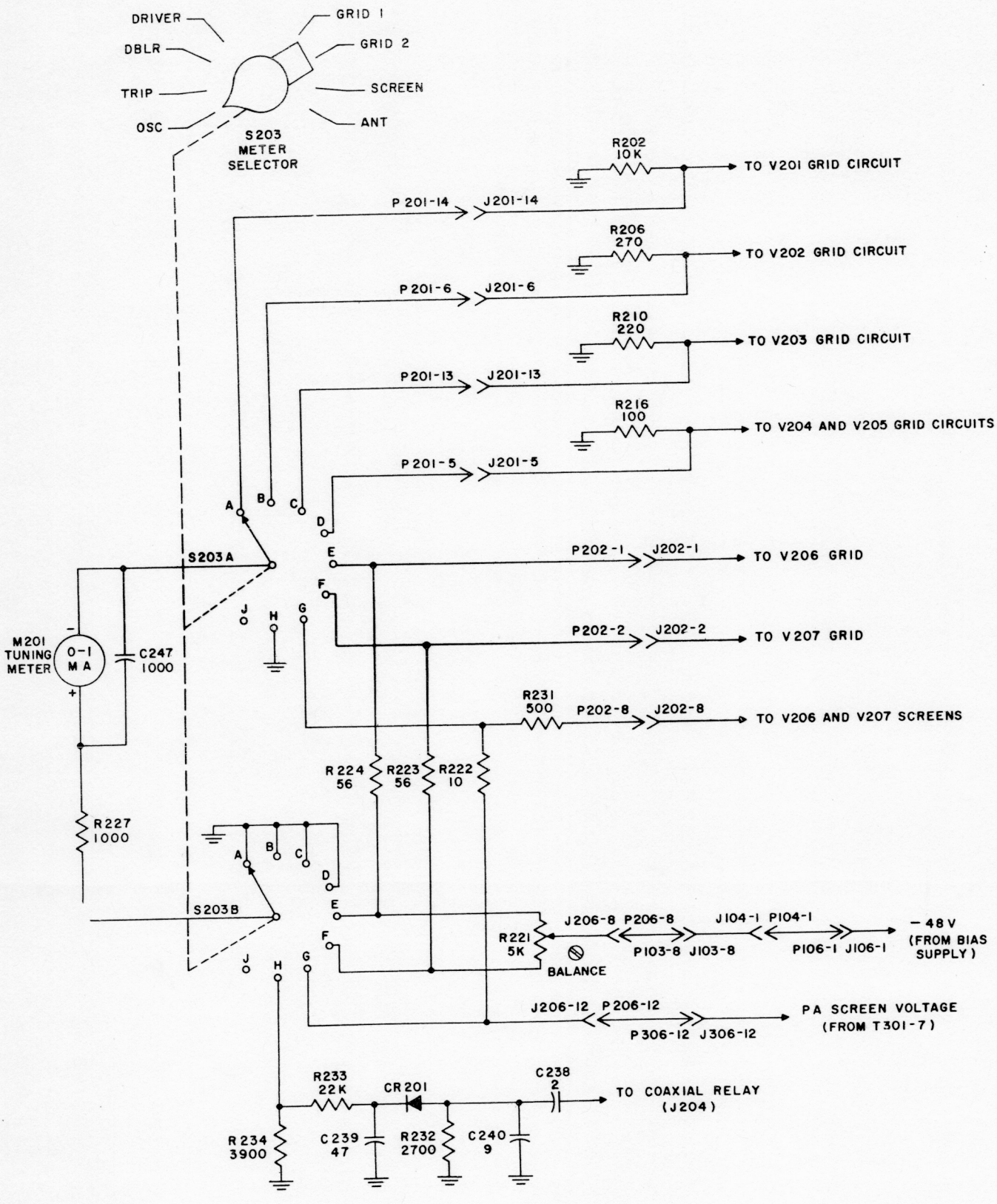


Figure 4-6. Tuning Meter Circuit, Simplified Schematic Diagram

e. TUNING METER. - (Refer to figure 4-6.) The r-f metering circuit is composed of TUNING METER M201, a 0-1 ma meter, and METER SELECTOR S203, a two-pole, nine-position switch. For eight of its positions, S203 shunts the meter across a series resistor in each of eight different circuits within the transmitter. Appropriately sized resistors are used in seven of the circuits to provide approximately mid-scale meter readings when the circuit is operating normally. In the eighth circuit (the OSC position of the METER SELECTOR switch), the resistor permits a normal meter reading of at least 0.1 ma. An indication of the r-f output of the transmitter is provided by the TUNING METER when S203 is in its ANT position. A voltage detector, composed of an r-f rectifier and filter, is connected to the r-f input terminal of the coaxial relay. The meter shunt resistor, R234, is connected in series with the filter load resistor, R233. The resultant meter indication is directly proportional to the r-f voltage at the ANT output connector of the transmitter.

4-3. MODULATOR.

The Modulator is composed of the audio input circuits, an audio preamplifier, an audio limiter, an audio amplifier, an audio driver and an audio modulator. The audio signals are received from either the dynamic microphone, the carbon microphone, or the telephone lines. The modulator amplifies the signals, limits them (if the LIMITER IN-OUT switch has been set to its IN position), and superimposes them upon the d-c voltages supplied the plates and screens of the power amplifier tubes.

a. AUDIO INPUT CIRCUITS. (Refer to figure 4-7.)

(1) DYNAMIC MICROPHONE. - The dynamic microphone is connected to the Modulator

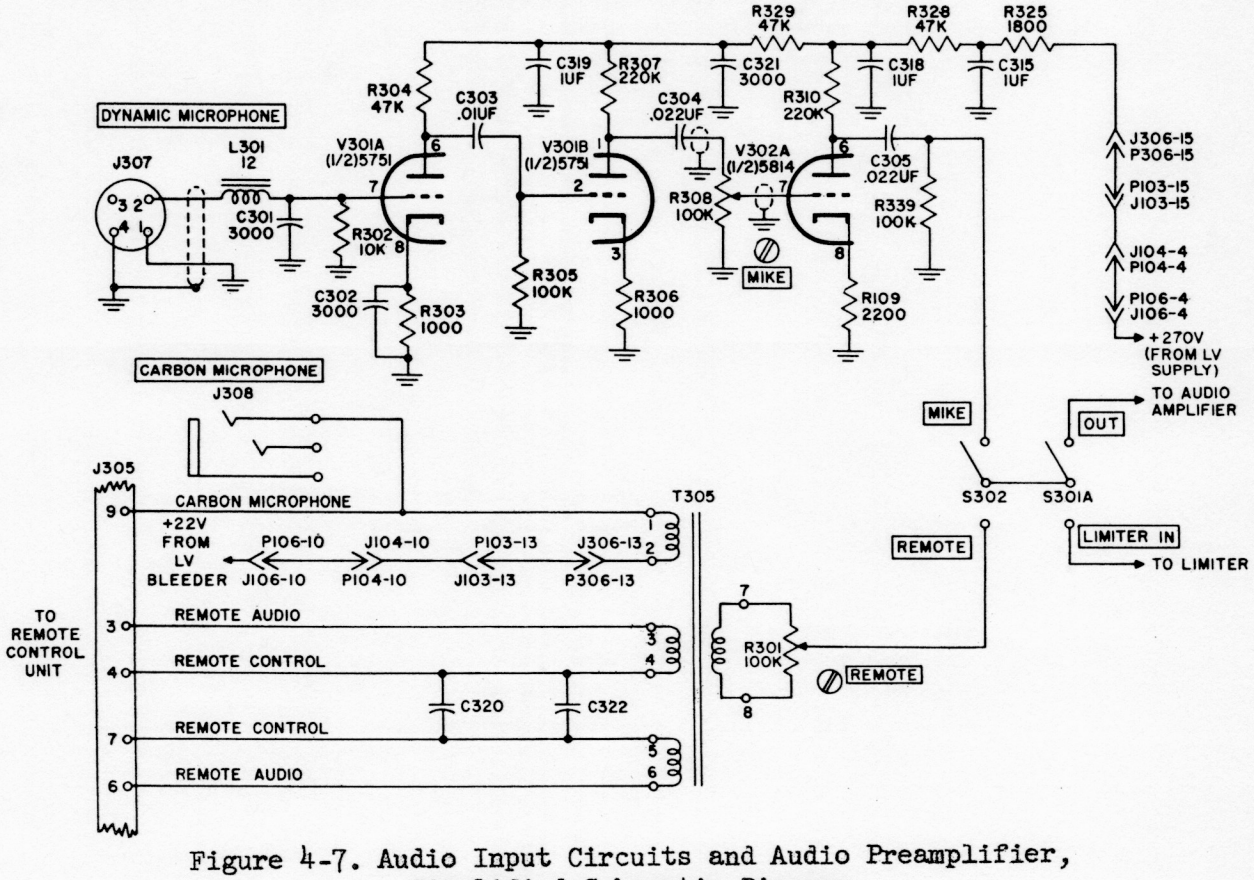


Figure 4-7. Audio Input Circuits and Audio Preamplifier, Simplified Schematic Diagram

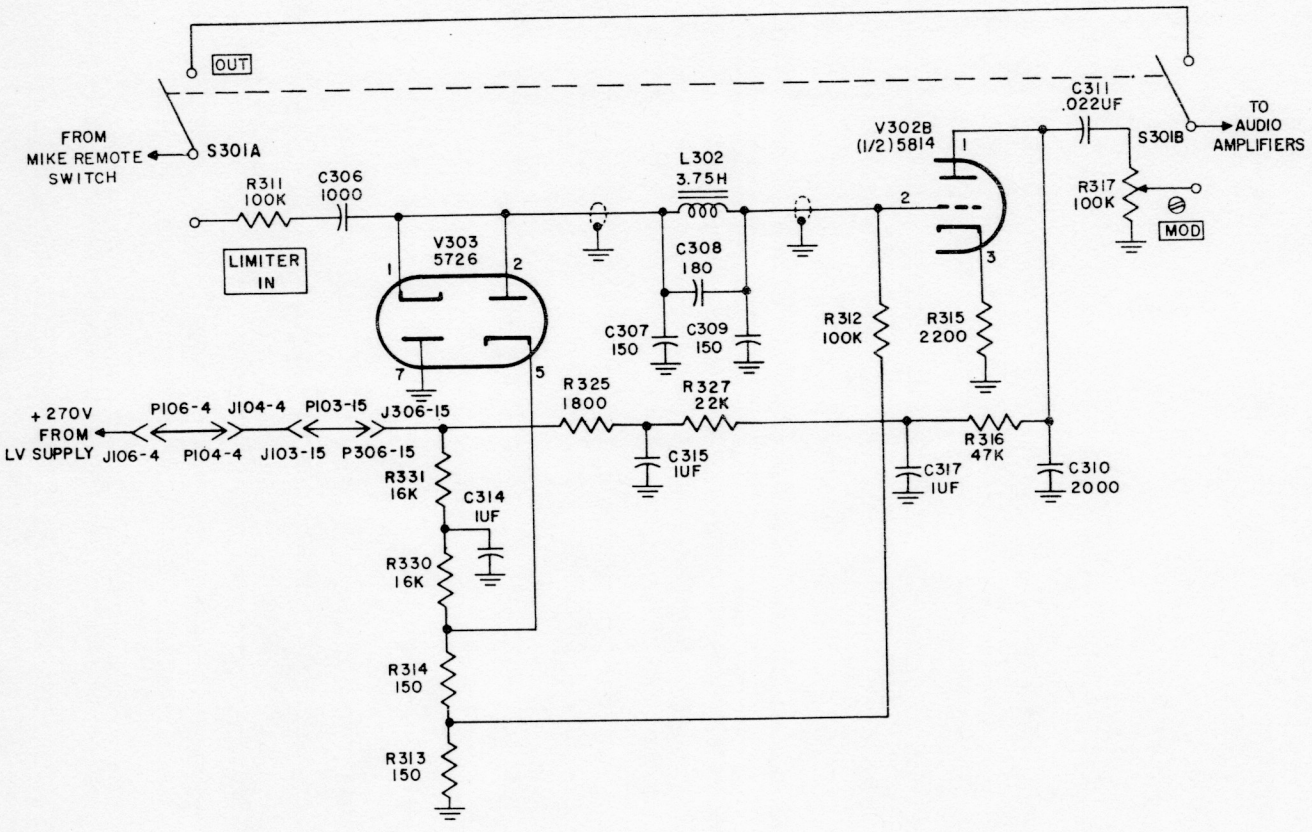


Figure 4-8. Audio Limiter, Simplified Schematic Diagram

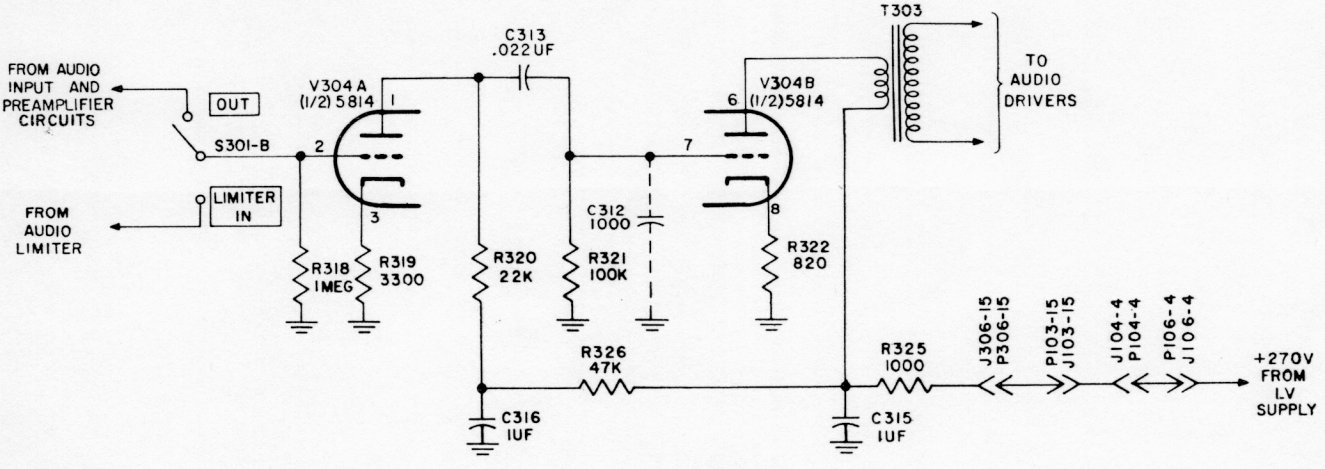


Figure 4-9. Audio Amplifier, Simplified Schematic Diagram

Unit via four-terminal jack J307. The microphone output, at pin 2 of the jack, is applied to the grid of the first audio preamplifier stage, V301A. L301 and C301, connected between J307 and the grid of V301A, form a decoupling circuit which blocks stray r-f from entering the amplifier.

(2) TELEPHONE LINES. - A pair of 600 ohm telephone lines connects the remote audio signals to two of the three primary windings of audio input transformer T305 via terminals 3 and 6 of jack J305. The lines are isolated for d-c at the transformer by capacitors C320 and C322. Thus, each line may be used to carry a discrete d-c control signal in addition to the audio signals. The secondary of T305 is connected across the REMOTE potentiometer, R301. The potentiometer control arm is available as a screwdriver adjustment on the front of the Modulator Unit chassis. The signal at the arm of R301 is connected to the REMOTE terminal of the MIKE-REMOTE switch, S302.

(3) CARBON MICROPHONE. - The carbon microphone is connected to the modulator via microphone jack J308. The microphone output is applied to the third primary winding of transformer T305. The REMOTE potentiometer, therefore, controls the gain of signals from the carbon microphone as well as from the telephone lines. D-c voltage for the carbon microphone is supplied from the junction of R106 and R109, in the low voltage bleeder. R109 is by-passed for audio by capacitor C109.

b. AUDIO PREAMPLIFIER. - (Refer to figure 4-7.) The audio output of the dynamic microphone is applied to the grid of amplifier V301A, 1/2 of a 5751. C302, in the cathode circuit, and C321, in the plate circuit, serve to bypass any r-f voltages to ground. The plate of V301A is coupled to the grid of amplifier V301B by capacitor C303. V301B is coupled to MIKE potentiometer R308 by capacitor C304. The potentiometer control arm is available as a screwdriver adjustment on the front of the Modulator Unit chassis. The output of the potentiometer is applied to the grid of amplifier V302A, 1/2 of a 5814. The output of V302A is applied to the MIKE terminal of switch S302 via capacitor C304.

The center terminal of the MIKE-REMOTE switch is connected to the center terminal of the first section of the LIMITER IN-OUT switch, S301A. When S301 is in its IN position, the audio signal which passes the MIKE-REMOTE switch enters the audio limiter circuit; when S301A is in its OUT position, the signal bypasses the limiter and enters the audio amplifier.

c. AUDIO LIMITER. - (Refer to figure 4-8.) The audio limiter consists of V303, a type 5726 double diode, connected in a shunt type limiting circuit. The cathode of V303A and the plate of V303B are held at +1.5 v; the plate of V303A is connected to ground while the cathode of V303B is held at +3 v. The audio signals from switch S301A, thus, are limited to an upper level of +3 v and a lower one of ground.

The low-pass filter, following the limiter, consists of inductor L302 and capacitors C307 and C309, connected in a pi-type circuit. Capacitor C308 is connected in parallel with L302 to form a parallel resonant circuit at the cut-off frequency. The filter, thus, provides rapid attenuation to all frequencies above 3000 cycles.

The output of the filter is connected to the grid of audio amplifier V302B, 1/2 of a 5814. The clipped audio signal is amplified to approximately its original level by V302B, then applied to the MOD potentiometer, R317, via coupling capacitor

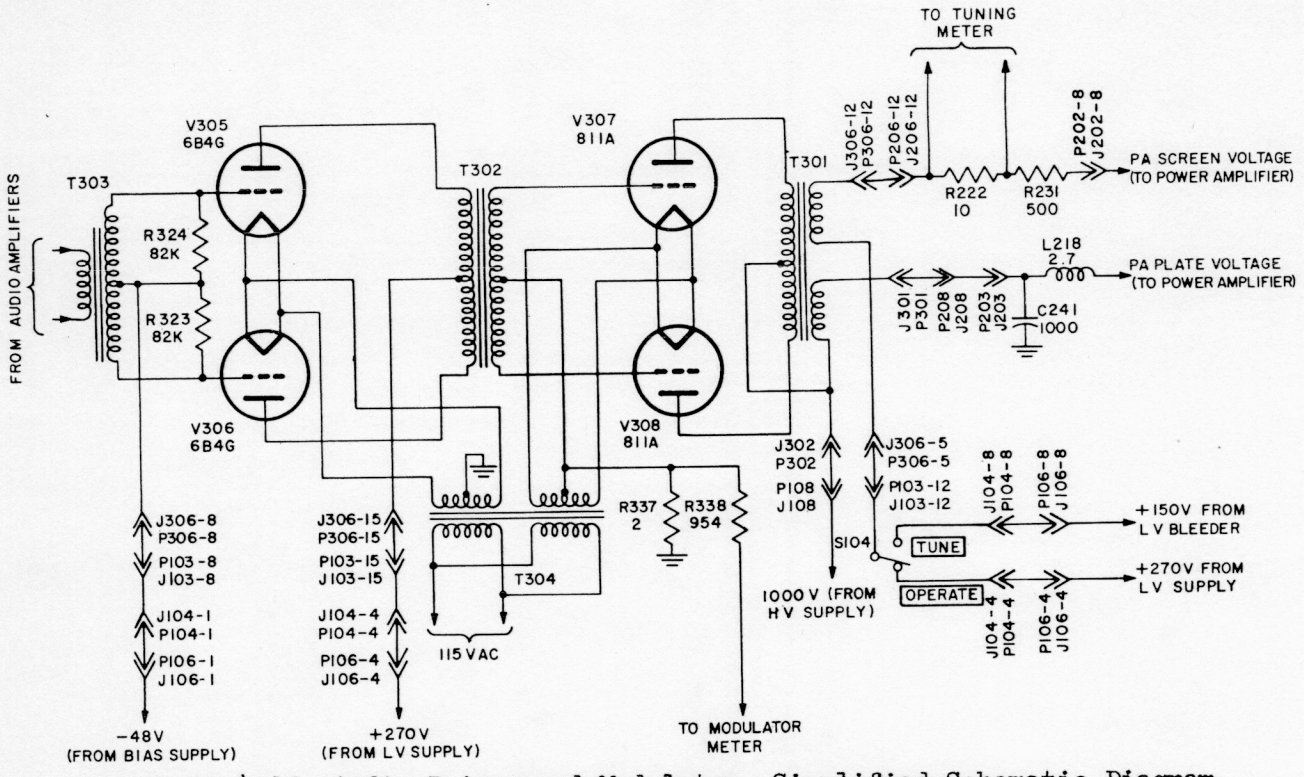


Figure 4-10. Audio Driver and Modulator, Simplified Schematic Diagram

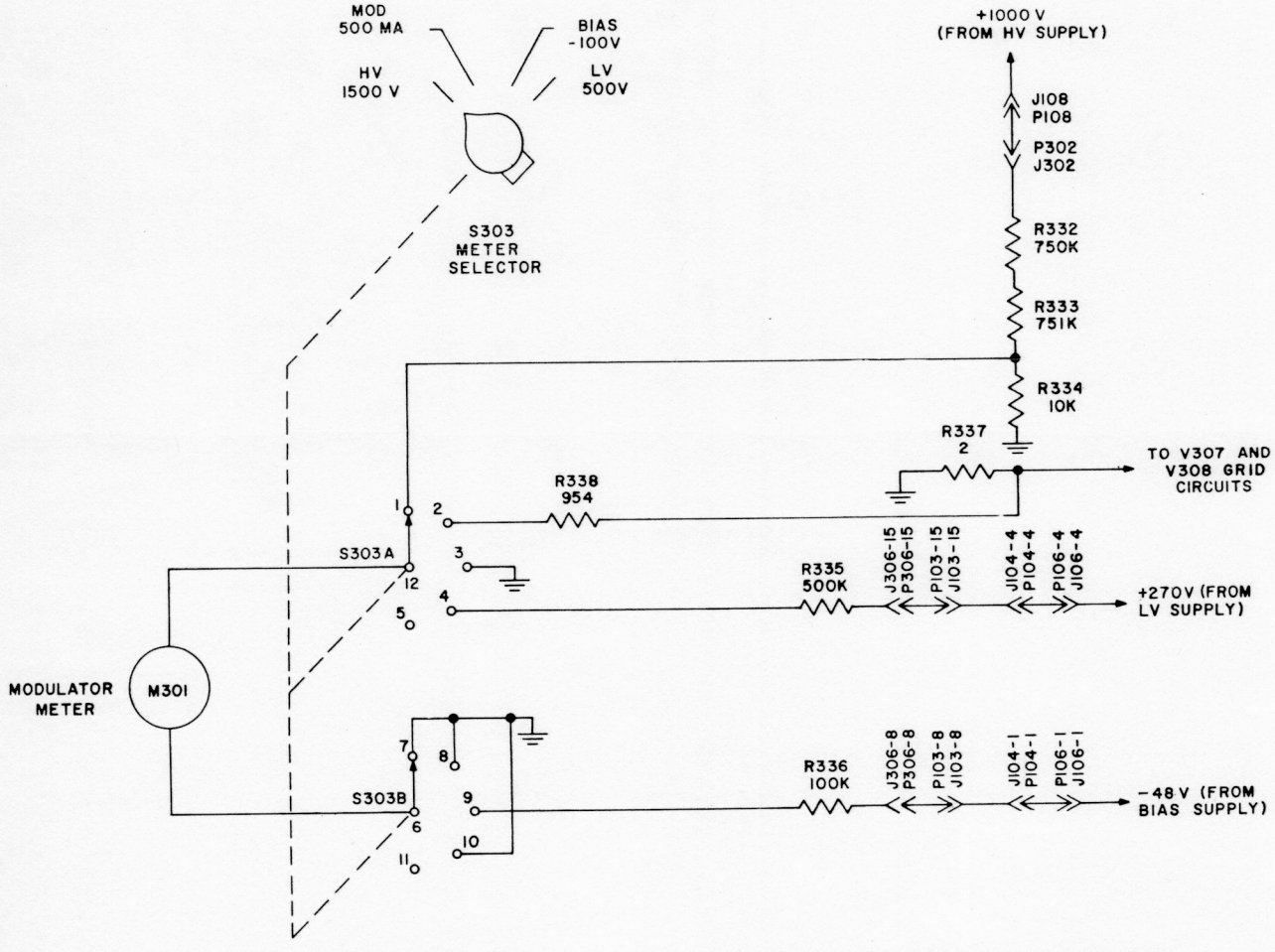


Figure 4-11. Modulator Meter Circuit, Simplified Schematic Diagram

C311. The control arm of R317 is available as a screwdriver adjustment on the front of the Modulator Unit. The potentiometer must be adjusted to supply an output signal which will provide the desired per cent modulation of the carrier. The output of the potentiometer is connected to the audio amplifier via the second half of the LIMITER IN-OUT switch, S301B.

d. AUDIO AMPLIFIER. - (Refer to figure 4-9.) The audio signal from S301B is applied to the grid of amplifier V304A, 1/2 of a 5814. Capacitor C313 couples the plate of the amplifier to the grid of audio amplifier V304B. The output of amplifier V304B is coupled to the grids of the push-pull audio driver by transformer T303. For communications service, where it is desired to limit the high-frequency audio response, capacitor C312 must be connected between the grid of V304B and ground. (See paragraph 2-4C for the procedure to be followed in making this connection.) For VOR service, this connection must not be made, since the audio frequency instantaneous response must extend beyond the highest frequency of the 9960 F-M subcarrier.

e. AUDIO DRIVER. - (Refer to figure 4-10.) The audio driver uses V305 and V306, both type 6B4G triodes, connected in a push-pull amplifier circuit. The drivers are operated Class A, with a -48 v fixed bias applied to the grids from the bias supply. The filaments are connected in parallel across one of the 6.3 v secondary windings of transformer T304. The plates are held at the +270 v output of the low voltage supply. The output of the driver is coupled to the audio modulator by transformer T302.

f. AUDIO MODULATOR. - (Refer to figure 4-10.) The audio modulator uses two type 811A triodes, V307 and V308, connected in a Class B push-pull circuit. The modulator produces the 200 watts of audio power required to modulate the power amplifier stage of the R-F Unit. The filaments are connected in parallel across the other 6.3 v secondary winding of transformer T304. The grids, connected to the center tap of this winding, are operated at zero bias. R337, between the center tap and ground, provides an indication of the common grid current for the modulator meter, M301. The plates of the modulator tubes are connected to opposite ends of the primary winding of modulation transformer T301. The +1000 v output of the high voltage supply is applied to the plates via a center tap on this winding. The transformer has two secondary windings. The output of one of them, superimposed on a d-c level of +270 v, is applied to the screens of power amplifiers V206 and V207. The output of the other secondary winding, superimposed on a d-c level of +1000 v, is applied to the plates of V206 and V207 through the r-f decoupling network.

g. MODULATOR METER. - (Refer to figure 4-11.) The Modulator Unit metering circuit is composed of meter M301 and two-pole, five position, meter selector switch S303. In its first, or HV, position, the switch shunts the meter across resistor R334, one element of a voltage divider network which also includes resistors R332 and R333. The voltage divider is connected in parallel with the bleeder of the high voltage supply. For its HV setting, the meter provides an indication of the +1000 v output of the high voltage supply on its 0-1500 v scale. In its second position, the selector switch shunts the meter across R337, in the common grid circuit of modulator tubes V307 and V308. For this setting, the meter provides an indication of the combined grid currents of the two tubes on its 0-500 ma scale. The normal reading for this current is 45 ma with no modulation component present, and 250 ma with the modulation component present. In its third position, the switch connects the meter across the bleeder of the bias supply. For this setting the meter

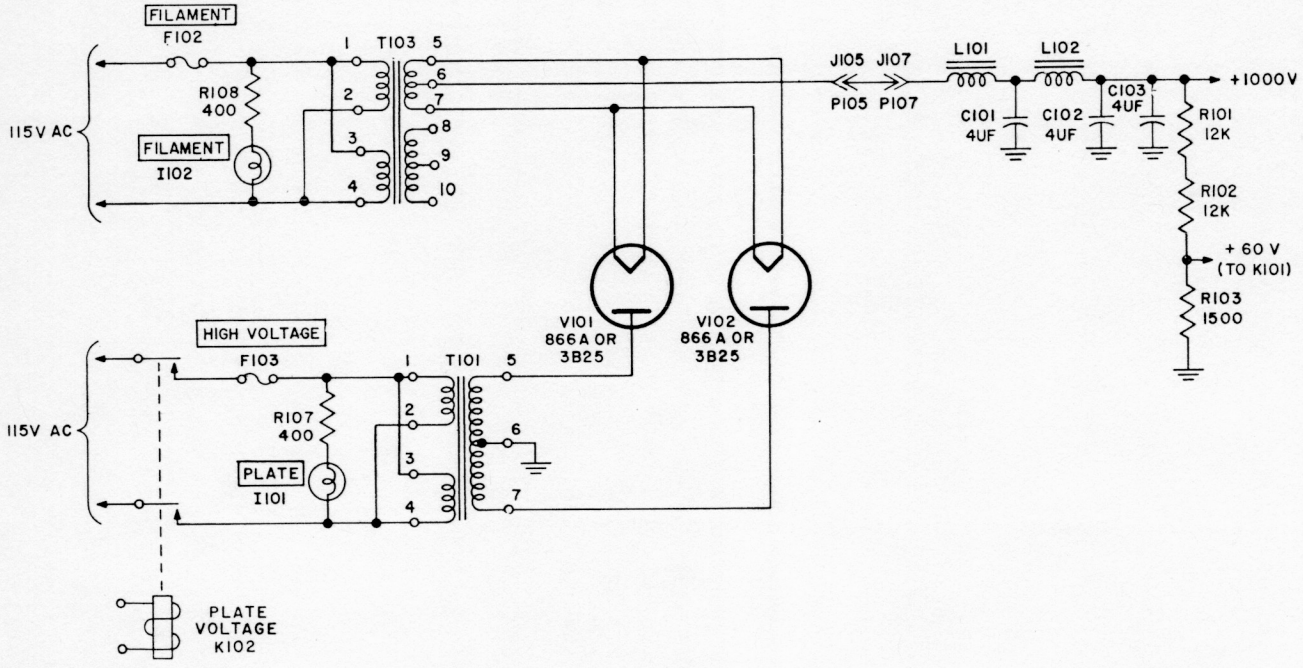


Figure 4-12. High Voltage Supply, Simplified Schematic Diagram

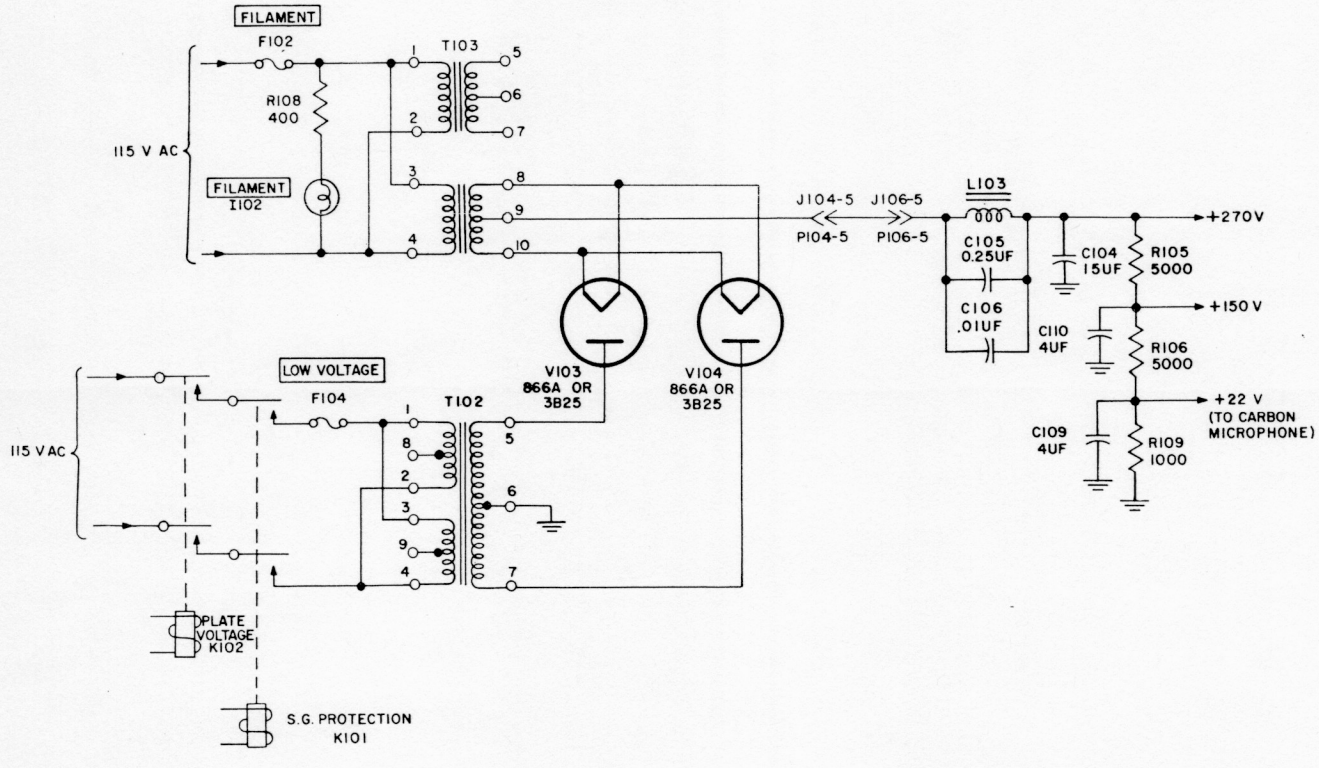


Figure 4-13. Low Voltage Supply, Simplified Schematic Diagram

provides an indication of the -48 v bias voltage on its 0-100 v scale. In its fourth position, the switch connects the meter across the bleeder of the low voltage supply. For this setting, the meter provides an indication of the +270 v output of the low voltage supply.

4-4. POWER SUPPLY.

The d-c voltages required by the 242F-2 Transmitter are as follows: +1000 v, +270 v, +150 v, +60 v, +22 v, and -48 v. These voltages are supplied by a high voltage supply, a low voltage supply, and a bias supply. The high voltage and low voltage supplies are physically divided between the Rectifier and Control Unit and the Filament and Bias Supply Unit. The bias supply is contained within the Filter and Bias Supply Unit. The filament voltages required by the transmitter are supplied by two filament transformers: T201, located in the R-F Unit, and T3-4, in the Modulator Unit.

a. HIGH VOLTAGE SUPPLY. - (Refer to figure 4-12.) The high voltage supply consists of a full-wave vacuum tube rectifier, a two-section choke-input filter, and a bleeder network. The rectifier, contained within the Rectifier and Control Unit, uses two 866As connected in a full-wave circuit. The a-c primary power is supplied the receifier by transformers T101 and T103.

The filter uses L101, a "swinging" choke, and capacitor C101 in its first section. The second section uses fixed choke L102 and paralleled capacitors C102 and C103. The two sections reduce the ripple at least 50 db below the d-c voltage. The bleeder, composed of resistors R101, R102, and R103, supplies a minimum load for the high voltage supply and provides output voltages of +1000 v and +60 v.

The +1000 v output of the bleeder is supplied to the plates of power amplifiers V206 and V207 via one of the secondary windings of modulation transformer T301, and to the plates of modulator tubes V307 and V308 via the primary winding of the same transformer. The +60 v output energizes the SG PROTECTION relay, K101, in the control circuit.

b. LOW VOLTAGE SUPPLY. - (Refer to figure 4-13.) The low voltage supply consists of a full-wave rectifier, an "L" section choke-input filter, and a bleeder network. The rectifier, contained within the Rectifier and Control Unit, uses two 866As connected in a full-wave circuit. The a-c primary power is supplied the rectifier by transformers T102 and T103.

The filter uses inductor L103 as the series element and C104 as the shunt element. Capacitors C105 and C106 are connected in parallel with L103 to form a parallel resonant circuit at the fundamental ripple frequency. The ripple output of the filter is at least 40 db below the d-c level. The bleeder, composed of resistors R105, R106, and R109, supplies a minimum load for the low voltage supply and provides output voltages of +270 v, +150 v, and +22 v.

The +270 v output of the bleeder is supplied to the screens of the power amplifiers and the plates and screens of all the other tubes of the transmitter except V307 and V308. The +150 v output is connected to the power amplifier screens via the TUNE terminal of the TUNE-OPERATE switch. This voltage is used as screen voltage for the power amplifier tubes during tuning of the R-F circuits. The +22 v output supplies the button current required by the carbon microphone.

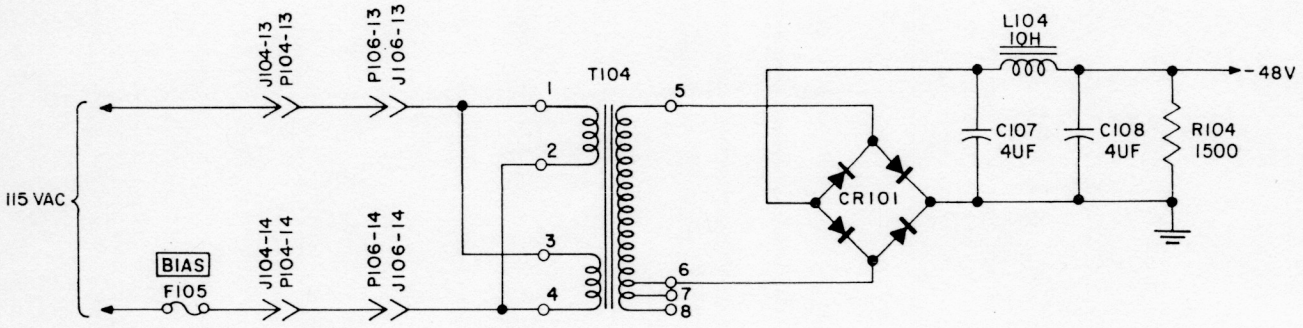


Figure 4-14. Bias Supply, Simplified Schematic Diagram

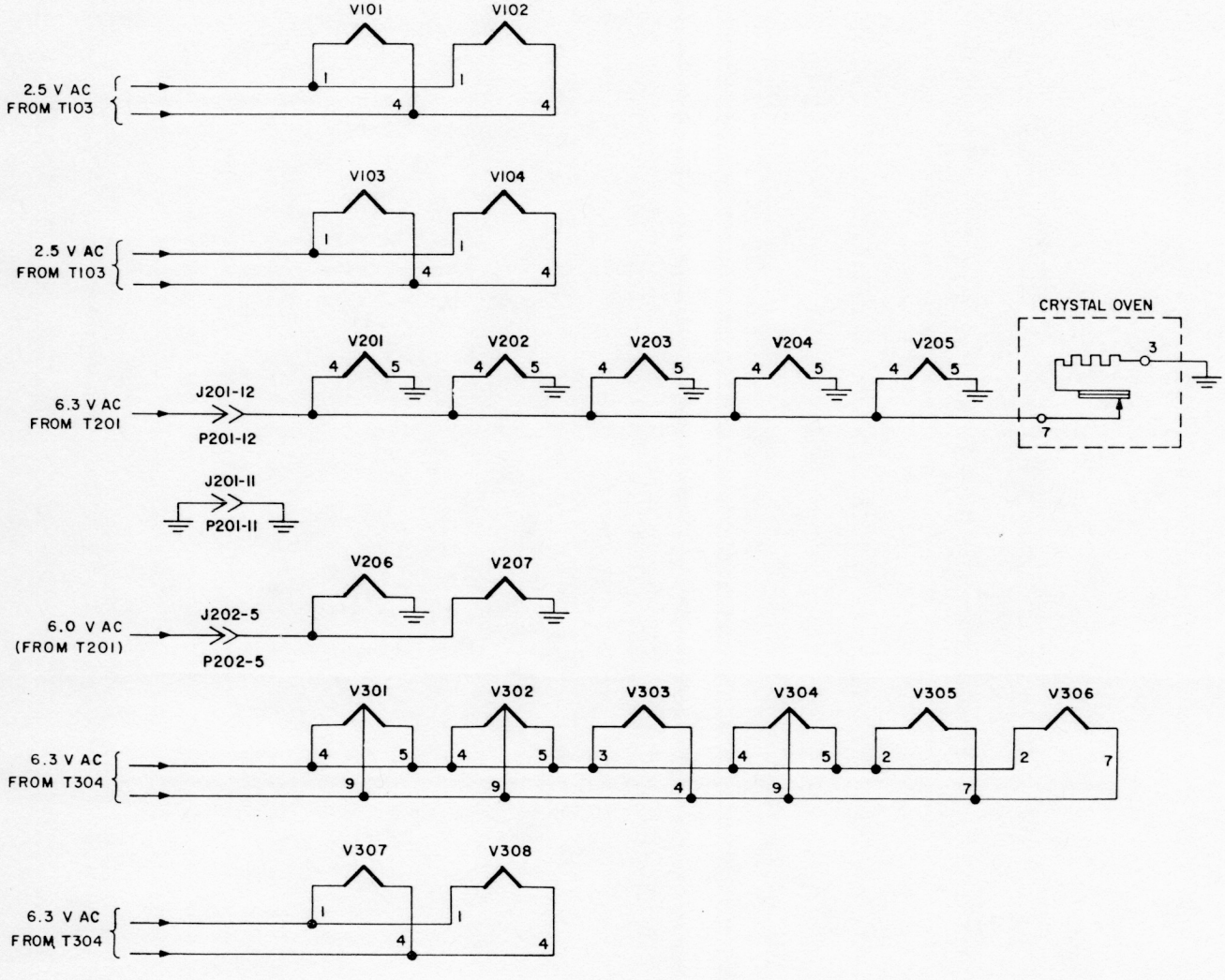


Figure 4-15. Filament Circuits, Simplified Schematic Diagram

c. BIAS SUPPLY. - (Refer to figure 4-14.) The bias supply consists of a copper-oxide full-wave rectifier, CR101, and an L-C pi-type filter, composed of L104, C107, and C108. The filter attenuates the fundamental ripple frequency at least 40 db below the d-c level. The primary a-c power is supplied the rectifier by transformer T104. The -48 v bias developed across bleeder R104 is distributed to the power amplifier grids and the audio driver (V305 and V306) grids.

The bias supply also provides energizing current for certain of the control relays within the equipment. The -48 v output of the supply is connected to relays K102 and K202 and to pin 1 of J305. For remote control installations, pins 1 and 2 of J305 may be jumpered to connect the -48 v output to relays K103 and K104.

d. FILAMENT CIRCUITS. - (Refer to figure 4-15.) The filaments of rectifiers V101 and V102 are connected in parallel across one of the 2.5 v secondary windings of transformer T103; the filaments of V103 and V104 are connected across the other 2.5 v secondary winding of that transformer. The filaments of tubes V201 through V205, and the heater element of the crystal oven, are connected in parallel across the 6.3 v secondary winding of T201. The filaments of 4x250Bs, V206 and V207 are connected in parallel across the 6.0 v secondary winding of T201. The filaments of tubes V301 through V306 are connected in parallel across one of the 6.3 v secondary windings of T304 while those of V307 and V308 are connected across the other 6.3 v secondary winding of that transformer.

4-5. CONTROL CIRCUITS. (Refer to figure 4-16A.)

The LOCAL-REMOTE switch, S102, adapts the control circuits for either local or remote control of the transmitter. When in its LOCAL position, S102 connects the switches on the transmitter panels into the control circuits. When in its REMOTE position, it connects the contacts of relays within the transmitter, which are controlled by switches on the Remote Control Unit, into the control circuits.

For both local and remote operation, the local ON-OFF switch, S101, controls the connection of primary power to the equipment. When the switch is in its ON position, a-c power is connected directly to the bias supply transformer, T104. Further distribution of the a-c power is then controlled by the local and remote switches, as described in the paragraphs which follow.

a. LOCAL CONTROL (S102 in LOCAL position).

(1) FILAMENT VOLTAGES. - For local operation, the ON-OFF switch, S101, provides complete control of the connection of primary power to filament transformers T103, in the Rectifier and Control Unit, T304, in the Modulator Unit, and T201, in the R-F Unit.

(2) PLATE AND SCREEN VOLTAGES. - The PLATE VOLTAGE relay, K102, controls the distribution of primary power to the HV plate supply transformer, T101. K102, in turn is controlled by the TIME DELAY relay, K204, and the PLATE ON-PUSH TO TALK switch, S103. The purpose of K204 is to prevent plate and screen voltages from being applied to the tubes of the R-F Unit and the Modulator Unit before their filaments have had time to warm up. The contacts of K204 close thirty-five seconds after filament power has been supplied the R-F Unit and connect one end of the coil of K102 to S103. When in its PLATE ON position, S103 connects this end of the coil to ground. The other end of the coil is connected directly to the -48 v output of the bias supply.

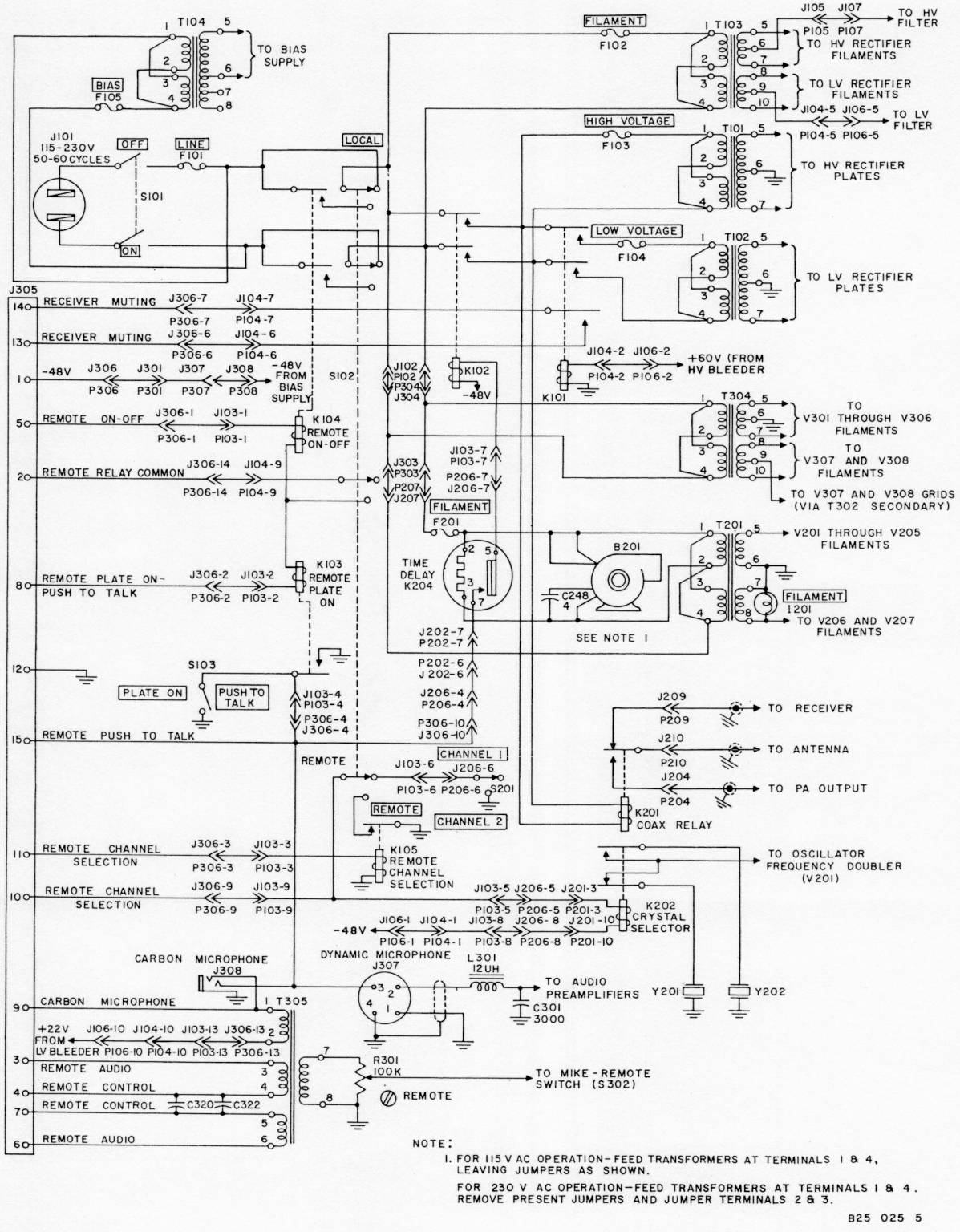


Figure 4-16A. Control Circuits, Simplified Schematic Diagram

The PLATE VOLTAGE relay, K102, and the SG PROTECTION relay, K101, control the distribution of primary power to the LV plate supply transformer, T102. Relay K101 is energized by the +60 v output of the high voltage bleeder. Whenever the high voltage fails, the relay becomes de-energized and its contacts disconnect the primary power source from T102. The purpose of K101 is to protect the power amplifier tetrodes from drawing excessive screen current when the voltage applied to their plates is below its normal value.

(3) CHANNEL SELECTION. - The CRYSTAL SELECTOR relay, K202, controls the connection of one or the other of the two crystals, Y201 and Y202, to the r-f oscillator circuit. When the CHANNEL 1-CHANNEL 2 switch, S201, is in its CHANNEL 1 position, K202 is de-energized and crystal Y201 is connected to the oscillator. When the switch is in its CHANNEL 2 position, K202 is energized and crystal Y202 is connected to the oscillator.

(4) COAXIAL RELAY. - The coaxial relay, K201, is connected across the primary windings of HV plate transformer T101; it is energized, therefore, only when primary power is being supplied that transformer. When energized, the relay connects the r-f output of the power amplifier to the ANT coaxial receptacle on the R-F Unit. When de-energized it connects the REC coaxial receptacle on that unit to the ANT one.

b. REMOTE CONTROL. (S102 in REMOTE position.)

(1) FILAMENT VOLTAGES. - For remote operation, the contacts of the REMOTE ON-OFF relay, K104, are connected in series with the local ON-OFF switch, S101. The remote ON-OFF switch and either the local or remote source of energizing current must be connected in series with K104 via terminals 2 and 5 of J305. (The local source of energizing current is available at terminal 1 of J305.) With the local ON-OFF switch in its ON position, the remote ON-OFF switch controls the connection of primary a-c power to filament transformers T103, T304, and T201.

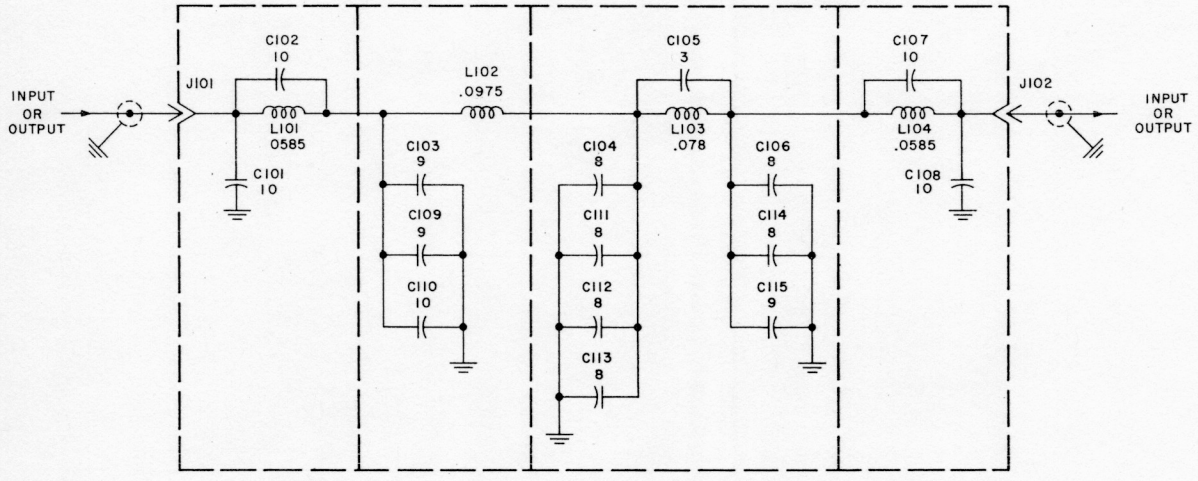
(2) PLATE AND SCREEN VOLTAGES. - The REMOTE PLATE ON relay, K103, controls the energizing of PLATE VOLTAGE relay K102. K103 must be connected in series with the remote PLATE ON-PUSH TO TALK switch and either the local or remote source of energizing current via pins 2 and 8 of J305. When the remote switch is in its PLATE ON position, K103 is energized and its contacts complete the circuit of K102. When the remote switch is in its PUSH TO TALK position, K102 may be energized only by the remote PUSH TO TALK button. This button is connected to the transmitter via terminal 15 of J305.

(3) CHANNEL SELECTION. - For remote operation, the remote CHANNEL 1-CHANNEL 2 switch may be used to control the CRYSTAL SELECTOR relay K202. The control circuits are designed with two REMOTE CHANNEL SELECTION inputs: terminal 11 of J205 receives ±48 v as the REMOTE CHANNEL 2 control signal while terminal 10 receives ground as that signal. The REMOTE CHANNEL SELECTION telephone line must be connected to one or the other of these inputs, depending upon which type of control is being used. The ±48 v control signal, from terminal 11, energizes the REMOTE CHANNEL SELECTION relay, K105. The contacts of this relay, when closed, complete the circuit of CRYSTAL SELECTOR relay, K202. The ground control signal, from terminal 10, completes the circuit of K202 directly. With K202 energized, crystal Y202 is connected to the R-F oscillator circuit.

4-6 35D-2 LOW PASS FILTER. (Refer to figure 4-17A.)

The 35D-2 Low Pass Filter consists of three L-sections connected in cascade. Each section consists of an air-core inductor, as the series element, and one to four ceramic capacitors, as the shunt elements. Three ceramic capacitors, C102, C105, and C107, are connected in parallel with inductors L101, L103, and L104, respectively. These parallel L-C circuits resonate at frequencies in the range 216 to 456 mc to increase the attenuation of the harmonic signals within that range. The filter provides a minimum attenuation of 60 db to all signals in the frequency range 216 to 456 mc.

The filter is so designed that it provides an attenuation of less than 0.8 db to signals, in the frequency range 108 to 152 mc, passing through it in either direction. The filter, thus, need not be removed from the transmission line when the antenna is connected to the receiver.



NOTES:
1. ALL INDUCTANCE IN MICROHENRIES
2. ALL CAPACITANCE IN MICROMICROFARADS
3. ALL INDUCTANCE VALUES ARE CALCULATED

B25 026 4

Figure 4-17A. Type 35D-2 Low Pass Filter, Simplified Schematic Diagram

SECTION V

MAINTENANCE

5-1. GENERAL.

This section presents preventive and corrective maintenance procedures for the 242F-2 Transmitter. The preventive maintenance procedures are provided to assist in keeping the transmitter in good working order, so that breakdowns and needless interruptions in service can be kept to a minimum. The corrective maintenance procedures may be used to locate the source of a trouble within the transmitter so that the correction can be made. The section presupposes that the maintenance personnel are familiar with the physical make-up of the equipment and have a thorough knowledge of its basic circuits. A trouble-shooting chart, a set of voltage and resistance measurements, and a schematic diagram of the equipment are provided for maintenance purposes.

5-2. TEST EQUIPMENT RECOMMENDED FOR MAINTENANCE.

(1) High Impedance Voltmeter: 20,000 ohms/volt d-c; 5000 ohms/volt a-c.

Ranges: 0-10, 0-300, 0-1500 volts d-c.

0-10, 0-150, 0-1500 volts a-c.

(2) Ohmmeter

Ranges: 0-10 ohms, 0-100,000 ohms, 0-5 megohms.

(3) D-C Vacuum Tube Voltmeter: 0-300 volt scale ranges, input impedance 11 megohms or higher. (Electronic Designs 100, RCA Voltohmyst, or equal.)

(4) A-C Vacuum Tube Voltmeter: 0-10 millivolt, 0-100 volt scale ranges. Modified as required for minimum sensitivity to extraneous r-f energy. (Hewlett-Packard 410, Ballantine 300, or equal.)

(5) R-F Wattmeter, 52 ohm dummy load: Bird Thruline wattmeter, Type 43, with 250 watt element, or Bird 612 r-f wattmeter, or equal.

(6) Oscilloscope: Dumont Type 304H, modified for VHF use, or Dumont Type 2559, or equal.

(7) Frequency measuring rack (9-13 mc.), if close frequency tolerances are required.

5-3. PREVENTIVE MAINTENANCE.

The following inspections and maintenance techniques should be performed periodically, as indicated by each paragraph heading:

a. WEEKLY.

(1) Check the ventilation of the power amplifier. (This item is very important and must not be overlooked.)

(2) Check the tuning of the R-F Unit.

(3) Record all TUNING METER and CATHODE METER readings in logbook. If a particular reading drops 20% from its original value, investigate to determine the cause.

b. MONTHLY.

(1) Perform the equipment checks specified in blocks 1, 2 and 3 of the trouble-shooting chart, figure 5-1A.

(2) Perform an "off-resonance" check of the power amplifier tubes as follows: With the LOADING and PLATE controls adjusted for critical coupling (refer to Table 2-1), detune the plate cavity to each side of the resonance, using the PLATE control. Record the CATHODE 1 and CATHODE 2 currents for resonance and for each off-resonant condition. For each tube, record the difference between the reading at resonance and the average of the two readings at off-resonance in the logbook. When the difference is considerably less than the difference noted when the tube was new, the tube is nearing the end of its useful life. (The point at which the tube must be replaced depends upon the application of the transmitter.)

CAUTION

Hold the detuned periods to a minimum (not longer than three seconds) to avoid damaging the 4x250Bs.

(3) Insert the 250 watt element into the THRULINE wattmeter and connect the THRULINE between the 35D-2 and the antenna. Check the PA tuning and record the incident and reflected power. If the readings deviate significantly from the original readings, investigate the cause.

(4) Remove the canvas duct between the blower and the power amplifier. Clean the screen which covers the input vent on the grid cavity. Remove the power amplifier from the R-F Unit chassis and open the plate cavity. Use a brush to clean dirt and other accumulations from the screens which cover the output vents.

(5) With the cavity off the chassis, use a brush to clean the blower impeller. After loosening the dust, run the blower to remove the accumulations from the impeller housing.

CAUTION

Steps (4) and (5) may have to be performed more or less often than once a month, depending upon the rate at which dust accumulates. The cavity must be well ventilated or the 4x250Bs will overheat and melt down.

1.

Check TUNING METER indications for GRID 1, GRID 2, and ANT positions of METER SELECTOR. Check CATHODE METER indications. If a wattmeter is available, check r-f power output at 35D-2 output connector.

If normal

If one or more indications are abnormal

a

Check PA grid and plate tuning. Perform "off-resonance" check on PA; replace 4x250Bs if necessary. Repeat checks of block 1, above.

If block 1 indications are now normal

b

If trouble was due to detuned PA:
1. Check ventilation of cavity.
2. Check antenna and transmission line.

If block 1 indications are still abnormal

c

Check TUNING METER indications for each position of METER SELECTOR switch from DRIVER to OSC.

If all block 1-c indications are normal

d

Check PA plate and screen voltages. PA plate voltage, at P203, should be +1000v. PA screen voltage, at pin 8 of P202, should be +270v. If either voltage is absent, check T301 and the connections between the transformer and P202.

If all block 1-c indications are abnormal

e

Check for lack of plate voltage as follows:
1. Check for blown fuse.
2. Check to see that P202 and J202 are properly engaged.
3. Check to see that contacts of K204 have closed
4. Check K101 and K102 for proper operation.
5. Check interconnecting wiring.
6. Check power supply for an open transformer or choke.

If block 1 indications are still abnormal

g

Replace antenna and 35D-2 with dummy load. Check PA grid and plate tuning. Repeat checks of block 1.

If block 1 indications are now normal

h

Trouble is probably caused by 35D-2, transmission line, or antenna.

If block 1 Indications are still abnormal

i

Connect dummy load directly to cavity output (P204). Retune PA grid and plate circuits. Repeat checks of block 1.

If block 1 indications are now normal

j

Trouble is in output circuit. Check the coaxial relay K201.

If block 1 indications are still abnormal

k

Replace 4x250Bs if they were not replaced in second step above. Repeat checks of block 1.

If block 1 indications are now normal

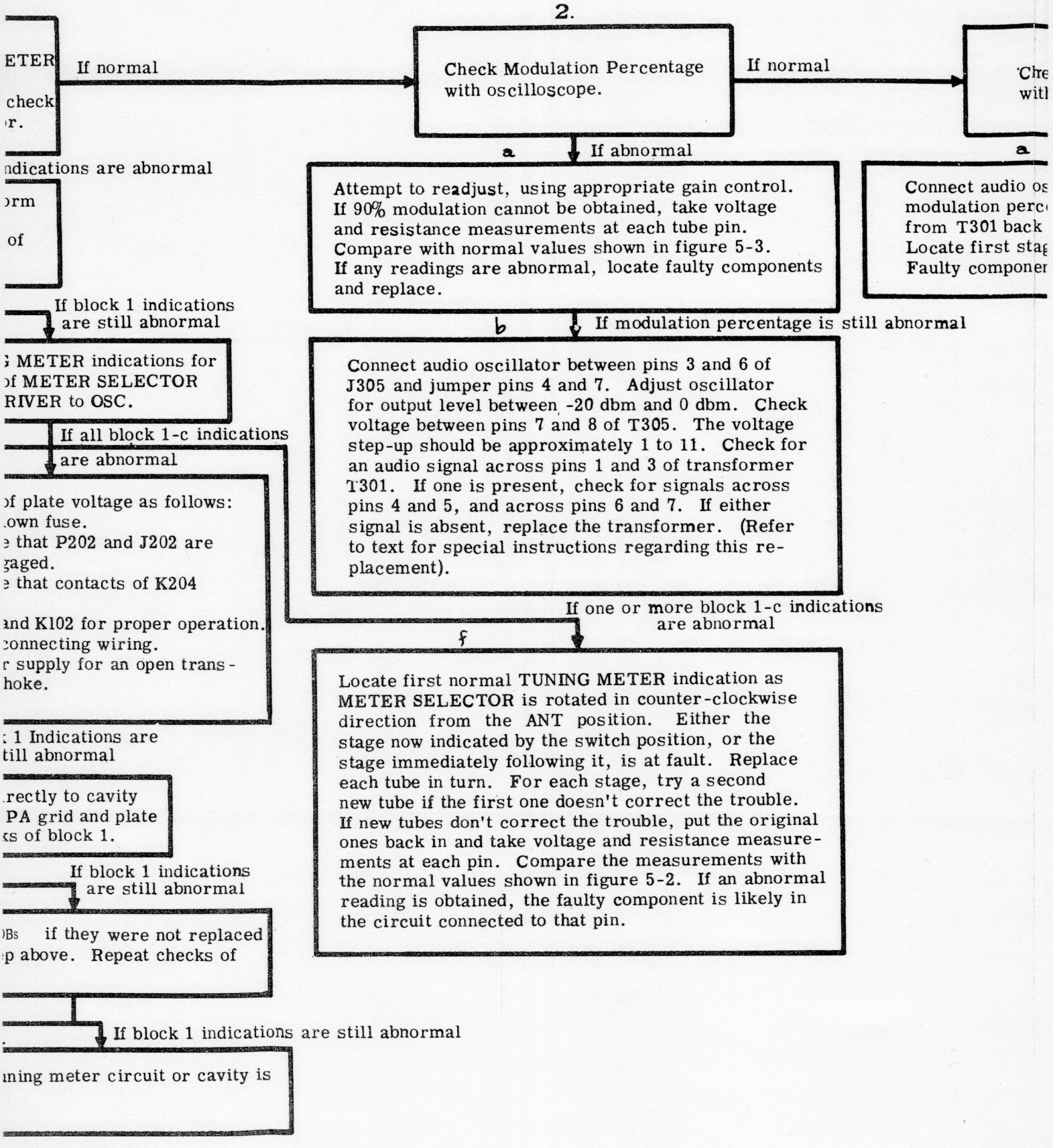
l

Trouble was due to bad 4x250Bs

If block 1 indications a

m

Either tuning meter circuit or cavity is at fault.



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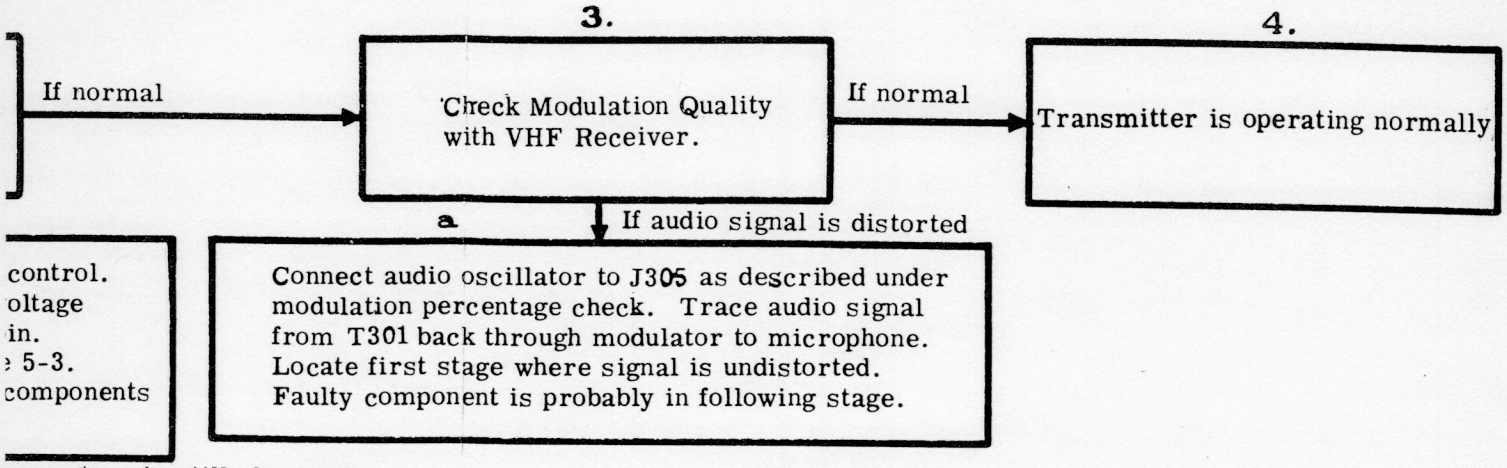

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Figure 5-1A. Trouble-Shooting Chart for Type 242F-2 Transmitter

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c. EVERY 90 DAYS.

(1) Check the tubes of the Modulator Unit and the Rectifier and Control Unit in a tube checker. Replace any weak tubes.

(2) If close frequency tolerances are required, check the frequency of the crystal. The respective trimming capacitor, C201 or C221, provides for fine adjustment of the crystal frequency.

5-4. CORRECTIVE MAINTENANCE.

Most of the troubles that develop within the transmitter are expected to be caused by faulty tubes. When a trouble develops, therefore, first isolate the source to one of the four units of the transmitter, then check the tubes in that section and replace those that are faulty. If these procedures do not correct the trouble, perform the basic section checks outlined in blocks 1, 2, and 3 of the trouble-shooting chart, figure 5-1A. If any one of these checks fails, proceed vertically from that block and perform the trouble-shooting procedures outlined for that section.

a. R-F Unit. - Use the TUNING METER and the CATHODE METER to locate faulty circuits within the R-F Unit. The ANT setting of the METER SELECTOR switch provides an indication, on the TUNING METER, of the r-f power output from the transmitter. This reading should be within the range 0.4 to 0.5 ma. Connect a wattmeter to the 35D-2 output connector to obtain the actual value of the r-f power output.

If the r-f power output is below normal, check the CATHODE METER indications and the GRID 1 and GRID 2 indications of the TUNING METER. In most cases, an abnormal CATHODE METER reading indicates trouble in either the power amplifier or the transmitter output circuit, while an abnormal GRID 1 or GRID 2 reading indicates trouble in one or more of the stages preceding the power amplifier.

(1) NO INDICATION ON EITHER METER. - If there are no GRID 1 and GRID 2 indications and no CATHODE METER indications, check for lack of plate voltage as indicated in block 1-e of the trouble-shooting chart.

(2) GRID 1 AND GRID 2 INDICATIONS NORMAL BUT ONE OR BOTH CATHODE METER INDICATIONS ABNORMAL. - If the GRID 1 and GRID 2 indications are 0.4 ma or more, but one or both of the CATHODE METER indications are less than 200 ma, check the PA grid and plate tuning.

NOTE

> If the CATHODE METER readings are such that the BALANCE control cannot restore balance within 10% to the plate currents, one of the 4x250Bs is weak and must be replaced.

Perform an off-resonance check as outlined in paragraph 5-3 and replace one or both of the 4x250Bs, if necessary. If one or both of the CATHODE METER indications are still abnormal, check the PA plate and screen voltages as outlined in block 1-d of the trouble-shooting chart.

CAUTION

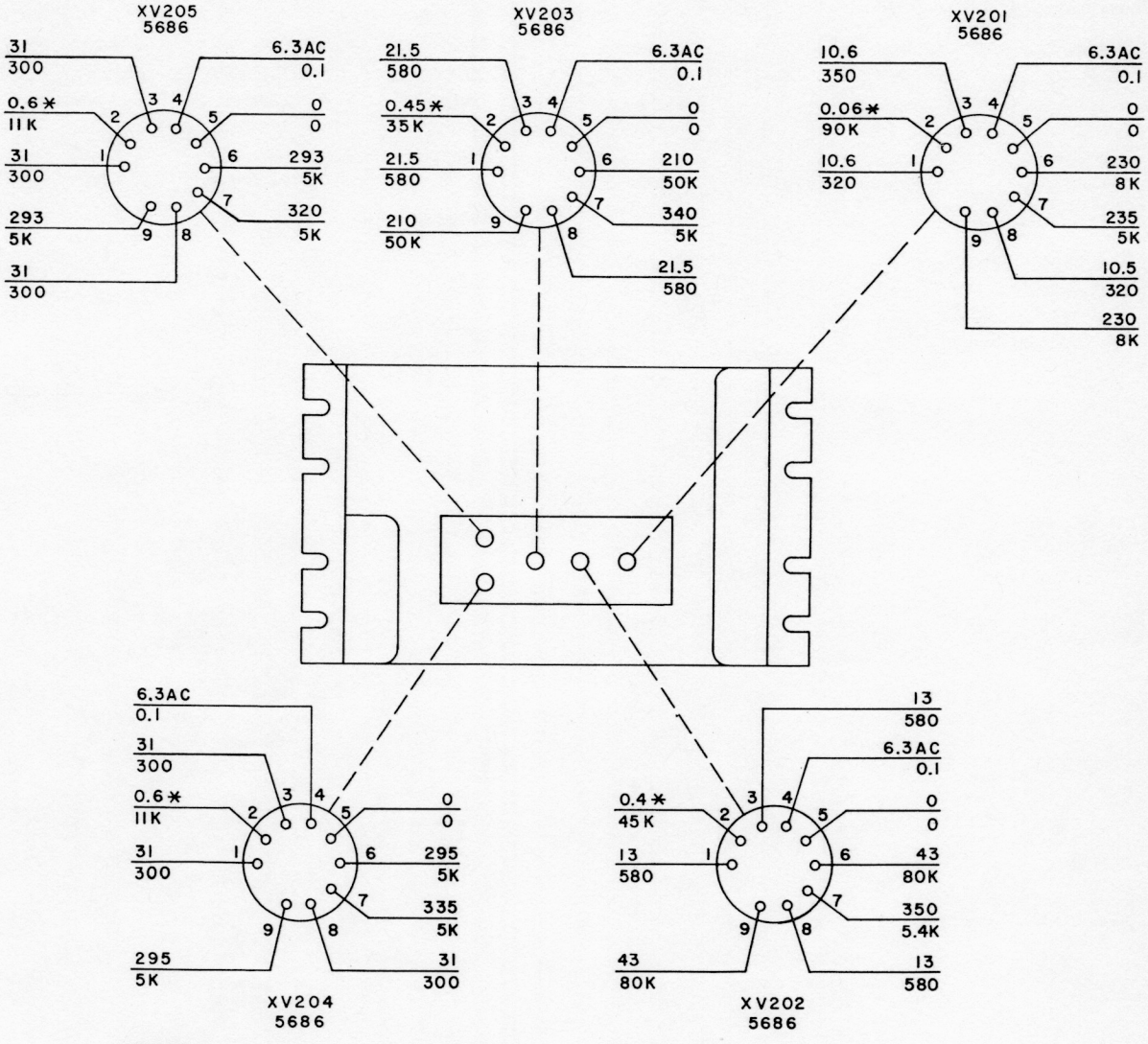
Use care in the replacement of the modulation transformer, T301. The transformer has phased secondary windings and the plate and screen voltages must rise and fall at the same time during modulation. If the transformer is connected improperly, the power amplifier will operate as a dynatron oscillator at an audio rate. The voltage thus developed will probably cause damage to the cavity or the transformer.

If the PA plate and screen voltages are normal, perform the check outlined in block 1-g of the trouble-shooting chart. If, with the dummy load connected to the transmitter output, the CATHODE METER indications are normal, the trouble is probably caused by the 35D-2, the transmission line, or the antenna. If the CATHODE METER indications are still abnormal, connect the dummy load directly to the cavity output, P204. If the indications are now normal, the trouble is probably in the coaxial relay, K201. If the indications are still abnormal, either the cavity or the tuning meter circuit may be at fault.

(3) CATHODE METER INDICATIONS NORMAL BUT GRID 1 AND GRID 2 INDICATIONS ABNORMAL. - If the CATHODE METER indications are in the range 200 ma to 230 ma, but the GRID 1 and GRID 2 indications are less than 0.5 ma, one or more of the stages preceding the power amplifier is probably at fault. Use the checks outlined in block 1-f of the trouble-shooting chart to isolate the trouble to two successive stages. If replacing the tubes in those stages does not correct the trouble, take voltage and resistance measurements at the pins of the tubes. (Refer to figure 5-2A.) An abnormal measurement usually indicates a faulty component in the circuit connected to that pin. Tubes and carbon resistors may be replaced from the local supply; other components may be ordered from Collins Radio Company using the appropriate part numbers listed in Section 6.

b. MODULATOR. - The presence of the modulation component can be detected by setting the METER SELECTOR to the SCREEN position and observing the TUNING METER for variations in the final screen current. To check the modulation percentage, connect an oscilloscope to the transmitter output and observe the wave-form. By adjusting the respective MIKE or REMOTE gain control, at least 90% modulation should be obtainable. If this modulation level cannot be obtained, perform the modulator checks outlined in blocks 2a and 2b of the trouble-shooting chart. (Refer to figure 5-3 for the voltage and resistances measurements of the tubes in the Modulator Unit.)

Check the modulation quality with a VHF receiver, tuned to the transmitter output frequency. If distortion is present, use the procedures outlined in block 3a of the trouble-shooting chart to locate the faulty components.



NOTES:

1. ALL VOLTAGES ABOVE THE LINE, RESISTANCES BELOW THE LINE.
2. VOLTAGE MEASUREMENTS TAKEN DURING PLATE-ON, CHANNEL 1 OPERATION OF THE TRANSMITTER.
3. ALL MEASUREMENTS WITH RESPECT TO CHASSIS GROUND.
4. ALL VOLTAGES ARE D-C UNLESS OTHERWISE INDICATED.
5. * INDICATES READING IS THE GRID CURRENT INDICATION PROVIDED BY TUNING METER. THIS READING IS NOT THE ACTUAL VALUE OF GRID CURRENT OF TUBE.

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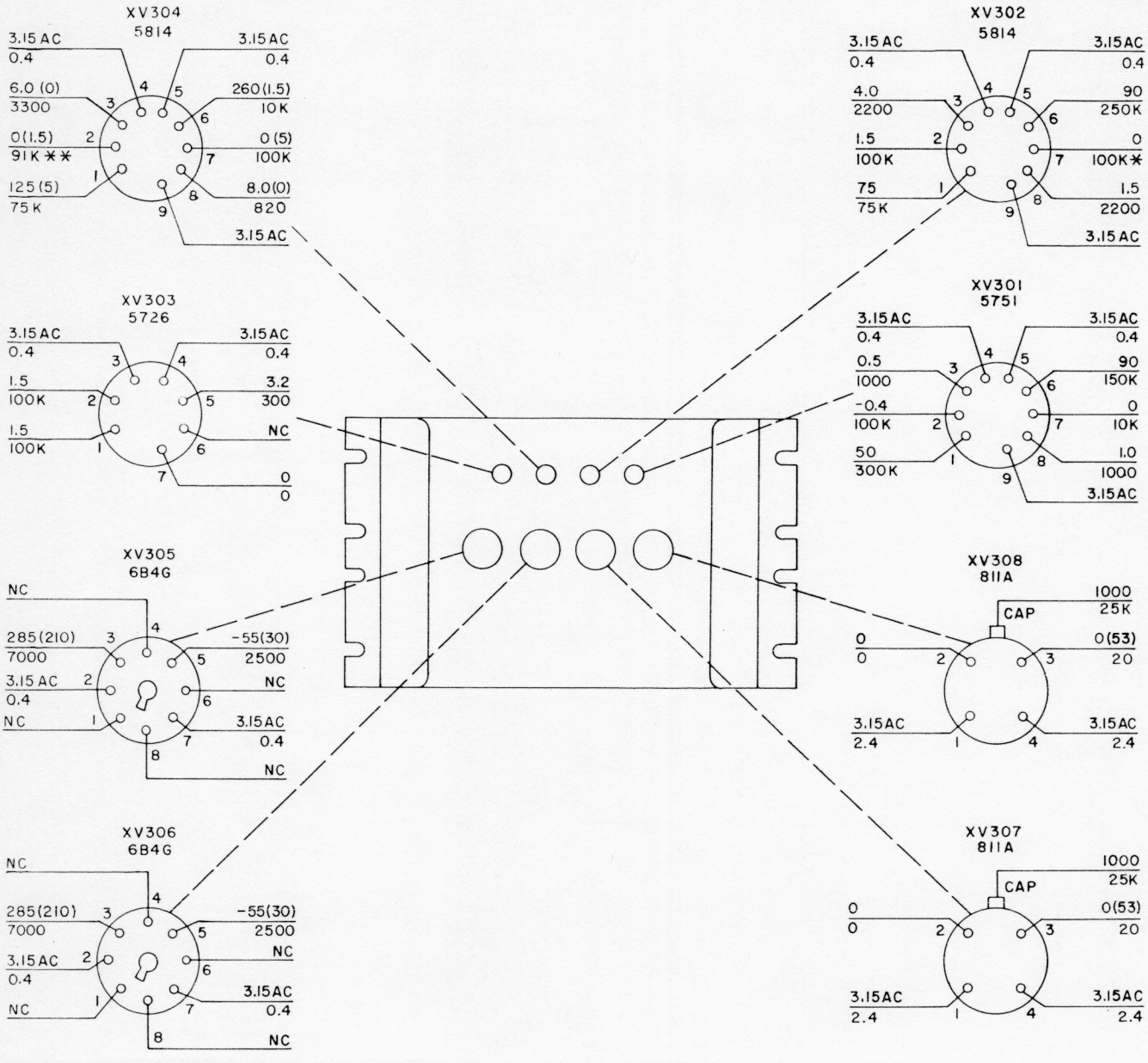
Figure 5-2A. Type 242F-2 R-F Unit, Voltage and Resistance Measurements Diagram



1. ALL VOLTAGE MEASUREMENTS ABOVE THE LINES, ALL RESISTANCES BELOW THE LINES.
2. VOLTAGE MEASUREMENTS IN VOLTS; RESISTANCE MEASUREMENTS IN OHMS. (ALL MEASUREMENTS MADE WITH RESPECT TO CHASSIS GROUND.)
3. ALL MEASUREMENTS NOT ENCLOSED BY PARENTHESIS WERE MADE WITH NO AUDIO INPUT TO THE MODULATOR. THESE MEASUREMENTS ARE D-C UNLESS OTHERWISE INDICATED.
4. ALL READINGS ENCLOSED BY PARENTHESIS ARE AUDIO VOLTAGE MEASUREMENTS. THESE READINGS WERE MADE WITH AN AUDIO OSCILLATOR CONNECTED TO PINS 3 AND 6 OF J305 AND ADJUSTED FOR ONE VOLT OUTPUT AT 1000 CPS. REMOTE POTENTIOMETER CONTROL WAS ADJUSTED FOR A 250 MA INDICATION ON THE MODULATOR METER (90% MODULATION). (MIKE-REMOTE SWITCH MUST BE IN REMOTE POSITION, LIMITER IN-OUT SWITCH IN 'OUT' POSITION DURING THESE MEASUREMENTS.)
5* INDICATES MIKE POTENTIOMETER CONTROL IS IN EXTREME CLOCKWISE POSITION FOR THIS MEASUREMENT.
6** INDICATES LIMITER IN-OUT SWITCH IS IN 'OUT' POSITION, MIKE REMOTE SWITCH IS IN MIKE POSITION FOR THIS MEASUREMENT.

Figure 5-3. Type 242F-2 Modulator Unit, Voltage and Resistance Measurements Diagram

SECTION VI
PARTS LIST

6-1. PARTS LIST FOR 242F-2 TRANSMITTER.

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
B201	PA Cooling	BLOWER:	009 1283 00
C101	High Voltage Filter	CAPACITOR: 4 mf; +40% -15%; 1500 WV	962 4128 00
C102	High Voltage Filter	CAPACITOR: 4 mf; +40% -15%; 1500 WV	962 4128 00
C103	High Voltage Filter	CAPACITOR: 4 mf; +40% -15%; 1500 WV	962 4128 00
C104	Low Voltage Filter	CAPACITOR: 15 mf; +40% -15%; 1000 WV	962 4044 00
C105	Low Voltage Filter	CAPACITOR: .25 mf; ±10%; 1000 WV	930 0128 00
C106	Low Voltage Filter	CAPACITOR: .1 mf; ±10%; 100 WV	930 0124 00
C107	Bias Filter	CAPACITOR: 4 mf; ±20%; 130 WV	931 0035 00
C108	Bias Filter	CAPACITOR: 4 mf; ±20%; 130 WV	931 0035 00
C109	Carbon Mike Filter	CAPACITOR: 4 mf; ±20%; 130 WV	931 0035 00
C110	Low Voltage Filter	CAPACITOR: 4 mf; +40% -15%; 600 WV	962 4319 00
C201	Crystal Calibration	CAPACITOR: Variable; 3-13 mmf; 500 WV	917 1029 00
C202	Meter Circuit Bypass	CAPACITOR: 1000 mmf; ±20%; 500 WV	912 0938 00
C203	Crystal Shunting	CAPACITOR: 9 ± 1 mmf; 500 WV	916 0135 00
C204	Feedback	CAPACITOR: 200 mmf; ±20%; 500 WV	912 0940 00
C205	V201 Screen Bypass	CAPACITOR: 1000 mmf; ±20%; 500 WV	912 0938 00
C206	V201 RF Decoupling	CAPACITOR: 1000 mmf; ±20%; 500 WV	912 0938 00

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
C207	V202 Meter Circuit Bypass	CAPACITOR: 1000 mmf; ±20%; 500 WV	912 0938 00
C208	V202 Cathode Bypass	CAPACITOR: 1000 mmf; ±20%; 500 WV	912 0938 00
C209	V202 Screen Bypass	CAPACITOR: 1000 mmf; ±20%; 500 WV	912 0938 00
C210	V202 RF Decoupling	CAPACITOR: 1000 mmf; ±20%; 500 WV	912 0938 00
C211	V203 Meter Circuit Bypass	CAPACITOR: 500 mmf; ±20%; 500 WV	912 0937 00
C212	V203 Cathode Bypass	CAPACITOR: 500 mmf; ±20%; 500 WV	912 0937 00
C213	V203 Screen Bypass	CAPACITOR: 500 mmf; ±20%; 500 WV	912 0937 00
C214	V203 RF Decoupling	CAPACITOR: 500 mmf; ±20%; 500 WV	912 0937 00
C215	Meter Circuit Bypass	CAPACITOR: 500 mmf; ±20%; 500 WV	912 0937 00
C216	V204 Cathode Bypass	CAPACITOR: 500 mmf; ±20%; 500 WV	912 0667 00
C217	V205 Cathode Bypass	CAPACITOR: 500 mmf; ±20%; 500 WV	912 0677 00
C218	V204 Screen Bypass	CAPACITOR: 500 mmf; ±20%; 500 WV	912 0937 00
C219	V205 Screen Bypass	CAPACITOR: 500 mmf; ±20%; 500 WV	912 0937 00
C220	RF Decoupling	CAPACITOR: 500 mmf; ±20%; 500 WV	912 0937 00
C221	Crystal Calibration	CAPACITOR: Variable; 3-13 mmf; 500 WV	917 1029 00
C222	V206 Cathode	CAPACITOR: Mica button; 1000 mmf; ±20%; 500 WV	912 0938 00
C223	V206 Cathode	CAPACITOR: Mica button; 1000 mmf; ±20%; 500 WV	912 0938 00
C224	V206 Cathode	CAPACITOR: Mica button; 1000 mmf; ±20%; 500 WV	912 0938 00
C225	V206 Cathode	CAPACITOR: Mica button; 1000 mmf; ±20%; 500 WV	912 0938 00
C226	V207 Cathode	CAPACITOR: Mica button; 1000 mmf; ±20%; 500 WV	912 0938 00
C227	V207 Cathode	CAPACITOR: Mica button; 1000 mmf; ±20%; 500 WV	912 0938 00
C228	V207 Cathode	CAPACITOR: Mica button; 1000 mmf; ±20%; 500 WV	912 0938 00

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
C229	V207 Cathode	CAPACITOR: Mica button; 1000 mmf; ±20%; 500 WV	912 0938 00
C230	V207 Screen	CAPACITOR: 3750 mmf;	Built into Tube Socket
C231	V206 Screen	CAPACITOR: 3750 mmf;	Built into Tube Socket
C232	V206 Grid	CAPACITOR: Grid Assy. - RH	561 1385 003
C233	V207 Grid	CAPACITOR: Grid Assy. - LH	561 1379 003
C234	Grid Cavity Tuning	CAPACITOR:	Fabricated Grid Tuning
C235	Plate Cavity Tuning	CAPACITOR: Variable; 3-30 mmf; 8000 WV	919 0137 00
C236	Not Used		
C237	Not Used		
C238	PA Output Coupling for Metering	CAPACITOR: 2 mmf; ±¼ mmf; 500 WV	916 0075 00
C239	CR 201 Bypass	CAPACITOR: 47 mmf; ±2%	916 4361 00
C240	CR 201 Bypass	CAPACITOR: 9 mmf; ±¼ mmf;	916 0133 00
C241	High Voltage Filter	CAPACITOR: 1000 mmf; ±20%; 500 WV	913 0101 00
C242	Not Used		
C243	V206 Cathode Feed-thru	CAPACITOR: 1000 mmf; ±20%; 500 WV	912 0668 00
C244	V207 Cathode Feed-thru	CAPACITOR: 1000 mmf; ±20%; 500 WV	912 0668 00
C245	V207 Filament Feed-thru	CAPACITOR: 1000 mmf; ±20%; 500 WV	912 0668 00
C246	V207 Screen Feed-thru	CAPACITOR: 1000 mmf; ±20%; 500 WV	912 0668 00
C247	M201 Bypass	CAPACITOR: 1000 mmf; ±10%; 500 WV	935 4053 00
C248	B201 Phase Shift	CAPACITOR: 4 mf; +40% -15%; 600 WV	962 4319 00
C249	Plate Cavity Tuning	CAPACITOR: 75 mmf; ±5%; 5000 WV	913 0830 00

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
C250	Plate Cavity Tuning	CAPACITOR: 75 mmf; ±5%; 5000 WV	913 0830 00
C251	Plate Cavity Tuning	CAPACITOR: 75 mmf; ±5%; 5000 WV	913 0830 00
C252	V202 Heater Filter	CAPACITOR: 1000 mmf; +20% -0%; 500 WV	913 0146 00
C253	V203 Heater Filter	CAPACITOR: 1000 mmf; +20% -0%; 500 WV	913 0146 00
C254	B+ Filter in R-f Driver	CAPACITOR: 1000 mmf; +20% -0%; 500 WV	913 0146 00
C255	B+ Filter in R-f Driver	CAPACITOR: 1000 mmf; +20% -0%; 500 WV	913 0146 00
C301	V301 Grid Bypass	CAPACITOR: 3000 mmf; ±20%; 500 WV	913 0153 00
C302	V301 Cathode Bypass	CAPACITOR: 3000 mmf; ±20%; 500 WV	913 0153 00
C303	V301 Coupling	CAPACITOR: .01 mf ±10%; 300 WV	935 2117 00
C304	V301 Output Coupling	CAPACITOR: .022 mf ±10%; 400 WV	931 0291 00
C305	V302A Coupling	CAPACITOR: .022 mf ±10%; 400 WV	931 0291 00
C306	Coupling to V303	CAPACITOR: .001 mf ±10%; 400 WV	931 0277 00
C307	V303 Filter	CAPACITOR: 150 mmf ±2%; 500 WV	912 0505 00
C308	V303 Filter	CAPACITOR: 180 mmf ±2%; 500 WV	912 0511 00
C309	V303 Filter	CAPACITOR: 150 mmf ±2%; 500 WV	912 0505 00
C310	V302B Plate Bypass	CAPACITOR: .0022 mf ±10%; 400 WV	931 0281 00
C311	V302B Plate Coupling	CAPACITOR: .022 mf ±10%; 400 WV	931 0291 00
C312	V304 Audio Bypass	CAPACITOR: .001 mf ±10%; 400 WV	931 0277 00
C313	V304 Grid Coupling	CAPACITOR: .022 mf ±10%; 400 WV	931 0291 00
C314	Decoupling	CAPACITOR: 1 mf +20% -10%; 600 WV	961 4562 00
C315	Decoupling	CAPACITOR: 1 mf +20% -10%; 600 WV	961 4562 00
C316	Decoupling	CAPACITOR: 1 mf +20% -10%; 600 WV	961 4562 00
C317	Decoupling	CAPACITOR: 1 mf +20% -10%; 600 WV	961 4562 00
C318	Decoupling	CAPACITOR: 1 mf +20% -10%; 600 WV	961 4562 00
C319	Decoupling	CAPACITOR: 1 mf +20% -10%; 600 WV	961 4562 00

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
C320	T304 Simplex	CAPACITOR: 1 mf +20% -10%; 600 WV	961 4562 00
C321	Decoupling	CAPACITOR: 3000 mmf ±20%; 500 WV	913 0153 00
C322	T304 Simplex	CAPACITOR: 1 mf +20% -10%; 600 WV	916 4562 00
CR101	Bias Voltage Rectifier	BRIDGE RECTIFIER: Selenium IR 1558 B04	353 0134 00
CR201	Antenna Output Metering	RECTIFIER: Germ Diode	353 0028 00
EV201 EV202 EV203 EV204 EV205 EV301 EV302 EV304	For Corresponding Tube Numbers	SHIELD:	141 0147 00
EV303	For V303	SHIELD:	141 0143 00
EV206	Forces Air thru V206	CHIMNEY:	220 1150 00
EV207	Forces Air thru V207	CHIMNEY:	220 1150 00
F101	A-C Power Input	FUSE: 115 VAC. 20 A 230 VAC. 10 A	264 0006 00 264 0003 00
F102	Rectifier and Control Filaments	FUSE: 115 VAC. 5 A 230 VAC. 3 A	264 4090 00 264 4080 00
F103	High Voltage	FUSE: 115 VAC. 10 A 230 VAC. 5 A	264 0003 00 264 4090 00
F104	Low Voltage Transformer	FUSE: 115 VAC. 5 A 230 VAC. 3 A	264 4090 00 264 4080 00
F105	Bias	FUSE: 115 VAC. .250 A 230 VAC. .125 A	264 4020 00 264 4010 00
F201	R-F Unit Filament	FUSE: 115 VAC. 3 A 230 VAC. 2 A	264 4080 00 264 4070 00
F301	Modulator Filament	FUSE: Type 3AG; 250 V, 1 A.	264 4050 00
H201	Carries Air from Blower	CANVAS DUCT:	561 1336 002
I101	High Voltage on	INDICATOR LAMP:	262 3330 00

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
		Lens for I101	262 2110 00
I102	Low Voltage on	INDICATOR LAMP: Lens for I102	262 3330 00 262 2130 00
I201	R-F Unit Filament	LIGHT	262 3240 00
IX201		LAMP HOLDER	262 0334 00
J101	A-C Input	CONNECTOR: 2 pin power plug	368 0045 00
J102	A-C Output	CONNECTOR: 2 pin power receptacle	368 0053 00
J103	Rectifier & Control	CONNECTOR: 15 contact receptacle	366 0005 00
J104	Rectifier & Control	CONNECTOR: 15 contact receptacle	366 0005 00
J105	High Voltage Output	CONNECTOR: Single contact receptacle	372 1099 00
J106	Filter and Bias	PLUG: 12 prong Jones plug	365 0008 00
J107	H.V. Input	CONNECTOR: Single contact receptacle	372 1099 00
J108	H.V. Output	CONNECTOR: Single contact receptacle	372 1098 00
J201	R-f Driver	CONNECTOR: 15 Pin receptacle or plug	371 0020 00
J202	R-f Driver	CONNECTOR: 8 prong socket	365 2080 00
J203	H.V. to P.A.	CONNECTOR: 1 pin receptacle	372 1099 00
J204	P.A. Output	CONNECTOR: UG-290/U BNC	357 9054 00
J205	Driver to P.A.	CONNECTOR: Type BNC	357 9108 00
J206	R-F Unit	CONNECTOR: 15 contact receptacle	365 0008 00
J207	A-C to R-F Unit	CONNECTOR: Twist-Lock plug	368 0009 00
J208	H-V to R-F Unit	CONNECTOR: 1 pin receptacle	372 1099 00
J209	Receiver	CONNECTOR:	Built on Coax Relay
J210	Antenna	CONNECTOR:	Built on Coax Relay
J301	Modulated H.V. Output	CONNECTOR: Single contact H.V. receptacle - Red	372 1099 00

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
J302	Modulator H.V. Input	CONNECTOR: Single contact H.V. receptacle - Black	372 1098 00
J303	Modulator A-C Output	CONNECTOR: Twist-Lock receptacle	368 0053 00
J304	Modulator A-C Input	CONNECTOR: Twist-Lock Plug	368 0009 00
J305	Modulator	CONNECTOR: 12 prong Jones plug	365 0008 00
J306	Modulator	CONNECTOR: 12 prong Jones plug	365 0008 00
J307	High Impedance Mike	CONNECTOR: 4 contact receptacle	369 9000 00
J308	Carbon Mike	CONNECTOR: 3 contact phone jack	358 1050 00
K101	Screen Grid Protection	RELAY: 48 VDC; 4 A	972 1327 00
K102	Interlock	RELAY: 48 VDC; 2 A	972 1326 00
K103	Remote P-T-T	RELAY: 48 VDC; 1 A	972 1325 00
K104	Remote On-Off	RELAY: 48 VDC; 2 A	972 1326 00
K105	Remote Crystal Selec.	RELAY: 48 VDC; 1 A	972 1325 00
K201	Antenna Sharing	RELAY: 115 VAC two-position Coaxial	410 0104 00
K202	Crystal Selector	RELAY: 48 VDC; 1A, 1 B	972 1268 00
K203	Deleted		
K204	Thermal Time Delay	RELAY: 115 VAC, 30 sec.	402 0207 00
L101	H.V. Filter Input	CHOKE: Swinging; 1200 WV	678 0611 00
L102	H.V. Filter	CHOKE: Filter; 5 henries 1200 WV	678 0610 00
L103	L.V. Filter	CHOKE: Filter; 5 henries 300 WV	678 0609 00
L104	Bias Filter	BIAS CHOKE: Filter; 10 henries 100 WV	678 0596 00
L201	V201 Cathode Isolation	CHOKE: 500 uh	240 0073 00
L202	V201 Plate Tank	COIL:	561 0710 002
L203	V202 Grid Tank	COIL:	561 0710 002
L204	V201 Decoupling	CHOKE: 3.3 uh	240 0065 00

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
L205	V202 Plate Tank	COIL:	561 0715 002
L206	V203 Grid Tank	COIL:	561 0715 002
L207	V203 Plate Tank	COIL:	561 0716 002
L208	Driver Grid Tank	COIL:	561 0718 002
L209	V203 Decoupling	CHOKE: 1.5 uh	240 0063 00
L210	V204 Grid Isolation	CHOKE: 12 uh	240 0049 00
L211	V205 Grid Isolation	CHOKE: 12 uh	240 0049 00
L212	V204 Plate Isolation	CHOKE: 2.7 uh	240 0012 00
L213	V205 Plate Isolation	CHOKE: 2.7 uh	240 0012 00
L214	Driver Plate Tank	COIL:	561 0718 002
L215	Driver Output Coupling	LINK:	Fabricated
L216	P.A. Grid Injection	INDUCTOR:	Built in Grid Line
L217	P.A. Output Pickup	INDUCTOR:	Built in Plate Line
L218	Plate Cavity H.V. Filter	RF CHOKE: 2.7 uh	240 0012 00
L301	R-f Choke	COIL: 12 uh	240 0049 00
L302	Audio Reactor	REACTOR: 3.75 h	678 0077 00
M201	R-F Unit Tuning	METER: 0-1 ma	450 0076 00
M202	P.A. Cathode Current	METER: 0-300 ma	450 0090 00
M301	Modulator Multimeter	METER: 0-1 ma	458 0237 00
P102	A-C Output	CONNECTOR: Twist-Lock plug	368 0051 00
P103	Rectifier and Control	CONNECTOR: 15 prong socket	365 8150 00
P104	Rectifier and Control	CONNECTOR: 15 prong socket	365 8150 00
P105	H.V. Output	CONNECTOR: Single contact H.V. plug - Red	372 1103 00

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
P106	Filter and Bias	CONNECTOR: 15 prong socket	366 8150 00
P107	H.V. Input	CONNECTOR: Single contact H.V.	372 1103 00
P108	H.V. Output	CONNECTOR: Single contact	372 1102 00
P201	Driver	PLUG: 15 contact receptacle or plug	371 0019 00
P202	Driver	PLUG: 8 contact receptacle	366 4080 00
P203	H.V. to P.A.	PLUG: Single contact plug	372 1103 00
P204	P.A. Output	PLUG: UG-88/U connector	357 9018 00
P205	Driver to P.A.	PLUG: UG-88/U connector	357 9018 00
P206	R-F Unit	PLUG: 15 prong socket	366 8150 00
P207	A-C to R-F Unit	PLUG: Twist-Lock receptacle	368 0010 00
P208	H.V. to R-F Unit	PLUG: Single contact plug	372 1103 00
P301	Modulated H.V. Output	CONNECTOR: Single contact H.V. plug - Red	372 1103 00
P302	Modulator H.V. Input	CONNECTOR: Single contact H.V. plug - Black	372 1102 00
P303	Modulator A-C Output	CONNECTOR: Twist-Lock plug	368 0051 00
P304	Modulator A-C Input	CONNECTOR: Twist-Lock female connector	368 0010 00
P306		CONNECTOR: 15 prong cable connector	368 8150 00
P		SHELL: For P201	371 0035 00
R101	H.V. Supply Output	RESISTOR: 12K; ±10%; 30 W	747 2102 00
R102	H.V. Supply Output	RESISTOR: 12K; ±10% 30 W	747 2102 00
R103	H.V. Supply Output	RESISTOR: 1500 ohm; ±10% 10 W	710 0027 00
R104	Bias Supply Output	RESISTOR: 1500 ohm; ±10%; 10 W	710 0027 00
R105	L.V. Supply Bleeder	RESISTOR: 5K; ±10%; 10 W	710 1542 00
R106	L.V. Supply Bleeder	RESISTOR: 5K; ±10% 10 W	710 1542 00
R107	I101 Voltage Dropping	RESISTOR: Wire wound 400 ohm; ±10%; 10W	710 1400 20

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
R108	I102 Voltage Dropping	RESISTOR: Wire wound 400 ohm; ±10%; 10 W	710 1400 20
R109	L.V. Supply Bleeder	RESISTOR: 1000 ohm; ±10%; 10 W	710 1142 00
R201	V201 Grid	RESISTOR: 100K ohm; ±10%; 1/2 W	745 1170 00
R202	V201 Meter Shunt	RESISTOR: 10K ohm; ±10%; 1/2 W	745 1128 00
R203	V201 Cathode Bias	RESISTOR: 330 ohm; ±10%; 1/2 W	745 1065 00
R204	V201 Screen Dropping	RESISTOR: 3300 ohm; ±10%; 1/2 W	745 1107 00
R205	V202 Grid	RESISTOR: 47K ohm; ±10%; 1 W	745 3156 00
R206	V202 Meter Shunt	RESISTOR: 220 ohm; ±10%; 1/2 W	745 1062 00
R207	V202 Screen Dropping	RESISTOR: 1200 ohm; ±10%; 2 W	745 5356 00
R208	V202 Screen Dropping	RESISTOR: 68K ohm; ±10%; 1/2 W	745 1429 00
R209	V203 Grid	RESISTOR: 33K ohm; ±10%; 1 W	745 3415 00
R210	V203 Meter Shunt	RESISTOR: 560 ohm; ±10%; 1/2 W	745 1062 00
R211	RF Dropping	RESISTOR: 500 ohm; ±10%; 10 W	710 1500 00
R212	V203 Cathode	RESISTOR: 1200 ohm; ±10%; 2 W	745 5356 00
R213	V203 Screen Dropping	RESISTOR: 47K ohm; ±10%; 1/2 W	745 1422 00
R214	V204 Grid	RESISTOR: 22K ohm; ±10%; 1/2 W	745 1142 00
R215	V205 Grid	RESISTOR: 22K ohm; ±10%; 1/2 W	745 1142 00
R216	Meter Shunt	RESISTOR: 330 ohm; ±10%; 1/2 W	745 1044 00
R217	V204 Cathode Bias	RESISTOR: 300 ohm; ±10%; 10 W	710 1300 10
R221	Balance - P.A. Grids	RESISTOR: Variable resistor 5K; 2 W	750 0501 00
R222	P.A. Screen Metering	RESISTOR: 10 ohm; ±5%; 1/2 W	745 1002 00
R223	P.A. Grid Metering	RESISTOR: 56 ohm; ±10%; 1/2 W	745 1034 00
R224	P.A. Grid Metering	RESISTOR: 56 ohm; ±10%; 1/2 W	745 1034 00
R225	P.A. Grid Limiting	RESISTOR: 1000 ohm; ±10%; 2 W	745 9097 00
R226	P.A. Grid Limiting	RESISTOR: 1000 ohm; ±10%; 2 W	745 9097 00
R227	M201 Multiplier	RESISTOR: 1000 ohm; ±10%; 1/2 W	745 1086 00

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
R228	P.A. Cathode Metering	RESISTOR: 18 ohm; ±10%; 2 W	745 9024 00
R229	P.A. Cathode Metering	RESISTOR: 18 ohm; ±10%; 2 W	745 9024 00
R230	Not Used		
R231	P.A. Screen	RESISTOR: 500 ohm; ±10%; 10 W	710 1500 20
R232	P.A. Output Metering	RESISTOR: 2700 ohm; ±10%; 1/2 W	745 1104 00
R233	P.A. Output Metering	RESISTOR: 22K ohm; ±10%; 1/2 W	745 1142 00
R234	P.A. Output Metering	RESISTOR: 3900 ohm; ±10%; 1/2 W	745 1111 00
R235	V202 Cathode	RESISTOR: 1200 ohm; ±10%; 2 W	745 5356 00
R236	V203 Cathode	RESISTOR: 1200 ohm; ±10%; 2 W	745 5356 00
R301	Remote Level	RESISTOR: Variable; 100K ±20%; 2 W	380 0322 00
R302	V301 Grid (2)	RESISTOR: 10K; ±10%; 1/2 W	745 1128 00
R303	V301 Cathode (8)	RESISTOR: 1000 ohm; ±10%; 1/2 W	745 1086 00
R304	V301 Plate (6)	RESISTOR: 47K; ±10%; 1/2 W	745 1156 00
R305	V301 Grid (2)	RESISTOR: 100 K; ±10%; 1/2 W	745 1170 00
R306	V301 Cathode (3)	RESISTOR: 1000 ohm; ±10%; 1/2 W	745 1086 00
R307	V301 Plate (1)	RESISTOR: 220K; ±10%; 1/2 W	745 1184 00
R308	V302 Grid (7)	RESISTOR: Variable 100K; ±20%; 2 W	380 0322 00
R309	V302 Cathode (8)	RESISTOR: 2200 ohm; ±5%; 1/2 W	745 1100 00
R310	V302 Plate (6)	RESISTOR: 220K; ±10%; 1/2 W	745 1184 00
R311	Clipper Isolation	RESISTOR: 100K; ±10%; 1/2 W	745 1170 00
R312	V302 Grid (2)	RESISTOR: 100K; ±10%; 1/2 W	745 1170 00
R313	Voltage Divider	RESISTOR: 150 ohm; ±10%; 1/2 W	745 1051 00
R314	Voltage Divider	RESISTOR: 150 ohm; ±10%; 1/2 W	745 1051 00
R315	V302 Cathode (3)	RESISTOR: 2200 ohm; ±5%; 1/2 W	745 1100 00
R316	V302 Plate (1)	RESISTOR: 47K; ±10%; 1/2 W	745 1156 00
R317	MOD Level	RESISTOR: Variable; 100K ±20%; 2 W	380 0322 00

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
R318	V304 Grid (2)	RESISTOR: 1 Meg; ±10%; 1/2 W	745 1212 00
R319	V304 Cathode (3)	RESISTOR: 3300 ohm; ±10%; 1/2 W	745 1107 00
R320	V304 Plate (1)	RESISTOR: 22K ohm; ±10%; 1/2 W	745 1142 00
R321	V340 Cathode (8)	RESISTOR: 100K ohm; ±10%; 1/2 W	745 1170 00
R322	V304 Cathode (8)	RESISTOR: 820 ohm; ±10%; 1/2 W	745 1083 00
R323	V306 Grid (5)	RESISTOR: 82K ohm; ±10%; 1/2 W	745 1167 00
R324	V305 Grid (5)	RESISTOR: 82K ohm; ±10%; 1/2 W	745 1167 00
R325	B+ Decoupling	RESISTOR: 1800 ohm; ±10%; 2 W	745 9108 00
R326	B+ Decoupling	RESISTOR: 47K ohm; ±10%; 1/2 W	745 1156 00
R327	B+ Decoupling	RESISTOR: 22K ohm; ±10%; 1/2 W	745 1142 00
R328	B+ Decoupling	RESISTOR: 47K ohm; ±10%; 1/2 W	745 1156 00
R329	B+ Decoupling	RESISTOR: 47K ohm; ±10%; 1/2 W	745 1156 00
R330	Voltage Divider	RESISTOR: 16K ohm; ±5%; 10 W	710 0256 00
R331	Voltage Divider	RESISTOR: 16K ohm: ±5%; 10 W	710 0256 00
R332	Metering Precision	RESISTOR: 751K ohm; ±1%; 1 W	705 3011 00
R333	Metering Precision	RESISTOR: 751K ohm: ±1%; 1 W	705 3011 00
R334	Metering Precision	RESISTOR: 10K ohm; ±10%; 1 W	745 9139 00
R335	Metering Precision	RESISTOR: 500K ohm; ±1%; 1 W	705 3012 00
R336	Metering Precision	RESISTOR: 100K ohm; ±1%; 1 W	705 3010 00
R337	Metering Precision	RESISTOR: 2 ohm; ±1%; 2 W	747 9333 00
R338	Metering Precision	RESISTOR: 954 ohm; ±1%; 2 W	747 9332 00
R339	V302 Loading	RESISTOR: 100K ohm; ±10%; 1/2 W	745 1170 00
S101	Power On-Off	SWITCH: SPST	266 3060 00
S102	Remote-Local	SWITCH: 4PDT	266 0072 00
S103	On-Push to Talk	SWITCH: SPST	266 3060 00

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
S104	Operate - Tune	SWITCH: SPST	266 3060 00
S201	Channel 1 - Channel 2	SWITCH: SPST	266 3060 00
S202	Cathode 1 - Cathode 2	SWITCH: SPST	266 3060 00
S203	Meter, Circuit Selector	SWITCH: Rotary	259 0651 00
S301	Limiter	SWITCH: DPDT	266 3060 00
S302	Remote - Mike	SWITCH: DPDT	266 3060 00
S303	Metering	SWITCH: Rotary, 2 wafer 4 position	259 0270 00
T101	H.V. Plate	TRANSFORMER: Plate; 1000 V at 775 ma secondary	672 0608 00
T102	L.V. Plate	TRANSFORMER: Plate; 270 V at 335 ma secondary	672 0607 00
T103	H.V. & L.V. Filament	TRANSFORMER: Filament 2.5 V	672 0602 00
T104	Bias Supply	TRANSFORMER: 50 V at 60 ma	672 0594 00
T201	R-F Unit Filament	TRANSFORMER: 6.3 V, 1.75 a; 6.0 V, 5.3 a	672 0600 00
T301	Modulation	TRANSFORMER: (1-3) 5700 ohm; (4-5) 2500 ohm; (6-7) 150 V.	677 0603 00
T302	Modulator Driver	TRANSFORMER: (1-3) 3000 ohm; (4-6) 600 ohm.	677 0605 00
T303	Modulator Interstage	TRANSFORMER: (1-3) 10K; (3-5) 160K.	677 0604 00
T304	Modulator Filament	TRANSFORMER: 6.3 V, 6 a; 6.3 V, 8 a	672 0601 00
T305	Audio Input	TRANSFORMER: (1-2) 82 ohm; (3-6) 600 ohm; (7-8) 1 M.	677 0548 00
V101	H.V. Rectifier	TUBE: Type 866A	257 0076 00
V102	H.V. Rectifier	TUBE: Type 866A	257 0076 00
V103	L.V. Rectifier	TUBE: Type 866A	257 0076 00
V104	L.V. Rectifier	TUBE: Type 866A	257 0076 00

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
V201	Oscillator	TUBE: 5686	253 0009 00
V202	Tripler	TUBE: 5686	253 0009 00
V203	Doubler	TUBE: 5686	253 0009 00
V204	Driver	TUBE: 5686	253 0009 00
V205	Driver	TUBE: 5686	253 0009 00
V206	Power Amplifier	TUBE: Type 4x250B	256 0112 00
V207	Power Amplifier	TUBE: Type 4x250B	256 0112 00
V301	Audio Amplifier	VACUUM TUBE: Type 5751	253 0012 00
V302	Amplifier-Limiter	VACUUM TUBE: Type 5814	253 0013 00
V303	Detector	VACUUM TUBE: Type 5726	253 0003 00
V304	Amplifier	VACUUM TUBE: Type 5814	253 0013 00
V305	Driver of Modulator	VACUUM TUBE: Type 6B4G	255 0124 00
V306	Driver of Modulator	VACUUM TUBE: Type 6B4G	255 0124 00
V307	Modulator	VACUUM TUBE: Type 811A	256 0053 00
V308	Modulator	VACUUM TUBE: Type 811A	256 0053 00
XF101	For F101	HOLDER:	265 1019 00
XF102	For F102	HOLDER:	265 1019 00
XF103	For F103	HOLDER:	265 1019 00
XF104	For F104	HOLDER:	265 1019 00
XF105	For F105	HOLDER:	265 1019 00
XF201	For F201	HOLDER:	265 1019 00
XF301	For F301	HOLDER:	265 1019 00
XI101	For I101	HOLDER:	262 0034 00
XI102	For I102	HOLDER:	262 0034 00
XI201	For I201 For I201	HOLDER: JEWEL	262 0334 00 262 2130 00

ITEM	CIRCUIT FUNCTION	DESCRIPTION	PART NUMBER
XV101	For V101	SOCKET:	220 1185 00
XV102	For V102	SOCKET:	220 1185 00
XV103	For V103	SOCKET:	220 1185 00
XV104	For V104	SOCKET:	220 1185 00
XV201 XV202 XV203 XV204 XV205	For Corresponding Tube numbers	SOCKET: 9 pin miniature	220 1104 00
XV206		SOCKET:	561 1386 002
XV207		SOCKET:	561 1386 002
XV301	For V301	SOCKET:	220 1103 00
XV302	For V302	SOCKET:	220 1103 00
XV303	For V303	SOCKET:	220 1111 00
XV304	For V304	SOCKET:	220 1103 00
XV305	For V305	SOCKET:	220 1121 00
XV306	For V306	SOCKET:	220 1121 00
XV307	For V307	SOCKET:	220 1018 00
XV308	For V308	SOCKET:	220 1018 00
Y201	Oscillator	CRYSTAL: CR-27/U	Depends on Frequency
Y202	Oscillator	CRYSTAL: CR-27/U	Depends on Frequency
Z201	Crystal	OVEN:	292 0063 00

6-2. PARTS LIST FOR 35D-2 FILTER.

ITEM	DESCRIPTION	PART NUMBER
C101	CAPACITOR: Fixed, 10mmf, ±10%; 5000 WV	913 0765 00
C102	CAPACITOR: Fixed, 10mmf, ±10%; 5000 WV	913 0765 00
C103	CAPACITOR: Tubular ceramic, 9.0 mmf, ±1/4%; 500 WV	916 0133 00
C104	CAPACITOR: Tubular ceramic, 8.0 mmf, ±1/4%; 500 WV	916 0129 00
C105	CAPACITOR: Fixed ceramic, 3mmf, ±1/2%; 5000 WV	913 2056 00
C106	CAPACITOR: Tubular ceramic, 8.0 mmf, ±1/4%; 500 WV	916 4362 00
C107	CAPACITOR: Fixed, 10mmf, ±10%; 5000 WV	913 0765 00
C108	CAPACITOR: Fixed, 10mmf, ±10%; 5000 WV	913 0765 00
C109	CAPACITOR: Ceramic, 910 mmf, ±1/4%; 500 WV	916 0133 00
C110	CAPACITOR: Ceramic, 10.0 mmf, ±1/4%; 500 WV	916 0137 00
C111	CAPACITOR: Ceramic, 8.0 mmf, ±1/4%; 500 WV	916 0129 00
C112	CAPACITOR: Ceramic, 8.0 mmf, ±1/4%; 500 WV	916 0129 00
C113	CAPACITOR: Ceramic, 8.0 mmf, ±1/4%; 500 WV	916 0129 00
C114	CAPACITOR: Ceramic, 8.0 mmf, ±1/4%; 500 WV	916 0129 00
C115	CAPACITOR: Ceramic, 9.0 mmf, ±1/4%; 500 WV	916 0133 00
J101	CONNECTOR: UG-58/U	357 9003 00
J102	CONNECTOR: UG-58/U	357 9003 00
L101	COIL ASSEMBLY: 2 turns	561 2637 002
L102	COIL ASSEMBLY: 2 1/2 turns	561 2635 002
L103	COIL ASSEMBLY: 2 1/2 turns	561 2636 002
L104	COIL ASSEMBLY: 2 1/2 turns	561 2637 002

SECTION VII

ILLUSTRATIONS

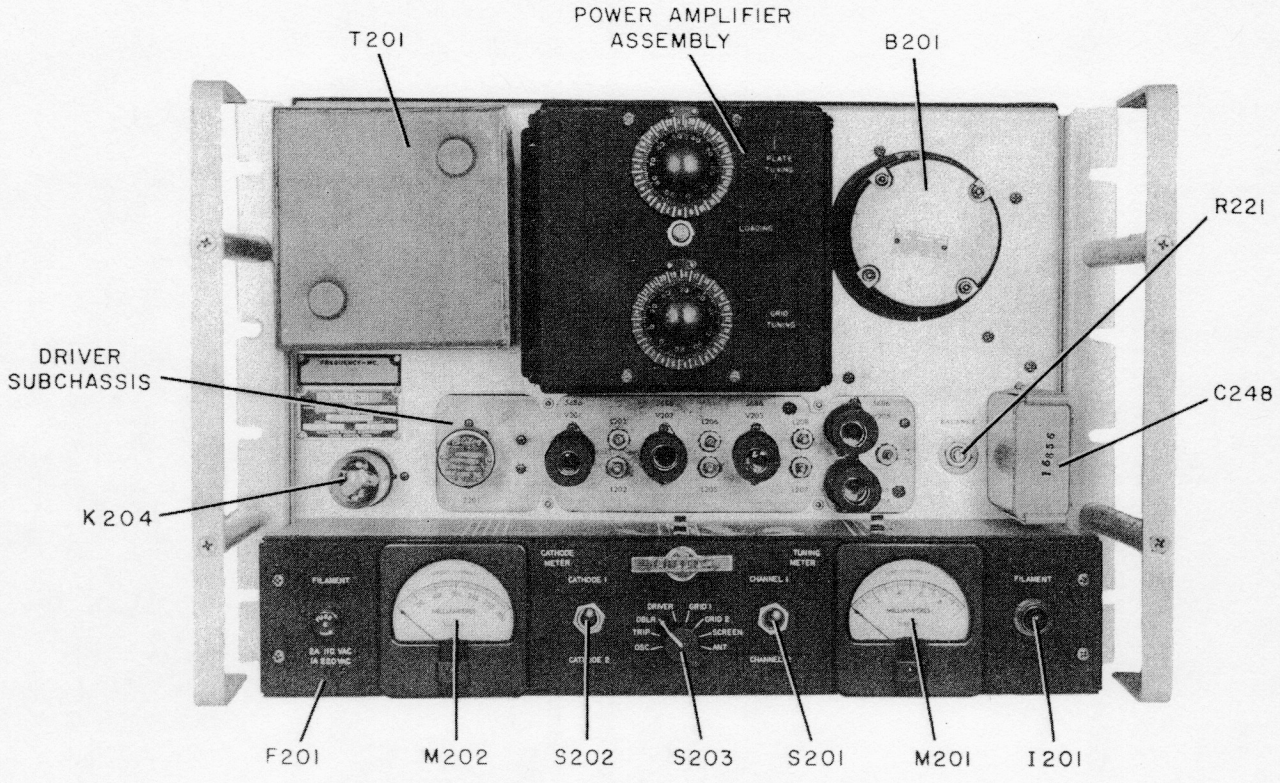


Figure 7-1A. Type 242F-2 R-F Unit, Front View

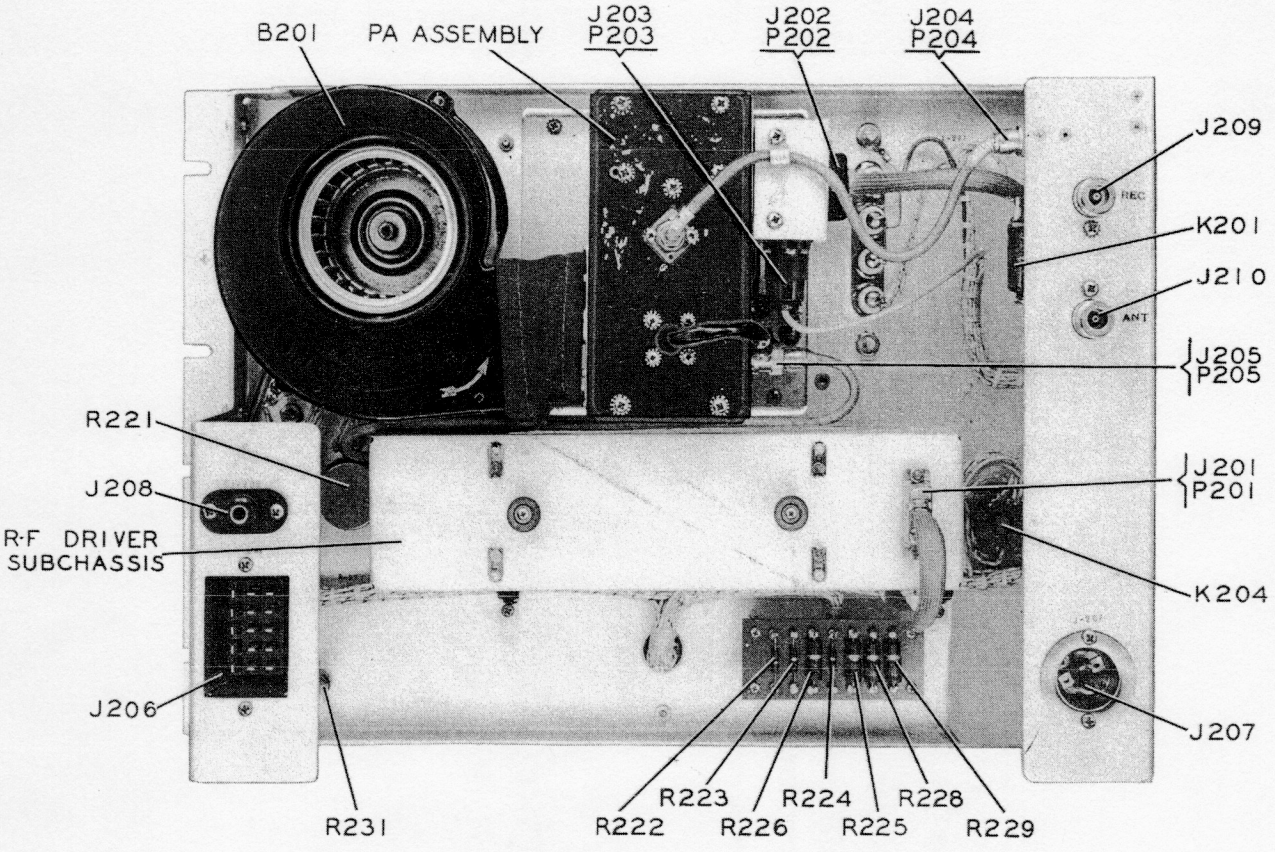


Figure 7-2A. Type 242F-2 R-F Unit, Rear View, Dust Cover Removed

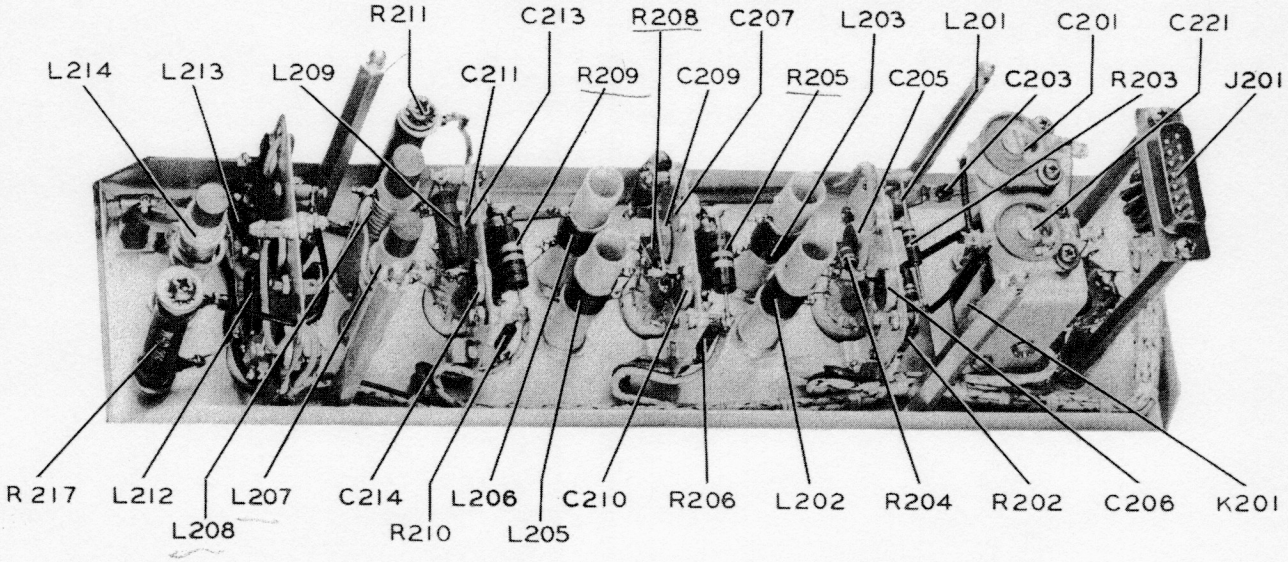


Figure 7-3A. Type 242F-2 R-F Driver Subchassis, Rear View, Shield Removed

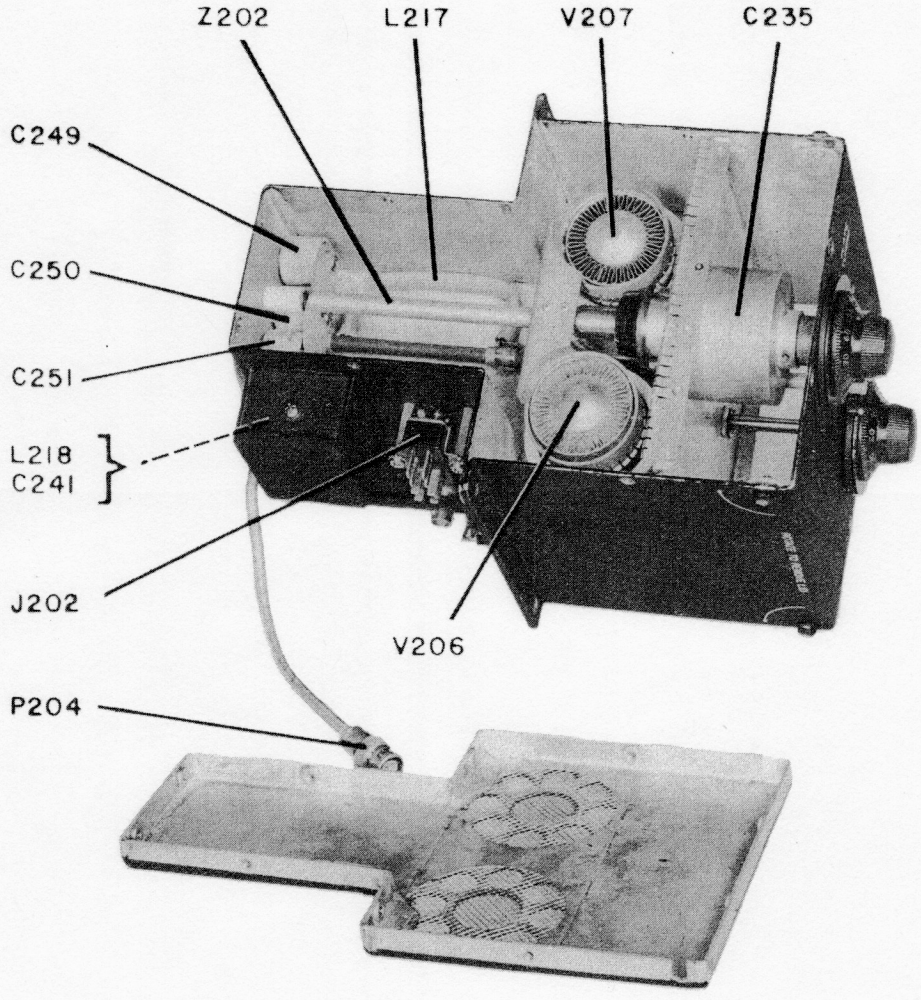


Figure 7-4A. Power Amplifier Assembly, Plate Cover Removed

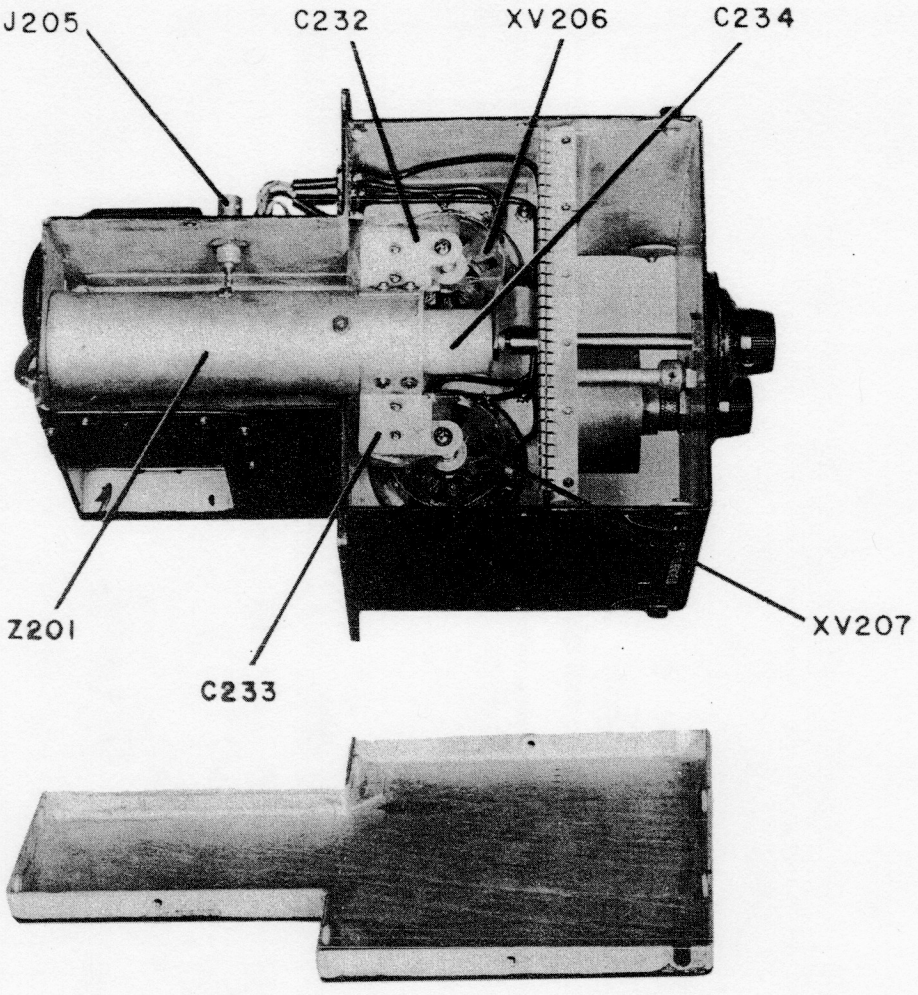


Figure 7-5A. Power Amplifier Assembly, Grid Cover Removed

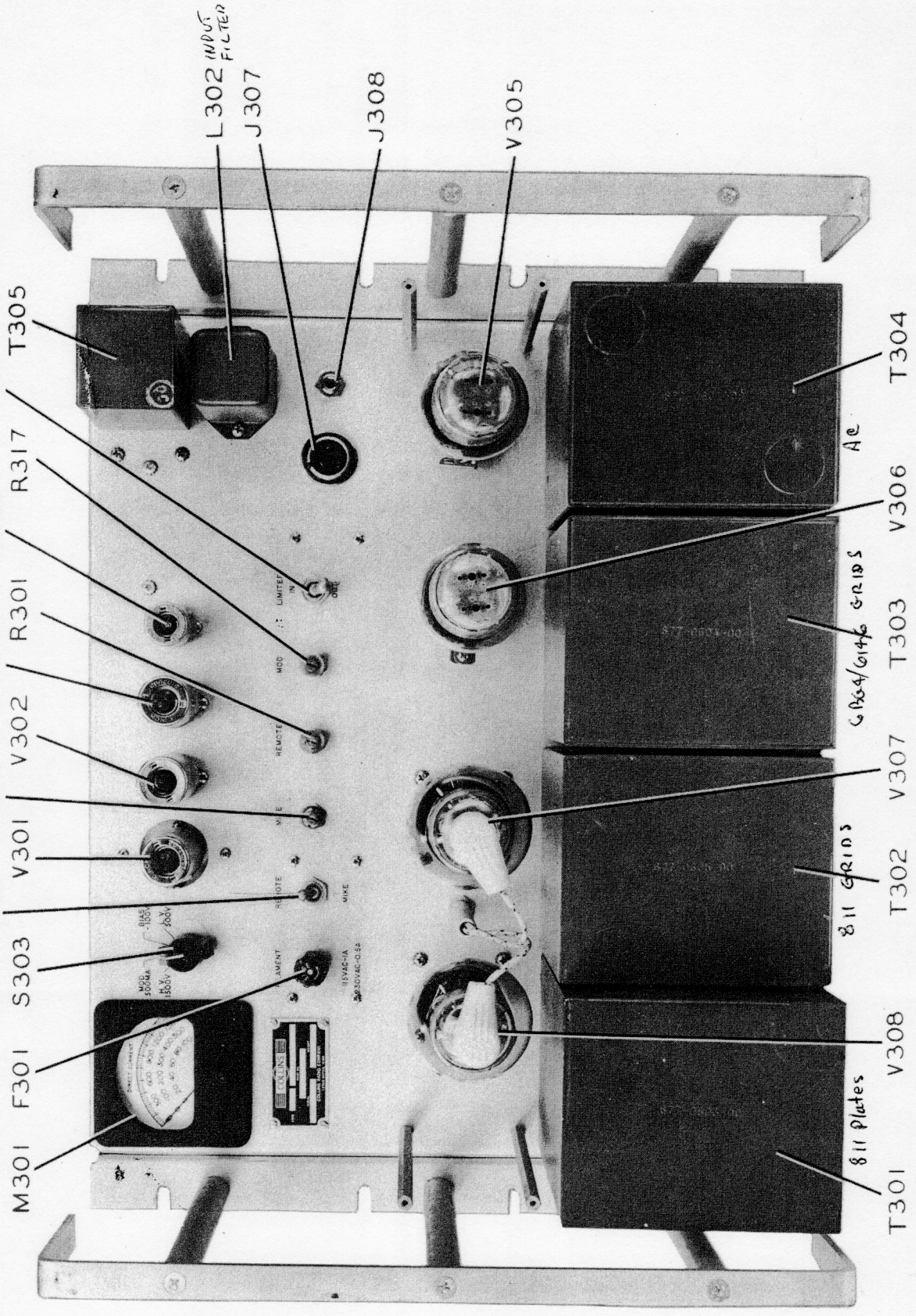


Figure 7-6. Type 242F-2 Modulator Unit, Front View

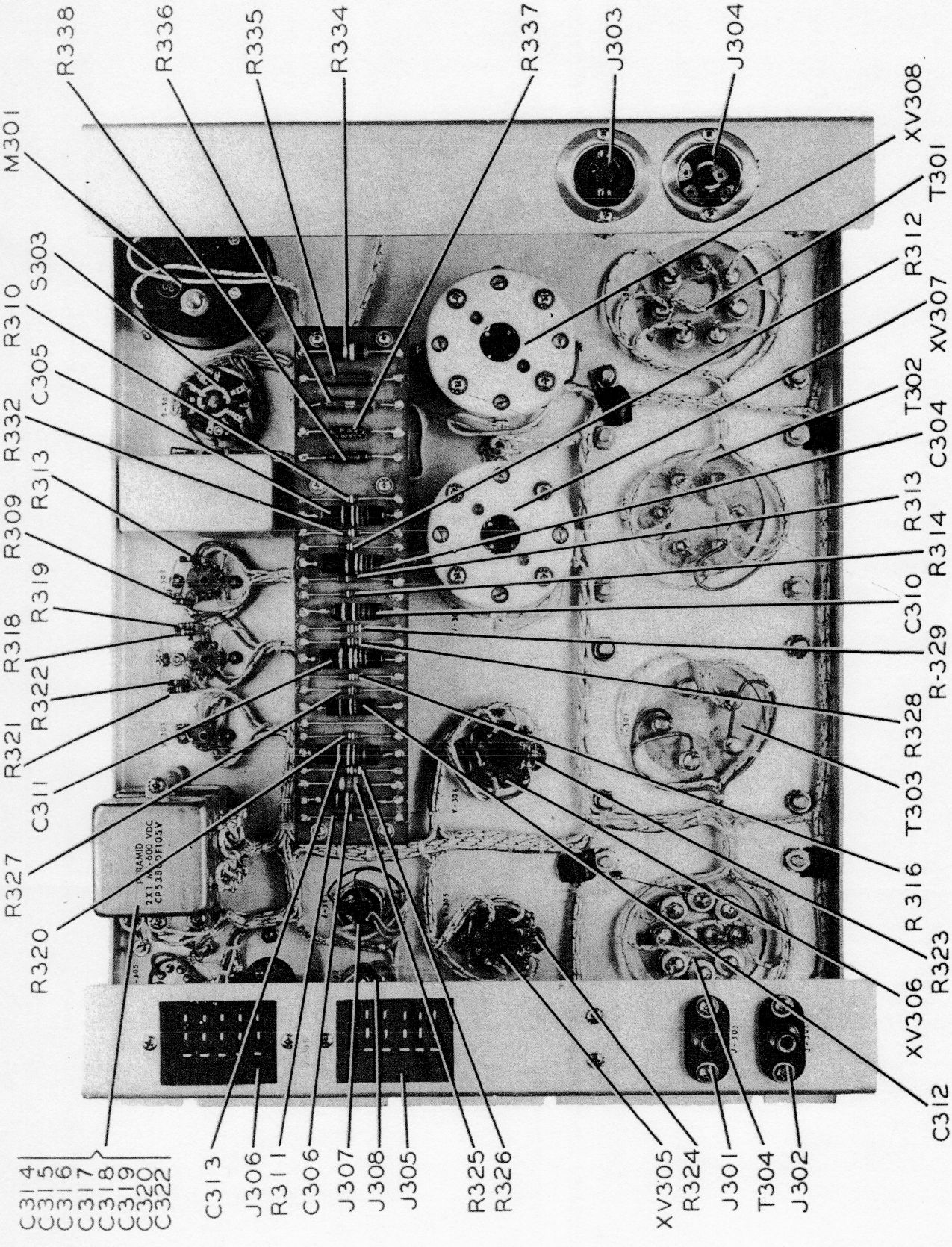


Figure 7-7. Type 242F-2 Modulator Unit, Rear View, Dust Cover Removed

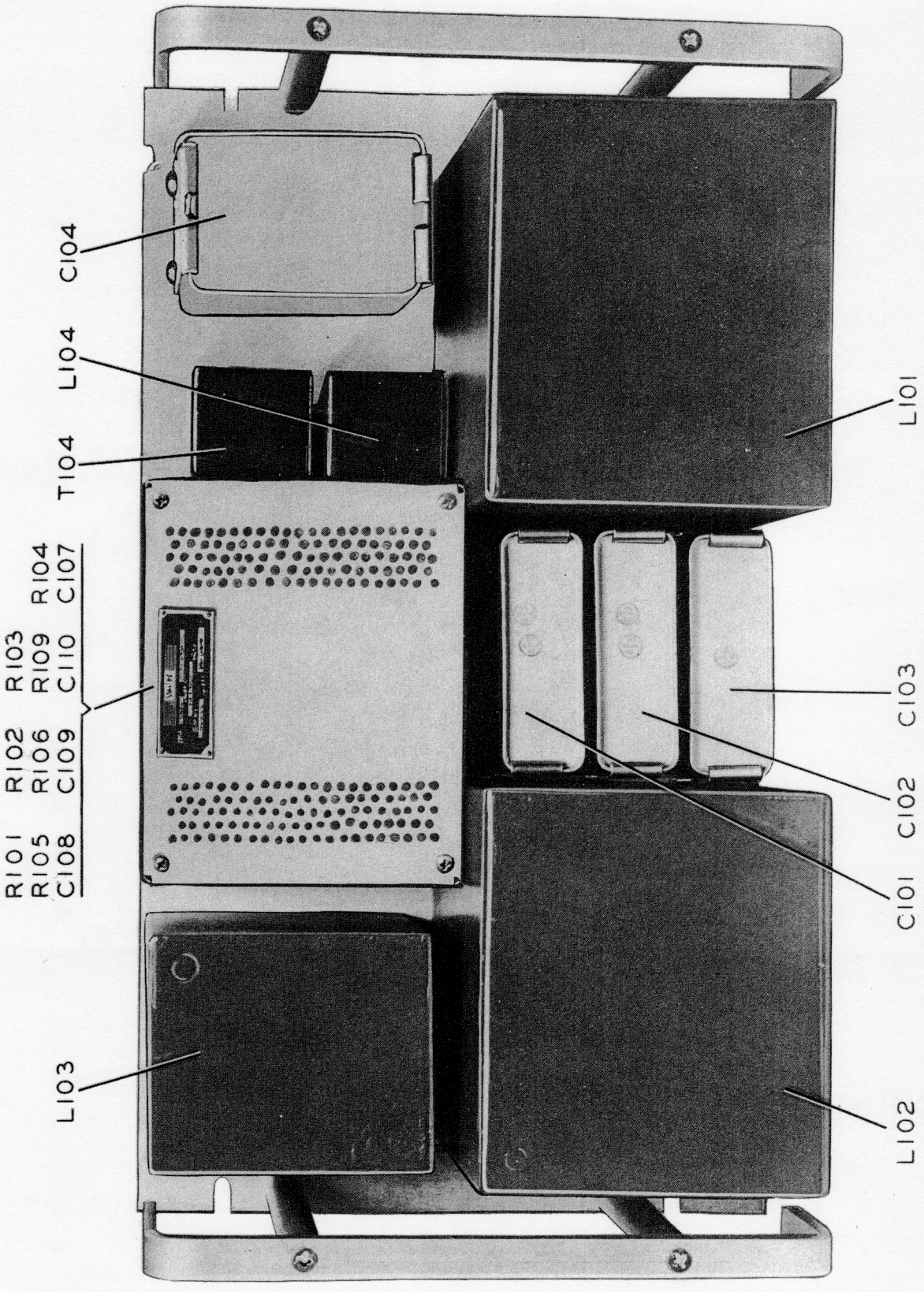


Figure 7-8. Type 242F-2 Filter and Bias Supply Unit, Front View

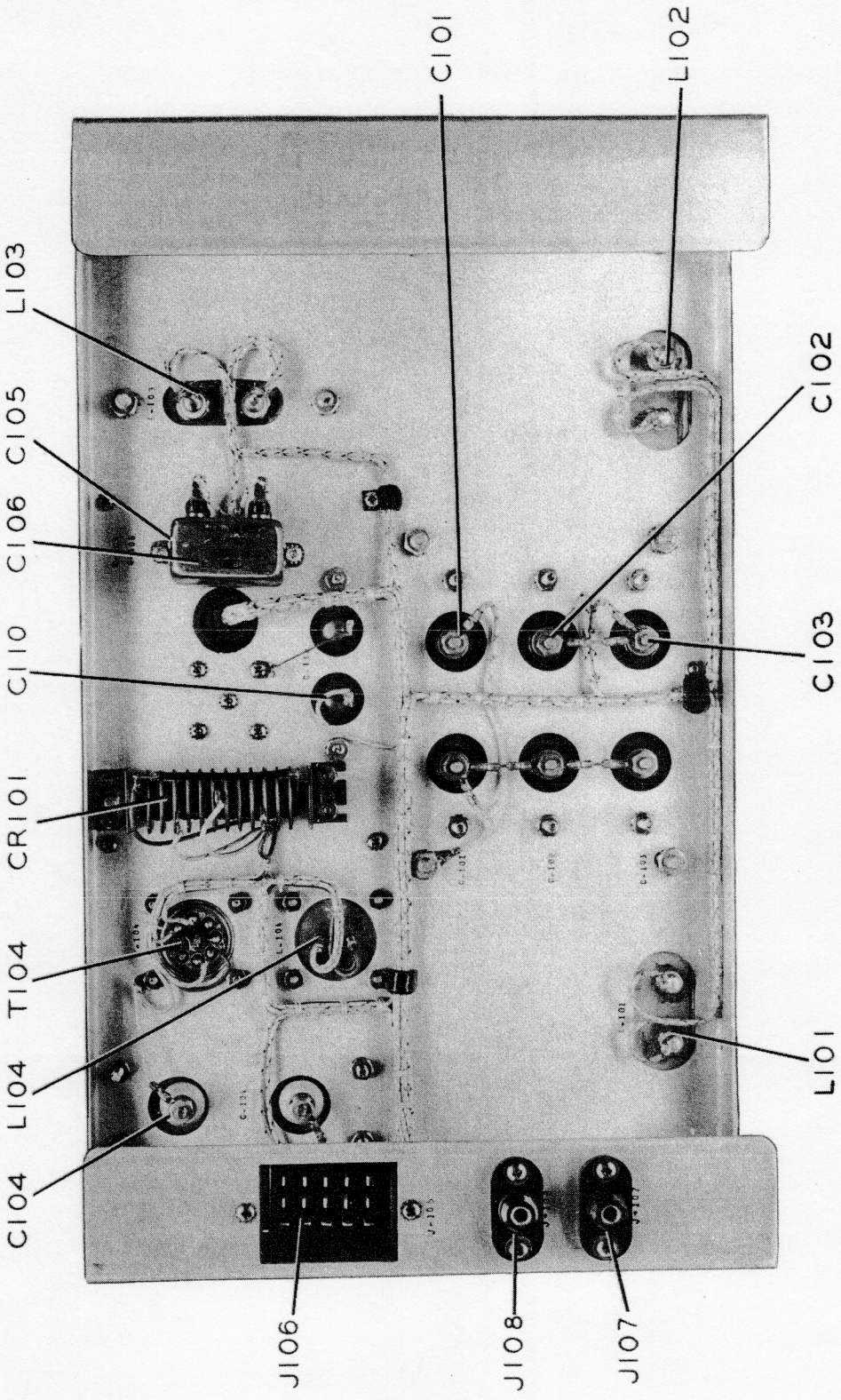


Figure 7-9. Type 242F-2 Filter and Bias Supply Unit, Rear View, Dust Cover Removed

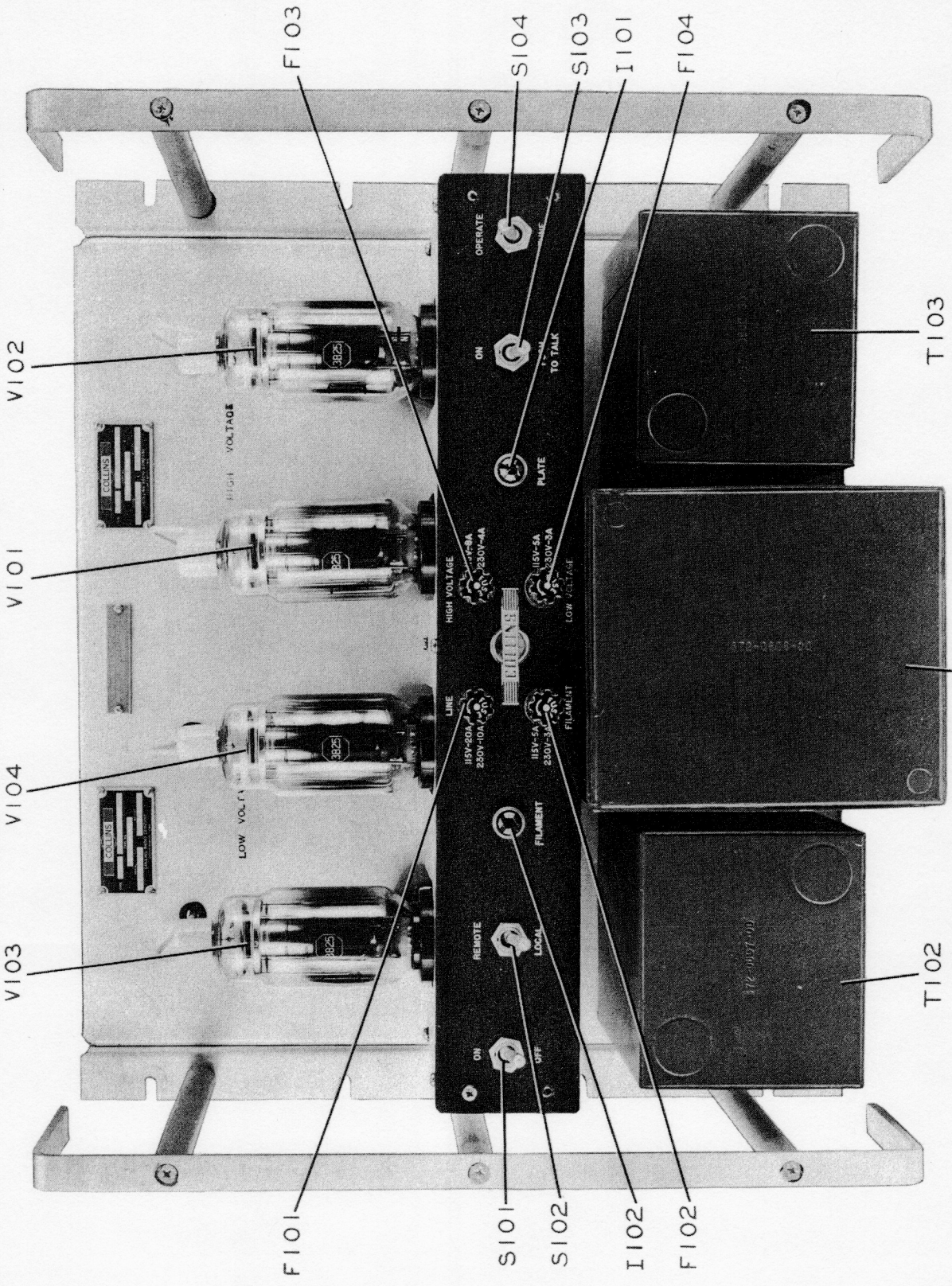


Figure 7-10. Type 242F-2 Rectifier and Control Unit, Front View

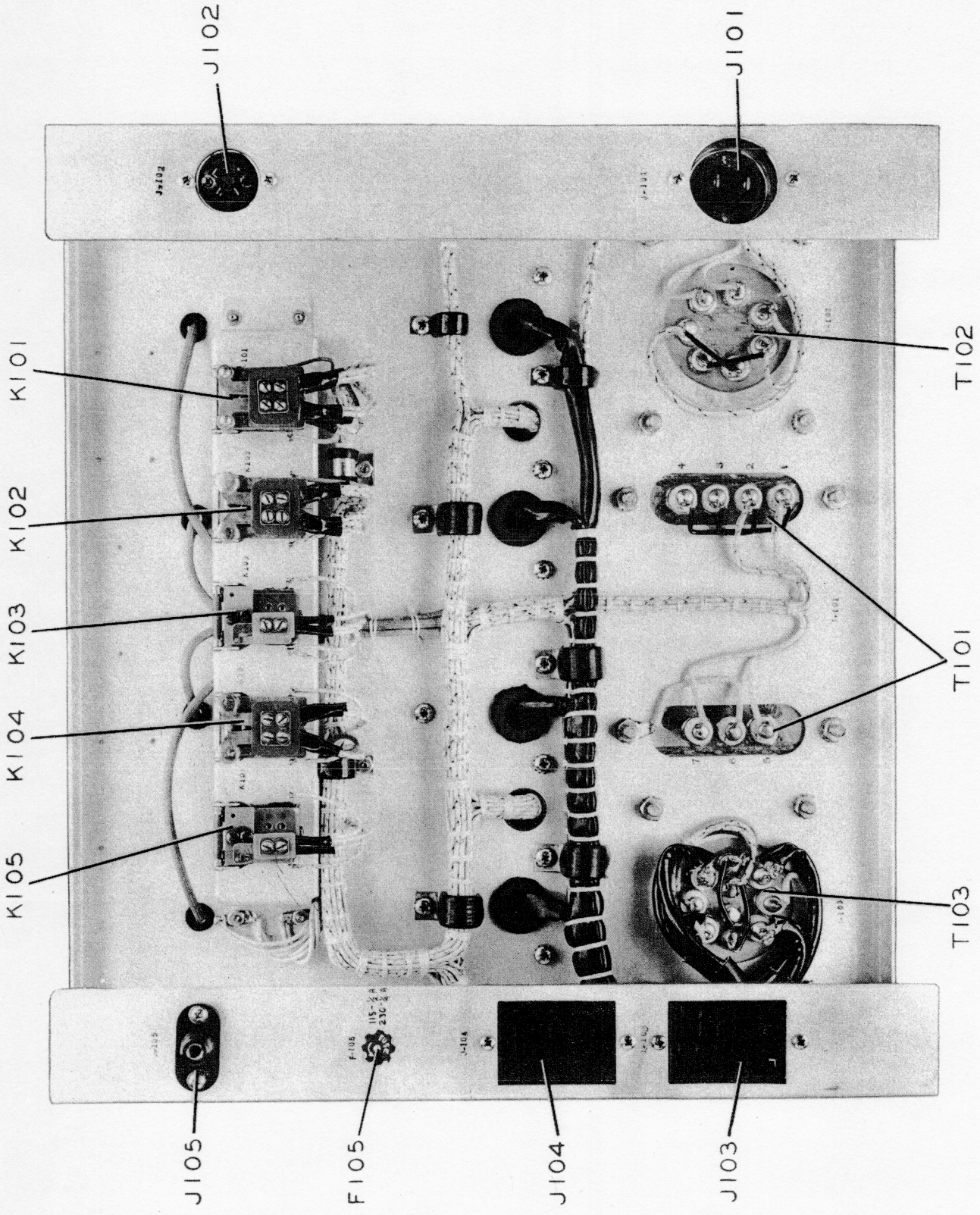


Figure 7-11A. Type 242F-2 Rectifier and Control Unit, Rear View, Dust Cover Removed

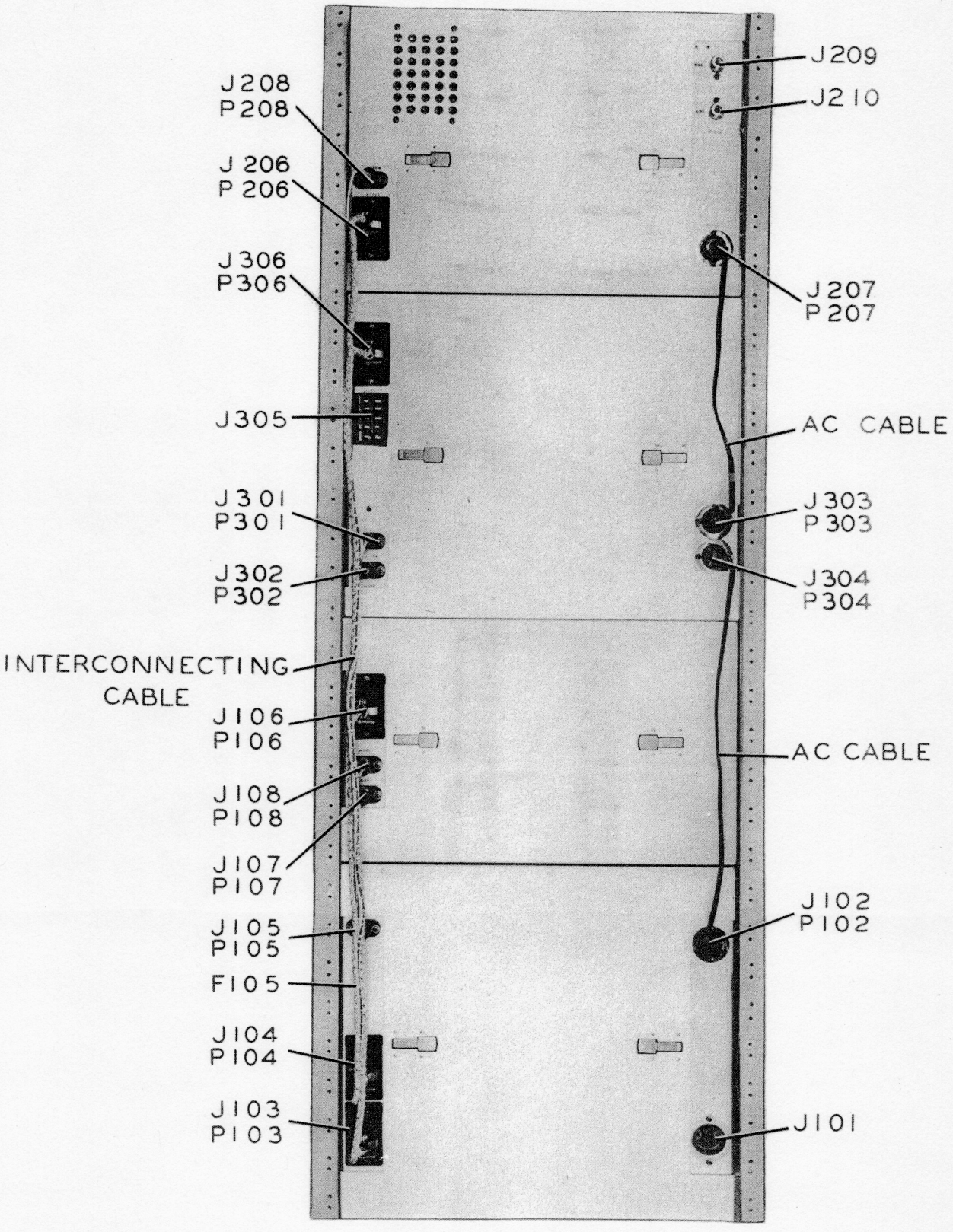


Figure 7-12. Type 242F-2 Transmitter, Rear View, Dust Cover On

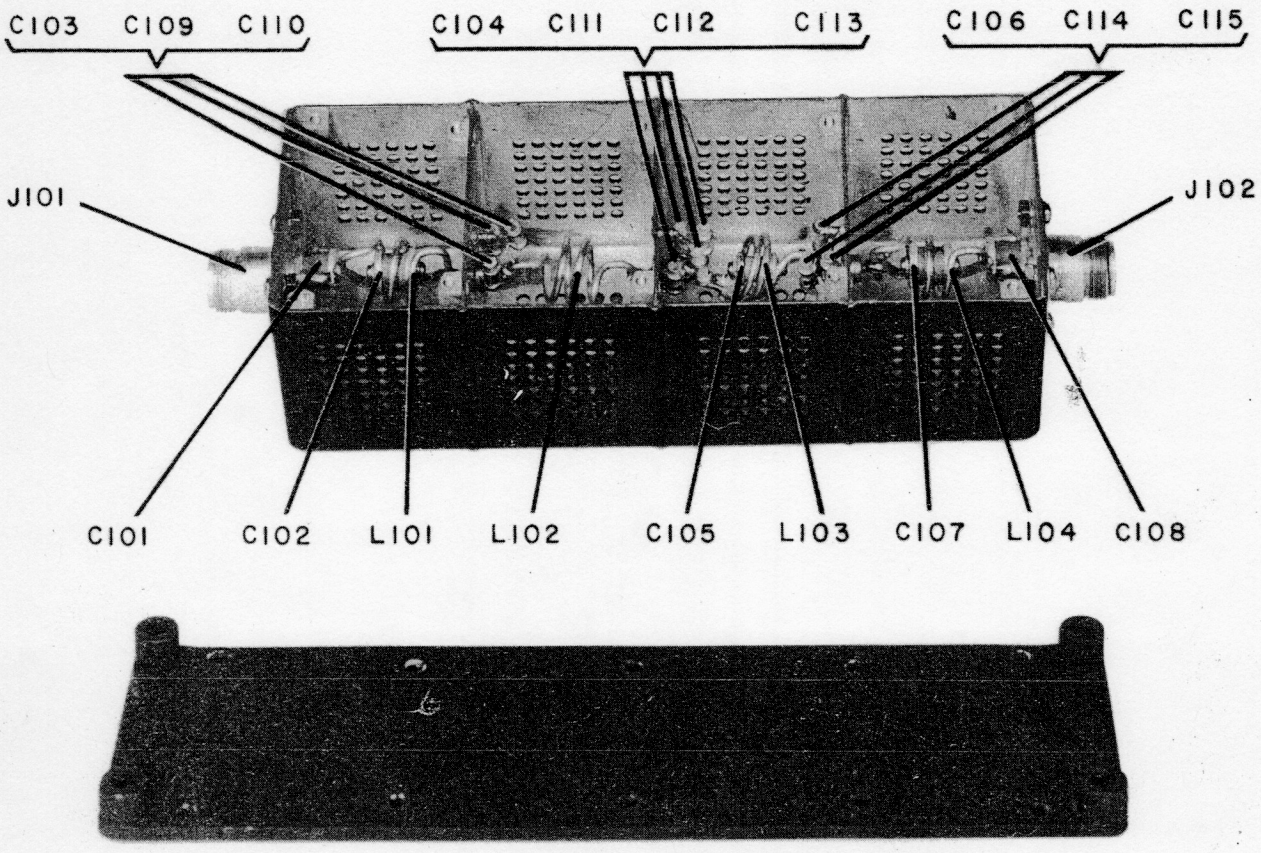


Figure 7-13A. Type 35D-2 Low Pass Filter, Cover Removed