

**INSTRUCTION BOOK**  
**FOR**  
**TYPE TA-12C**  
**AIRCRAFT TRANSMITTER**



**BENDIX RADIO**  
DIVISION OF  
**BENDIX AVIATION CORPORATION**  
BALTIMORE, MARYLAND  
U. S. A.

**IB 393-3**

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THIS MANUAL DOES NOT SUPPLY INFORMATION REGARDING THE *GENERAL CHARACTERISTICS* OF THE UNIT WITH WHICH IT IS CONCERNED NOR OF ITS RELATION TO COMPONENT UNITS OF A TYPICAL INSTALLATION. COMPLETE INFORMATION IS PROVIDED IN THE INSTRUCTION BOOK FOR THE MODEL TA-12 SERIES AIRCRAFT TRANSMITTING EQUIPMENT SUPPLEMENTED BY AN INSTRUCTION BOOK FOR THE SPECIFIC REVISION OF EACH COMPONENT COMPRISING THE COMPLETE RADIO TRANSMITTING INSTALLATION.

*Radio Dept.*

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# INSTRUCTION BOOK

*for*

## TYPE TA-12C

### AIRCRAFT TRANSMITTER

#### 1. FREQUENCY RANGE

Channel	Frequency Range	
	Kilocycles	Meters
1	300 to 600	1000 to 500
2	3000 to 4800	100 to 62.5
3	4800 to 7680	62.5 to 39
4	7680 to 12,000	39 to 25

#### 2. POWER INPUT

Input current under various operating conditions (25-volt input):

- 2.35 amperes—Tube heating current only
- 7.2 amperes—Switch on CW position, Key open
- 14.95 amperes—Switch on CW position, Key closed
- 11.05 amperes—Switch on MCW position, Key open
- 17.8 amperes—Switch on MCW position, Key closed
- 17.1 amperes—Switch on R/T position, without modulation

The above data is for channels 2, 3, and 4. The relay in Type MT-53B Antenna Loading Unit draws an additional 0.25 ampere when channel 1 is used.

#### 3. TUBES USED

Function	Quantity	Type
Oscillator Circuit	4	12SK7
Intermediate Power Amplifier Circuit	1	807
Power Amplifier Circuit	2	807

#### 4. SERVICING

##### 4-1. DIRECT CURRENT VOLTAGES (TYPICAL)

Circuit Symbol	Plate Voltage	Screen Voltage	Filament Voltage	Cathode Voltage	Bias Voltage	Cathode Current in Milli-amperes
V101	291	153	12.2	+2	0	
V102	258	131	12.0	0	0	
V103	257	119	12.0	0	0	
V104	256	110	12.1	0	0	
V105	563	233	5.9	26	0	42
V106 } V107 }	545	255	6.1	0	-25	210

Conditions:

- Voltmeter Sensitivity, 1000 ohms per volt
- Input Voltage, 25 volts
- Measurements to be made at B+ ends of plate choke coils
- Switch on R/T position
- No modulation

##### 4-2. RADIO FREQUENCY CURRENTS

The following data is taken at the high and low ends of each channel.

	Channel 1		Channel 2		Channel 3		Channel 4	
	Low	High	Low	High	Low	High	Low	High
Radio Frequency Current in Antenna . . . . .	1.5	1.15	2.09	1.83	2.13	2.21	2.15	2.25
Antenna Capacitance . . . . .	220	220	100	100	100	100	100	100
Antenna Resistance . . . . .	4	4	10	10	10	10	10	10
Output (Watts) . . . . .	9.0	5.29	43.7	33.5	45.4	48.9	46.3	50.7

## NOTE

AS A RESULT OF SHORTAGES OF CRITICAL MATERIALS, IT MAY BE NECESSARY FOR THE CONTRACTOR TO SUBSTITUTE LESS CRITICAL MATERIALS IN SOME INSTANCES. THE DATA SUPPLIED IN THIS BOOK REGARDING ELECTRICAL PARTS IS CORRECT AS OF THE DATE OF PUBLICATION.

TO ASSURE THAT ADEQUATE REPLACEMENT PARTS ARE OBTAINED, IT IS IMPERATIVE THAT REPLACEMENT PARTS BE ORDERED NOT ONLY BY THE CONTRACTOR'S DRAWING NUMBER AS IT APPEARS IN THE INSTRUCTION BOOK BUT ALSO BY THE CIRCUIT SYMBOL ASSIGNED TO THE PARTICULAR PART.



## 5. ELECTRICAL PARTS LIST, TYPE TA-12C AIRCRAFT TRANSMITTER, REF. NO. 110D/102

Symbol	Function	Description	Ref. No.	Bendix No.
<b>MOTOR</b>				
B101	Channel Selector Motor	12V Windshield Wiper	110K/9	AL72185-1
<b>CAPACITORS</b>				
C101	V101 Grid Blocking	250Mmf, $\pm 10\%$ , 500V DCW, Mica	110C/2126	C56312-251
C102	V101 Voltage Divider	.0015 Mfd, $\pm 1\%$ , 300V DCW, Zero temperature coefficient	110C/136	A30875
C103	V101 Voltage Divider	.003 Mfd, $\pm 1\%$ , 300V DCW, Zero temperature coefficient	110C/137	A30876
C104	V101 Screen Bypass	.01 Mfd, $\pm 10\%$ , 300V DCW, Mica	110C/26	C56312-103
C105	V101 Plate Coupling	.003 Mfd, $\pm 10\%$ , 300V DCW, Mica	110C/66	C56312-302
C106	V101 Plate Bypass	Same as C104	.	.
C107	V102 Oscillator Grid Tank, Fixed	200 Mmf, $\pm 1\%$ , Zero temperature coefficient	110C/138	A30907
C108	V102 Grid Tuning	425.5 Mmf, Max.	110C/139	A28248
C109	V102 Grid Blocking	100 Mmf, $\pm 10\%$ , Zero temperature coefficient	110C/140	A28072-1
C110	V102 Screen Bypass	Same as C105	.	.
C111	V102 Plate Bypass	Same as C105	.	.
C112	V103 Oscillator Grid Tank, Fixed	Same as C107	.	.
C113	V103 Grid Tuning	Same as C108	.	.
C114	V103 Grid Blocking	Same as C109	.	.
C115	V103 Screen Bypass	Same as C105	.	.
C116	V103 Plate Bypass	Same as C105	.	.
C117	V104 Oscillator Grid Tank, Fixed	Same as C107	.	.
C118	V104 Grid Tuning	Same as C108.	.	.
C119	V104 Grid Blocking	Same as C109	.	.
C120	V104 Screen Bypass	Same as C105	.	.
C121	V104 Plate Bypass	Same as C105	.	.
C122	V105 Cathode Bypass	.01 Mfd, $\pm 10\%$ , 600V DCW, Mica	110C/126	A13752-14
C123	V105 Screen Bypass	Same as C122	.	.
C124	V105 Plate Bypass	.01 Mfd, $\pm 10\%$ , 1200V DCW, Mica	110C/59	A13756-14
C125	V106 Grid Blocking	25 Mmf, $\pm 10\%$ , 600V DCW, Mica	110C/127	A13752-20
C126	V105 Plate Coupling	.005 Mfd, $\pm 10\%$ , 1200V DCW, Mica	110C/142	A13756-11
C127	V105 Plate Tuning Channel 2	100 Mmf Max., Variable	110C/143	A28255
C128	V105 Plate Tuning Channel 3	Same as C127	.	.
C129	V105 Plate Tuning Channel 4	Same as C127	.	.
C130	V106, V107 Grid Bias Bypass	Same as C122	.	.
C131	V106, V107 Cathode Bypass	Same as C122	.	.
C132	V106, V107 Screen Bypass	.002 Mfd, $\pm 10\%$ , 1200V DCW, Mica	110C/144	A13756-8
C133	V106, V107 Plate Blocking	.002 Mfd, $\pm 10\%$ , 1200V DCW, Mica	110C/145	C55564-40
C134	V106, V107 Plate Bypass	Same as C133	.	.
C135	V106, V107 Plate Padding, Channel 1	.002 Mfd, $\pm 10\%$ , 1200V DCW, Mica	110C/146	C55611-39
C136	V106, V107 Plate Padding, Channel 1	.003 Mfd, $\pm 10\%$ , 1200V DCW, Mica	110C/147	C55611-41
C137	V106, V107 Plate Padding, Channel 1	.001 Mfd, $\pm 5\%$ , 1200V DCW, Mica	110C/148	C55611-37
C138	PA Output Tuning, Channel 4	365 Mmf Max., Variable	110C/149	N91406-2
C139	PA Output Compensating, Channel 4	300 Mmf, $\pm 10\%$ , 1200V DCW, Mica	110C/150	C55564-56
C140	PA Output Tuning, Channel 3	Same as C138	.	.
C141	PA Output Compensating, Channel 3	Same as C139	.	.
C142	PA Output Tuning, Channel 2	Same as C138	.	.
C143	PA Output Compensating, Channel 2	Same as C139	.	.

## 5. ELECTRICAL PARTS LIST (Continued)

Symbol	Function	Description	Ref. No.	Bendix No.
<b>CAPACITORS (Continued)</b>				
C144	Antenna Coupling, Channel 4	100 Mmf, $\pm 5\%$ , 3000V DCW, Mica	110C/67	A12282-2
C145	Antenna Coupling, Channel 3	Same as C144		
C146	Antenna Coupling, Channel 2	Same as C144		
C147	Filament Bypass	.03 Mfd, $\pm 10\%$ , 600V DCW, Mica	110C/151	A13752-21
C148	V101 Oscillator, Temp. Compensation	30 Mmf, $\pm 1$ Mmf	110C/613	A28948
C149	Motor Surge Filter	.25 Mfd., 600V DCW	110C/1230	A204-4
<b>RECEPTACLES</b>				
J102	V105 Cathode Current Meter Jack	Single circuit, Closed	110H/53	A30024
J103	V106, V107 Cathode Current Meter Jack	Same as J102		
P101	Interconnecting Cable	16 Contact, Wall mounting	110H/52	A30881
<b>RELAY</b>				
K101	High Voltage and Antenna Relay	2P2T & 2PST, 180 $\Omega$ coil, 24V	110F/14	B8416-1
<b>INDUCTORS</b>				
L101	Osc. Tuning, Channel 1	Variometer	110C/208	AC56749-1
L102	RF Choke	6 section, 400 turns per section, Minimum Q25	110C/209	AA27573-1
L103	RF Choke	Same as L102		
L104	Oscillator, Channel 2	19.35 $\mu$ H, 44 turns, Tapped at 10 $\frac{1}{2}$ turns	110C/210	AA28706-1
L105	Oscillator, Channel 3	7.48 $\mu$ H, 23 turns, Tapped at 6 $\frac{1}{2}$ turns	110C/677	AC57555-1
L106	Oscillator, Channel 4	2.96 $\mu$ H, 12 turns, Tapped at 3 $\frac{1}{2}$ turns	100C/678	AC57555-3
L107	IPA Impedance Coupling Choke	5 sections, 475 turns per section, No. 32 enamel wire	110C/213	AA28678-1
L108	IPA Plate, Channel 2	19.5 $\mu$ H, 45 turns	110C/214	AA28706-2
L109	IPA Plate, Channel 3	7.48 $\mu$ H, 23 turns	110C/679	AC57555-2
L110	IPA Plate, Channel 4	2.96 $\mu$ H, 12 turns	110C/680	AC57555-4
L111	PA Plate Impedance Choke	6 section, 215 turns per section, No. 30 S.S.E. wire	110C/2832	AA107698-1
L112	PA Variable Output, Channel 1	Variometer, 2 bank 55 $\frac{1}{2}$ turns total	110C/217	AC56783-1
L113	PA Variable Output, Channel 2	50 turns #20 wire	110C/218	AC56964-2
L114	PA Variable Output, Channel 3	37 turns #20 wire	110C/219	AC56964-1
L115	PA Variable Output, Channel 4	30 turns #18 wire	110C/220	AA28581-1
<b>METER</b>				
M101	Measurement of Antenna Current	O-5A RF Thermocouple, Aircraft movement, for tropical service	110A/52	A100070
<b>SOLENOID</b>				
O-101A	Channel Selector, Switch Clutch Control	Solenoid Assembly 425 turns, #24 wire	110F/16	AA28664-1
<b>PLUG</b>				
	Interconnecting Cable	16 contact, 90° or 16 contact, straight	110H/71 110H/526	A30939 A30882
<b>RESISTORS</b>				
R101	V101 Grid Leak	180,000 $\Omega$ , $\pm 10\%$ , 1W, Ceramic	110C/2117	A18009-184
R102	V101 Screen Dropping	50,000 $\Omega$ , $\pm 10\%$ , 1W, Ceramic	110C/333	A18009-503
R103	V102 Grid Leak	100,000 $\Omega$ , $\pm 10\%$ , 1W, Ceramic	110C/334	A18009-104
R104	V102 Screen Dropping	Same as R102		

## 5. ELECTRICAL PARTS LIST (Continued)

Symbol	Function	Description	Ref. No.	Bendix No.
<b>RESISTORS (Continued)</b>				
R105	T101 Loading	2000Ω, ±10%, 1W, Ceramic	110C/335	A18009-202
R106	V103 Grid Leak	Same as R103	.	.
R107	V103 Screen Dropping	Same as R102	.	.
R108	T102 Loading	7000Ω, ±10%, 1W, Ceramic	110C/355	A18009-702
R109	V104 Grid Leak	Same as R103	.	.
R110	V104 Screen Dropping	Same as R102	.	.
R112	V105 Grid Bias	10,000Ω, ±10%, 1W, Ceramic	110C/336	A18009-103
R113	V105 Cathode Bias	600Ω, ±10%, 10W, Vitreous	110C/337	A13945-29
R114	Filament Dropping	7Ω, ±1%, 10W, Vitreous	110C/338	A13945-72
R115	High Voltage Bleeder	25,000Ω, ±10%, 20W, Vitreous	110C/339	A28310-4
R116	High Voltage Dropping	12,000Ω, ±10%, 20W, Vitreous	110C/340	A28310-6
R117	V106, V107 Grid Leak	10,000Ω, ±10%, 10W, Vitreous	110C/341	A13945-53
R118	V107 Plate Parasitic Suppressor	50Ω, ±10%, 1W, Ceramic, Shunt Wound with 19 turns #24 wire	110C/2835	AA107695-1
R119	V106 Plate Parasitic Suppressor	Same as R118	.	.
R120	V106, V107 Screen Dropping	15,000Ω, ±10%, 20W, Vitreous	110C/281	A28310-5
R121	Static Drain	2 megohm, ±20%, 2W	110C/342	A4516-25
R122	Static Drain, Channel 4	500,000Ω, ±10%, 1W, Ceramic	110C/284	A18009-504
R123	Static Drain, Channel 3	Same as R122	.	.
R124	Static Drain, Channel 2	Same as R122	.	.
R125	V106, V107 Grid Bias Filter	5000Ω, ±10%, 2W	110C/343	A4516-17
R-126	V106 Grid Parasitic Suppressor	50Ω, ±10%, ½W, Ceramic	110C/495	A18150-500
R127	V107 Grid Parasitic Suppressor	Same as R126	.	.

### SWITCHES

S101	Motor Starting	SPST Push Control, .75A, 125V, Normally open	110F/62	A14164
S102A	Positioning Control for Channel Selector Motor	Motor Positioning { Stator Rotor	110F/63 110F/64	AC56967-1 AA28595-1
S102B	Oscillator Plate Supply Selector	Channel selector	110F/85	A28152
S102C	Oscillator Output Selector	Same as S102B	.	.
S102D	IPA Output Circuit Selector	4 position	110F/86	A28545
S102E	PA Output Circuit Selector	4 position { Stator Rotor	110F/87 110F/88	AC56965-1 AA28579-1
S102F	Antenna Circuit Selector	4 position { Stator Rotor	110F/87 110F/89	AC56965-1 AA28579-2
S102G	Antenna Loading	Same as S102B	.	.
S110	Antenna Relay Control	Same as S101	.	.

### TRANSFORMERS

T101	Channel 2 Band Pass	2 section, 70 turns per section	110K/562	AA27565-2
T102	Channel 3 Band Pass	Same as T101	.	.
T103	Channel 4 Band Pass	2 Section, 48 turns/pie	110K/138	AA100376-1

### VACUUM TUBES

V101	Oscillator, Channel 1	Triple grid, Super control amplifier, 12SK7	110E/28	.
V102	Oscillator, Channel 2	Same as V101	.	.
V103	Oscillator, Channel 3	Same as V101	.	.
V104	Oscillator, Channel 4	Same as V101	.	.

## 5. ELECTRICAL PARTS LIST (Continued)

Symbol	Function	Description	Ref. No.	Bendix No.
<b>VACUUM TUBES (Continued)</b>				
V105	IPA	Beam power amplifier, 807	110E/8	.
V106	PA	Same as V105	.	.
V107	PA	Same as V105	.	.
<b>SOCKETS</b>				
X101	Channel 1 Tube	Octal base, Steatite	110H/103	A16818-2
X102	Channel 2 Tube	Same as X101	.	.
X103	Channel 3 Tube	Same as X101	.	.
X104	Channel 4 Tube	Same as X101	.	.
X105	IPA Tube	5 prong, Medium, Steatite	110H/104	A18168-2
X106	PA Tube	Same as X105	.	.
X107	PA Tube	Same as X105	.	.

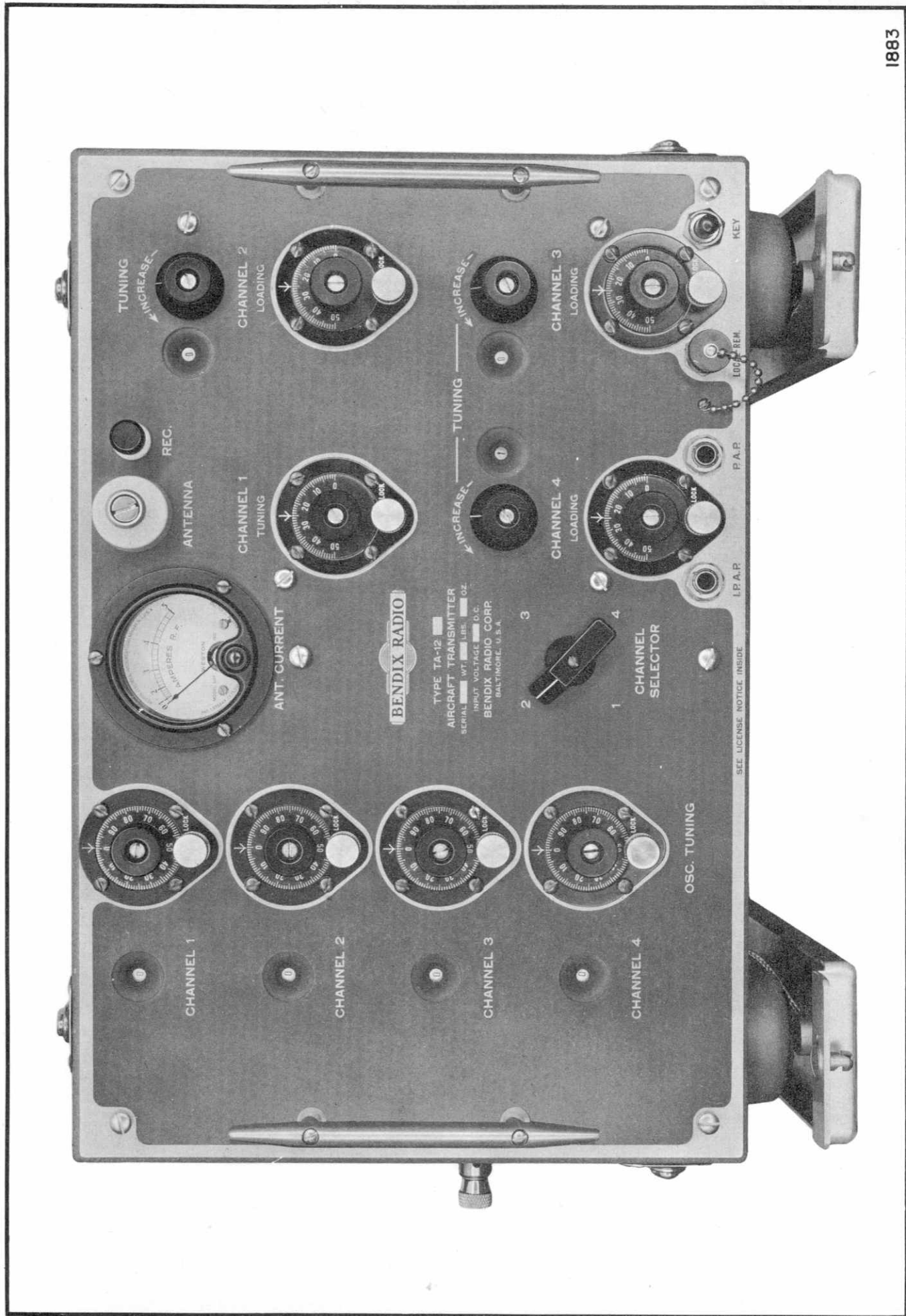


FIGURE 1—FRONT VIEW TYPE TA-12 C TRANSMITTER



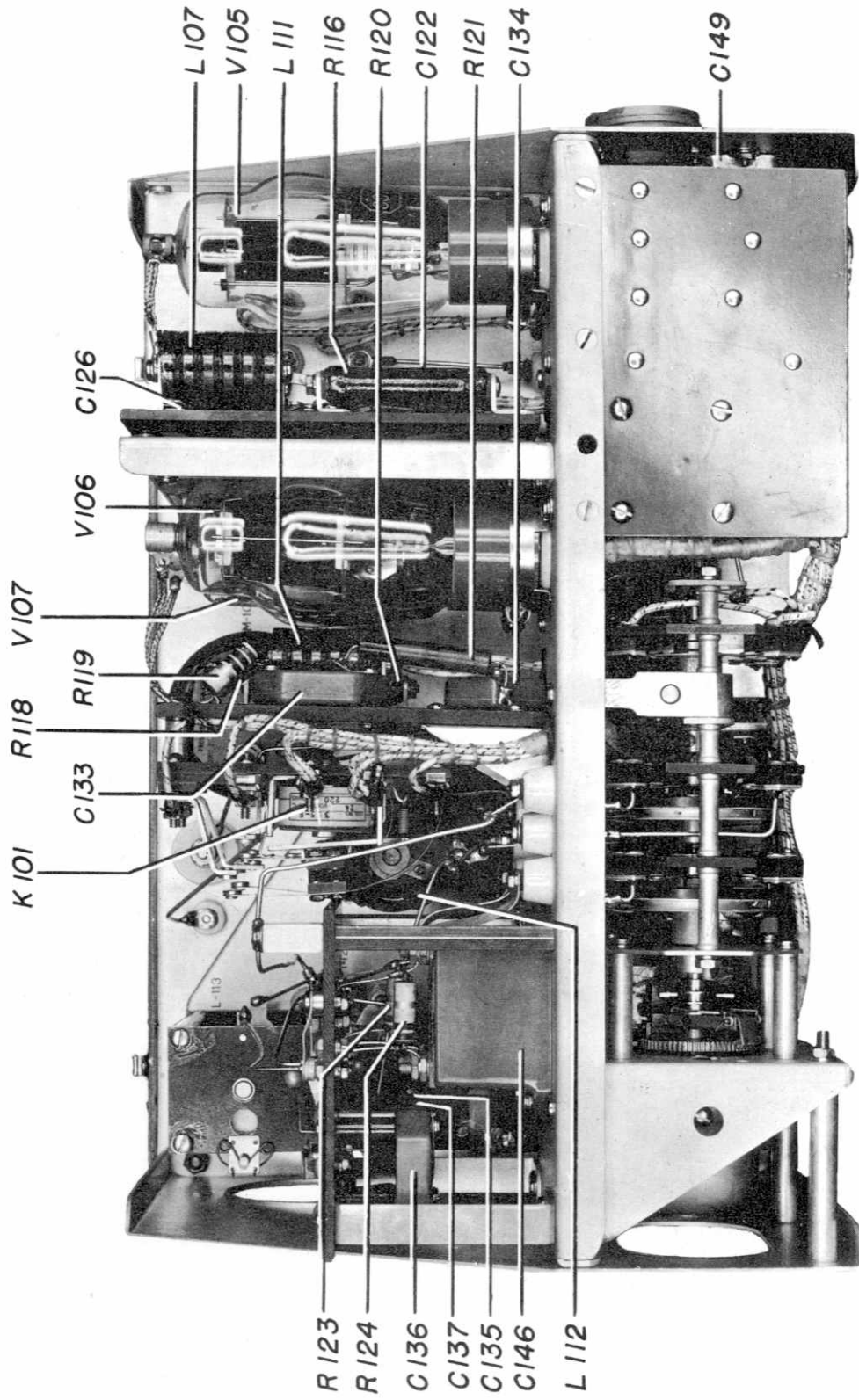
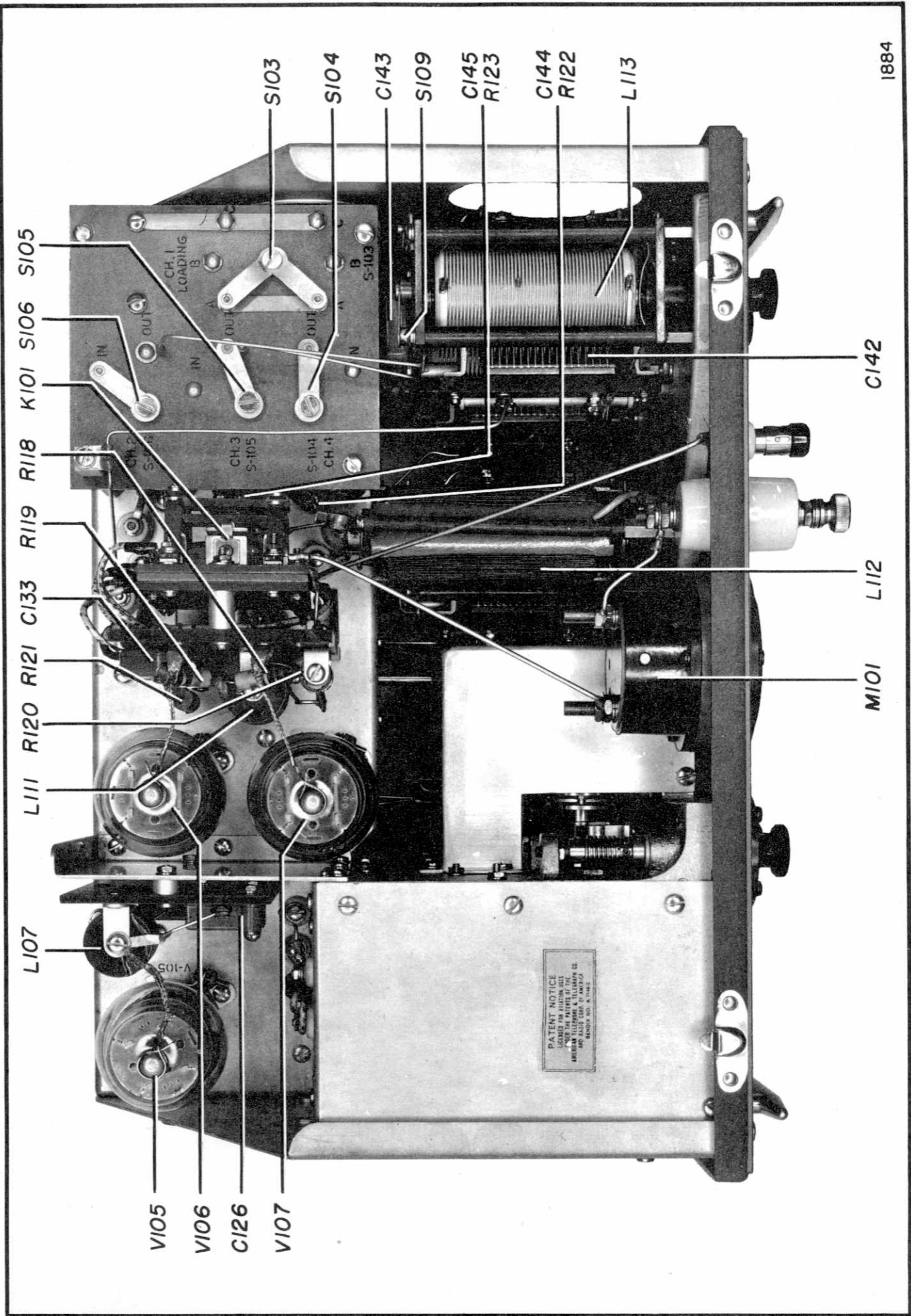


FIGURE 2—REAR VIEW TYPE TA-12 C TRANSMITTER







L107  
 V105  
 V106  
 C/26  
 V107  
 L113  
 R120  
 R121  
 C/33  
 R119  
 R118  
 K101  
 S106  
 S105  
 CH.1  
 CH.2  
 CH.3  
 CH.4  
 S-105  
 S-104  
 S-103  
 S103  
 S104  
 C/43  
 S109  
 C/45  
 R123  
 C/44  
 R122  
 L113  
 C/42  
 L112  
 M101

FIGURE 3—TOP VIEW TYPE TA-12 C TRANSMITTER



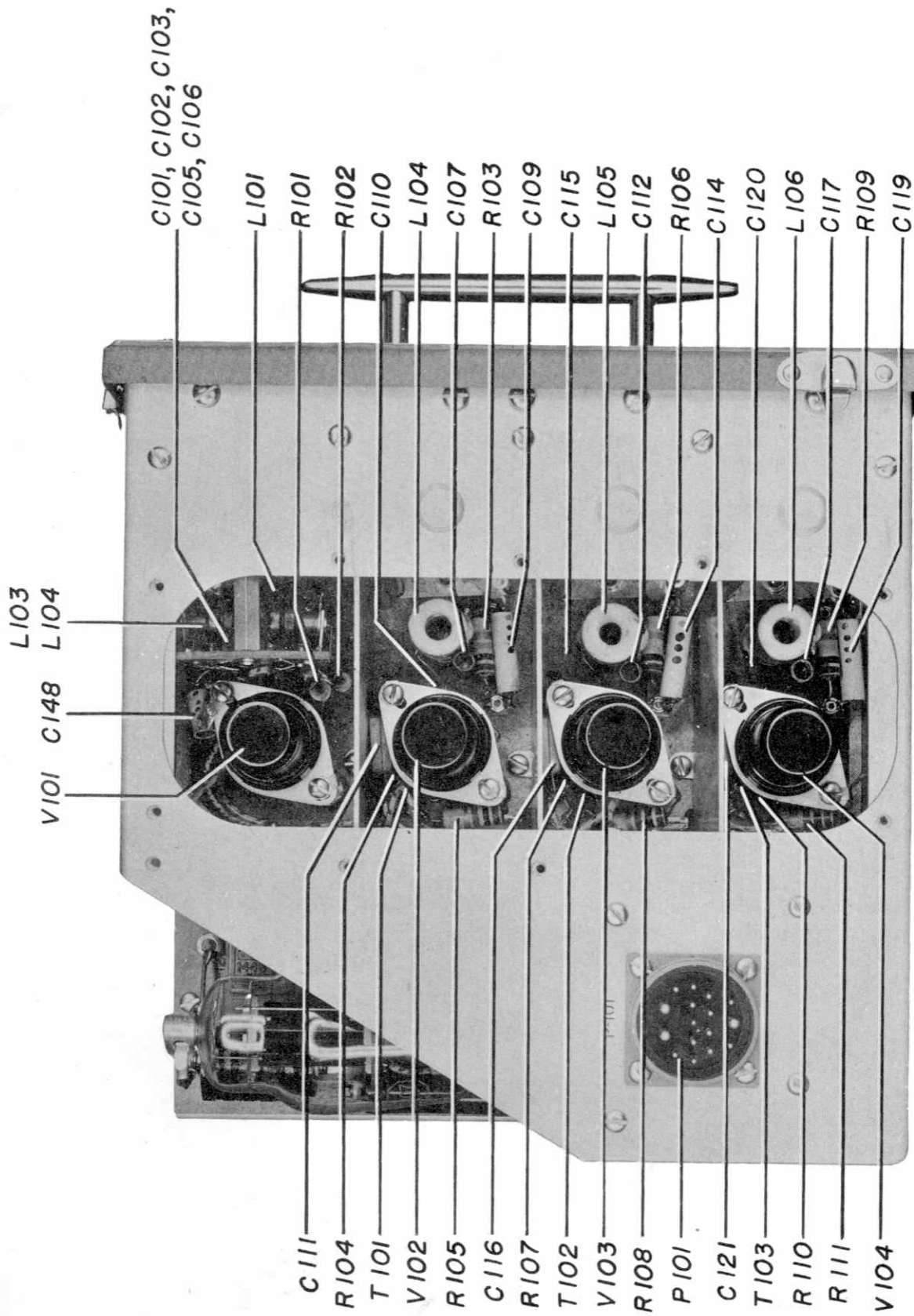


FIGURE 4—SIDE VIEW TYPE TA-12 C TRANSMITTER



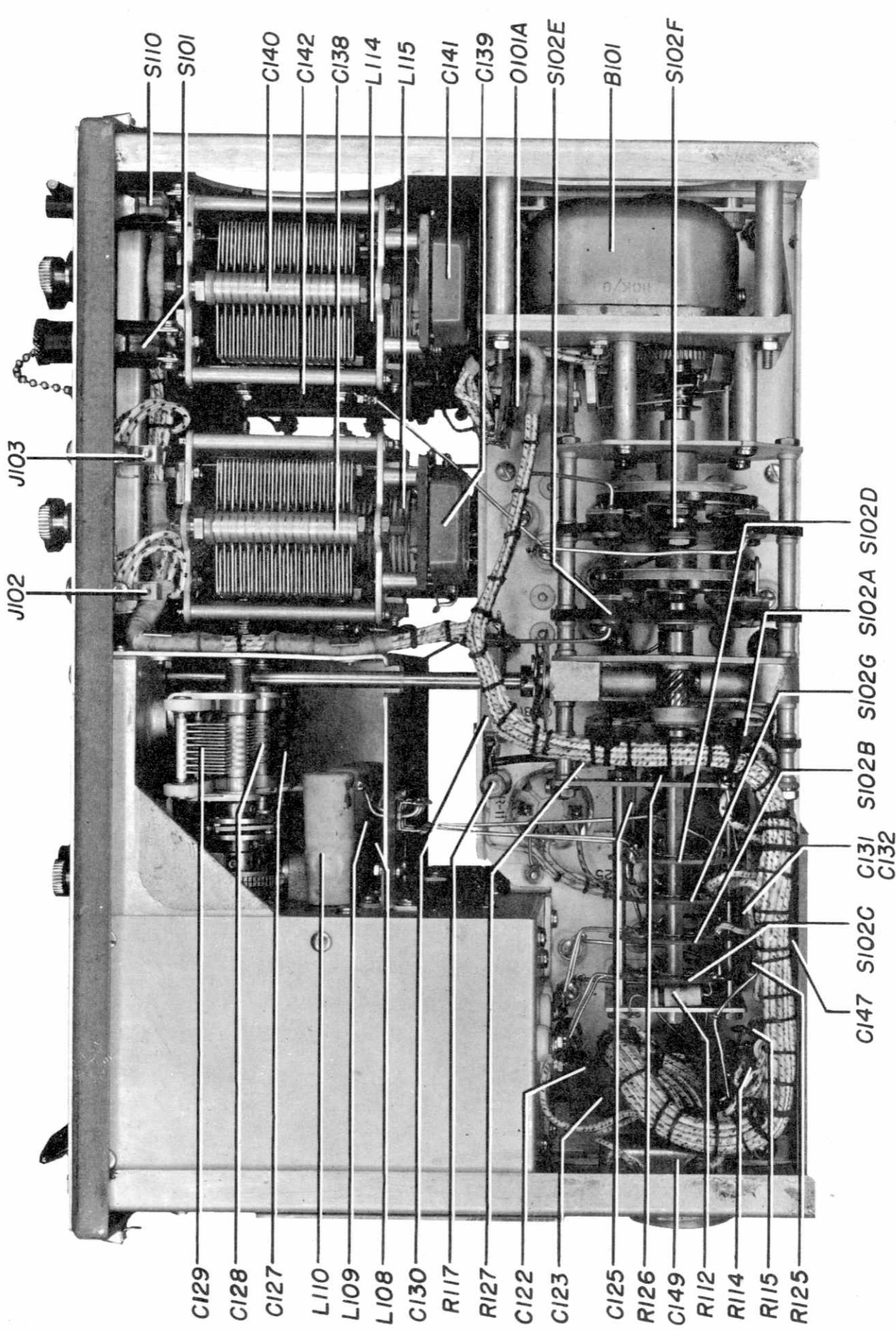
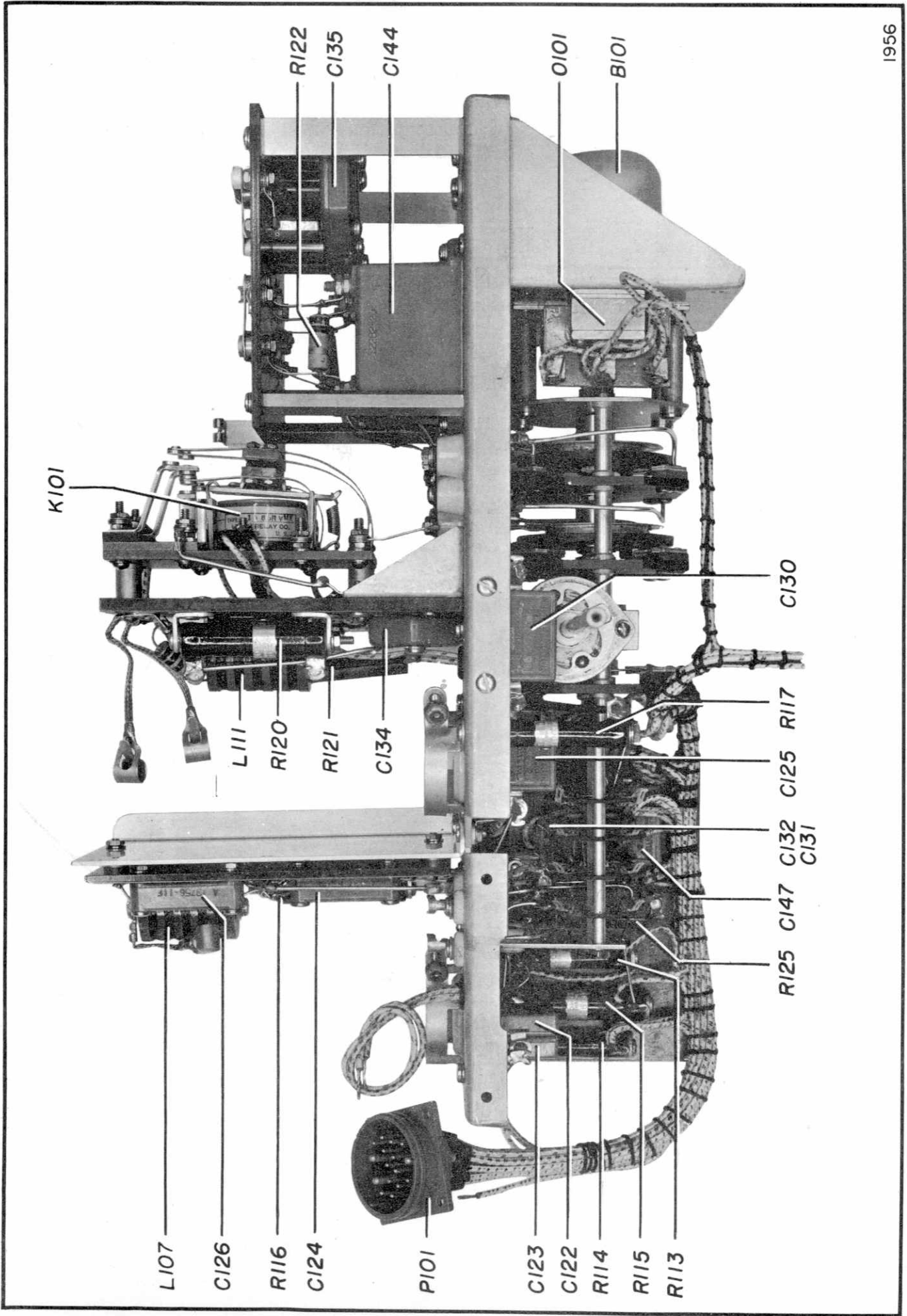


FIGURE 5—BOTTOM VIEW TYPE TA-12 C TRANSMITTER





K101

L107

C126

R116

C124

P101

C123

C122

R114

R115

R113

L111

R120

R121

C134

R125 C147 C132 C125 R117

C130

C131

R122

C135

C144

O101

B101

FIGURE 6—FRONT VIEW CHASSIS ASSEMBLY





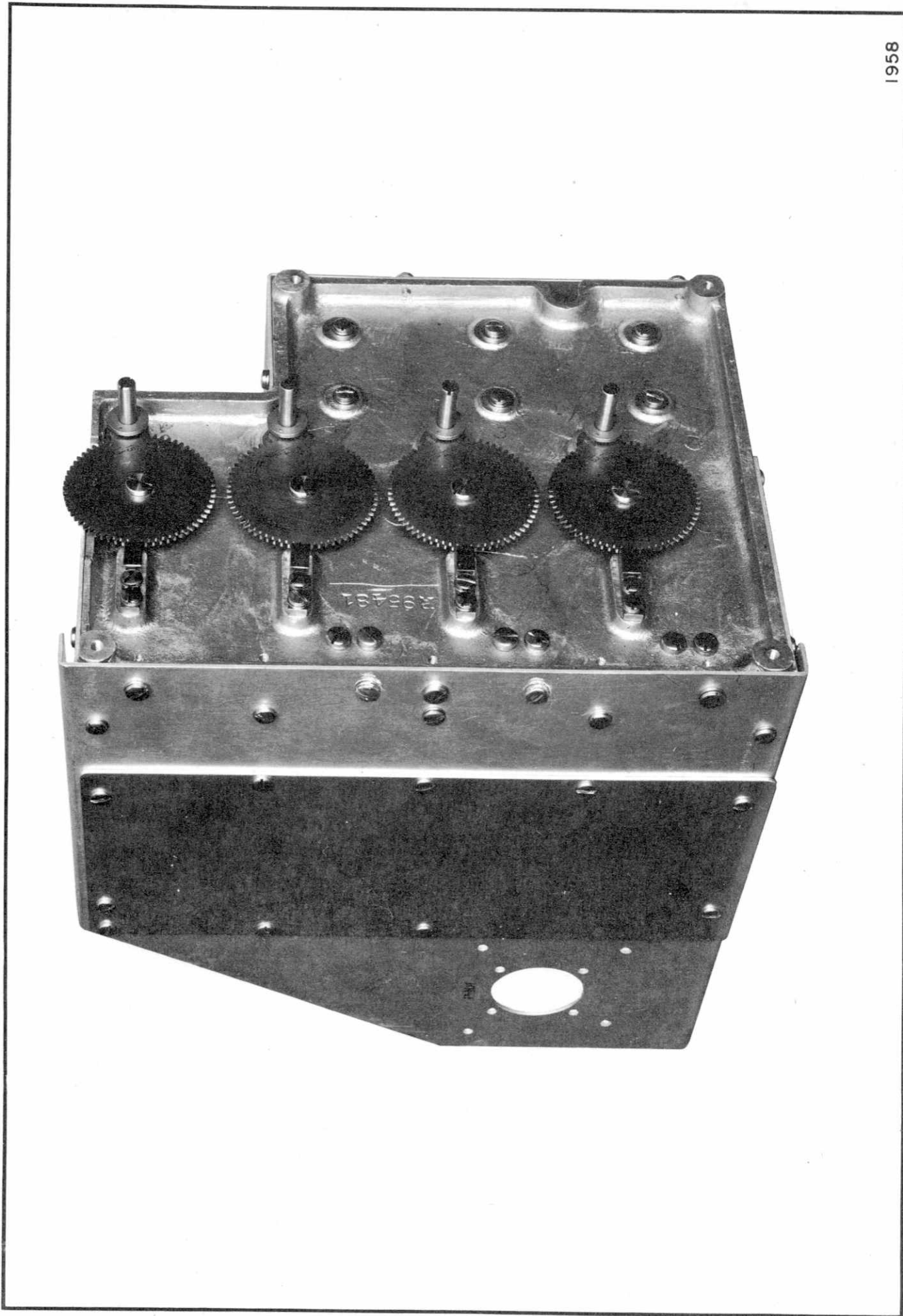


FIGURE 7—FRONT VIEW OSCILLATOR ASSEMBLY



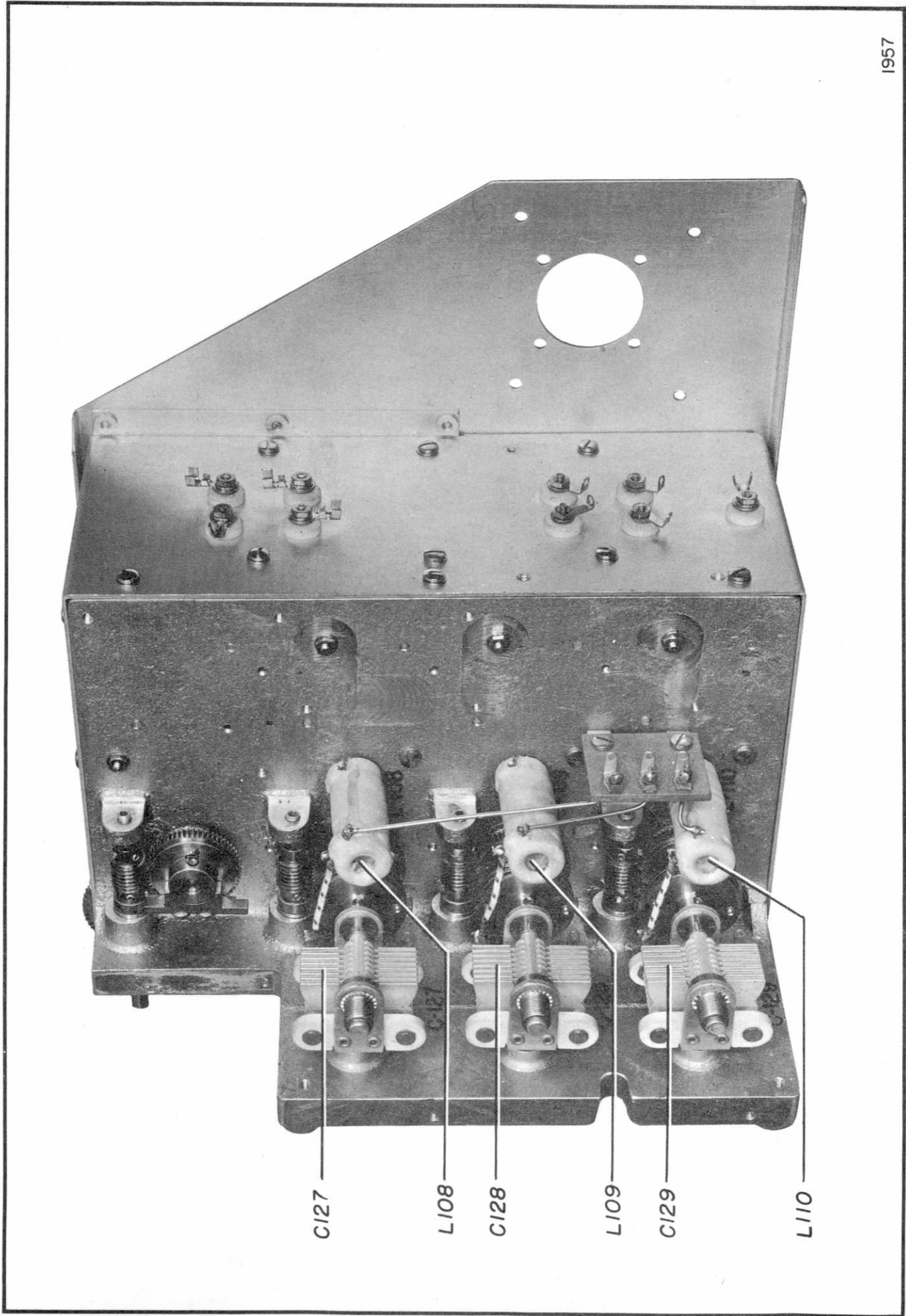


FIGURE 8—RIGHT SIDE VIEW OSCILLATOR ASSEMBLY



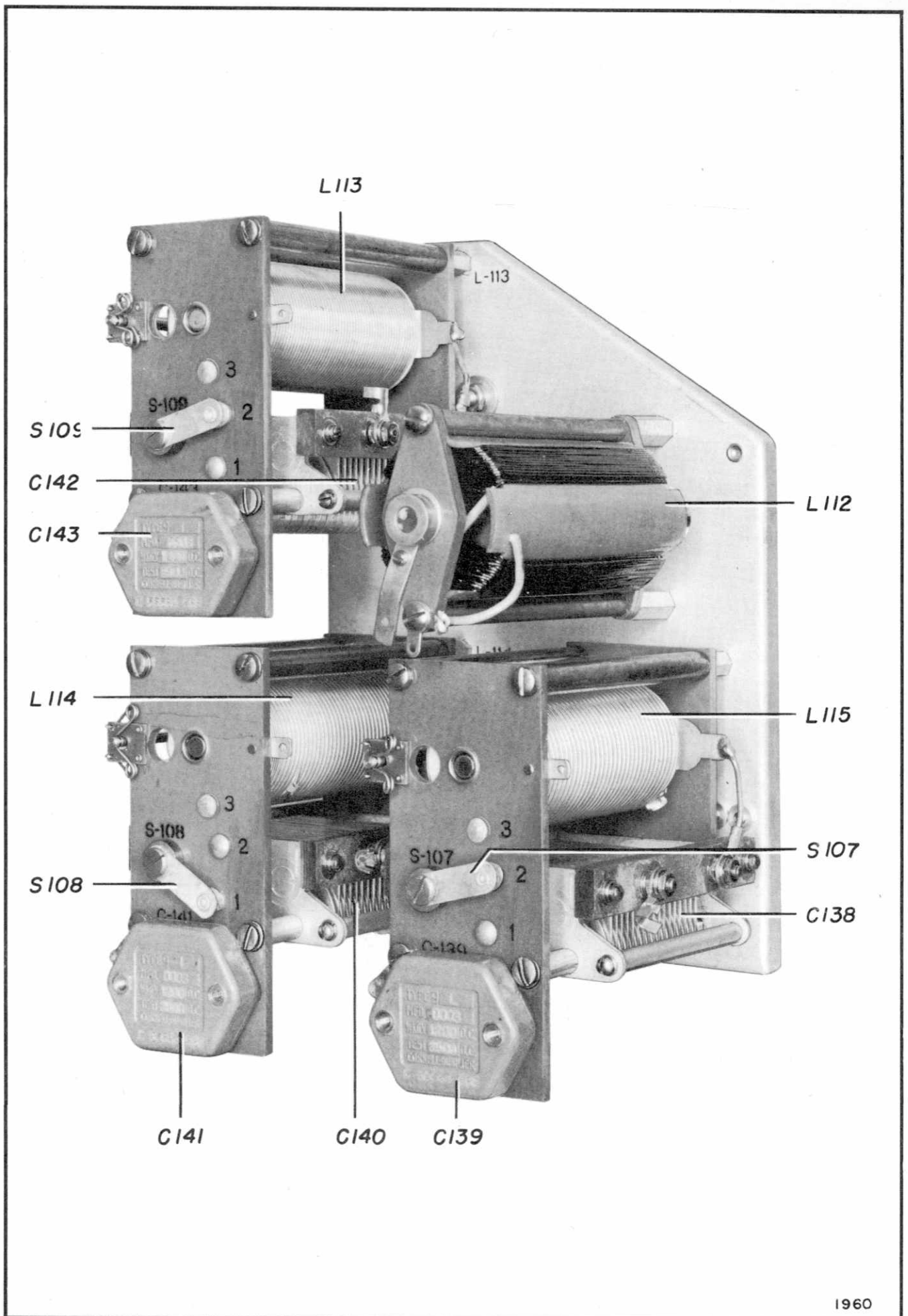


FIGURE 9—REAR VIEW COIL AND CAPACITOR ASSEMBLY



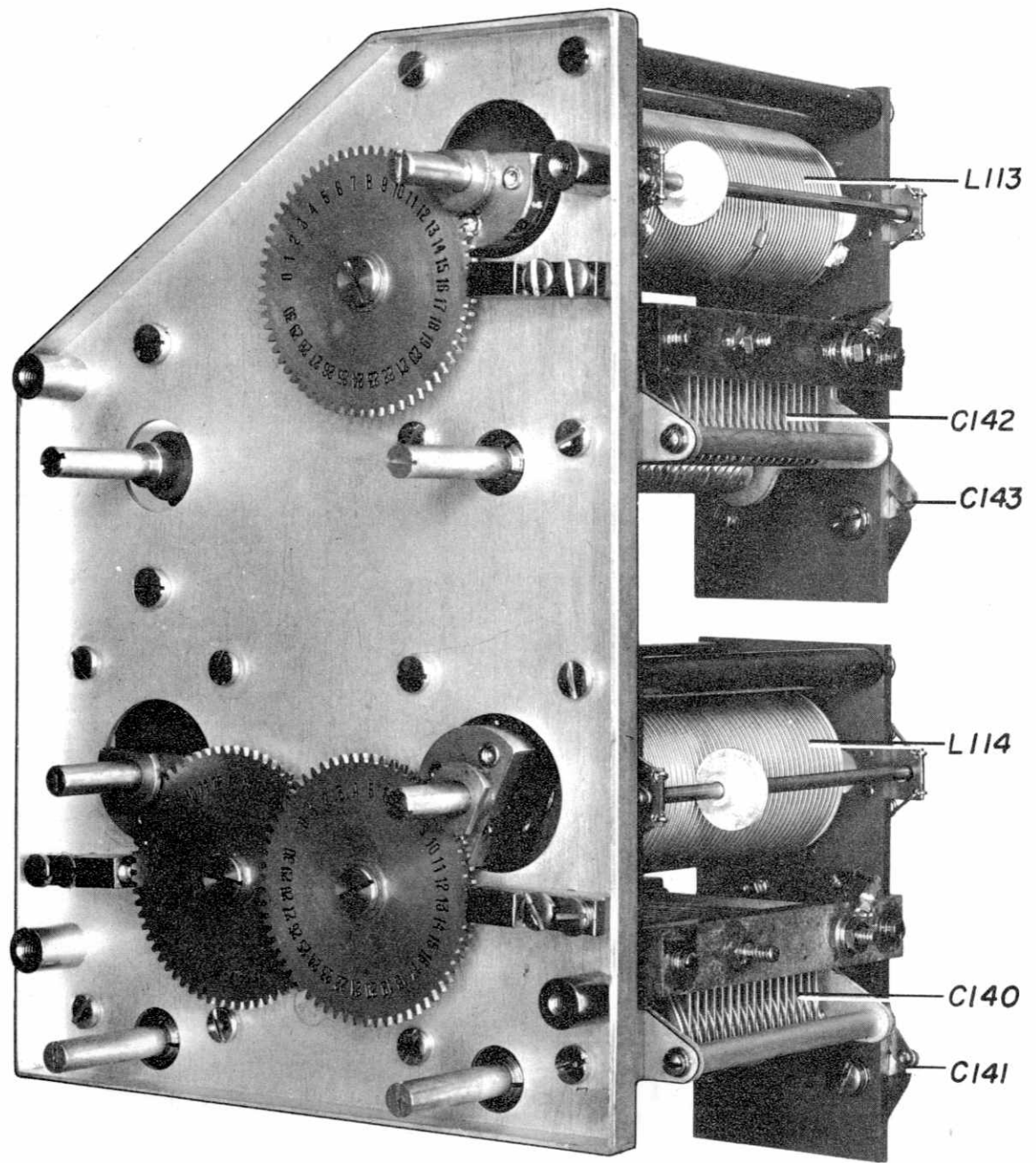
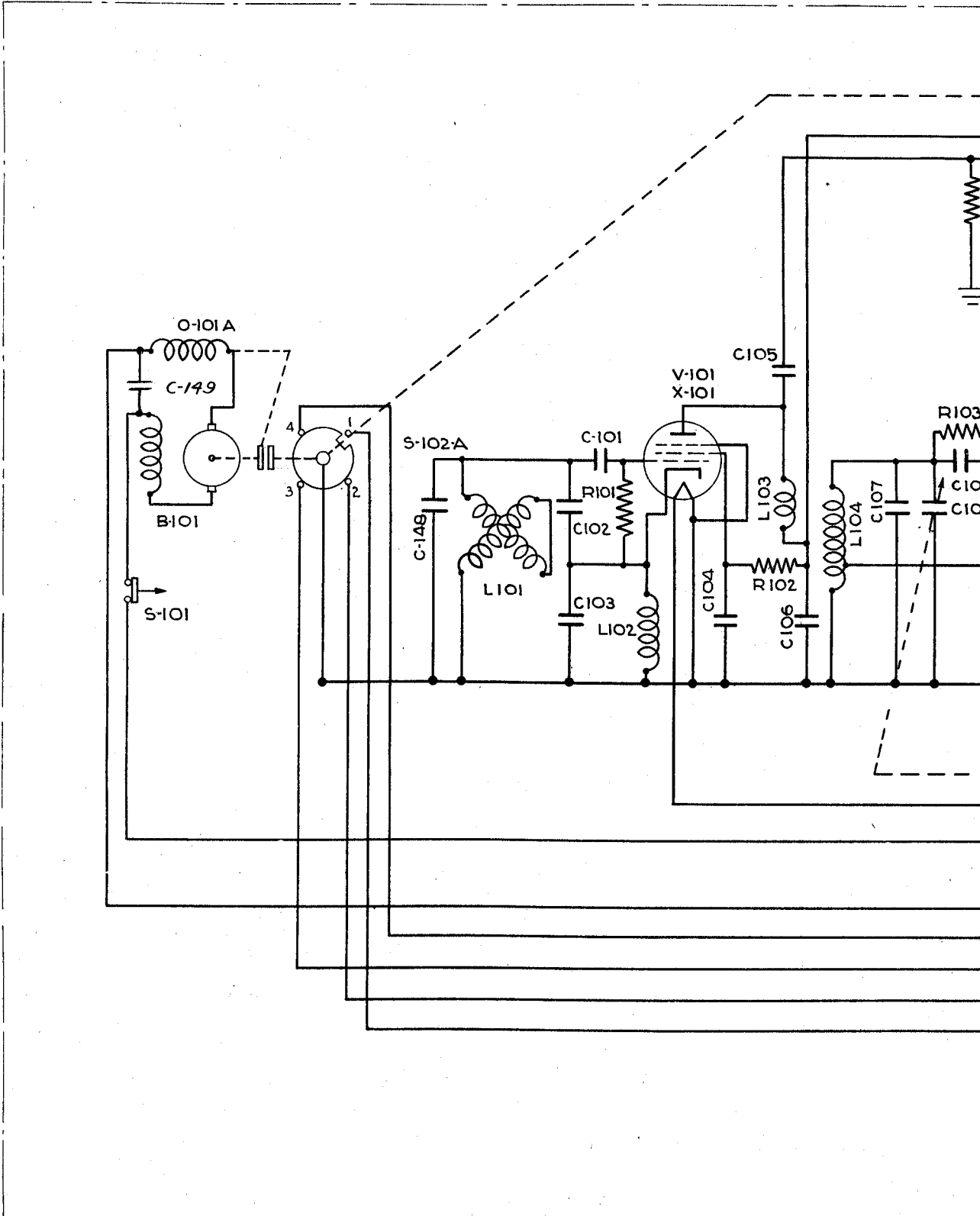


FIGURE 10—FRONT VIEW COIL AND CAPACITOR ASSEMBLY

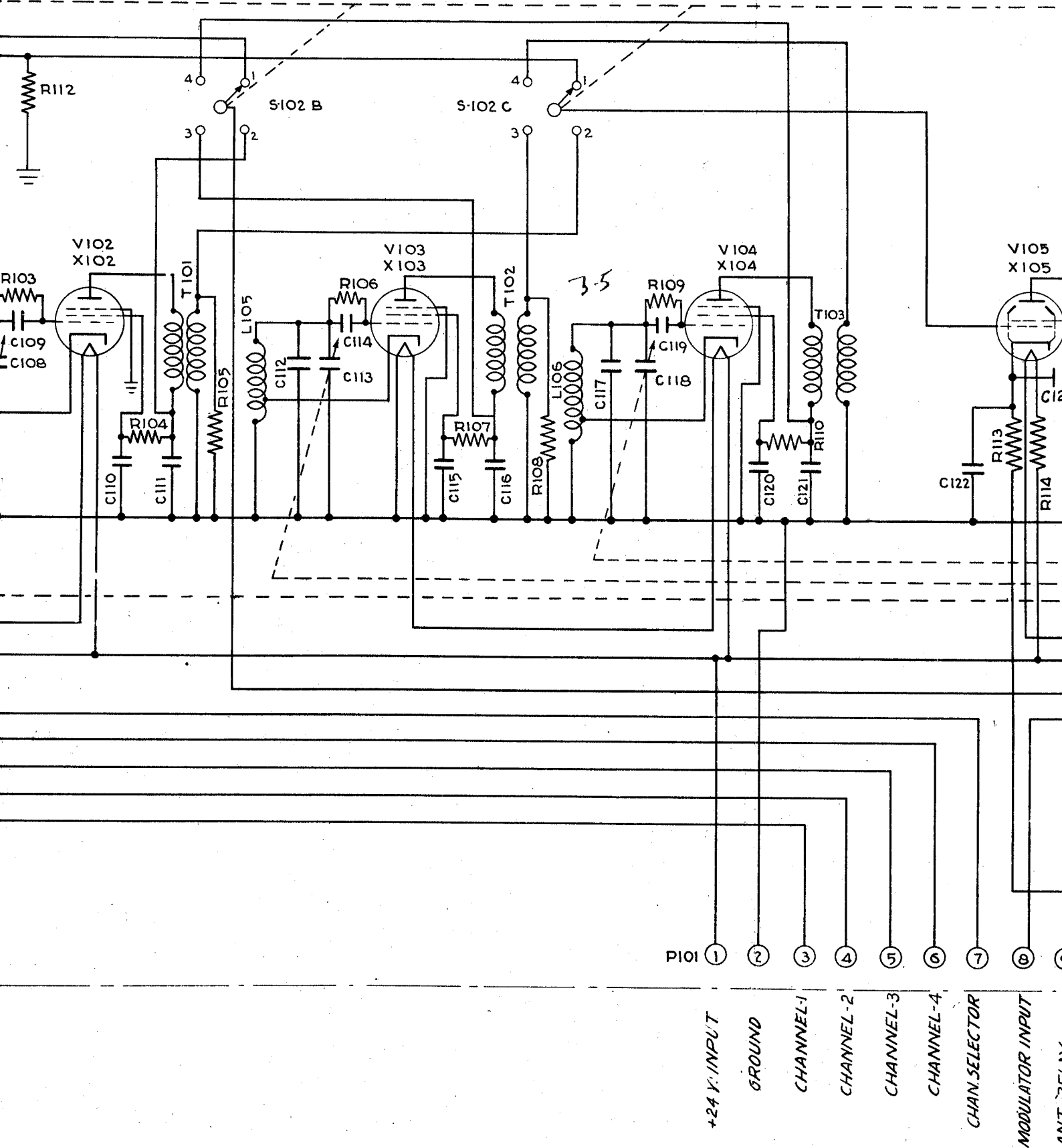




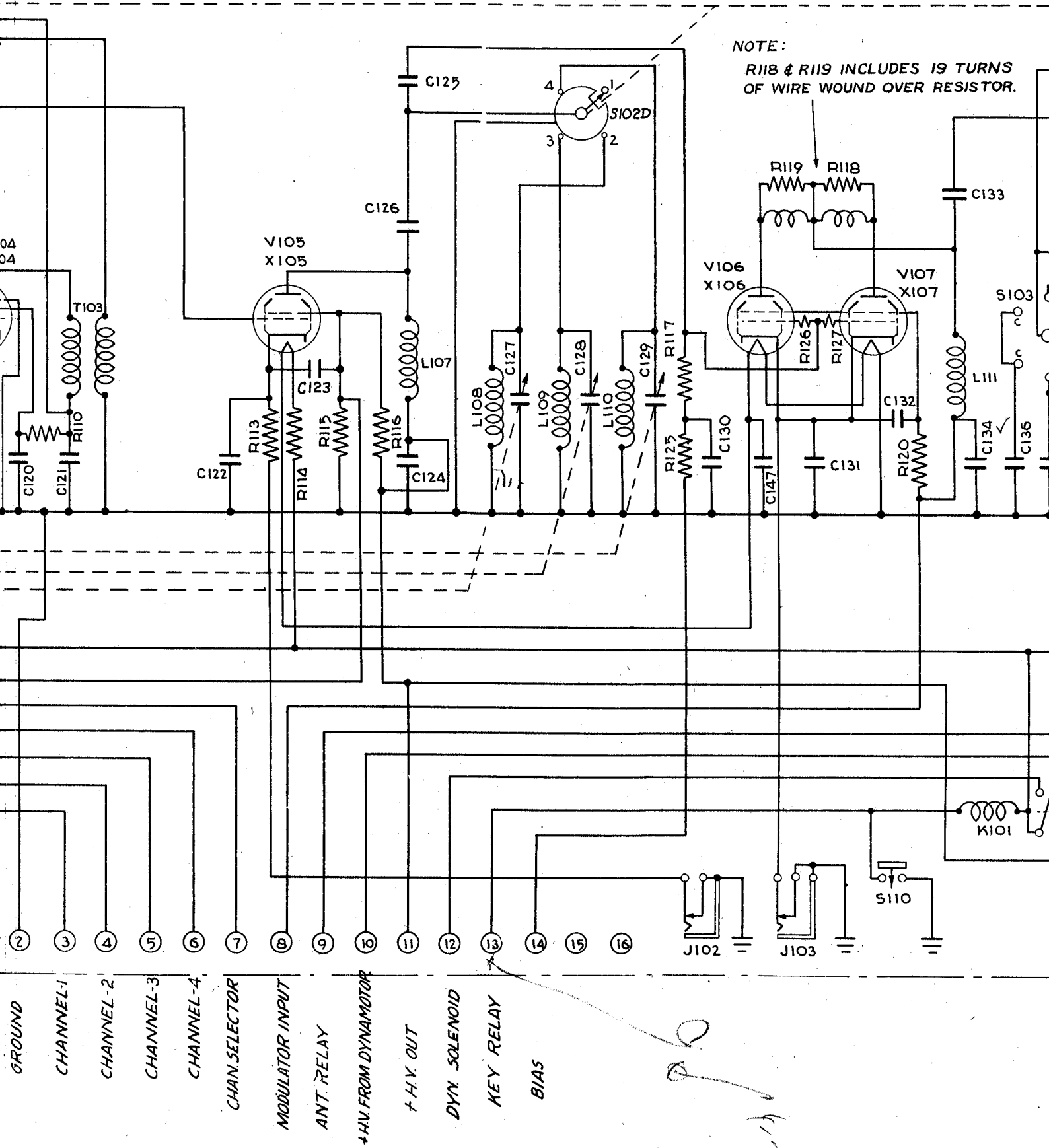


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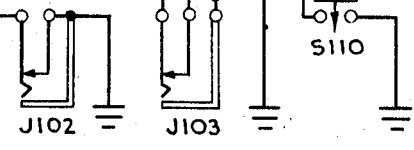






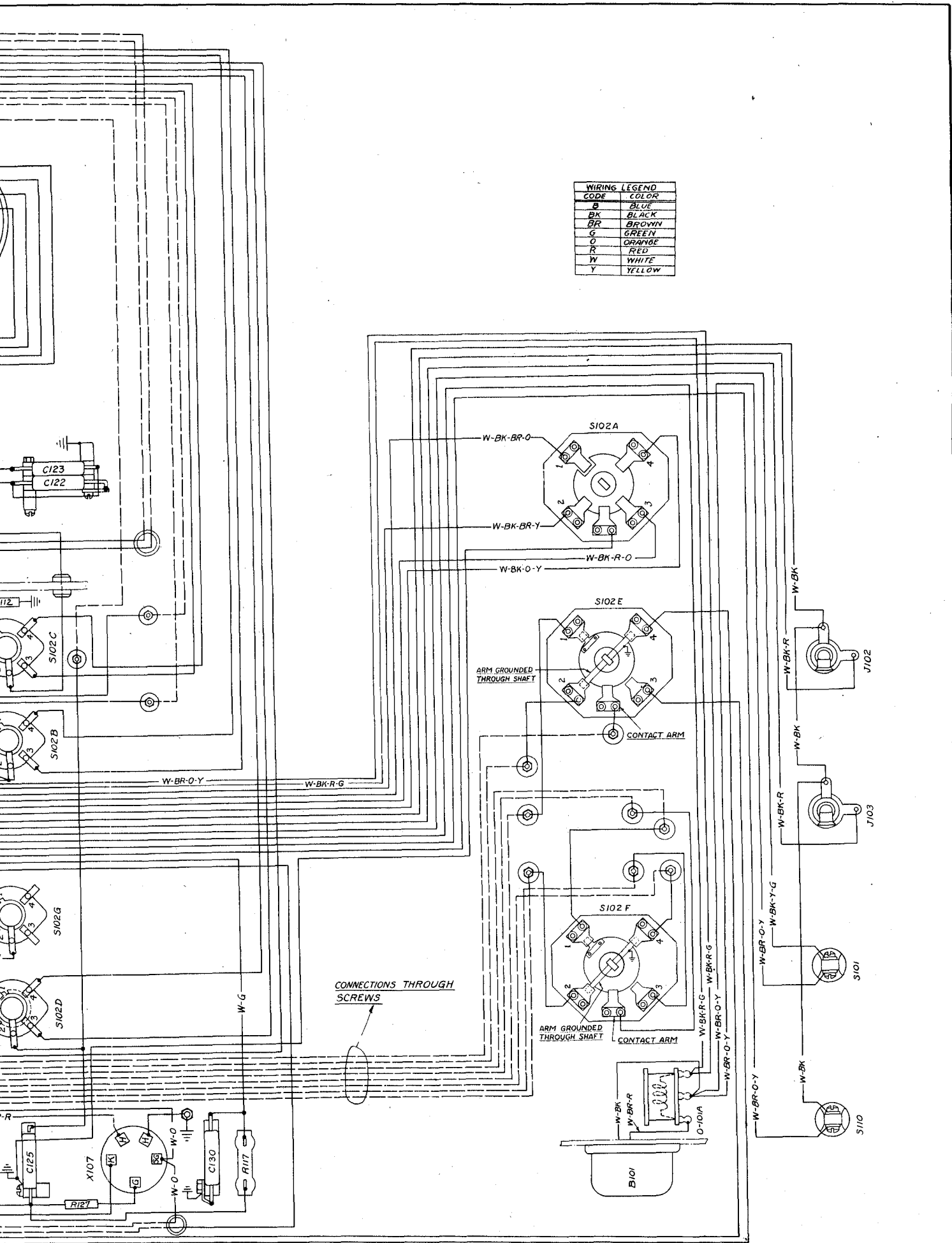
NOTE:  
 R118 & R119 INCLUDES 19 TURNS  
 OF WIRE WOUND OVER RESISTOR.

- 2 GROUND
- 3 CHANNEL-1
- 4 CHANNEL-2
- 5 CHANNEL-3
- 6 CHANNEL-4
- 7 CHAN. SELECTOR
- 8 MODULATOR INPUT
- 9 ANT. RELAY
- 10 +H.V. FROM DYNAMOTOR
- 11 +H.V. OUT
- 12 DYN. SOLENOID
- 13 KEY RELAY
- 14 BIAS
- 15
- 16



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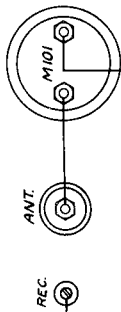
WIRING CODE	LEGEND COLOR
B	BLUE
BK	BLACK
BR	BROWN
G	GREEN
O	ORANGE
R	RED
W	WHITE
Y	YELLOW

CONNECTIONS THROUGH SCREWS

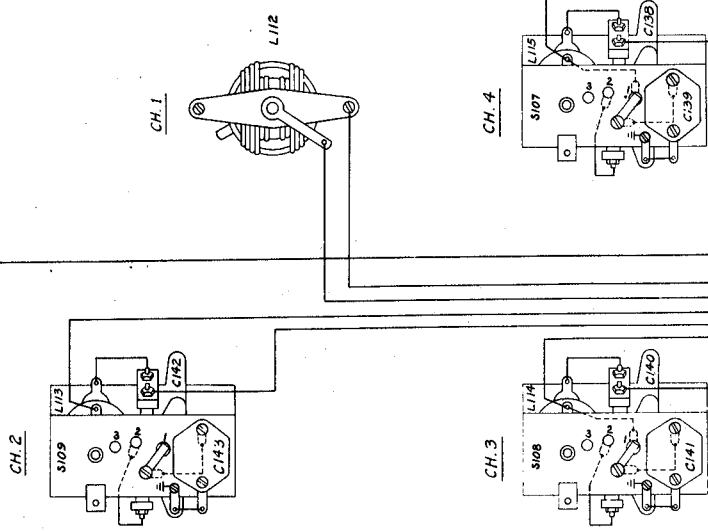
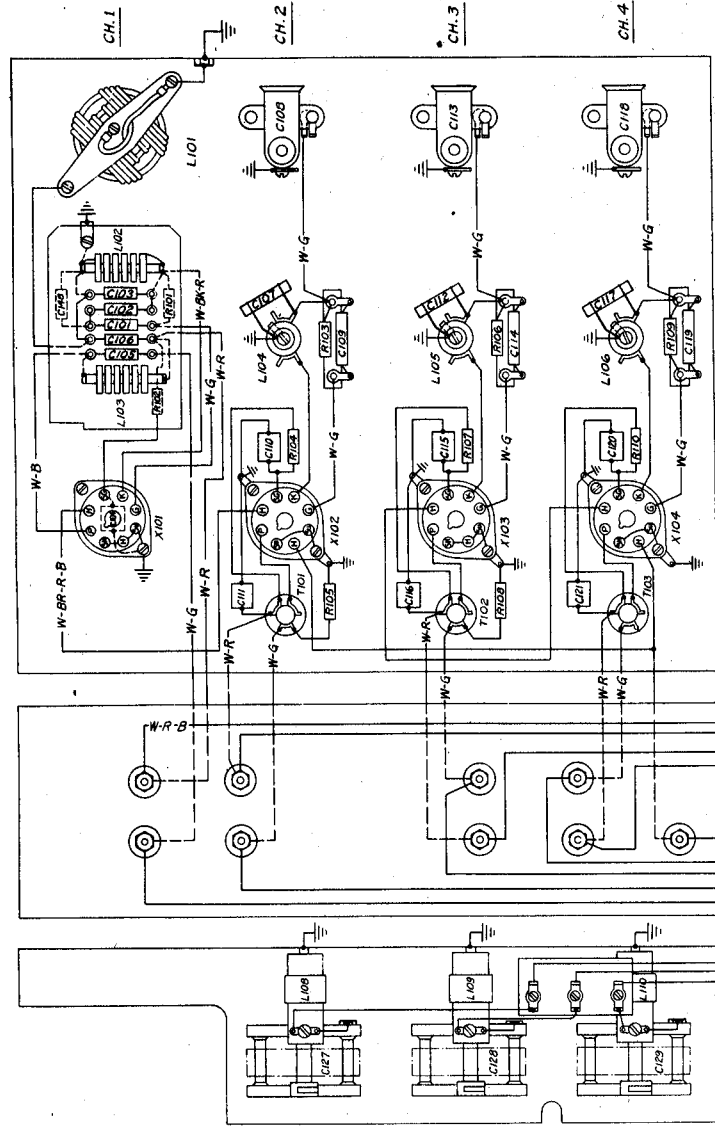
FIGURE 12—WIRING DIAGRAM TYPE TA-12 C TRANSMITTER





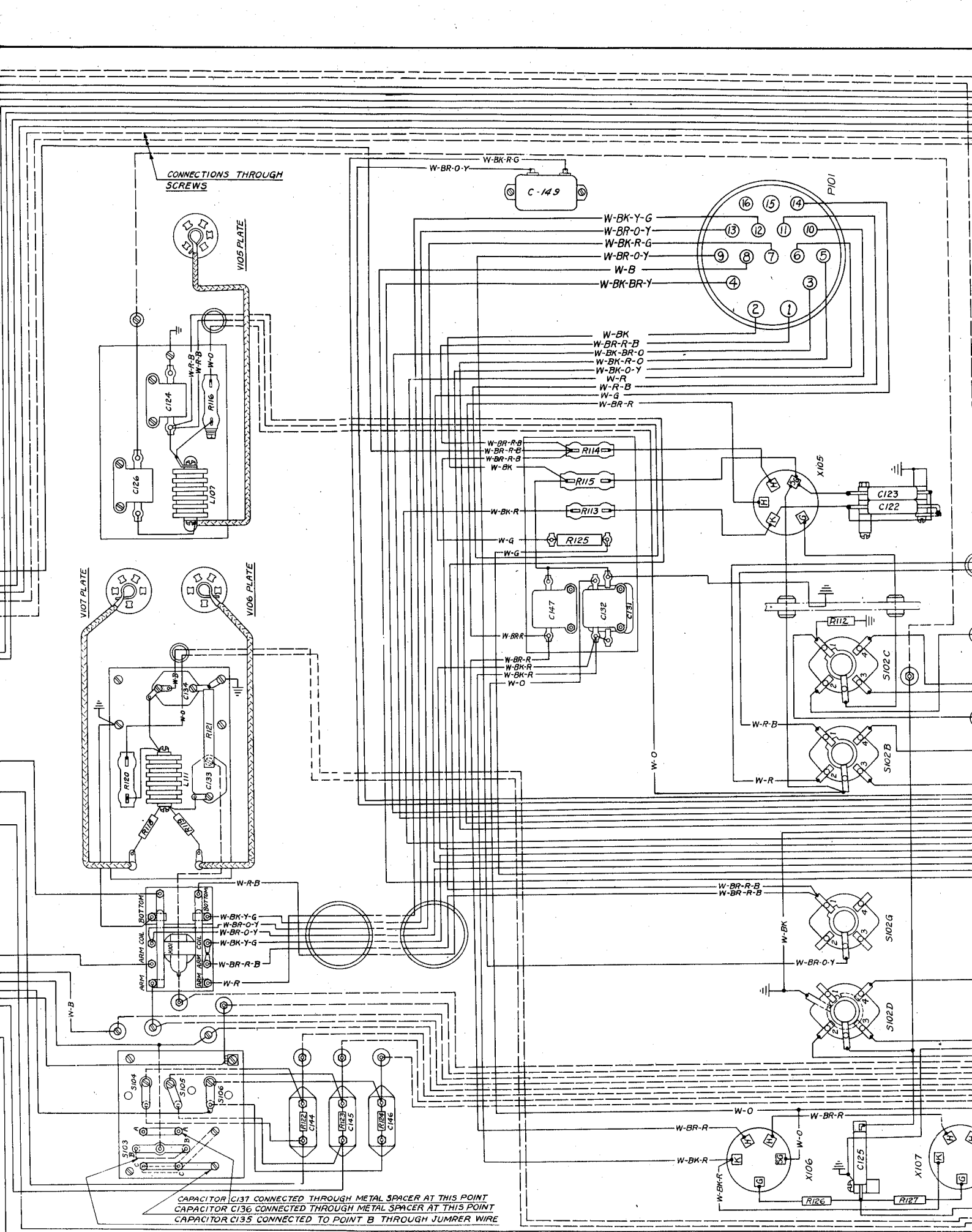


OSCILLATOR SECTION



VICT PLATE





CONNECTIONS THROUGH SCREWS

VIO5 PLATE

VIO7 PLATE

VIO6 PLATE

CAPACITOR C137 CONNECTED THROUGH METAL SPACER AT THIS POINT  
 CAPACITOR C136 CONNECTED THROUGH METAL SPACER AT THIS POINT  
 CAPACITOR C135 CONNECTED TO POINT B THROUGH JUMPER WIRE







FREQUENCY CALIBRATION  
BENDIX TYPE TA-12 C TRANSMITTER

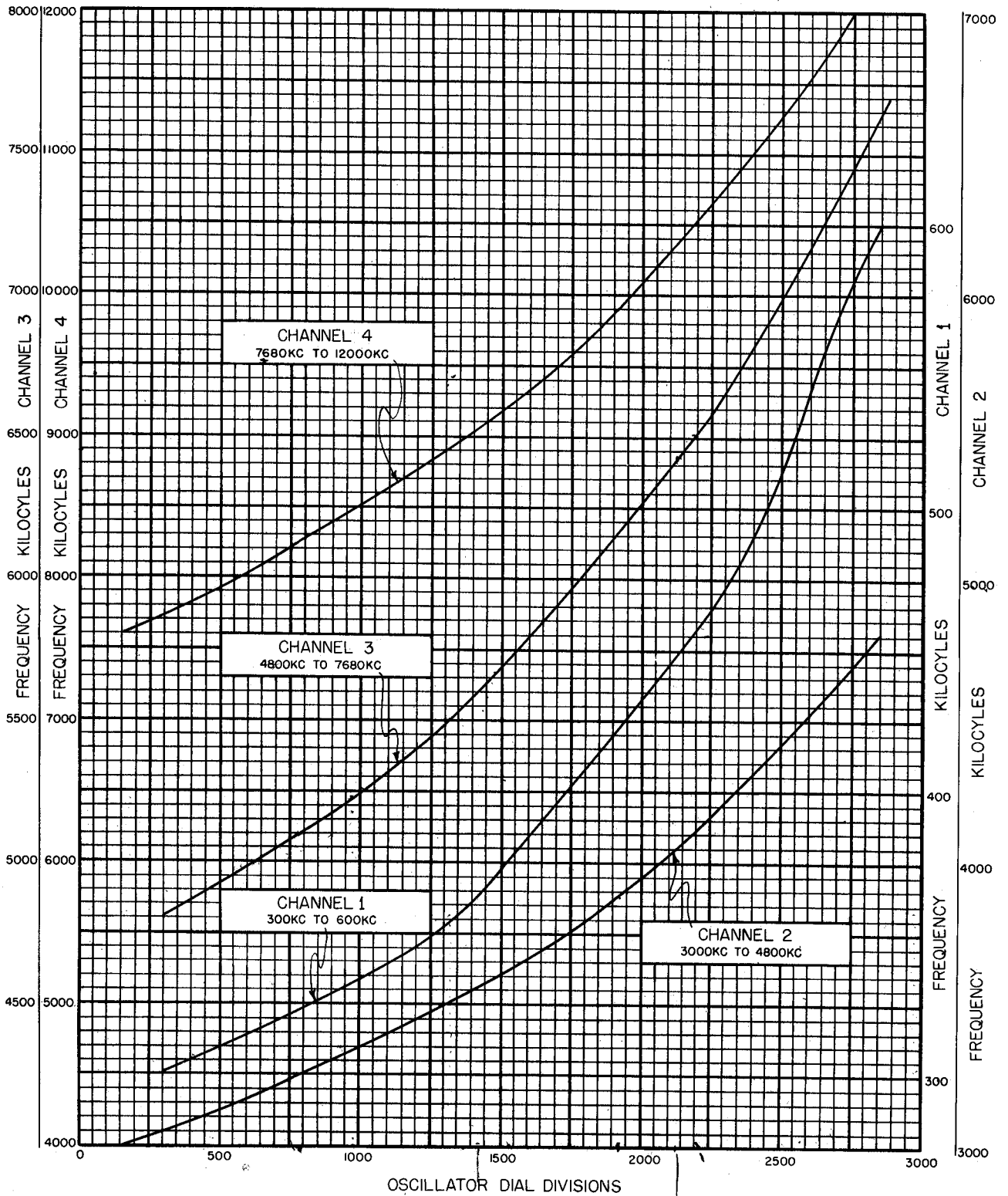


FIGURE 13—FREQUENCY CALIBRATION TYPE TA-12 C TRANSMITTER

