

incident to the breaking of a ground connection somewhere. It may invariably be corrected by additional grounding, shielding or both after the offending circuit is isolated.

When the defective grounding or shielding occurs in filament circuits the condition is indicated by noise in the carrier. Additional grounding and shielding is the proper remedy in this case also.

#### 4. Power Supply Circuits

Troubles in the speech input supply circuits can usually be located very quickly with the aid of a DC voltmeter.

#### *C. RADIO RECEIVING OUTFIT*

A gradual decrease in the volume of reception indicates that the filament or plate batteries are becoming exhausted. Examine the vacuum tubes. If the filaments of the vacuum tubes cannot be made to glow at a yellow-red color by adjustment of the rheostat, the decreased volume is caused by an exhausted filament battery and this battery should be recharged. If the filaments can be made to glow at the above brilliancy and the volume of reception is still unsatisfactory, the plate batteries are probably exhausted and should be replaced.

A sudden cessation of reception probably indicates that a vacuum tube has been burned out. Examine the vacuum tubes. If they are extinguished, one of them is probably burned out. The filaments of the tubes are connected in series and if one is burned out all the tubes will fail to light. To determine which tube is burned out, test each tube in succession by replacing it with a new one and noting whether all the tubes then light.

*NOTE:* To insure continuous service from the radio receiver it is recommended that at least three spare No. 215-A Vacuum Tubes be kept on hand to be used as replacements.

If difficulties other than those mentioned above are experienced, examine the receiver cord, the wiring to the batteries and the connections between the radio receiver, the tuning unit and the filter for loose or broken connections.

The location of the various parts of the No. 4-D Radio Receiver is shown on page 122. The connection diagram of the various units comprising the No. 6204-D Radio Receiving Outfit is shown on pages 123 and 124.

The location of the various parts of the No. 4-C Radio Receiver is shown on page 125. A schematic of the connections between the various units comprising the No. 6004-C Radio Receiving Outfit is shown on pages 126, 127 and 128.

## CHAPTER VIII

### ENGINEERING SERVICE

In case it is impossible to locate the cause of the trouble with the aid of the foregoing suggestions or should the purchaser desire to avail himself of engineering services, the matter should be referred to the nearest Branch House of the Graybar Electric Company, and authorization for such service placed with them.

In Canada this service may be obtained through the Northern Electric Company, Limited, and through the International Standard Electric Corporation in other foreign countries.

## CHAPTER IX

### ORDERING INFORMATION

All orders for replacement apparatus should be placed with the nearest branch house of the Graybar Electric Company (in the U. S. A.), the Northern Electric Company, Limited (in Canada), or the International Standard Electric Corporation (in other foreign countries), and should clearly indicate the name and code number or other designation of the apparatus desired. This information may be found on the apparatus itself and in most cases it also appears on the drawings. As a further aid a list of the apparatus assembled in the 6-A Radio Transmitter is included and will be found on the following pages:

### ORDERING INFORMATION

#### *For Apparatus Mounted in 6-A Radio Transmitter*

Apparatus Designation	No. of Units	Information to be furnished with order	Unit Value
<b>Capacities</b>			
C-1	1	82-A Condenser	1 MF
C-2	1	UC-1852 Faradon Condenser	.005
C-3	1	UC-2253 Faradon Condenser	.0025
C-4.1	1	UC-2318 Faradon Condenser	.002
C-4.2	1	UC-2318 Faradon Condenser	.002
C-5	1	UC-1852 Faradon Condenser	.005
C-6	1	UC-1816 Faradon Condenser	.010
C-7.1	1	UC-2316 Faradon Condenser	.0005

C-7.2	1	UC-2303 Faradon Condenser	.00025
C-7.3	1	UC-2316 Faradon Condenser	.0005
C-7.4	1	UC-1886 Faradon Condenser	.001
C-7.5	1	UC-1886 Faradon Condenser	.001
C-8	1	UC-1852 Faradon Condenser	.005
C-9	1	UC-2317 Faradon Condenser	.0035
C-10.1	1	UC-1896 Faradon Condenser	.020
C-10.2	1	UC-1896 Faradon Condenser	.020
C-10.3	1	UC-1849 Faradon Condenser	.010
C-10.4	1	UC-2223 Faradon Condenser	.005
C-10.5	1	UC-2390 Faradon Condenser	.0025
C-11.1	3	95-B Condensers	1 MF
C-11.2	3	95-B Condensers	1 MF
C-12	1	82-A Condenser	1 MF
C-13	1	117-A Condenser	1 MF
C-14	1	117-A Condenser	1 MF
C-15	3	KS-3042 Condensers	2.8 MF
C-16	1	95-A Condenser	1 MF
C-17	1	UC-2297 Faradon Condenser	.002-.040
C-18	1	119-A Condenser	.5 MF
C-19	9	21-AA Condensers	1 MF

### Fuses

A list will be found on page 8 of the text.

### Inductances

Apparatus Designation	No. of Units	Information to be furnished with order
L-2.1	1	D-78395 Retard Coil
L-2.2	1	D-78395 Retard Coil
L-3	1	126-A Retard Coil
L4.1	1	5-B Choke Coil
L4.2	1	5-B Choke Coil
L5	1	Choke Coil per detail #1 on drawing ESO-307474
L6	1	Inductance Coil per drawing ESR-307463
L7	1	Inductance Coil per drawing ESR-307675
L8	1	Inductance Coil per drawing ESR-307459
L9.1	1	5-B Choke Coil

L9.2	1	5-B Choke Coil
L10.1	1	5-B Choke Coil
L10.2	1	5-B Choke Coil
L11	1	Choke Coil per detail #1, drawing ESO-307473
L12	1	Choke Coil per detail #7, drawing ESL-307925
L13.1	1	5-B Choke Coil
L13.2	1	5-B Choke Coil
L14	1	Choke Coil per detail #1, drawing ESL-307925
L15	1	64-A Retard Coil
L16	1	75-B Retard Coil
L17	1	Choke Coil per detail #1, drawing ESL-308363
L18.1	1	5-B Choke Coil
L18.2	1	5-B Choke Coil

### Meters

Apparatus Designation	No. of Units	Information to be furnished with order
M1	1	Weston Model #301 D. C. Milliammeter scale 0-100 ma.
M2	1	Weston Model #301 D. C. Ammeter Scale 0-1.5 amperes
M3	1	Weston Model #425 Thermoammeter Scale 0-20 amperes (Thermocouple of same serial number to be furnished with meter)
M4	1	Weston Model #425 Thermoammeter Scale 0-15 amperes (Thermocouple of same serial number to be furnished with meter)
M5	1	Weston Model #301 D. C. Milliammeter Scale 0-100 ma.
M6	1	Weston Model #425 Thermoammeter Scale 0-1 ampere (Thermocouple of same serial number to be furnished with meter)
M7	1	Weston Model #301 D. C. Milliammeter Scale 0-500 ma.
M8	1	Weston Model #301 D. C. Milliammeter Scale 0-100 ma.
M9	1	Weston Model #301 D. C. Milliammeter Scale 0-300 ma.
M10	1	Weston Model #301 D. C. Milliammeter Scale 5-0-10 ma.

M11	1	Weston Model #431 (per KS-3064) D. C. Voltmeter 0-5000 volts furnished with metal case.
M12	1	Weston Model #431 D. C. Voltmeter Scale 0-400 volts furnished with metal case
M13	1	Weston Model #431 D. C. Voltmeter Scale 0-30 volts furnished with metal case

### Relays

Apparatus Designation	No. of Units	Information to be furnished with order
S1	1	G. E. Co. "PQ-6" Instantaneous One Circuit Contacts, circuit opening, hand reset relay, coil to carry continuously 1.5 ampere DC and calibrated to operate at 1.0-1.5-2.0 and 3.0 amperes
S2	1	G. E. Co. "PQ" Definite time delay relay to operate on 22 volts DC constantly applied, closing one circuit with a delay of 10 to 15 seconds and equipped with quick release valve per SL-1893427-G-1.
S3	1	B-36 Relay
S4	1	Magnetic Switch C-R 4002 A-2 similar to catalog #1772583-G-3 except equipped with 5 ampere blowout coil, the operating coil to operate continuously at 250 volts DC.
S5	1	Magnetic Switch C-R 4002 A-2 similar to catalog #1772583-G-3 except equipped with 5 ampere blowout coil, the operating coil to operate continuously at 250 volts DC.
S6	1	226-A Relay (furnished only on transmitters numbered 119 or higher)

### Resistances

Apparatus Designation	No. of Units	Information to be furnished with order
R1	1	W.-L. "CM" 4 ohm $\pm 5\%$ Resistance with tab terminals
R2	1	W.-L. "CM" 1.34 ohm $\pm 5\%$ Resistance with tab terminals

R3	1	W.-L. "CM" 1.34 ohm $\pm$ 5% Resistance with tab terminals
R4	1	W.-L. "CM" 1500 ohm $\pm$ 10% Resistance with tab terminals
R5.1	1	W.-L. "CM" 79 ohm $\pm$ 1% Resistance with tab terminals
R5.2	1	W.-L. "CM" 9 ohm $\pm$ 5% Resistance with tab terminals (taps at 3 ohms and 6 ohms $\pm$ 5% each section)
R5.3	1	W.-L. "CM" 112 ohm $\pm$ 1% Resistance with tab terminals
R5.4	1	W.-L. "CM" 112 ohm $\pm$ 1% Resistance with tab terminals
R9.1	1	W.-L. "D" 500 ohm $\pm$ 5% Resistance with clamp terminals
R9.2	1	W.-L. "D" 500 ohm $\pm$ 5% Resistance with clamp terminals
R11	1	W.-L. "CM" 25000 ohm $\pm$ 5% Resistance with tab terminals tapped at 9000 ohms $\pm$ 5% (9000 ohm section marked R11.1-16000 ohm section marked R11.2)
R13	1	W.-L. "CM" 48000 ohm Resistance with tab terminals
R14		(Part of L14 assembly)
R15.1	1	18-P Resistance
R15.2	1	18-P Resistance
R15.3	1	18-AR Resistance
R15.4	1	18-P Resistance
R15.5	1	18-P Resistance
R15.6	1	18-AP Resistance
R16	1	W. L. "B" 5000 ohm $\pm$ 10% Resistance
R17.1	1	62-B Resistance
R17.2	1	62-A Resistance
R17.3	1	62-A Resistance
R18	1	W.-L. "O" 1000 ohm $\pm$ 10% Resistance with tab terminals
R19	1	W.-L. "BM" 11 ohm $\pm$ 5% Resistance with tab terminals
R20	1	Weston External Resistance Box per Weston drawing CD-52719 furnished with model #431 Voltmeter Scale 0-5000 volts per KS-3064

*R21	1	W.-L. Field Rheostat for 250-V Generator— M.G. set KS
*R22	1	W.-L. Field Rheostat for 24-V Generator— M.G. set KS
*R23	1	W.-L. Field Rheostat for High Voltage Gen- erator M.G. set KS
R24.1	1	38-W Resistance
R24.2	1	38-W Resistance
R24.3	1	38-W Resistance
R25	1	Weston Miniature Precision Resistor per Weston drawing CD-46882 to be ordered with model 431 (M) DC Voltmeter scale 0-400 volts

\*Specify KS number which is stamped on the base of motor-generator set.

### Transformers

T1	1	233-C Input Transformer
T2	1	D-79629 Output Transformer

## CHAPTER X

### *SPARE PART EQUIPMENT*

A. The following is a list of spare parts supplied with the 106-A Radio Telephone Broadcasting Equipment.

- 1—788 Cord
- 3—728 Cords (one each red, white, and green) 1 foot long, equipped with
- 6—110 Plugs
- 10—35-F Fuses,  $\frac{1}{2}$  ampere
- 10—35-B Fuses, 3 amperes
- 6—62-B Fuses
- 4—2-F Lamps
- 2—Lamps per W. E. List #12052 or 6-8 volt, 2 candle power, double contact, bayonet bases, Mazda 64
- 2—62-A Resistances
- 1—62-B Resistance
- 3—387-W Transmitters
- 2—102-D Vacuum Tubes
- 5—205-D Vacuum Tubes
- 2—211-D Vacuum Tubes
- 2—212-D Vacuum Tubes
- 6—215-A Vacuum Tubes
- 2—228-A Vacuum Tubes
- \*1—G. E. Co. Tungar Bulb Cat. No. 189048
- \*1—G. E. Co. Tungar Bulb Cat. No. 189049

\*Furnished only when power supply for charging is A. C.

B. The following list of apparatus is suggested as an additional complement of spare parts for this equipment. Any or all items, if desired, shall be ordered separately.

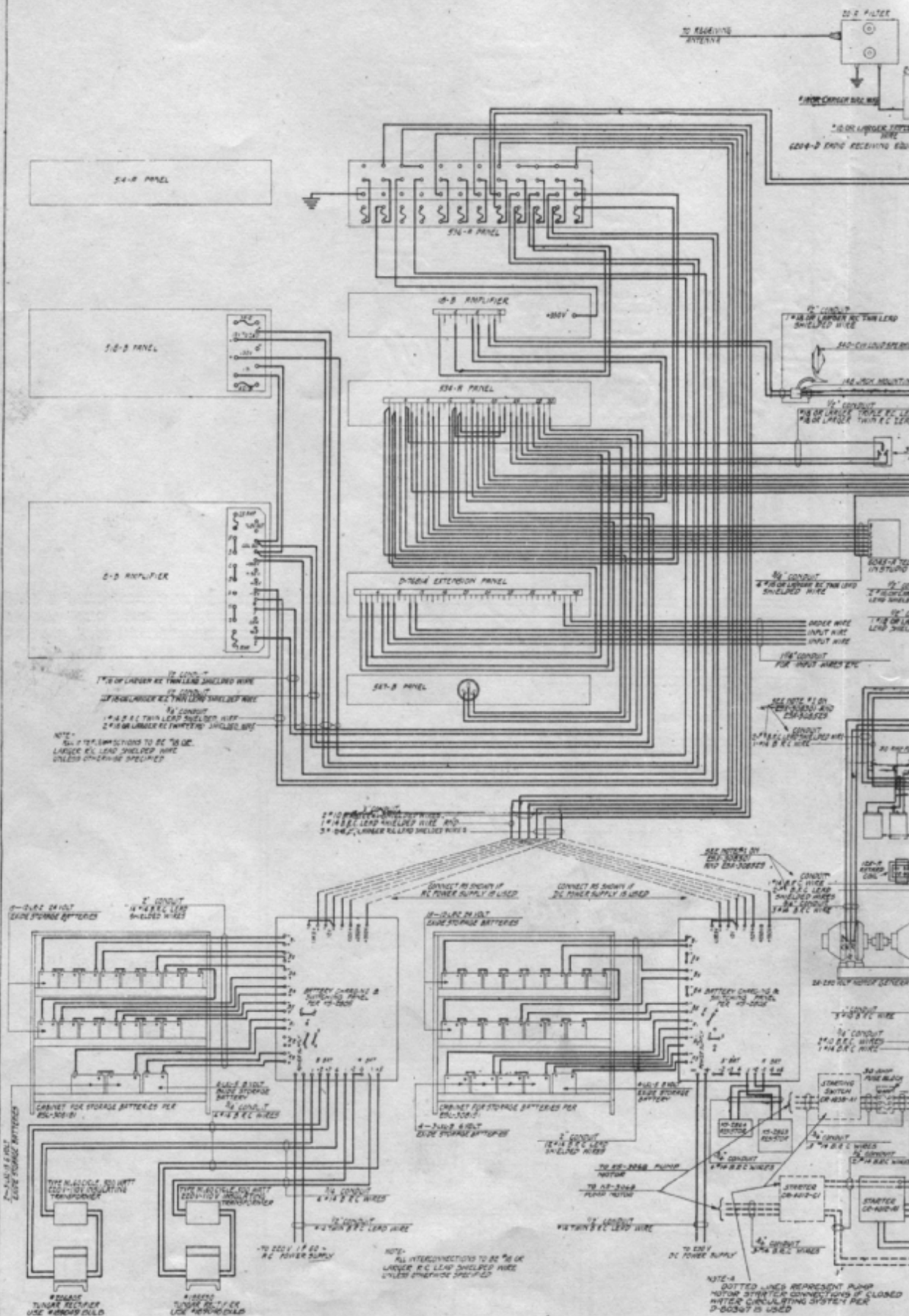
- 1—Armature for the Center 2000 Volt Generator of KS-5054 Motor-Generator Set
- 1—Armature for the End 2000 Volt Generator of the KS-5054 Motor-Generator Set
- 1—Complete Set of Brushes for the KS-5054 Motor-Generator Set



- 1—Complete Set of Brushes for the KS-5055 Motor Generator Set
- 2—82-A Condensers
- 2—95-B Condensers
- 1—Faradon UC-1896 Condenser
- 1—Faradon UC-2223 Condenser
- 1—Faradon UC-1849 Condenser
- 1—Faradon UC-2316 Condenser
- 1—Faradon UC-2303 Condenser
- 1—Faradon UC-1886 Condenser
- 1—KS-3042 Condenser
- 1—Ward-Leonard Type CM Resistance with "Tab" Terminals 4  
Ohms  $\pm 5\%$
- 1—Ward-Leonard Type CM Resistance with "Tab" Terminals 1.34  
Ohms  $\pm 5\%$
- 2—Ward-Leonard Type DM Resistance with "Tab" Terminals 500  
Ohms  $\pm 5\%$
- 2—Ward-Leonard Type CM Resistance with "Tab" Terminals 112  
Ohms  $\pm 1\%$
- 1—Ward-Leonard Type CM Resistance with "Tab" Terminals 79  
Ohms  $\pm 1\%$
- 1—Ward-Leonard Type CM Resistance with "Tab" Terminals 9  
Ohms  $\pm 5\%$  with taps at 3 Ohms and 6 Ohms Each Section  
 $\pm 5\%$
- 1—Ward-Leonard Type CM Resistance with "Tab" Terminals 25,000  
Ohms  $\pm 5\%$  with Tap at 9000 Ohms  $\pm 5\%$
- 1—Ward-Leonard Type CM Resistance with "Tab" Terminals 1500  
Ohms  $\pm 10\%$
- 1—Ward-Leonard Type CM Resistance with "Tab" Terminals 48,000  
Ohms  $\pm 5\%$
- 1—Ward-Leonard Type BM Resistance with "Tab" Terminals 5000  
Ohms  $\pm 10\%$
- 1—Ward-Leonard Type BM Resistance with "Tab" Terminals 11  
Ohms  $\pm 5\%$

INSTRUCTION BULLETIN #255

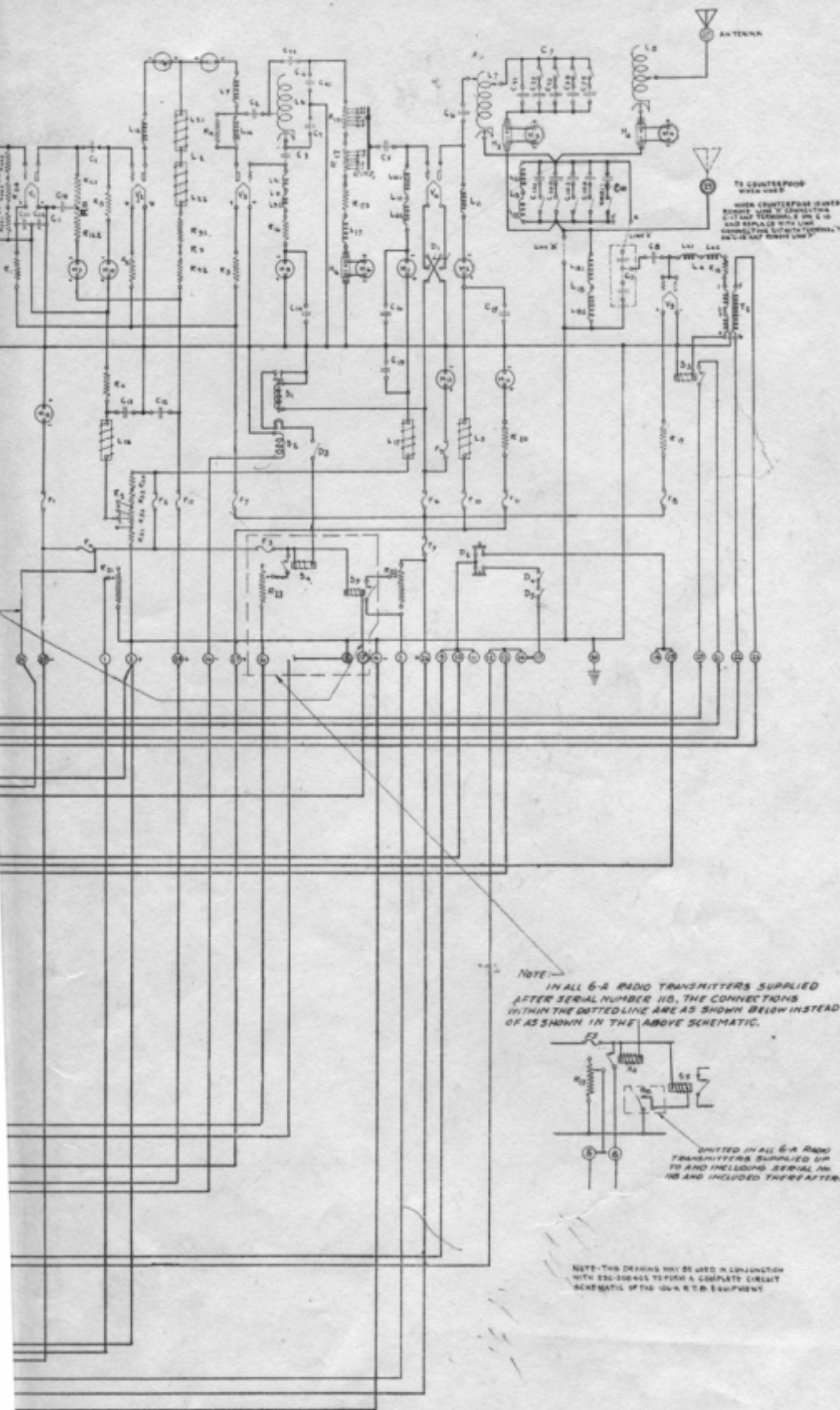




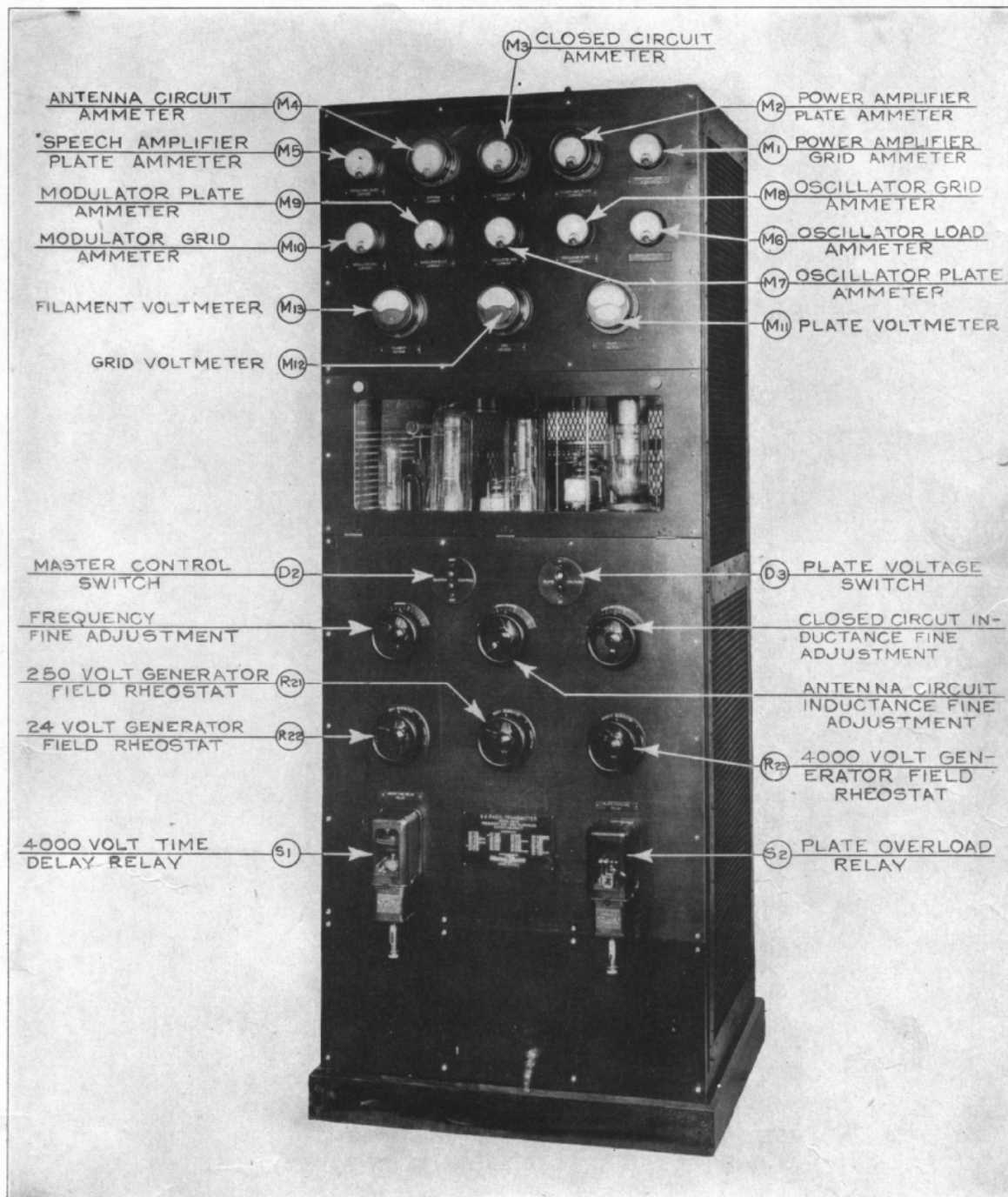




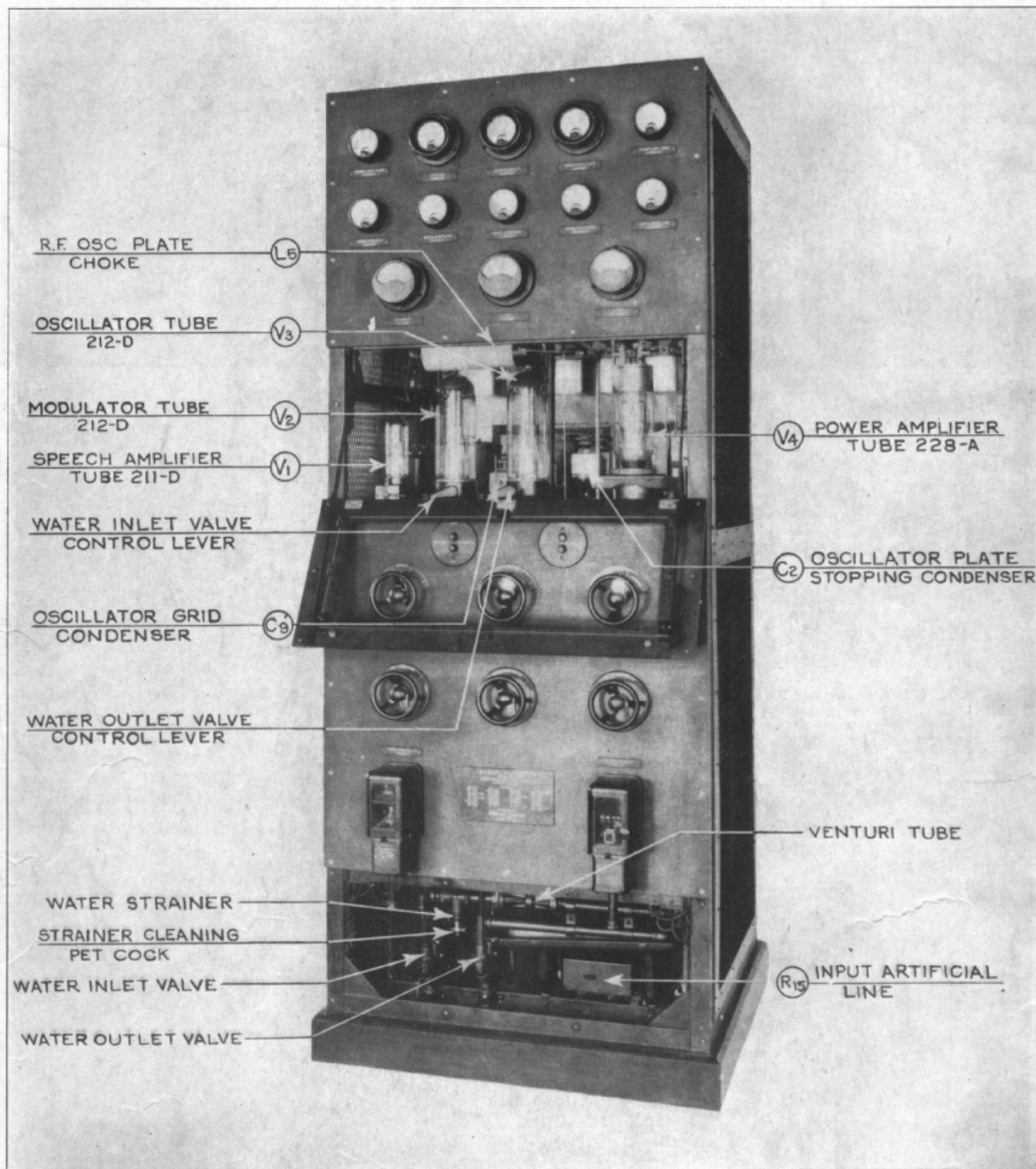




TRANSMITTER AND POWER EQUIPMENT SCHEMATIC—ESX-308487

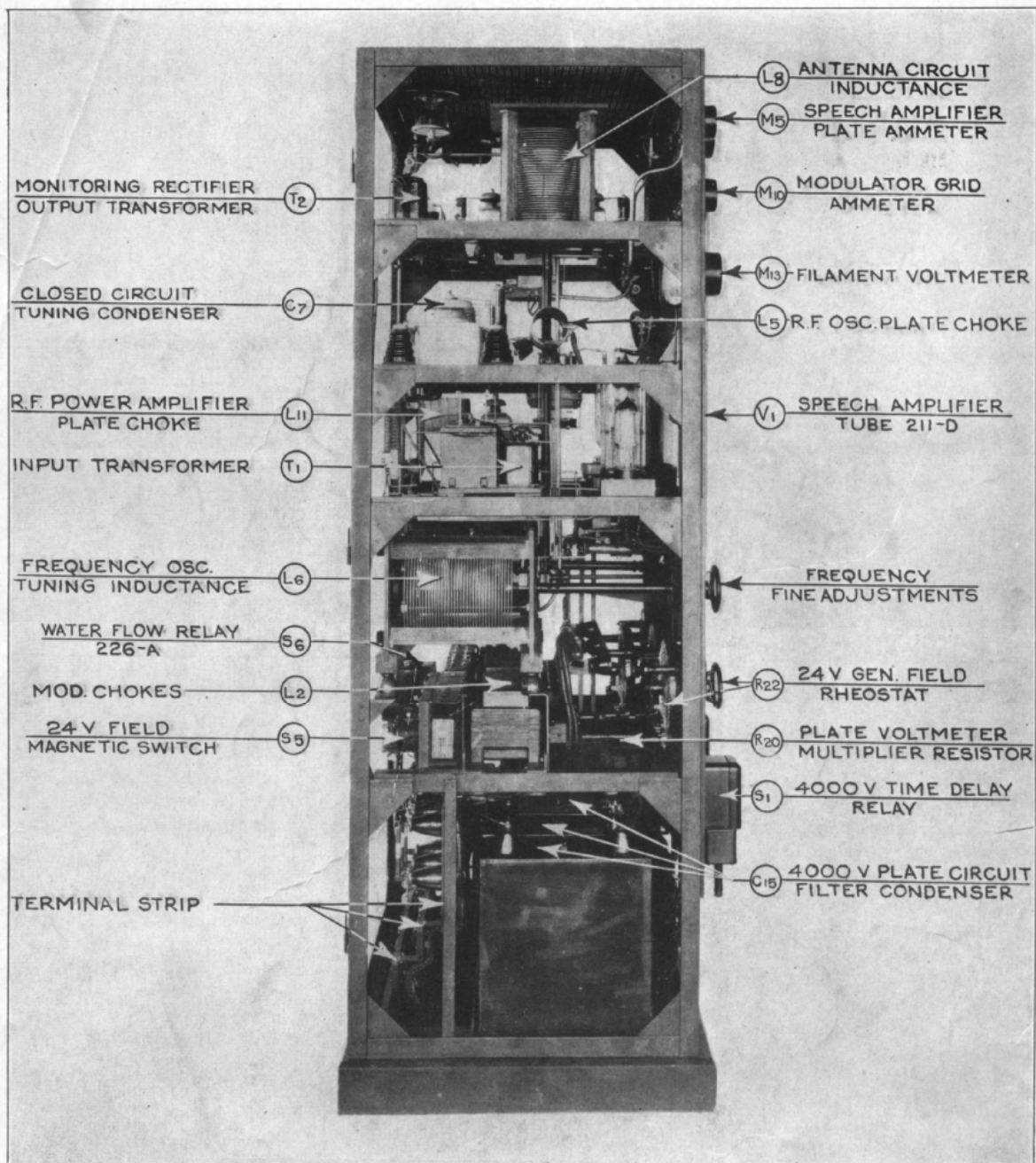


6-A RADIO TRANSMITTER FRONT VIEW—25453

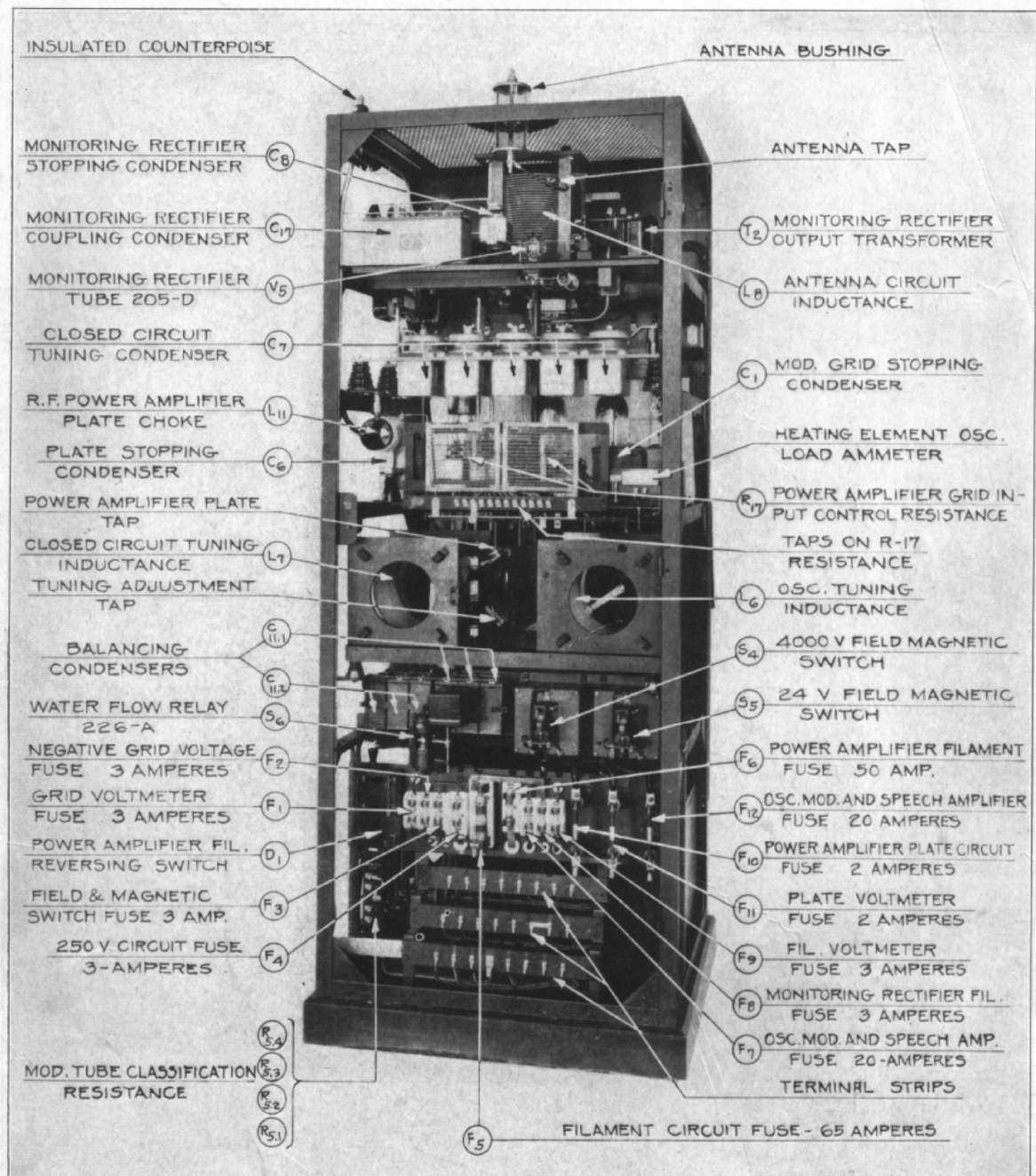


6-A RADIO TRANSMITTER FRONT VIEW (OPEN)—25452





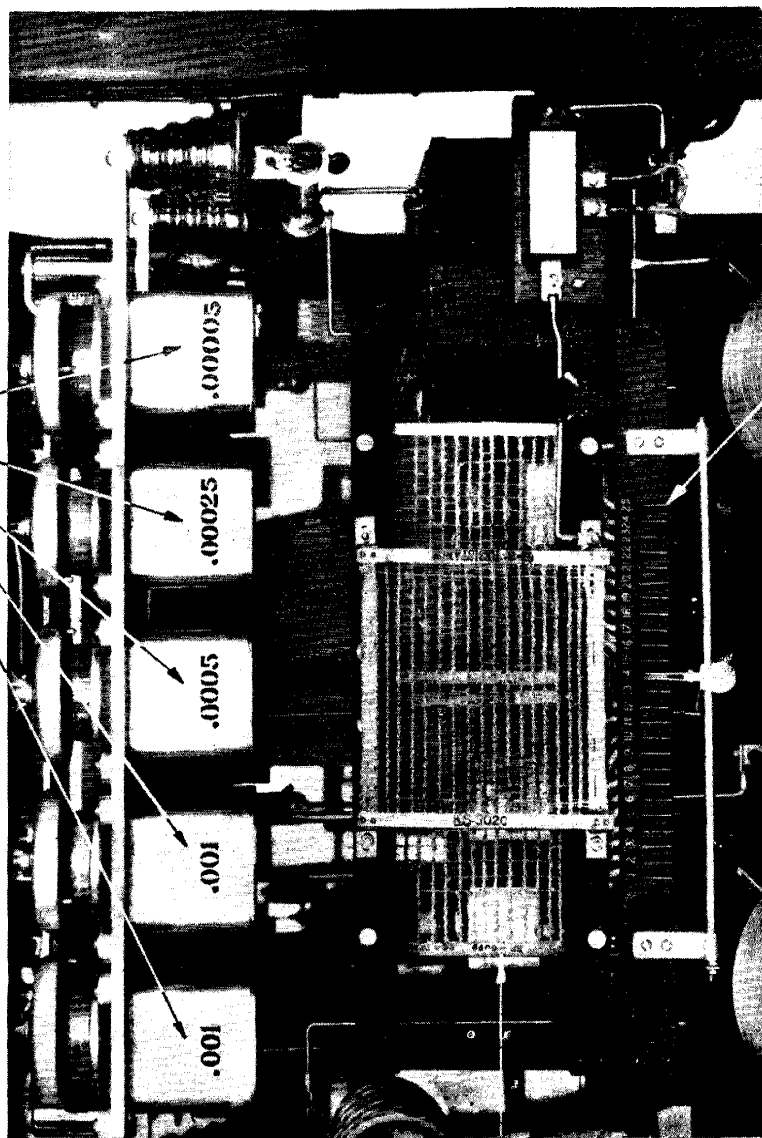
6-A RADIO TRANSMITTER LEFT SIDE (SCREENS OFF)—25454



• 6-A RADIO TRANSMITTER REAR-25457

CLOSED CIRCUIT TUNING  
CONDENSERS

C<sub>7</sub>

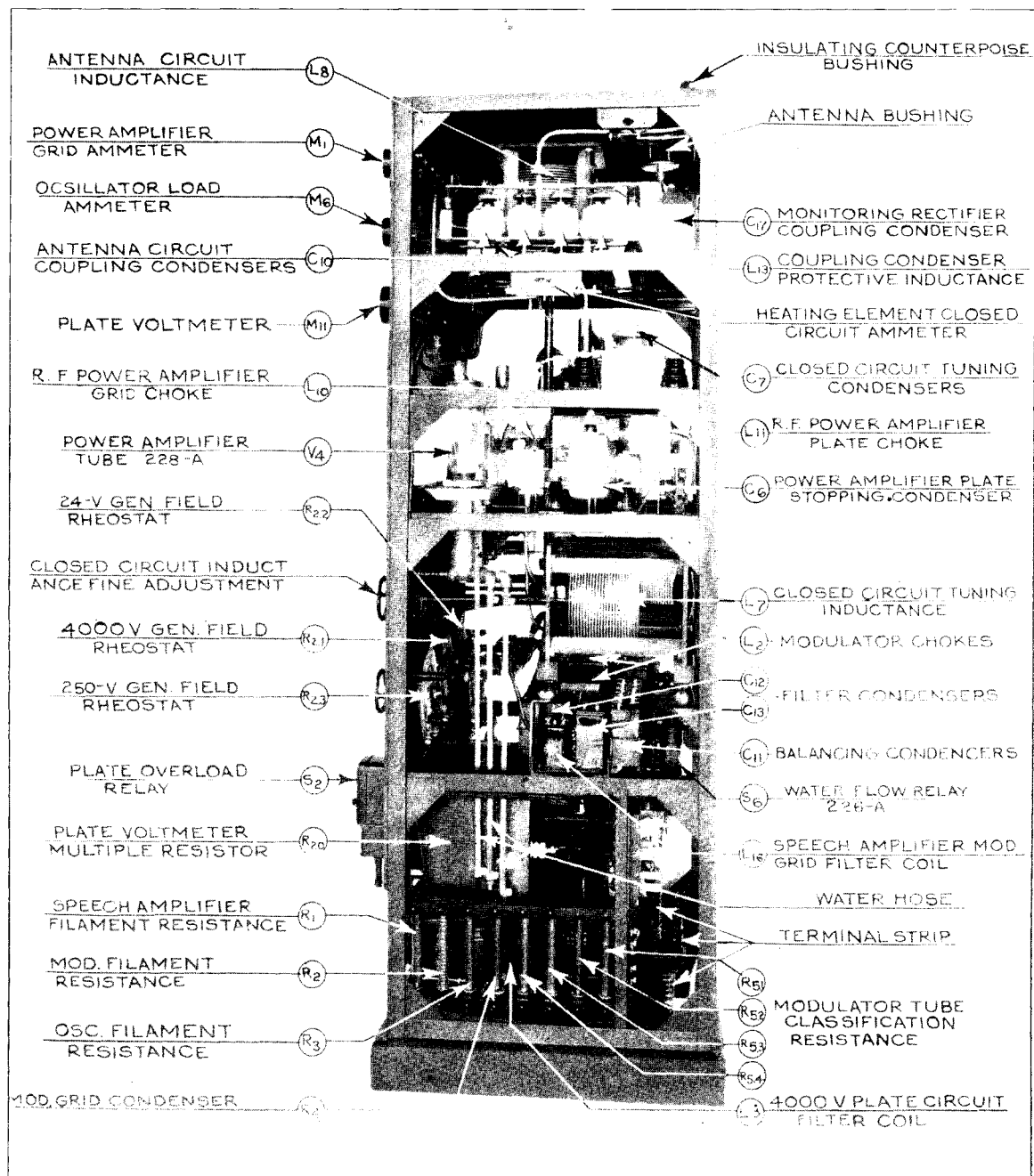


POWER AMPLIFIER GRID INPUT CONTROL  
RESISTANCE - 500-1000 WATT OUTPUT

R<sub>17</sub>

TAPS ON R-17 RESISTANCE

6-A RADIO TRANSMITTER REAR VIEW (UPPER SECTION) - 25450



6-A RADIO TRANSMITTER RIGHT SIDE (SCREENS OFF)—25455

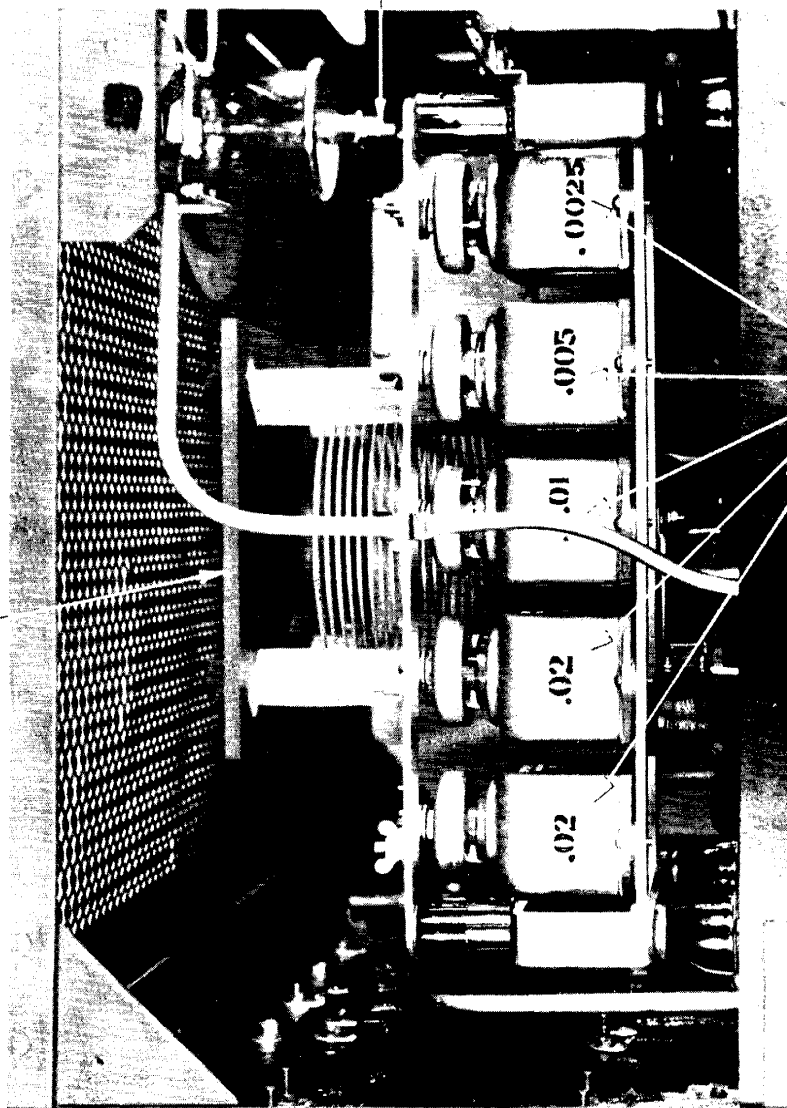
ANTENNA CIRCUIT  
INDUCTANCE

L8

ANTENNA  
BUSHING

ANTENNA CIRCUIT COUPLING  
CONDENSERS

C10



6-A RADIO TRANSMITTER RIGHT SIDE (UPPER SECTION)—25451



### NOTE

Pages 76, 77 and 78 each show the Schematic Wiring Diagram of the 6-A Radio Transmitter. These diagrams vary in the following details:

Page 76 shows the 6-A Transmitter equipped with the Pressure Relay and Resistance  $R_{23}$  connected to Terminal 6.

Page 77 shows the 6-A Transmitter equipped with type 226-A Relay and Resistance  $R_{23}$  connected to ground through Terminal 30.

Page 78 shows the 6-A Transmitter connected in the same manner as page 77 with the following additions:—

$R_{17}$  has been modified to include 25 taps for adjustment of power output between 500 and 1000 watts.

$C_{10}$  has been modified to include five condenser units of the following values:—.02, .02, .01, .005, .0025.

The modifications noted, with the exception perhaps of  $R_{23}$ , can be readily discerned and should be used as a guide in applying the schematic wiring diagram to any particular transmitter. In the case of  $R_{23}$  this change is incorporated in all transmitters serial #119 and higher.