unit.

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(h) After the oscillator has been adjusted so that the 1700 and the 2000 kc points fall exactly 12 turns apart, replace the oscillator in the exciter unit and adjust the dial as outlined in step (e). Be sure you have the 2000 kc point when tightening the set screws.

NOTE

Somewhat greater accuracy can be obtained if the oscillator end points are set using harmonic operation i.e. listen in the 14 or 28 mc region for the harmonics of the 1700 and 2000 kc signals and set the corresponding harmonic of the MO to zero beat with these.

g. EXCITER STAGES. - Should alignment of the exciter doubler and multiplier stages become necessary, procure a 10 ma meter and place in the final 807 grid circuit and a 150 ma meter and place in the plate of the final 807. See figure 8-14 for proper connections to the meters. If the stages are only slightly out of adjustment, it might be possible to re-align them simply by adjusting the inductance trimmer, in the coils involved, with the TUNING Control set at the point at which the output is the lowest. The grid current in the 807 doubler state should read at least 1 ma. If the exciter stages are very far out of alignment, proceed as outlined below.

(1) PROCEDURE. (Refer to figure 5-1.)

(a) Connect the concentric feed line from the exciter to the transmitter and turn the filaments of both equipments on.

(b) Place the band switches in both equipments in the 80 meter position.

(c) Rotate the tuning control to 3.5 megacycles.

(d) Loosen the set screws in the couplers connected to the shafts of C606, C613 and C618 and set these condensers so that the rotors are within a half inch of being closed. (measured from the tip of the rotors to the edge of the stators).

(e) Tighten the coupler set screws.

(f) With the tuning control set at 3.5 megacycles, adjust the inductance trimmers in the 80 meter coils (see figure 5-1) for maximum V604 grid current (L604) and minimum plate current dip (L610). Keep the 4-125A grid circuit in tune.

(g) Repeat steps (b) and (f) for 40 meters, adjusting L605 then L611.

(h) Repeat steps (b) and (f) for 20 meters, adjusting L607 then L612.

(i) Repeat steps (b) and (f) for 15 meters, adjusting L606 then L613.

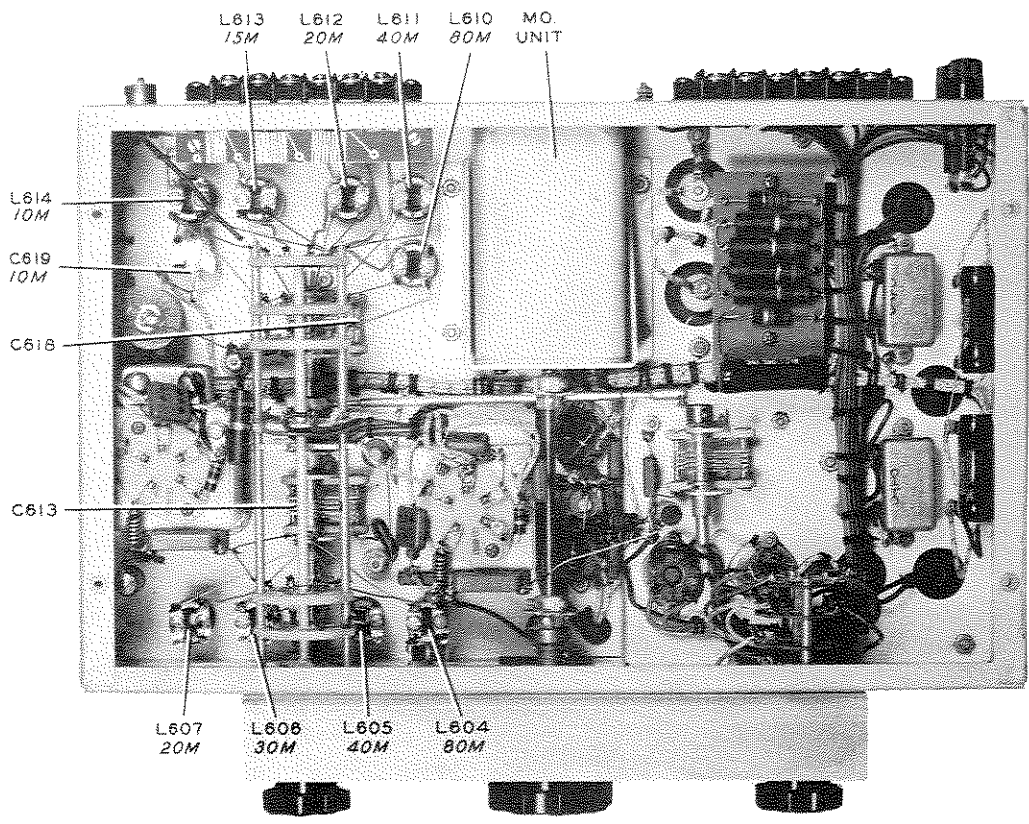
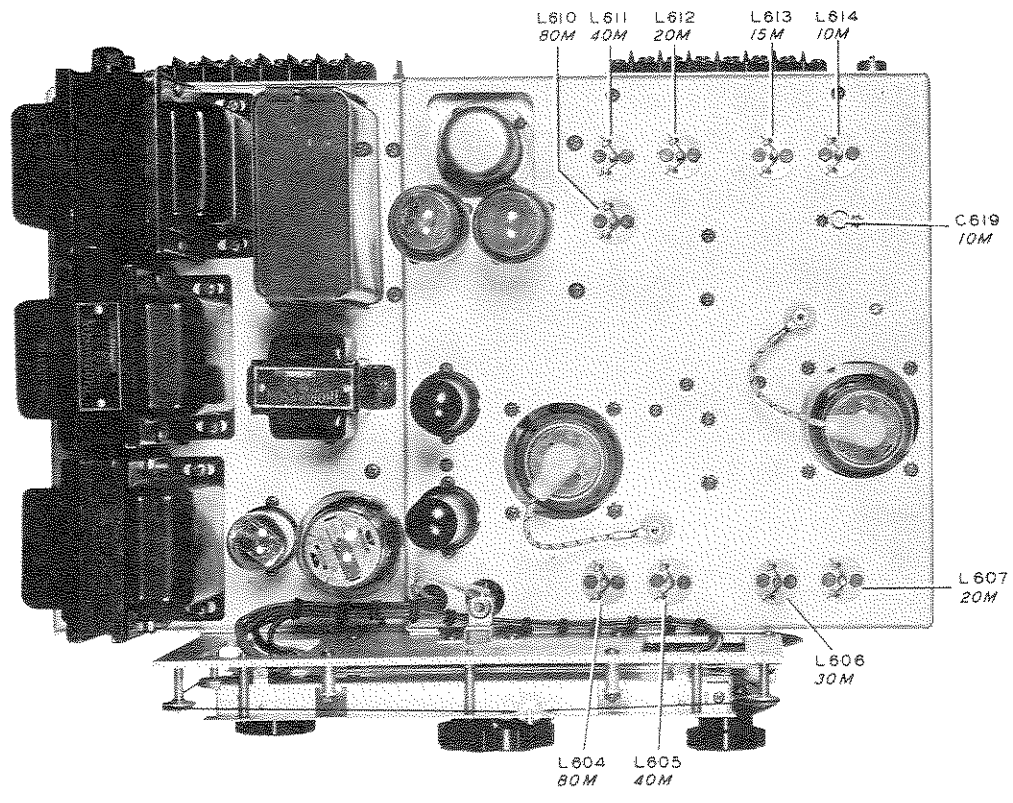


FIGURE 5-1 EXCITER ALIGNMENT ADJUSTMENTS

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(j) Operate the band switch to 10 meters and the tuning control to 29.5 megacycles. Tune capacitance trimmer C619 for minimum V604 plate current dip.

(k) Rotate the tuning control to 27.1 megacycles and adjust the inductance trimmer in L614 for minimum V604 plate current dip.

NOTE

If the exciter output is low at any position of the TUNING Control on the 10 meter and 80 meter bands, capacitor C606 can be loosened and adjusted to bring the output up. The output in the remaining bands should then be checked again.

(2) OUTPUT. - The exciter output can be changed by sliding the output link toward or away from the plate end of the output coils. If an output link is moved, it may be necessary to realign the corresponding coil. Attempt to set the output links to obtain 15 ma grid current from the 4-125A grid. V604 plate current should not run over 75 ma.

SECTION 6

SUPPLEMENTARY DATA

1. TYPICAL METER READINGS.

a. PHONE EMISSION. - (75M)

MOD PLATE CURRENT - (Static) 45 ma (100% MOD.) 175 ma

FILAMENT VOLTAGE - 5.0 v

PA GRID CURRENT - 15 ma

PA PLATE CURRENT - 150 ma

b. CW EMISSION (80M)

FILAMENT VOLTAGE - 5.0 v

PA GRID CURRENT - 15 ma

PA PLATE CURRENT - 200 ma

SECTION 7
PARTS LIST

310A EXCITER UNIT

ITEM	CIRCUIT FUNCTION	DESCRIPTION	COLLINS PART NUMBER
C001	Osc grid tank	CAPACITOR: 725 mmf $\pm 1\%$; 500 WVDC	913 0096 00
C002	Osc grid tank	CAPACITOR: 20 mmf ± 1 mmf; 500 WVDC	913 0051 00
C003	Osc grid trimmer	CAPACITOR: 26 mmf max; 3.6 mmf min	922 0019 00
C004	Osc grid blocking	CAPACITOR: 100 mmf ± 2.0 mmf; 500 WVDC	913 0067 00
C005	Osc grid	CAPACITOR: 20 mmf ± 1 mmf; 500 WVDC	913 0051 00
C006	Osc screen by-pass	CAPACITOR: .002 mf $\pm 15\%$; 350 WVDC	913 0095 00
C007	Osc plate blocking	CAPACITOR: .002 mf $\pm 15\%$; 350 WVDC	913 0095 00
C008	Osc high voltage filter	CAPACITOR: .002 mf $\pm 15\%$; 350 WVDC	913 0095 00
C601	Buffer cathode by-pass	CAPACITOR: 2200 mmf $\pm 20\%$; 500 WVDC	935 4123 00
C602	Buffer plate blocking	CAPACITOR: 2200 mmf $\pm 20\%$; 500 WVDC	935 4123 00
C603	6AG7 freq doubler screen by-pass	CAPACITOR: .01 mf $\pm 20\%$; 300 WVDC	935 2118 00
C604	6AG7 freq doubler cathode by-pass	CAPACITOR: 2200 mmf $\pm 20\%$; 500 WVDC	935 4123 00
C605	6AG7 freq doubler high voltage filter	CAPACITOR: 2200 mmf $\pm 20\%$; 500 WVDC	935 4123 00
C606	6AG7 freq doubler plate tuning	CAPACITOR: 6 mmf min, 50 mmf max	922 0021 00
C607	Freq multiplier grid coupling	CAPACITOR: 1000 mmf $\pm 20\%$; 2500 WVDC	936 0250 00
C608	Freq multiplier grid bias filter	CAPACITOR: 2200 mmf $\pm 20\%$; 500 WVDC	935 4123 00
C609	Freq multiplier cathode by-pass	CAPACITOR: .01 mf $\pm 20\%$; 200 WVDC	935 2118 00
C610	Freq multiplier filament by-pass	CAPACITOR: .01 mf $\pm 20\%$; 300 WVDC	935 2118 00
C611	Freq multiplier screen voltage filter	CAPACITOR: .01 mf $\pm 20\%$; 300 WVDC	935 2118 00
C612	Freq multiplier plate blocking	CAPACITOR: 2200 mmf $\pm 20\%$; 500 WVDC	935 4123 00

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310A EXCITER UNIT

ITEM	CIRCUIT FUNCTION	DESCRIPTION	COLLINS PART NUMBER
C613	Freq multiplier plate tuning	CAPACITOR: 6 mmf min, 50 mmf max	922 0021 00
C614	807 freq doubler grid coupling	CAPACITOR: .001 mf $\pm 20\%$; 2500 WVDC	936 0250 00
C615	807 freq doubler screen voltage filter	CAPACITOR: .1 mf $+40 -15\%$; 600 WVDC	961 4020 00
C616	807 freq doubler filament by-pass	CAPACITOR: .01 mf $\pm 20\%$; 300 WVDC	935 2118 00
C617	807 freq doubler plate blocking	CAPACITOR: 2200 mmf $\pm 20\%$; 500 WVDC	935 4123 00
C618	807 freq doubler plate tuning	CAPACITOR: 35 mmf max; 5 mmf min	922 0022 00
C619	807 freq doubler plate tuning	CAPACITOR: 25.7 mmf max; 3.9 mmf min	922 0017 00
C620	Bias voltage filter	CAPACITOR: 20 mf $+100\% -10\%$; 100 WVDC	183 3310 00
C621	Bias voltage filter	CAPACITOR: 20 mf $+100\% -10\%$; 100 WVDC	183 3310 00
C622	High voltage filter	CAPACITOR: 10 mf $\pm 10\%$; paper; 1000 WVDC	930 0038 00
C623	807 freq doubler cathode by-pass	CAPACITOR: .01 mf $\pm 20\%$; 300 WVDC	935 2118 00
E601	Freq multiplier grid	PARASITIC SUPP: 47 ohm $\pm 10\%$; 1 w resistor shunted by 8 turns #18 tinned copper wire	571 1064 10
E602	807 freq doubler grid	PARASITIC SUPP: 47 ohm $\pm 10\%$; 1 w resistor shunted by 8 turns #18 tinned copper wire	571 1064 10
F601	Filament transformer primary	FUSE: 2 amps; 250 v	264 4070 00
F602	High voltage transformer primary	FUSE: 2 amp; 250 v	264 4070 00
I101, I102, I103, I104, I105	Band indicator	LAMP: 6 v; 0.2 amp; midget flange base; bulb T-1-3/4	262 0023 00

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ITEM	CIRCUIT FUNCTION	DESCRIPTION	COLLINS PART NUMBER
I106, I107, I108, I109, I110	Band indicator	LAMP: 6 v; 0.2 amp; midget flange base; bulb T-1-3/4	262 0023 00
I111	Filament pilot lamp	LAMP: Color disc; yellow	262 3240 00
J601	Key jack	JACK: 2 conductor; closed circuit; for plug with 1/4" barrel	360 1060 00
J602	RF output	CONNECTOR: Wall mtg; pressure type contact; single conductor; 5/8" OD	369 1007 00
L001	Osc grid	COIL: Special wound; #29 tinned copper and #26 enameled wire	503 0205 002
L002	Osc plate feed	CHOKE: 600 /u hy; resonates at .65 mc with 100 mmf capacitor	503 0201 001
L601	Buffer plate feed	CHOKE: 2.5 mh; 0.125 amp	240 5300 00
L602	6AG7 freq doubler plate tank	COIL: 100 turns; #30 silk enameled wire	503 0711 002
L603	Freq multiplier plate feed	CHOKE: 2.5 mh; 0.125 amp;	240 5300 00
L604	Freq multiplier plate tank	COIL: 80 meters; 44 turns; #26 wire	503 0701 002
L605	Freq multiplier plate tank	COIL: 40 meters; 21 turns; #22 wire	503 0700 002
L606	Freq multiplier plate tank	COIL: 30 meters; 14 turns; #16 wire	503 0699 002
L607	Freq multiplier plate tank	COIL: 20 meters; 9 turns; #18 wire	503 0698 002
L608	807 freq doubler grid	CHOKE: 2.5 mh; 0.125 amp; 50 ohms;	240 2100 00
L609	807 freq doubler plate feed	CHOKE: RF; 1 mh \pm 10% 0.6 amp	240 2600 00
L610	807 freq doubler plate tank	COIL: 80 meters; 62 turns; #28 wire	503 0697 002

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310A EXCITER UNIT

ITEM	CIRCUIT FUNCTION	DESCRIPTION	COLLINS PART NUMBER
L611	807 freq doubler plate tank	COIL: 40 meters; 30 turns; #24 wire	503 0696 002
L612	807 freq doubler plate tank	COIL: 20 meters; 14 turns; #18 wire	503 0695 002
L613	807 freq doubler plate tank	COIL: 15 meters; 7-1/2 turns; #18 wire	503 0694 002
L614	807 freq doubler plate tank	COIL: 10 meters; 6 turns; #14 wire	503 0693 002
L620	Bias supply filter	REACTOR: 22 hy; 0.035 amp	668 0021 00
L621	High voltage supply filter	REACTOR: 15 hy; 0.150 amp	668 0024 00
P001	Osc connector	PLUG: 4 term; mounted on black phenolic	503 0204 002
R001	Osc grid	RESISTOR: 150,000 ohms $\pm 5\%$; 1/2 w	729 5150 41
R002	Osc screen	RESISTOR: 68,000 ohms $\pm 5\%$; 1/2 w	729 5684 10
R003	Osc output loading	RESISTOR: 47,000 ohms $\pm 5\%$; 1/2 w	729 5474 10
R601	Buffer grid	RESISTOR: 10,000 ohms $\pm 10\%$; 1 w	745 3128 00
R602	Buffer cathode	RESISTOR: 3300 ohms $\pm 10\%$; 1 w	745 3107 00
R603	6AG7 freq doubler grid	RESISTOR: 47,000 ohms $\pm 10\%$; 1 w	745 3156 00
R604	6AG7 freq doubler cathode	RESISTOR: 470 ohm $\pm 10\%$; 1 w	745 3072 00
R605	6AG7 freq doubler screen	RESISTOR: 33,000 ohms $\pm 10\%$; 2 w	745 5149 00
R606	Freq multiplier grid	RESISTOR: 22,000 ohms $\pm 10\%$; 2 w	745 5142 00
R607	Freq multiplier cathode	RESISTOR: 3000 ohm $\pm 10\%$; 25 w	710 3342 00
R608, R609	Freq multiplier cathode	RESISTOR: 5600 ohms $\pm 10\%$; 2 w	745 5118 00
R610	Freq multiplier cathode	RESISTOR: 12,000 ohm $\pm 10\%$; 2 w	745 5132 00

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310A EXCITER UNIT

ITEM	CIRCUIT FUNCTION	DESCRIPTION	COLLINS PART NUMBER
R611	Freq multiplier screen	RESISTOR: 47 ohm $\pm 10\%$; 1 w	745 3030 00
R612	807 freq doubler grid	RESISTOR: 33,000 ohm $\pm 10\%$; 2 w	745 5149 00
R613	807 freq doubler screen	RESISTOR: 47 ohm $\pm 10\%$; 1 w	745 3030 00
R614	Bias supply bleeder	RESISTOR: 1500 ohms $\pm 10\%$; 2 w	745 5093 00
R615	Bias supply bleeder	RESISTOR: 1500 ohm $\pm 10\%$; 2 w	745 5093 00
R616	High voltage supply bleeder	RESISTOR: 33,000 ohms $\pm 10\%$; 1 w	745 3149 00
R617	High voltage supply bleeder	RESISTOR: 33,000 ohms $\pm 10\%$; 1 w	745 3149 00
R618	High voltage supply bleeder	RESISTOR: 3000 ohm $\pm 10\%$; 25 w	710 3342 00
R619	High voltage supply bleeder	RESISTOR: 3000 ohm $\pm 10\%$; 25 w	710 3342 00
R620	807 freq doubler disabling	RESISTOR: 68,000 ohms $\pm 10\%$; 2 w	745 5163 00
R621	Stabilizing resistor	RESISTOR: 47,000 ohms $\pm 10\%$; 2 w	745 5156 00
R622	V601 plate loading	RESISTOR: 10,000 ohm $\pm 10\%$; 1 w	745 3128 00
R623	V604 screen dropping	RESISTOR: 5600 ohm $\pm 10\%$; 2 w	745 5118 00
R624	Matching resistor	RESISTOR ASY: Nicrome wire wound on special form	503 4439 002
S601	Band selecting	SWITCH: 7 circuit; 5 position 6 deck	259 0030 00
S602	Exciter control	SWITCH: 5 circuit; 4 position; 3 deck; 30° detent	259 0031 00
T601	Filament and pilot lamp	TRANSFORMER: Pri; 115 v, 50/60 cps; Sec #1: 5.0 v, 3 amp; Sec #2: 5/6, 3/7.5 v, 6 amps	662 0022 00
T602	High voltage	TRANSFORMER: Pri: 115 v, 50/60 cps; Sec: 1450 v, CT; tap at 75 v	662 0023 00

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310A EXCITER UNIT

ITEM	CIRCUIT FUNCTION	DESCRIPTION	COLLINS PART NUMBER
V001	Oscillator	TUBE: Type 6SJ7; triple grid amp	255 0030 00
V601	Isolation buffer	TUBE: Type 6AG7; pentode power amp	255 0039 00
V602	Frequency doubler	TUBE: Type 6AG7; pentode power amp	255 0039 00
V603	Freq multiplier	TUBE: Type 807; beam power amp	256 0033 00
V604	Freq doubler	TUBE: Type 807; beam power amp	256 0033 00
V605, V606	Voltage regulator	TUBE: Type VR105 voltage regulator	257 0002 00
V607	Bias rectifier	TUBE: Type 6X5GT; full wave high vacuum rect	255 0037 00
V608	High voltage rectifier	TUBE: Type 5R4GY; full wave high vacuum rect	257 0020 00
XF601, XF602	Holder for F601, F602	HOLDER: Fuse; extractor post	265 1002 00
XI111	Socket for I111	MOUNTING: Pilot light	262 1210 00
XV001	Socket for V001	SOCKET: Octal	220 1850 00
XV601, XV602	Sockets for V601, V602	SOCKET: Octal	220 1005 00
XV603, XV604	Sockets for V603, V604	SOCKET: 5 prong; ceramic	220 5520 00
XV605, XV606, XV607, XV608	Sockets for V605, V606, V607, V608	SOCKET: 8 prong; octal; mtg plate moulded in socket	220 1005 00

30K TRANSMITTER UNIT

C201	PA grid tuning	CAPACITOR: 20 mmf to 67 mmf	920 0001 00
C202	PA grid blocking	CAPACITOR: .001 mf $\pm 20\%$; 500 WV	935 4101 00
C203, C204	Filament by-pass	CAPACITOR: .0047 mf $\pm 20\%$	936 1105 00
C205	Screen by-pass	CAPACITOR: .0047 mf $\pm 20\%$	936 1105 00
C206	Plate blocking	CAPACITOR: 150 mmf	924 1004 00
C207	C207A and B PA plate tuning	CAPACITOR: Dual section; 13 mmf to 34.5 mmf and 20 mmf to 57 mmf	920 0002 00
C208	Antenna coil tuning	CAPACITOR: 19 mmf to 202 mmf; dual section	920 0023 00

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30K TRANSMITTER UNIT

ITEM	CIRCUIT FUNCTION	DESCRIPTION	COLLINS PART NUMBER
C209	20M grid coupling	CAPACITOR: 200 mmf $\pm 5\%$; 600 WVDC	913 0132 00
C210	20M grid coupling	CAPACITOR: 250 mmf $\pm 5\%$; 600 WVDC	913 0133 00
C211	15M grid coupling	CAPACITOR: 300 mmf $\pm 5\%$; 600 WVDC	913 0134 00
C212	10M grid coupling	CAPACITOR: 250 mmf $\pm 5\%$; 600 WVDC	913 0133 00
C301	V301 cathode by-pass	CAPACITOR: 20 mf $+100\%$ -10% ; 100 WV	183 3310 00
C302	C302A, C302B, C302C	CAPACITOR: 3 x .1 mfd; $+40$ -15% ; 600 WV	961 4059 00
C302A	V301 screen by-pass	Part of C302	
C302B	V301 plate	Part of C302	
C302C	decoupling		
C304, C305	Audio coupling capacitor	CAPACITOR: .01 mf $\pm 20\%$; 200 WV	935 2118 00
C306	Filter tuning capacitor	CAPACITOR: 180 mmf $\pm 5\%$; 500 WV	935 0116 00
C307, C308	Audio filter	CAPACITOR: 200 mmf $\pm 5\%$; 500 WV	935 0118 00
C309	V302 cathode by-pass	CAPACITOR: 20 mf $+100\%$ -10% ; 100 WV	183 3310 00
C310	Audio coupling	CAPACITOR: 0.1 mf $+40\%$ -15% ; 600 WV	961 5020 00
C311	V304 cathode bypass	CAPACITOR: 20 mf $+100\%$ -10% ; 100 WV	183 3310 00
C312, C313, C314	Plate decoupling	CAPACITOR: 4 mf $+40\%$ -15% ; 600 WV	961 3005 00
C315	Mod grid by-pass	CAPACITOR: 4700 mmf $\pm 20\%$; 500 WV	935 2104 00
C316	V301 grid by-pass	CAPACITOR: 100 mmf $\pm 20\%$; 500 WV	935 0107 00
C317	V301 cathode by-pass	CAPACITOR: .001 mf $\pm 20\%$; 500 WV	935 4101 00
C401, C402	Filter	CAPACITOR: 4 mf $+40\%$ -15% ; fixed; 600 WV	961 3005 00
C403	Filter	CAPACITOR: 10 mf $\pm 10\%$; 1000 WV	930 0038 00

PARTS LIST

30K TRANSMITTER UNIT

ITEM	CIRCUIT FUNCTION	DESCRIPTION	COLLINS PART NUMBER
C501	Reactor tuning	CAPACITOR: 0.1 mf $\pm 10\%$; 5000 WV	930 0042 00
*C501	Reactor tuning	CAPACITOR: .15 mf $\pm 10\%$; 5000 WV	930 0035 00
C502, C503	Filter	CAPACITOR: 2 mf $\pm 10\%$; 4,000 WV	930 0040 00
F101, F102	Line fuse	FUSE: 15 amp; 125 v	264 1150 00
F301	T303 primary	FUSE: 1/2 amp; 250 v; 2 ohms	264 4260 00
F401	T401 primary	FUSE: 1/2 amp; 250 v; 2 ohms	264 4260 00
F402	T402 primary	FUSE: 3 amp; 250 v	264 4080 00
F403	T403 primary	FUSE: 2 amp; 250 v	264 4070 00
F501	T501 primary	FUSE: 1 amp; 250 v; 0.7 ohms	264 4280 00
I101	Filament pilot	LIGHT: Candelabra base; 125 v; 0.040 amps; 6 watts	262 3320 00
I102	Plate pilot	LIGHT: Candelabra base; 125 v; 0.040 amps; 6 watts	262 3320 00
J201	PA r-f input receptacle	CONNECTOR: Standard open circuit input; wall mounting; pressure type contact for single conductor shielded cables	369 1007 00
J301	Microphone connec- tor receptacle	CONNECTOR: Standard open circuit input; wall mounting; pressure type contact for single conductor; shielded cables	369 1008 00
K401	Plate power control	RELAY: Single pole normally open double break; 15 amps; 112 v; 5000 ohms	405 0021 00
L201	V201 grid	COIL: 80 meters; 48 turns #24 G.A. enam. wire	503 4441 002
L202	V201 grid	COIL: 40 meters; 80 turns #24 G.A. Magnet wire	503 4442 002
L203	V201 grid	COIL: 20 meters; 10 turns; #18 G.A. tinned copper wire	503 4443 002
L204	V201 grid	COIL: 15 meters; 7 turns; #18 G.A. tinned copper wire	503 4444 002
L205	V201 grid	COIL: 10 meters; 5 turns #18 tinned copper wire	503 4445 002
* 50	cps equipments		

PARTS LIST

30K TRANSMITTER UNIT

ITEM	CIRCUIT FUNCTION	DESCRIPTION	COLLINS PART NUMBER
L211	V201 grid	CHOKER: 2.5 mh $\pm 10\%$; 50 ohms	240 5300 00
L212	V201 plate	CHOKER: 1.0 mh $\pm 10\%$; 0.6 amp	240 2600 00
L213	V201 plate	COIL: 40 & 80 meter plate tank; 24 turns #14 wire	503 3491 002
L214	V201 plate	COIL: 15 & 20 meter plate tank; 8 turns #10 wire	503 3492 002
L215	V201 plate	COIL: 10 meter, 4 turns #10 GA tinned copper wire	503 8832 002
L216	Link coil	COIL ASSEM: Plug-in; 80 - 40 meter	520 3509 00
L217	Antenna coil		
L218	Antenna coil		
L216	Link coil	COIL ASSEM: Plug-in; 20-15-10 meter	520 3510 00
L217	Antenna coil		
L218	Antenna coil		
L219, L220	Static drain choke	CHOKER: 1 mh $\pm 10\%$; 0.6 amp	240 2600 00
L301	Audio filter	CHOKER: Audio reactor; 3.75 hy ± 0.25 henry; 100 - 5000 cps	678 0077 00
L302	V301 grid	CHOKER: 3.8 microhy; 300 ma	240 0032 00
L401	Filter	CHOKER: 12 hy 75 ma filter reactor; 120 cps	678 0075 00
L402	Filter	CHOKER: 6 hy 250 ma filter reactor; 120 cps	678 0076 00
L501, L502	HV filter	CHOKER: 12 hy 300 ma; filter reactor; 120 cps	678 0081 00
M101	PA plate current	METER: 300 ma; 30 scale divisions 10 ma per division; DC milliammeter	450 0031 00
M102	PA grid current	METER: 25 ma; DC milliammeter	450 0029 00
M103	Filament voltage	METER: 10 v AC	452 0006 00
M104	Modulator plate current	METER: 200 ma; 40 scale divisions; 5 milliamps per division	450 0030 00
M105, M106	Antenna current	METER: 0-3 amp RF; 30 scale divisions	451 0018 00

PARTS LIST

30K TRANSMITTER UNIT

ITEM	CIRCUIT FUNCTION	DESCRIPTION	COLLINS PART NUMBER
P301	Microphone plug	CONNECTOR: Plug connector for single conductor shielded cables	369 1006 00
R101	Series resistor for tuning	RESISTOR: 660 w, heater element conical; 115 v	711 0003 00
R201	PA grid leak	RESISTOR: 5000 ohms $\pm 10\%$; 25 watts	710 3542 00
R202	PA screen dropping resistor	RESISTOR: 5000 ohms $\pm 10\%$; 50 watts	710 4542 00
R301	RF filter	RESISTOR: 47,000 ohms $\pm 10\%$; 1/2 watt	745 1156 00
R302	V301 grid	RESISTOR: 1.0 meg $\pm 10\%$; 1/2 watt	745 1212 00
R303	V301 cathode	RESISTOR: 1000 ohms $\pm 10\%$; 1/2 watt	745 1086 00
R304	V301 screen dropping	RESISTOR: .47 meg $\pm 10\%$; 1/2 watt	745 1198 00
R305	V301 plate	RESISTOR: 100,000 ohms $\pm 10\%$; 1 watt	745 3170 00
R306	V302 grid	RESISTOR: 500,000 ohms potentiometer	376 3027 00
R307	V302 cathode	RESISTOR: 1000 ohms $\pm 10\%$; 1 watt	745 3086 00
R308	V302 plate	RESISTOR: 47,000 ohms $\pm 10\%$; 2 watt	745 5156 00
R309	Audio dropping	RESISTOR: 100,000 ohms $\pm 10\%$; 1/2 watt	745 1170 00
R310	V302 grid	RESISTOR: 100,000 ohms $\pm 10\%$; 1 watt	745 3170 00
R311, R312	Voltage divider and V302 cathode	RESISTOR: 620 ohms $\pm 5\%$; 1 watt	745 3077 00
R313	Voltage divider and V302 cathode	RESISTOR: 330 ohms $\pm 10\%$; 1 watt	745 3065 00
R314	V302 plate	RESISTOR: 47,000 ohms $\pm 10\%$; 2 watt	745 5156 00
R315	Gain control	RESISTOR: 100,000 ohms potentiometer	380 3100 40
R316	V304 bias	RESISTOR: 750 ohms $\pm 10\%$; 10 watts	710 1750 20
R317	Plate decoupling	RESISTOR: 47,000 ohms $\pm 10\%$; 1 watt	745 3156 00
R318	Plate decoupling	RESISTOR: 4000 ohms $\pm 10\%$; 50 watts	710 4442 00
R319	Plate decoupling	RESISTOR: 20,000 ohms $\pm 10\%$; 10 watts	710 1204 20

PARTS LIST

30K TRANSMITTER UNIT

ITEM	CIRCUIT FUNCTION	DESCRIPTION	COLLINS PART NUMBER
R320	Plate decoupling	RESISTOR: 4,700 ohms $\pm 10\%$; 2 watt	745 5114 00
R401	Modulator bias control	RESISTOR: 750 ohms $\pm 10\%$; 25 watts	735 0002 00
R402	Bias voltage divider	RESISTOR: 500 ohms $\pm 10\%$; 10 watts	710 1500 20
R403	Bias voltage divider	RESISTOR: 1000 ohms $\pm 10\%$; 10 watts	710 1142 00
R404	Bleeder voltage divider	RESISTOR: 25,000 ohms $\pm 10\%$; 50 watts	710 4254 20
R501, R502, R503, R504	Bleeder	RESISTOR: 25,000 ohms $\pm 10\%$; 50 watts	710 4254 20
S101	Filament adjusting	SWITCH: 3 position single circuit, 10 amp contacts in all positions	259 1180 00
S102	Tune-operate	SWITCH: 3 position single circuit, 10 amp contacts in all positions	259 1180 00
S103	Filament power	SWITCH: SPST toggle	266 3005 00
S104	Plate power	SWITCH: SPST toggle	266 3005 00
S105	Door interlock	SWITCH: Push button; 3 amps; 125 v	266 0003 00
S201	S201A, S201B, S201C	SWITCH: 4 circuits; 5 position, 4 decks; 3 decks are single circuit 5 position shorting, 1 deck shorts all except one contact together	259 0020 00
S201A	Relay selector	Section of S201	
S201B	Link selector	Section of S201	
S201C	Grid coil selector	Section of S201	
S202	S202A, B, C, D	SWITCH: 5 position tap switch; 4 deck	503 3540 004
S202A	Plate coil selector	Section of S202	
S202B	Plate coil shorting	Section of S202	
S202C	Antenna selector	Section of S202	
S202D	Antenna selector	Section of S202	

PARTS LIST

30K TRANSMITTER UNIT

ITEM	CIRCUIT FUNCTION	DESCRIPTION	COLLINS PART NUMBER
T101	High voltage plate	TRANSFORMER: 50/60 cps; Pri: 115 v; Sec: 5700 v, CT; 300 ma <i>(2850 v_{DC})</i>	662 0015 00
T301	Modulator input	TRANSFORMER: Driver; class "B"; Pri: 60 ma unbalanced; 2500 ohms; Sec: 15 ma balanced; 15,000 ohms, CT	677 0074 00
T302	Modulation	TRANSFORMER: Modulation; Pri: 175 ma bal; 32,000 ohms CT; Sec #1: 150 ma; 16,700 ohms; Sec #2: 50 ma unbalanced; 248 v rms w/1770 v across Sec #2	677 0073 00
T303	V304 filament	TRANSFORMER: 50/60 cps; Pri: 115 v; Sec: 6.3 v; CT; 3.0 amps	672 0069 00
T401	Bias power	TRANSFORMER: 50/60 cps; Pri: 115 v; Sec: 5.0 v, 2.0 amps; 5.0 v, 2.0 amps; 420 v, CT; 0.100amp	672 0068 00
T402	LV power	TRANSFORMER: 50/60 cps; Pri: 105 v, 115 v, 125 v; Sec: 1320 v; CT; .177 amps	672 0080 00
T403	V202, V305, V306 filament	TRANSFORMER: 50/60 cps; Pri: 105 v, 110 v, 115 v; Sec: 5.0 v; CT; 20.0 amps	672 0072 00
T501	High voltage rectifier filament	TRANSFORMER: 50/60 cps; Pri: 105 v, 110 v, 115 v; Sec: 2.5 v; 10 A	672 0079 00
V201	Power amplifier	TUBE: Type 4-125A; power tetrode	256 0068 00
V301	Audio input	TUBE: Type 6SJ7; triple grid detector amplifier	255 0030 00
V302	Audio amplifier	TUBE: Type 6SN7-GT; twin triode amplifier	255 0033 00
V303	Clipper	TUBE: Type 6H6; twin diode	255 0117 00
V304	Audio driver	TUBE: Type 6B4G; power amplifier triode	255 0124 00
V305, V306	Modulator	TUBE: Type 75 TH; medium MU triode	256 0071 00
V401	Bias rectifier	TUBE: Type 5R4GY; full-wave high-vacuum rectifier	257 0020 00
V402	Low voltage rectifier	TUBE: Type 5R4GY; full-wave high-vacuum rectifier	257 0020 00
V501, V502	High voltage rectifier	TUBE: Type 866A; half-wave mercury-vapor rectifier	256 0049 00

PARTS LIST

30K TRANSMITTER UNIT

ITEM	CIRCUIT FUNCTION	DESCRIPTION	COLLINS PART NUMBER
XF101, XF102	Sockets for F101, F102	MTG BLOCK: Fuse; 2 plug receptacle	265 1013 00
XF301, XF401, XF402, XF403, XF501	Holders for F301, F401, F402, F403, F501	HOLDER: Fuse; extractor post	265 1002 00
XI101, XI102	Sockets for I101, I102	SOCKET: Pilot light	262 0033 00
XR101	Socket for R101	SOCKET: Heater; std screw type	265 1010 00
XV201	Socket for V201	SOCKET: Tube socket for 5 prong tube	220 1016 00
XV301, XV302, XV303, XV304	Socket for V301, V302, V303, V304	SOCKET: Eight prong tube socket	220 1005 00
XV305, XV306	Socket for V305, V306	SOCKET: Four prong tube socket	220 5450 00
XV401, XV402	Socket for V401, V402	SOCKET: Eight prong tube socket	220 1005 00
XV501, XV502	Socket for V501, V502	SOCKET: Four prong tube socket, 9/16" x 1-11/16" x 1-49/64"	220 5450 00

SECTION 8
ILLUSTRATIONS

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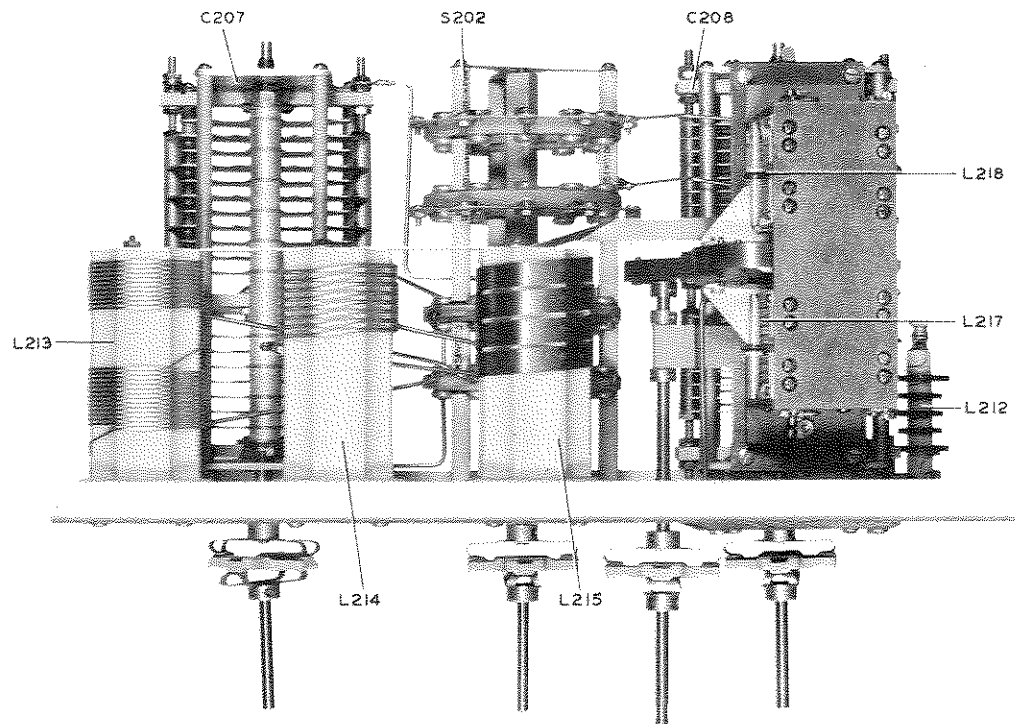


FIGURE 8-1 OUTPUT COIL & SWITCH ASSEMBLY, TOP VIEW

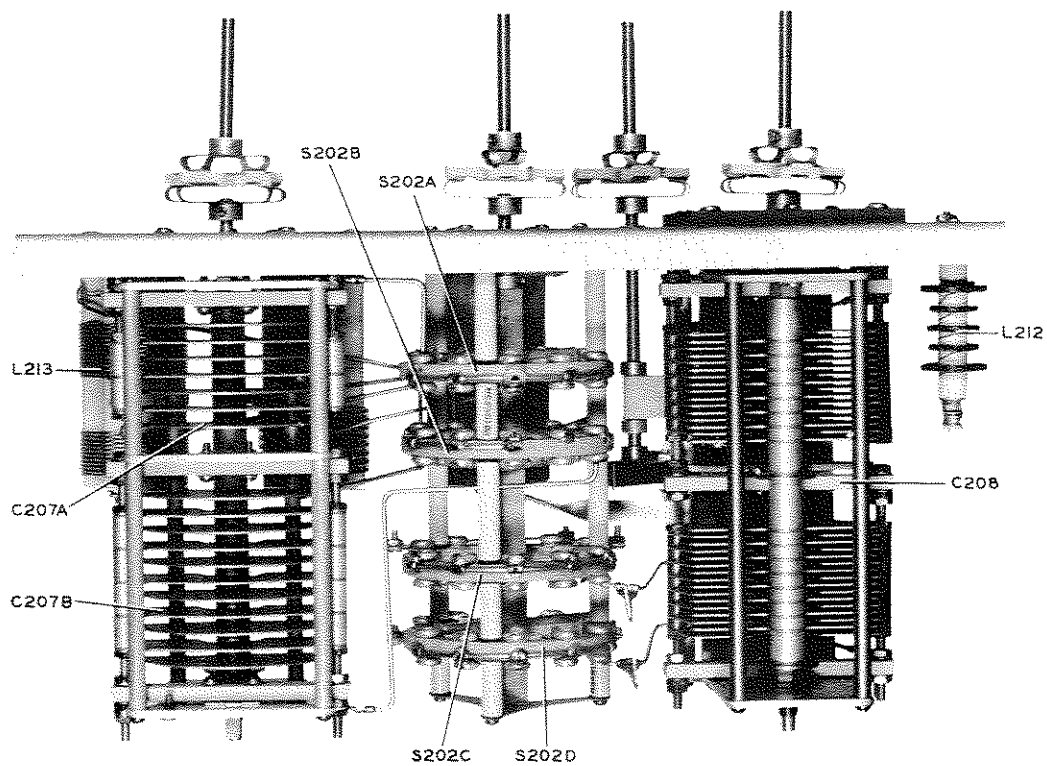


FIGURE 8-2 OUTPUT COIL & SWITCH ASSEMBLY, BOTTOM VIEW

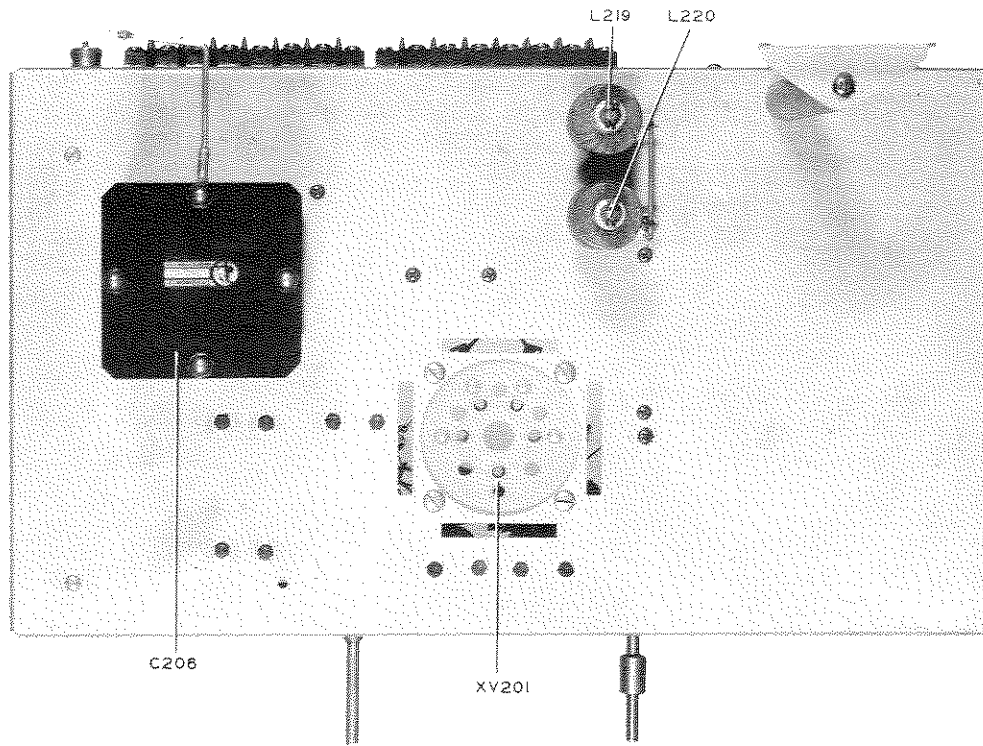


FIGURE 8-3 POWER AMPLIFIER TUBE CHASSIS, TOP VIEW

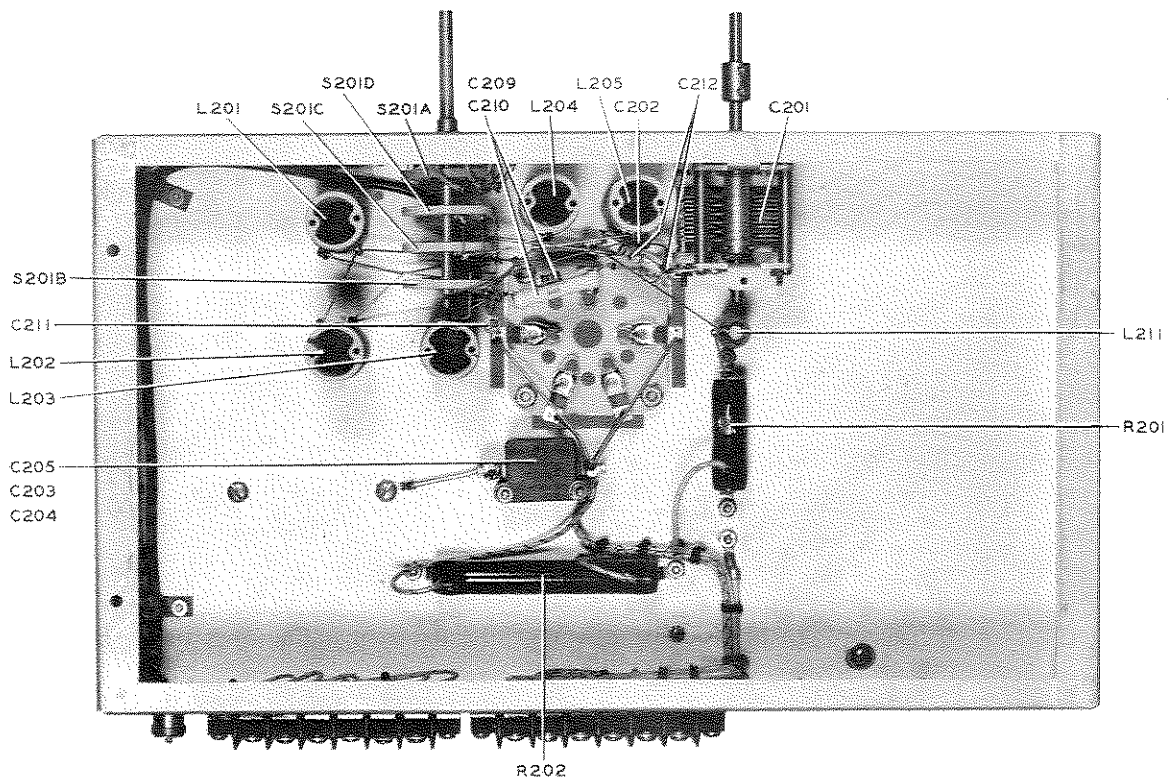


FIGURE 8-4 POWER AMPLIFIER TUBE CHASSIS, BOTTOM VIEW

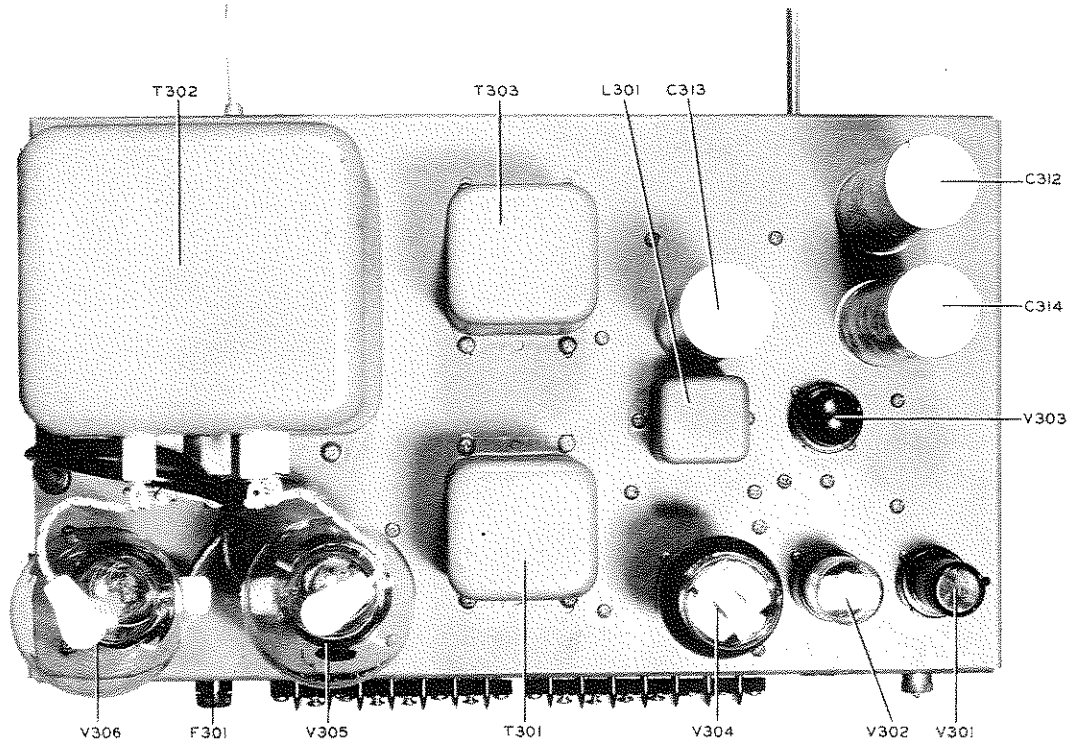


FIGURE 8-5 SPEECH AMPLIFIER AND MODULATOR, TOP VIEW

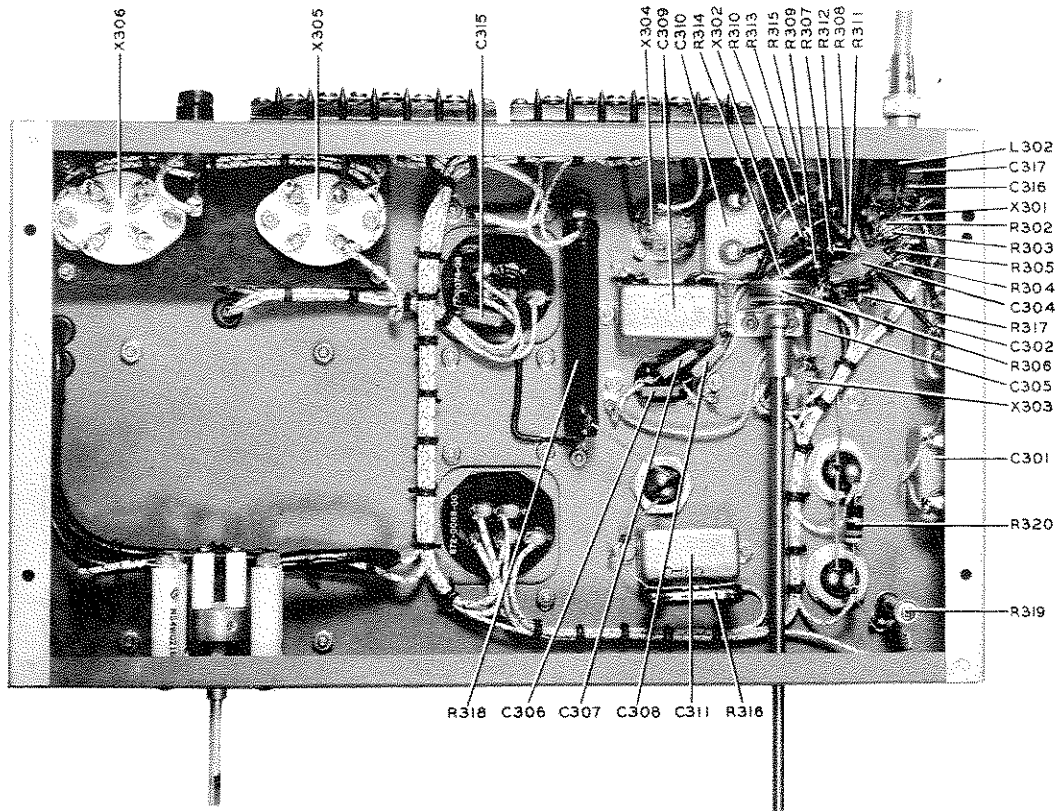


FIGURE 8-6 SPEECH AMPLIFIER AND MODULATOR, BOTTOM VIEW

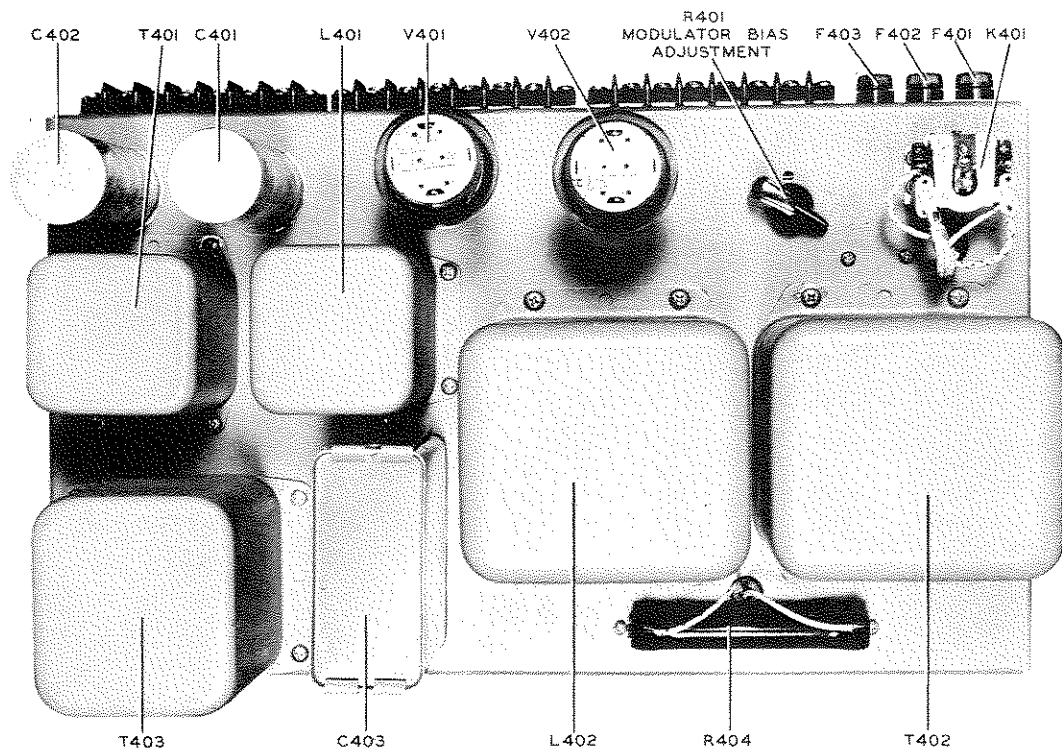


FIGURE 8-7 LOW VOLTAGE AND BIAS SUPPLY, TOP VIEW

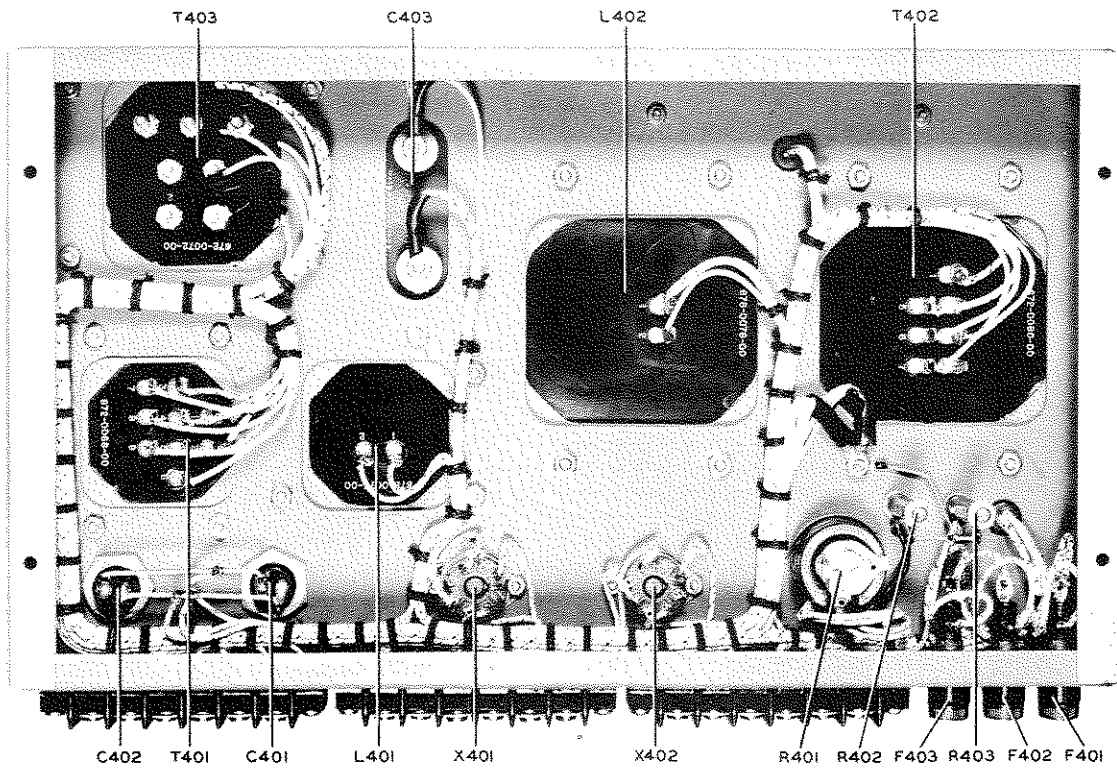


FIGURE 8-8 LOW VOLTAGE AND BIAS SUPPLY, BOTTOM VIEW

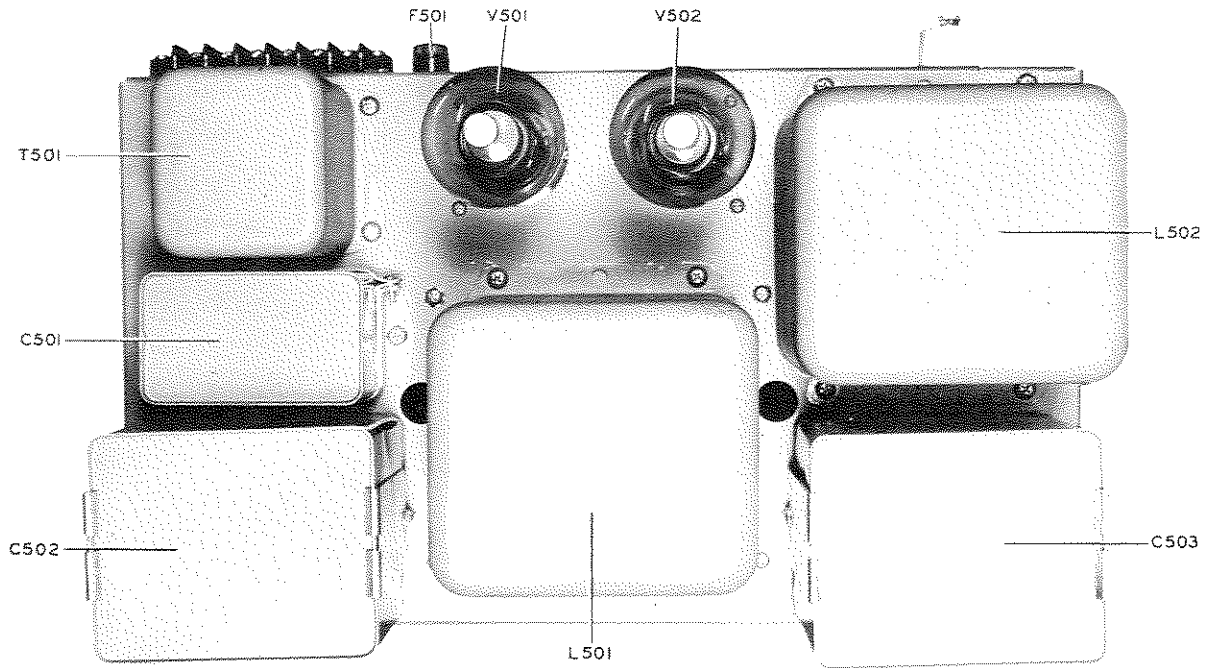


FIGURE 8-9 HIGH VOLTAGE RECTIFIER UNIT, TOP VIEW

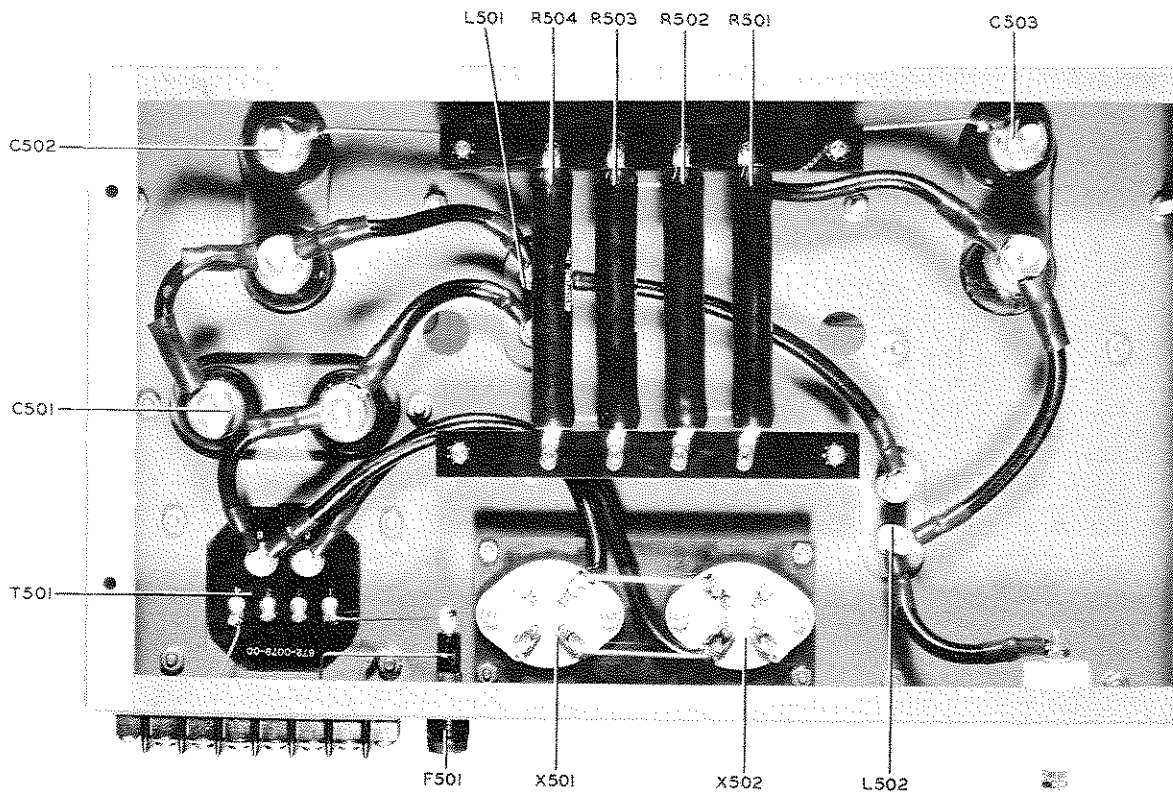
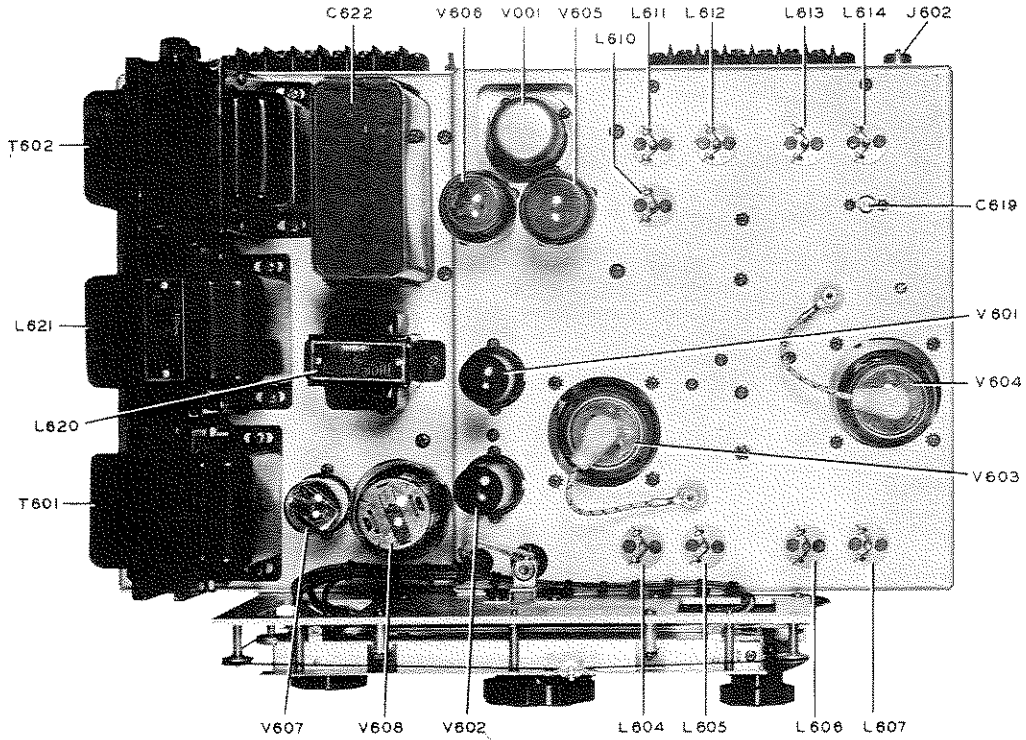


FIGURE 8-10 HIGH VOLTAGE RECTIFIER UNIT, BOTTOM VIEW



6X56T BRNG 6457
 FIGURE 8-11 EXCITER UNIT - TOP OPEN VIEW

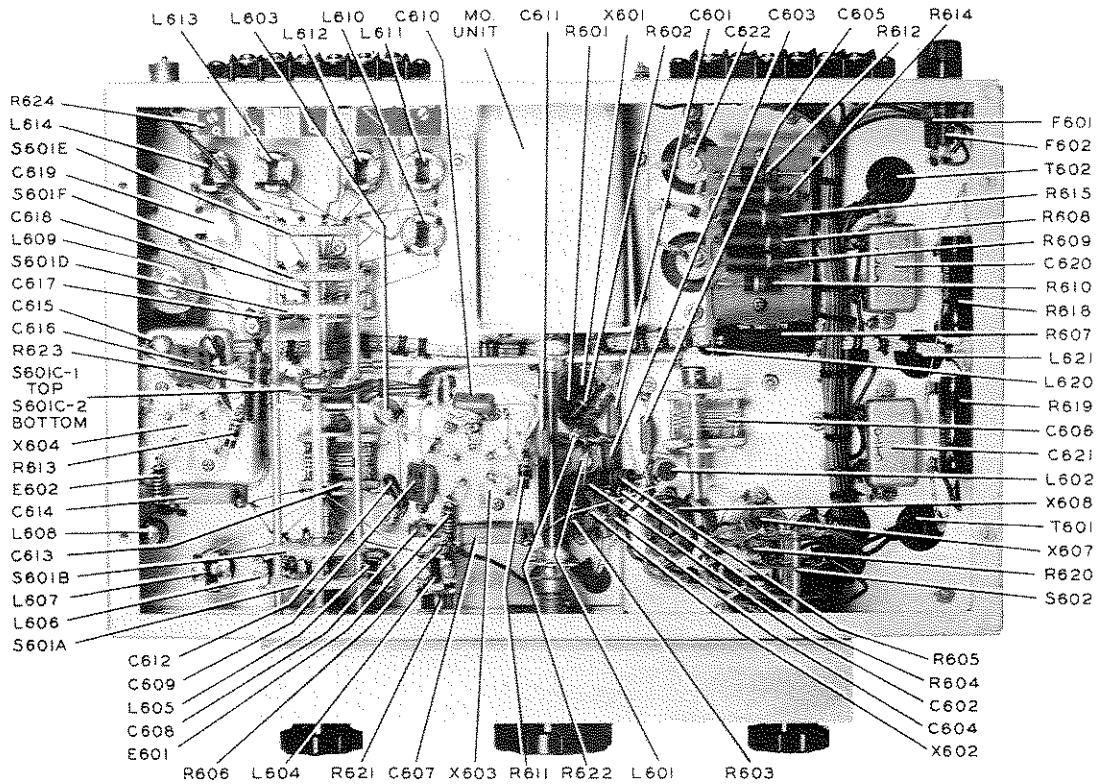
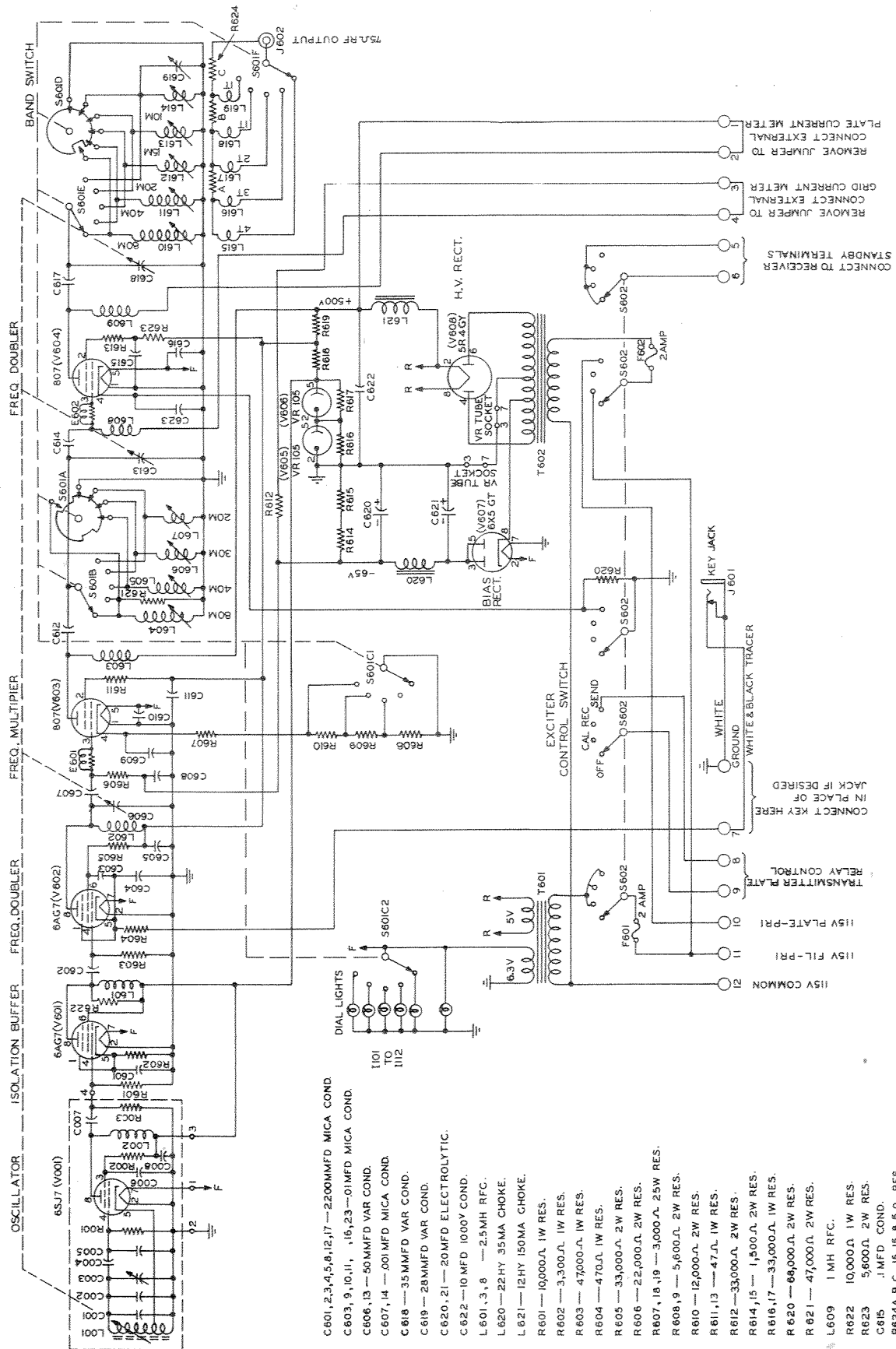
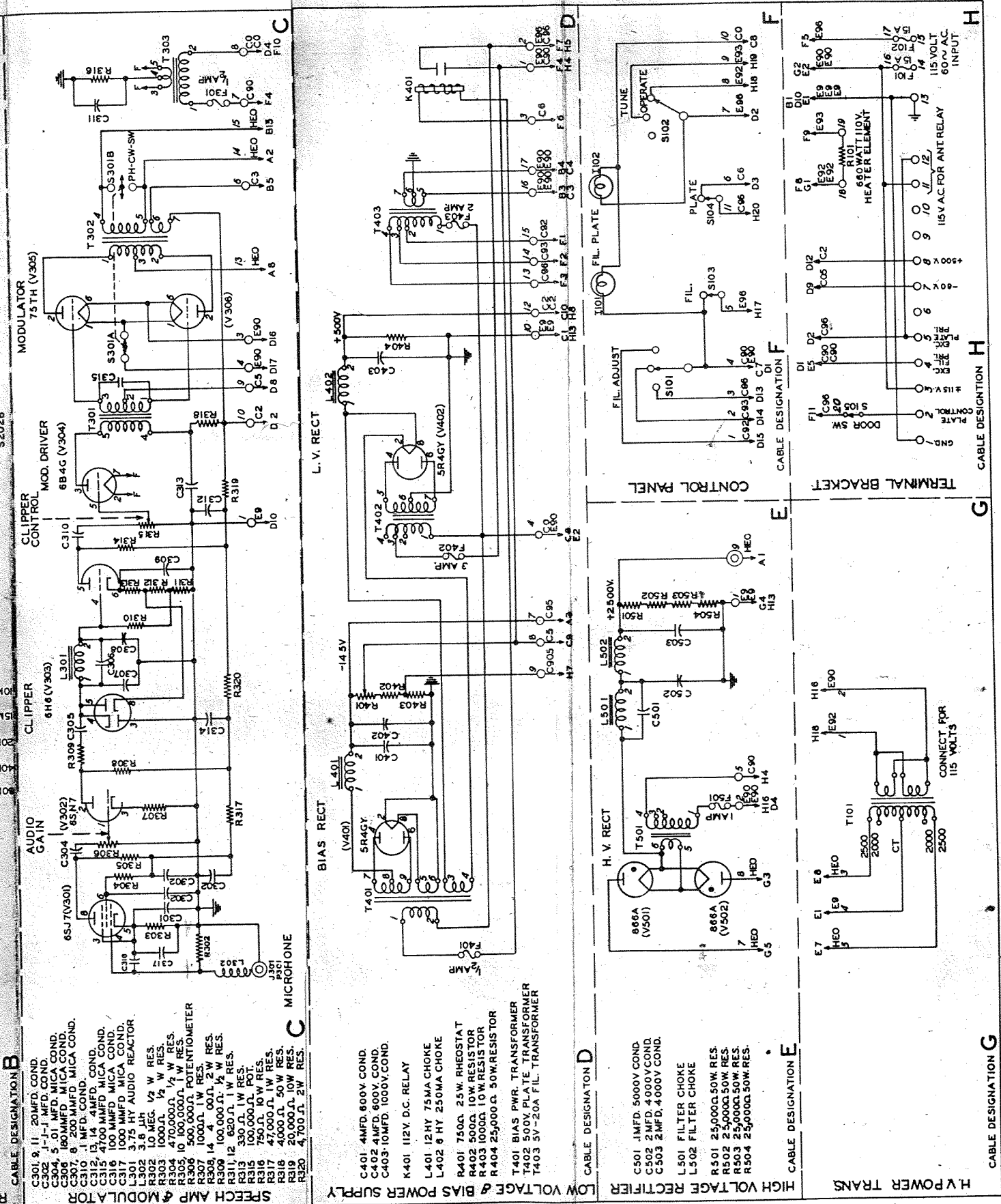


FIGURE 8-12 EXCITER UNIT - BOTTOM OPEN VIEW



- C601, 2, 3, 4, 5, 6, 12, 17 — 2200MMFD MICA COND.
- C603, 9, 10, 11, 15, 23 — 01MFD MICA COND.
- C606, 13 — 50MMFD VAR COND.
- C607, 14 — 201MFD MICA COND.
- C618 — 35MMFD VAR COND.
- C619 — 20MMFD VAR COND.
- C620, 21 — 20MFD ELECTROLYTIC.
- C622 — 10 MFD 1000V COND.
- L601, 3, 8 — 2.5MH RFC.
- L620 — 22HY 35MA CHOKE.
- L621 — 12HY 150MA CHOKE.
- R601 — 10,000.Ω 1W RES.
- R602 — 3,300.Ω 1W RES.
- R603 — 4,7000.Ω 1W RES.
- R604 — 470.Ω 1W RES.
- R605 — 33,000.Ω 2W RES.
- R606 — 22,000.Ω 2W RES.
- R607, 18, 19 — 3,000.Ω 25W RES.
- R608, 9 — 5,600.Ω 2W RES.
- R610 — 12,000.Ω 2W RES.
- R611, 13 — 47.Ω 1W RES.
- R612 — 33,000.Ω 2W RES.
- R614, 15 — 1,500.Ω 2W RES.
- R616, 17 — 33,000.Ω 1W RES.
- R620 — 60,000.Ω 2W RES.
- R621 — 47,000.Ω 2W RES.
- L609 — 1 MH RFC.
- R622 — 10,000.Ω 1W RES.
- R623 — 5,600.Ω 2W RES.
- C615 — .1 MFD COND.
- R624A, B, C — 15, 15, 8.5.Ω RES.

Figure 8-14 310A Exciter Unit Schematic Diagram



- CABLE DESIGNATION B**
- C301, 9, 11 20MFD. COND.
 - C302, 1-1 1MFD. COND.
 - C303, 50 1MFD. MICA COND.
 - C304, 6 200MMFD. MICA COND.
 - C307, 8 200MMFD. MICA COND.
 - C310, 1 MFD. COND.
 - C312, 13, 14 4MFD. COND.
 - C315, 4700MMFD. MICA COND.
 - C316, 100MMFD. MICA COND.
 - C317, 1000MMFD. MICA COND.
 - L301, 3.75 HY AUDIO REACTOR
 - L302, 3.5 JH
 - R302, 10MEG. 1/2 W. RES.
 - R303, 100,000. 1/2 W. RES.
 - R304, 100,000. 1/2 W. RES.
 - R305, 10 100,000. 1/2 W. RES.
 - R306, 500,000. POTENTIOMETER
 - R307, 100K. 1W. RES.
 - R308, 14 4 0.0. 1W. RES.
 - R309, 100,000. 1/2 W. RES.
 - R311, 12 650. 1W. RES.
 - R313, 330. 1W. RES.
 - R315, 100,000. POT.
 - R316, 750. 1W. RES.
 - R317, 47,000. 1/2 W. RES.
 - R318, 4,000. 1/2 W. RES.
 - R319, 20,000. 1/2 W. RES.
 - R320, 4,700. 1/2 W. RES.

- CABLE DESIGNATION C**
- C401, 4MFD. 600V. COND.
 - C402, 4MFD. 600V. COND.
 - C403, 10MFD. 1000V. COND.
 - K401, 112V. D.C. RELAY
 - L401, 12HY 75MA CHOKE
 - L402, 6 HY 250MA CHOKE
 - R401, 750K. 25W. RHEOSTAT
 - R402, 500K. 10W. RESISTOR
 - R403, 100K. 10W. RESISTOR
 - R404, 25,000. 50W. RESISTOR
 - T401, BIAS PWR. TRANSFORMER
 - T402, 50V. PLATE. TRANSFORMER
 - T403, 5V-20A FIL. TRANSFORMER

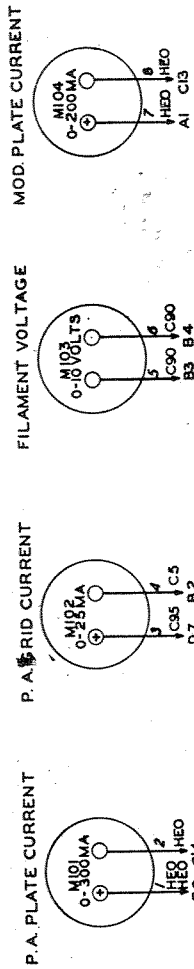
- CABLE DESIGNATION D**
- C501, 1MFD. 5000V. COND.
 - C502, 2MFD. 4,000V. COND.
 - C503, 2MFD. 4,000V. COND.
 - L501, FILTER CHOKE
 - L502, FILTER CHOKE
 - R501, 25,000. 50W. RES.
 - R502, 25,000. 50W. RES.
 - R503, 25,000. 50W. RES.
 - R504, 25,000. 50W. RES.

- CABLE DESIGNATION E**
- T501, 1AMP. TRANSFORMER
 - T502, 886A (V501)
 - T503, 886A (V502)

Figure 8-13 30K Transmitter Schematic Diagram

COLLINS 30K-1 AMATEUR TRANSMITTER

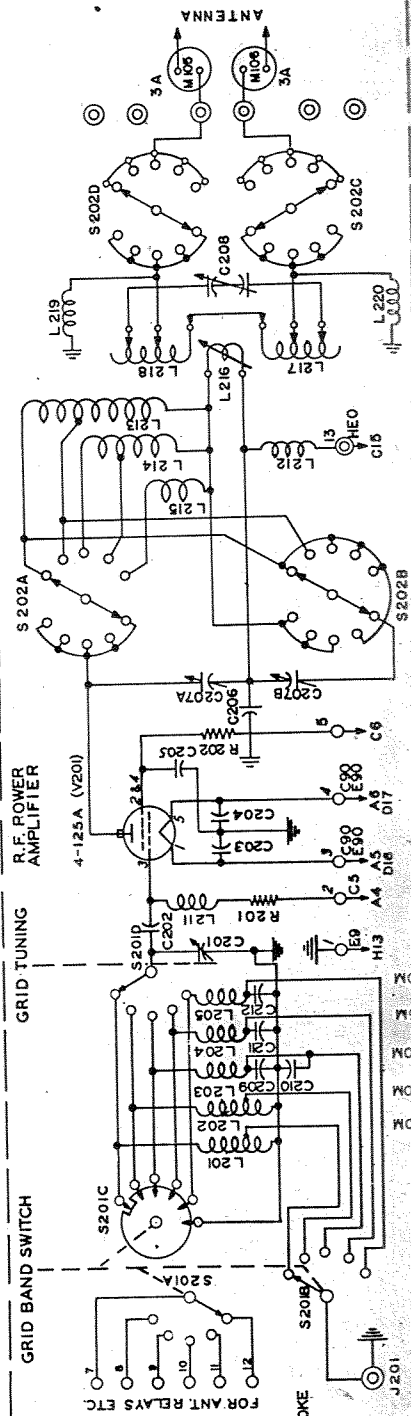
METER PANEL



CABLE DESIGNATION A

- C201 70MMF VAR COND.
- C202 .001MFD. MICA COND.
- C203 .15 MFD. MICA COND.
- C204 .15 MFD. FIXED AIR COND.
- C205 .15 MFD. 35.5MMF VAR COND.
- C206 200-200MMF VAR COND.
- C207 200MMF CERAMIC COND.
- C208 200MMF CERAMIC COND.
- C209 200MMF CERAMIC COND.
- C210 1/2 250MMF CERAMIC COND.
- C211 300MMF CERAMIC COND.
- L211 2.5MH. 125 MA. RF CHOKE.
- L212, L219, L220, 1MH. 600 MA. RF CHOKE.
- R201 5000 OHM 25 W. RESISTOR
- R202 5000 OHM 50 W. RESISTOR

R.F. PWR AMP TUBE & TANK CIRCUITS



R.F. PWR AMP TUBE & TANK CIRCUITS