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INSTRUCTION BOOK

FOR

MODEL TA-12B & TA-12C

AIRCRAFT TRANSMITTING EQUIPMENT

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BENDIX RADIO CORPORATION
BALTIMORE, MARYLAND

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INSTRUCTION BOOK
for
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1. INTRODUCTION

1-1. FUNCTION

The Bendix Model TA-12B Aircraft Transmitting Equipment comprises a remotely controlled, four channel, 40-watt output, master oscillator type transmitter; together with additional equipment necessary to obtain efficient operation of the transmitter proper. The four channels provide operation in the frequency ranges of 300 to 600 Kcs and 3,000 to 7,000 Kcs. Facilities are provided for telephone, CW, or MCW telegraph operation.

The Model TA-12C Aircraft Transmitting Equipment is identical with the Model TA-12B except for the frequency range, which is 300 to 600 Kcs and 3,000 to 12,000 Kcs for the Model TA-12C.

1-2. COMPOSITION

Each model TA-12B or TA-12C Aircraft Transmitting Equipment consists of the following major components:

Item	*Quantity*	*Description*	*Weight*
A	1	Type TA-12B or TA-12C Aircraft Transmitter, complete with shockmount and one set of vacuum tubes (4-12SK7, 3-807).	34.5 lbs.
B	1	Type MP-28B Power-Supply Unit, complete with shockmount and one set of vacuum tubes (1-6N7, 1-6F6, 2-807).	26.5 lbs.
C	1	Type MT-53B Antenna Loading Unit.	5 lbs.

1-3. ADDITIONAL EQUIPMENT REQUIRED

The following additional equipment is required for a complete installation:

Item	*Quantity*	*Description*	*Weight*
D	—	Interconnecting Cables	Varies with type of aircraft.
E	—	Junction Boxes	Varies with different installations
F	1	Type MT-51B Remote Control box or equivalent.	1.3 lbs.
G	1	24/28-V DC Power Source.	.
H	1	Antenna System (Details of antenna system vary with different installations).	.
*I	1	Type MT-66A Artificial Antenna for low frequency operation.	.
*J	1	MT-31C Tuning Meter	.

* NOTE: This equipment is used for tuning the transmitter and is not permanently installed in the aircraft.

1-4. PERFORMANCE CHARACTERISTICS

1-4-1. POWER OUTPUT

The transmitter delivers 40 watts of power into an antenna consisting of 10 ohms resistance in series with 250 Mmf capacitance. The actual radiated power output will depend on the antenna characteristics of the particular installation involved.

1-4-2. FREQUENCY COVERAGE

Operation of the transmitter over the rated frequency range is provided for by four channels, as shown in the following table:

Channel No.	*Model TA-12B Frequency Range*	*Model TA-12C Frequency Range*
1	300 to 600 Kcs	300 to 600 Kcs
2	3000 to 4800 Kcs	3000 to 4800 Kcs
3	4000 to 6400 Kcs	4800 to 7680 Kcs
4	4370 to 7000 Kcs	7680 to 12,000 Kcs

1-4-3. FREQUENCY STABILITY

The maximum frequency deviations under varying electrical and mechanical conditions are indicated in the following table:

a. Change of any or all tubes	.1%
b. Change of antenna tuning to produce a 25% change in antenna current	.03%
c. 10% simultaneous change of plate and filament voltages	.02%
d. Normal keying	.01%
e. With any 20° temperature change in the range of minus 30°C to plus 50°C	.05%
f. Relative humidity change from 20% to 80%	.05%
g. With ½ hour of vibration at an acceleration of 10g	.05%

1-4-4. Operating Temperature Limits

The transmitting equipment is designed to maintain established operating conditions over the temperature range from minus 30°C to plus 50°C.

1-5. ANTENNA REQUIREMENTS

The transmitter, in conjunction with the Type MT-53B Antenna Loading Unit, will operate into antennas whose characteristics fall within the following limits:

Frequency	*Reactance (Capacitive)*	*Resistance*
300 to 600 Kcs	6000 Ohms (Max.)	0 to 20 Ohms
3000 to 7000 Kcs	7000 Ohms (Max.)	2 to 50 Ohms

1-6. PRIMARY POWER REQUIREMENT

The transmitting equipment is designed for normal operation with 25 volts DC at the input terminals of the Type MP-28B Power Supply Unit but will operate on any DC power supply ranging from 20 to 28 volts, with corresponding changes in output power. The equipment is rated for intermittent service; 5 minutes on—5 minutes off. The power consumption is 16.5 amperes with 25 volts at the terminals of the Type MP-28B Power Supply Unit.

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2. DESCRIPTION

2-1. MECHANICAL

2-1-1. Type TA-12B or TA-12C Transmitter Unit

The component parts of the transmitter are assembled in a unit approximately 15⅛″ wide, 10¼″ high, and 6¾″ deep. This unit fits in a shockmounted aluminum case. The case and shockmounts are held in two mounting bases by means of Dzus fasteners. The mounting bases should be permanently installed in the aircraft. Outline and mounting dimensions of the transmitter and its mounting bases are shown in Figure 18.

The transmitter unit is composed of two main subassemblies mounted on a front panel and a third subassembly mounted to the rear of the other two. The oscillator assembly on the left side of the unit contains all of the oscillator circuits and a part of the intermediate power amplifier circuits. The coil and capacitor assembly on the right side of the unit contains the tuning elements for the power amplifier output circuits.

The chassis assembly, which is mounted to the rear of the other two, contains the balance of the circuits, including the channel selector switch.

The tuning controls, antenna ammeter, channel selector switch control, meter jacks and antenna posts are located on the front panel.

The power plug is on the left side of the unit and a door in this side of the case provides clearance for the plug when removing the transmitter.

The oscillator tuning dials, the antenna tuning dial for channel 1, and the loading dials for channels 2, 3, and 4 are provided with locks to maintain the proper settings after the transmitter is tuned.

2-1-2. Type MP-28B Power Supply Unit (Refer to Figures 6, 7, and 8)

The component parts of the Power Supply Unit are assembled on a shockmounted chassis. This chassis, with the shockmounts, is attached to a mounting base with snap fasteners. The base is permanently attached to the aircraft.

The power plug and the screw driver adjustment for sidetone level are located on the front of the chassis. The fuses are located on the left side behind a small removable plate.

The tubes and the dynamotor are mounted on top of the chassis. The tubes are accessible by removing the cover which is held in place by two Dzus fasteners.

2-1-3. Type MT-51B Remote Control Unit

Figure 10 identifies all controls located on the panel of the Type MT-51B Remote Control Unit, and also serves to identify and locate component electrical parts within the unit. Access to the interior may be had by loosening the screws located at the four corners of the front panel and lifting the control unit from its base.

2-2. ELECTRICAL

2-2-1. Oscillator Circuits (Refer to Figures 22 and 23)

Each of the four oscillators consists of a 12SK7 tube (V101, V102, V103, V104) with its associated circuits. In the oscillator for channel 1, the frequency is controlled by the variometer L101, and the tuning capacitors C148, C102, and C103. This circuit operates on the same frequency as the transmitter output. The oscillators for channels 2, 3, and 4, operate on one-half the output frequency. The capacitor C148, provides for temperature compensation of the channel 1 oscillator frequency.

In the oscillator for channel 1, grid bias is obtained by means of the grid blocking capacitor C101 and the grid leak R101. The cathode current flows through the RF choke L102. The plate of V101 is impedance coupled to the grid of the IPA through the blocking capacitor C105, the plate choke L103, and the channel switch S102C.

The frequency of the oscillator for channel 2 is controlled by the variable capacitor C108, the fixed capacitor C107, and the fixed inductance L104. The bias for this oscillator is obtained with the grid blocking capacitor C109 and the grid leak R103. The cathode returns to ground through the tap on L104. The plate of this oscillator is connected to the grid of the IPA through the band pass transformer T101 and the channel switch S102C.

The resistor R105 provides the proper load on T101 for obtaining suitably flat response over the oscillator frequency range of 1500 to 2400 Kcs.

The oscillators for channels 3 and 4 are identical to the one for channel 2, except for the inductance of their respective coils, L105 and L106.

The components of the oscillators for channels 2, 3, and 4 have very low temperature coefficients which eliminates the necessity for temperature compensation.

The channel switch S102B connects the plate voltage to the oscillator circuit corresponding to the channel being used.

2-2-2. IPA CIRCUITS (Refer to Figures 22 and 23)

The IPA consists of one Type 807 tube, V105, and its associated circuits. For channel 1 this tube is used as an untuned amplifier with impedance coupling in the plate and grid circuits.

For channels 2, 3, and 4 the IPA serves as a frequency doubler to provide excitation for the PA at twice the oscillator frequency. Section S102D of the channel switch selects the proper circuit for the desired channel. RF choke L107 provides the impedance coupling for channel 1. The coil L108 and the capacitor C127 provide the impedance for channel 2. Channels 3 and 4 use C128 and L109, and C129 and L110 respectively.

The capacitors C127, C128, and C129 are ganged with their respective oscillator capacitors to permit the use of a single tuning control for each channel. The values of inductance and capacitance for these IPA plate circuits have been chosen so that they will be tuned to the 2nd harmonic of the oscillator frequency over the entire band.

The switch section S102D is arranged so that it grounds the unused IPA plate coils.

The IPA screen voltage is obtained from the HV supply by means of the voltage dropping resistors R115 and R116. This voltage divider also provides the plate and screen voltages for the oscillator tubes.

The heater of the IPA is connected in series with R114 and the heaters of the two PA tubes V106 and V107 to permit operation from a 24-volt supply.

2-2-3. POWER AMPLIFIER CIRCUITS (Refer to Figures 22 and 23)

The power amplifier consists of two Type 807 tubes (V106, V107) operated in parallel. The resistors R127 and R126, in the grid circuit, and R118 and R119, in the plate circuit, provide parasitic suppression.

The grid bias for the PA is obtained from the negative HV terminal in the Type MP-28B Power Supply Unit through the grid leak and filter composed of R117, R125, and C130.

The plates of the PA tubes are shunt fed through the RF choke L111. The capacitor C133 isolates the plate voltage from the output circuits.

The PA output circuit is a modified pi network consisting, for channel 1, of the variometer L112 in series with the loading coil in the Type MT-53B Antenna Loading Unit, the capacitor bank C135, C136, C137, and the capacitance of the antenna.

The circuits for channels 2, 3, and 4 are similar except that both the coils and capacitors are continuously variable. On channels 2, 3, and 4, series antenna capacitors (C144, C145, C146) may be used to permit operation with antennas which have inductive reactance or small capacitive reactance.

This type of output circuit makes it possible to operate the transmitter into a wide range of antennas with efficient power transfer.

The modulator tubes, modulation transformer, and the low level amplifier stages are located in the Type MP-28B Power Supply Unit.

2-2-4. CHANNEL SWITCH (Refer to Figures 22 and 23)

Section S102A of the channel switch controls the positioning of the entire switch. The power for the motor, B101, connects to ground through this section and the motor rotates until the open segment breaks the motor current, thereby stopping the movement of the switch at the position determined by the setting of the remote control switch.

A solenoid operated clutch (O-101A) is provided with the motor to prevent overshooting due to the motor coasting after the power is removed. This solenoid is connected in series with the motor so that it is energized only when the motor is running.

Switch sections S102B, C, D, E, F, and G select the proper circuits for each stage of the transmitter.

2-2-5. ANTENNA RELAY

This relay keys the plate voltage of the transmitter on CW and MCW, switches the antenna from the transmitter to the receiver antenna post, and grounds the receiver connection when the transmitter is on. An additional contact is provided to energize the dynamotor starting solenoid in the Type MP-28B Power Supply Unit to provide push-to-talk operation when using radio telephone.

Switch S110 is provided to energize the antenna relay for operating the transmitter without the use of the remote control circuits.

2-2-6. METERS

The ammeter M101 on the front panel indicates the antenna current at the transmitter output terminal. The two jacks J102 and J103 provide meter connections for measuring the IPA and PA cathode currents. The MT-31C Tuning Meter, or the equivalent, should be used for measuring these currents.

2-2-7. POWER CIRCUITS (Refer to Figures 24 and 25)

The power supply section of the Type MP-28B Power Supply Unit contains one dynamotor with its associated starting solenoid K202, fuses, and filter circuits. The negative side of the dynamotor primary is grounded to the chassis, but the negative side of the secondary connects to ground through the resistor R209 to provide bias for the PA.

The field of the dynamotor is connected in parallel with the winding of the starting solenoid to eliminate any possibility of the power being applied to the armature without field excitation.

2-2-8. AUDIO CIRCUITS (Refer to Figures 24 and 25)

The audio system of the Type MP-28B Power Supply Unit consists of the two amplifiers V201 and V202, and the modulators V203 and V204. The tube complement is:

V201	—	6N7
V202	—	6F6
V203	—	807
V204	—	807

A relay, K203, is provided for switching the microphone transformer to the grid of either V201 or V202. The provision permits the use of an external preamplifier if desired. When this relay is not energized, the input transformer is connected to the second amplifier V202, and the first amplifier V201 is biased to cut off.

An extra winding on the modulator driver transformer, T203, provides sidetone through the potentiometer R210.

The relay, K201, is used to convert the first amplifier, V201, to an audio oscillator to provide modulation and sidetone for MCW operation and side-tone only, when using CW. When this relay is energized for providing oscillation, feedback from plate to grid is obtained from R214 and R215.

Relay K204 opens the cathode circuit of the modulators during CW operation to prevent modulation of the transmitter output.

2-2-9. TYPE MT-51B REMOTE CONTROL UNIT (Refer to Figure 26)

Remote control operation of the Model TA-12B or TA-12C Transmitting Equipment is obtained by means of a Type MT-51B Remote Control Unit or its equivalent. This unit consists of four switches mounted in a small box.

The CHANNEL switch is a single-pole, four-position switch for selecting the desired channel of the transmitter.

The EMISSION switch controls the type of emission. Its three positions are MCW, CW, and R/T. The last position is the radio telephone position.

The main power switch controls all circuits in the equipment.

The SEND switch has two positions, both of which energize the transmitter. One of these positions is non-locking to permit "push-to-talk" radio-telephone operation, while the other position is locking and permits continuous transmission.

The wiring to the EMISSION and SEND switches is arranged to provide the following operations:

A. With the EMISSION switch in the CW position, the SEND switch energizes the dynamotor starting solenoid K202 in the Type MP-28B Power Supply Unit. The telegraph key then controls the transmitter by means of the antenna relay K101 in the Type TA-12B or TA-12C Transmitter.
When in the CW position, relay K204 in the Type MP-28B Power Supply Unit opens the cathode circuit of the modulators V203 and V204, thus preventing modulation of the transmitter.
When in the CW position, relay K201 in the Type MP-28B Power Supply Unit converts the first audio amplifier tube V201 in the power supply unit to an audio oscillator to provide sidetone.

B. The operation on MCW is similar to that for CW except that relay K204 in the modulator cathode circuit is not energized, which permits the audio oscillator to modulate the transmitter.

C. With the EMISSION switch in the R/T position, the SEND switch energizes the antenna relay K101 in the Type TA-12B or TA-12C Transmitter which in turn starts the dynamotor and places the transmitter in operation. With this type of emission, the relay K201 in the Type MP-28B Power Supply Unit is not energized and the first audio tube may be used as a microphone amplifier.

2-2-10. TYPE MT-53B ANTENNA LOADING UNIT (Refer to Figures 12 and 27)

The Type MT-53B Antenna Loading Unit consists of a tapped loading coil and a vacuum relay. The relay is arranged to short circuit the coil except when transmitting on channel 1. This operation is obtained by means of interlock contacts on the channel switch in the Type TA-12B or TA-12C Transmitter.

The Type MT-53B Antenna Loading Unit is provided with two spheres which should be mounted on the highest voltage taps of the coil. These spheres are to aid in eliminating corona emission from the voltage taps. The larger of the two should be on the tap at the end of the coil which is connected to the vacuum relay. The smaller of the two should be on the adjacent tap. When the unit is used with an antenna that has such a large capacitance that the coil connector is placed on either of the taps which normally have corona balls mounted on them, the balls may be placed on any other taps.

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3. INSTALLATION

As the Type TA-12B and TA-12C Transmitters, Type MT-53B Antenna Loading Unit, and the Type MP-28B Power Supply Unit are provided with complete electrical remote control, they may be mounted in the most convenient location with respect to the antenna system and other radio equipment. It is desirable that the leads from the antenna to the loading unit and from there to the transmitter be as short and direct as possible.

When it is desired to operate the equipment on low frequencies into antennas whose capacitance is low, special precautions must be taken to allow for the high voltages encountered.

The main power leads to the Type MP-28B Power Supply Unit should have as low a resistance as possible. Any voltage drop in these leads will materially reduce the power output of the transmitter. In any case, leads no smaller than #10 should be used. Not more than 1.5 volts drop between main battery connection and dynamotor unit terminals is allowable.

The Type TA-12B and TA-12C Transmitters and Type MP-28B Power Supply Unit are provided with mounting plates which should be permanently attached to the structure of the airplane. They should be mounted so that they will be in a horizontal position when the plane is in normal flying attitude. (Refer to Figures 18 and 19)

The flexible cables to all units should have a free length of at least two feet and should have sufficient slack to eliminate all interference with the shock-mounting.

The shockmounts for the equipments are fastened to the mounting plates with quick action fasteners so that the equipment is removable for servicing and replacement.

Clearance must be provided around the Type TA-12B or TA-12C Transmitter mounting to make the power plug accessible and to permit the removal of the transmitter from its case to make tuning adjustments. (See Figure 18.) Clearance must also be provided around the Type MP-28B Power Supply Unit to permit access to the fuse panel. (Refer to Figure 19)

The Type MT-53B Antenna Loading Unit is also provided with shockmounts. The unit is fastened to

the structure of the aircraft by four number 8 machine screws run through the shockmounts. (Refer to Figure 21)

A list of interconnections between the various units of the Model TA-12B or TA-12C Aircraft Transmitter is shown in Figure 30. In using this chart, connect together all terminals on the equipment whose numbers appear in a horizontal line on the chart. For example, connect terminal number 2 on the Type TA-12B or TA-12C Aircraft Transmitter to terminal number 2 on the Type MP-28B Power Supply Unit and also to terminal number 8 on the Type MT-51B Remote Control box.

NOTE: As shown on the list of interconnections, terminal numbers 13 and 5 of the Type MP-28B Power Supply Unit, terminal number 6 of the Type MT-51B Remote Control box, and terminal number 1 of the Type TA-12B or TA-12C Transmitter, should all be connected together. This connection makes the transmitter suitable for use with a low-level output microphone. If a high-level output microphone or external microphone amplifier is to be used, the connections to terminal number 13 of the Type MP-28B Power Supply Unit should be omitted.

There is no provision for DC microphone supply in either the high-level or low-level position, hence, a dynamic type microphone must be used.

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4. INITIAL ADJUSTMENTS

4-1. PRELIMINARY OPERATIONS

4-1-1. OSCILLATOR CIRCUITS

Set the OSC. TUNING dial for each channel to the reading corresponding to the desired frequency. The frequency calibration curves (Figures 28 and 29) will permit setting the frequency to approximately ±.5%. When this accuracy is not sufficient, a frequency check must be obtained with an external frequency meter having the required accuracy.

The following tabulation shows the frequency coverage of each channel.

Channel	*Model TA-12B*		*Model TA-12C*	
	Min. Freq.	*Max. Freq.*	*Min. Freq.*	*Max. Freq.*
1	300 Kcs	600 Kcs	300 Kcs	600 Kcs
2	3000 Kcs	4800 Kcs	3000 Kcs	4800 Kcs
3	4000 Kcs	6400 Kcs	4800 Kcs	7680 Kcs
4	4370 Kcs	7000 Kcs	7680 Kcs	12000 Kcs

4-1-2. POWER AMPLIFIER

4-1-2-1. Channel 1

A. Set the CHANNEL 1 TUNING dial on 0.

B. Set the CHannel 1 LOADING switches in position A-A. These switches are in the rear of the transmitter and are accessible from the top when the transmitter is partially removed from its case.

C. Set the connector on tap #1 of the loading coil of the Type MT-53B Antenna Loading Unit. Tap #1 is adjacent to the left side of the unit and is accessible through the door on the front of the unit.

4-1-2-2. Channels 2, 3, and 4

A. Rotate the output TUNING dial of the desired channel as far as possible in a *counterclockwise* direction, thus placing the entire load coil in the circuit.

B. Set the antenna capacitor switches (S104, S105, S106) to the OUT position. These switches are on the same mounting board as the CHannel 1 LOADING switches.

C. Set the plate capacitor switches (S109, S108, S107) to the OUT position. These are located on the rear plates of the respective output coil and capacitor assemblies. They are accessible when the transmitter is removed from its case.

D. Set the output LOADING dial of the desired channel to 50, which corresponds to maximum capacitance.

E. Connect a Type MT-66A Artificial Antenna in place of the trailing wire antenna. Adjust this unit to have the same electrical characteristics as the trailing wire.

4-1-3. CONTROL AND METERING CIRCUITS

A. Set the EMISSION switch on the Type MT-51B Remote Control Box to the R/T position.

B. Remove the screw cap covering the LOCAL-REMote control switch on the front panel of the Transmitter.

C. Insert the plug of the Type MT-31C Tuning Meter in the jack marked P.A.P. This jack is in the PA cathode circuit.

D. Connect the Type MT-53B Antenna Loading Unit output to the antenna which will be used for channel 1.

E. Set the CHANNEL SELECTOR knob on the Type TA-12B or TA-12C Transmitter to channel 1.

F. Apply filament voltage by placing the main power switch, on the remote control, in the ON position.

4-2. FINAL OPERATIONS

IMPORTANT NOTE: The output circuit of the Type TA-12B or TA-12C Transmitter is a modified pi network. The series inductance and the shunt capacitance in the transmitter are both variable. The plate loading of the PA is determined by the relative values of the inductance and capacitance. If the output circuit is tuned for minimum plate current with a large value of inductance, the tubes will be very lightly loaded. With this condition the loading may be increased by decreasing the value of inductance and retuning with a larger value of capacitance.

4-2-1. CHANNEL 1

Set the CHANNEL SELECTOR switch to 1, and press the KEY switch on the lower right corner of the front panel of the transmitter. The PA plate current should rise to approximately 250 MA if the voltage at the terminals of the Type MP-28B Power Supply Unit is approximately 25V.

Rotate the CHANNEL 1 output TUNING dial slowly from 0 to 50. If there is no indication of a dip in plate current, release the key, move the connection one tap on the Type MT-53B Antenna Loading Unit coil and rotate the CHANNEL 1 TUNING dial through its range again. A tap position on the coil will be found that will permit tuning for minimum plate current. When approaching minimum plate current the antenna ammeter should begin to indicate and should reach a maximum at approximately the same point where the plate current is at a minimum.

If the plate current falls to a very low value the CHannel 1 LOADING switches should be moved to position B-B or C-C and the circuit retuned for minimum plate current. If this current is low on one setting of the loading switches and above 210 MA for the next position, the setting for the lower plate current should be used. The plate current should never be set at more than 210 MA.

If the battery voltage is lower than 25 volts, as measured at the Type MP-28B Power Supply Unit terminals, the PA plate current should be set proportionately lower than 210 MA during the tuning process. If the battery voltage will exceed 25 volts when the aircraft generator is charging, the loading should be adjusted to such a value that the PA plate current will never exceed 210 MA.

4-2-2. CHANNEL 2

Set the CHANNEL SELECTOR switch to 2, and press the KEY on the Type TA-12B or TA-12C Transmitter. Rotate the CHANNEL 2 LOADING dial slowly from 50 to 0, observing the PA plate current for any tendency to approach a minimum. If there is no dip in plate current or if the dip occurs at 0 on the dial, rotate the CHANNEL 2 TUNING dial clockwise and retune with the CHANNEL 2 LOADING dial until a true minimum is obtained. If a minimum is less than 210 MA (proportionately lower for low battery), rotate the CHANNEL 2 TUNING dial still further clockwise and retune. A setting should be found that will give a minimum plate current of 210 MA. Just as for channel 1, the loading should be adjusted so that the PA plate current will not exceed 210 MA if the battery voltage rises above 25 volts.

In order to obtain the proper loading, it may be necessary to connect the fixed plate capacitor in parallel with the variable by means of the switch S109 on the rear plate of the coil and capacitor assembly.

If the antenna has a small capacitive reactance, it may be necessary to connect the antenna series capacitor in the circuit by means of the switch S106 on the capacitor switch plate.

The antenna current should pass through maximum at approximately the same tuning point that gives minimum plate current.

4-2-3. CHANNELS 3 AND 4

The tuning procedure for channels 3 and 4 is similar to that for channel 2 except for channel 4 of the Type TA-12C Transmitter. On this channel, the loading should be adjusted to such a value that the PA plate current will be 175 MA instead of 210 MA, as used on the other channels.

4-2-4. GENERAL PRECAUTIONS

When tuning channels 2, 3, or 4, it is possible to tune to the 2nd harmonic of the desired signal under certain conditions of antenna constants and frequency. A wavemeter should be used to check the output frequency during the tuning procedure unless the operator has become sufficiently familiar with the equipment to avoid tuning to the harmonics.

When using a variable trailing wire antenna, the output tuning adjustments are made with the proper length of antenna reeled out. In flight, optimum transmission characteristics may be obtained by adjusting the length of the trailing portion of the antenna to obtain maximum antenna current.

When tuning up on the ground, the Type MT-66A Artificial Antenna should be used in place of the trailing wire. The settings of this antenna should be made approximately the equivalent of the trailing wire when in flight.

After completing the tuning procedure, be sure to lock the LOCAL-REMote switch with the screw cap. If this is not done, the CHANNEL SELECTOR cannot be operated from the remote position.

Disconnect the artificial antenna and reconnect the trailing wire antenna.

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5. OPERATION

5-1. GENERAL

After the final tuning procedure, the transmitter is ready for operation from the remote positions as described in the following paragraphs.

5-2. CW OPERATION

A. Place the EMISSION switch in the CW position and set the main power switch ON.

B. Set the CHANNEL selector switch to the desired channel.

C. Set the SEND switch in the locking position, which is with the switch handle toward the top of the control box.

D. Key the transmitter with the telegraph key.

5-3. MCW OPERATION

A. Place the EMISSION switch in the MCW position and set the main power switch ON.

B. Set the CHANNEL switch to the desired channel.

C. Set the SEND switch in the locking position.

D. Operate the telegraph key as desired.

5-4. RADIO TELEPHONE OPERATION

A. Place the EMISSION switch in the R/T position and set the main power switch ON.

B. Select the desired channel, by means of the CHANNEL switch.

C. Set the SEND switch in the locking position or hold it in the nonlocking position. Either position turns the transmitter on.

D. Modulate the transmitter by speaking into the microphone.

6. MAINTENANCE

6-1. ROUTINE INSPECTIONS

Routine inspection of each detail of the equipment should be made at intervals determined by the type of service in which the plane is flown.

All mountings should be inspected to see that they are rigidly attached to their supporting structures.

All relay and switch contacts should be inspected for rough or pitted contacts. If necessary, the surface should be smoothed carefully with a contact burnishing tool or Crocus cloth.

All interconnecting cables should be inspected to see that they are securely locked in their receptacles and to the junction box.

All tubes should be checked for proper seating in the sockets, and the hold-down clamps tightened.

If it is necessary to loosen any setscrews, other than those on the tuning dials, they should be coated with glyptal before tightening.

A complete operating test should be made before each flight.

6-2. DYNAMOTOR INSPECTION

The dynamotor should be inspected after 500 hours of service, or once a year, whichever period is shorter. Examine the brushes to see if they have worn properly and are free of hard spots. If such spots are apparent, replace the brush. Spotted brushes can be located by inspecting the commutator for grooves. Remove the bearings from the armature, clean with penetrating oil and carbon tetrachloride. Check bearings for tolerances and broken or chipped balls. Clean away all old grease and relubricate with *Royco, #6A Grease*, supplied by Royal Engineering Co., East Hanover, New Jersey, U. S. A. Wipe off dirt from the commutator, end bells, armature and housing. If the commutator does not have a smooth even surface, place the armature in a lathe and rotate it. Polish the faulty commutator with a piece of soapstone or take off a very thin cut (.003 inch). DO NOT USE EMERY CLOTH OR SANDPAPER. Remove all dust and dirt particles after polishing. A commutator should have a smooth polished surface free of dirt, grease or ridges. A commutator that is smooth and polished should not be turned down simply because it is discolored. Under normal conditions it should not be necessary to turn down the commutator before the expiration of 5,000 hours of service. After turning down, the commutator should be examined to determine if it will be necessary to undercut the mica separators. A small brush should be used to remove any foreign particles that remain between the commutator bars.

If the dynamotor is dismantled for service, it will be necessary to reassemble the brush holders carefully to be sure the brush slots are parallel to the commutator bars and that the holder does not rub on the armature. The setscrews that hold the brush holders in place should be coated with Glyptal before they are tightened. After assembly, the dynamotor should be run for a short period with the end bells removed to permit inspection for sparking or improper seating of the brushes.

6-3. LUBRICATION

6-3-1. GENERAL

All switch shafts and mechanical bearings are properly lubricated when assembled at the factory and should require little attention. However, a few drops of *Pioneer Instrument Oil #1*, supplied by Pioneer Instrument Co., Bendix, New Jersey, U. S. A., should be applied to shaft bearings if friction develops.

If it is necessary to lubricate switch contacts, a very small amount of *Royco #6A Grease* should be used.

6-4. SERVICING DATA

6-4-1. DC VOLTAGES

The following tables indicate the normal operating voltages for the Model TA-12B or TA-12C Aircraft Transmitting Equipment as measured with a voltmeter having a resistance of 1000 ohms per volt. In the RF

Radio Telephone Operation—No Modulation.
Type TA-12B or TA-12C Transmitter

Symbol	Function	Plate	Screen	Cathode	Filament	Fixed Grid Bias
V-101	Chan 1 Osc	250	135	0	12.6	.
V-102	Chan 2 Osc	250	135	0	12.6	.
V-103	Chan 3 Osc	250	135	0	12.6	.
V-104	Chan 4 Osc	250	135	0	12.6	.
V-105	IPA	535	265	29	6.3	.
V-106	PA	510	285	0	6.3	−24
V-107	PA	510	285	0	6.3	−24

Type MP-28B Power Supply Unit

V-201	(MCW Osc) Audio Amp.	295	.	5	6.2	.
V-202	Audio Amp.	300	300	18	6.2	.
V-203	Modulator	540	345	25	6.2	.
V-204	Modulator	540	345	25	6.2	.

The following is a typical set of data when operating into an antenna with the constants shown:

Channel	IPA Cathode MA	PA Cathode MA	Ant I	Ant C	Ant R
1	40	200	1.7 A	220 Mmf	4 ohms
2, 3, or 4	40	210	2.0 A	100 Mmf	10 ohms

stages, the voltage is measured at the low potential side of the RF Circuit. The voltages indicated are with 25 volts at the input terminals of the Type MP-28B Power Supply Unit.

The above figures will vary with different antennas. The figures shown for the antenna current represent the current into the antenna system. The antenna ammeter in the Type TA-12B and TA-12C Transmitter will indicate slightly more than this due to the shunt capacitance to ground of the antenna loading coil in the Type MT-53B Antenna Loading Unit.

6-4-2. PROCEDURE FOR REMOVING SUB ASSEMBLIES (Refer to Figures 13, 14, 15, 16, and 17)

If it is necessary to replace or service any parts not readily accessible, the following procedure should be used to dismantle the transmitter:

A. Remove all knobs and dial locks. When removing the knobs with locks, first tighten the lock then loosen the knob setscrew and remove the four mounting screws from the ring.

B. Remove the mounting nuts from the I.P.A.P. and P.A.P. jacks, LOCAL-REM. switch, and KEY.

C. Remove the handle from the right side.

D. Remove the connector between the antenna ammeter and the antenna relay.

E. Remove the connection to the REC. post.

F. Disconnect the bus wires that run from each loading capacitor to the chassis assembly and from each tuning coil to the chassis.

G. Disconnect the two wires that run from the channel 1 tuning variometer to the chassis assembly.

H. Remove the four screws located at the corners of the panel, the screw directly below the antenna ammeter, and the screw below the channel selector switch.

I. The front panel with the coil and capacitor assembly attached may now be removed from the rest of the transmitter.

J. To separate the panel from the coil and capacitor assembly, remove the last four screws from the front panel.

K. Remove the two cable clamps near the bottom of the IPA shield on the oscillator assembly.

L. Disconnect the twelve wires between the oscillator assembly and the chassis assembly Eight of these are located beneath the chassis and four above.

M. Remove the three screws that hold the PA shield to the oscillator assembly. This shield is located above the chassis between the IPA and PA tubes.

N. Remove the two screws which hold the flange of the chassis to the oscillator assembly. One of these is located near the end of the chassis and can be removed by a screw driver inserted from the rear between the chassis and the wiring to the power plug. The other screw, located at the right rear corner of the oscillator assembly, requires the use of an offset screw driver.

O. Remove the two screws that clamp the end chassis flange to the left side plate. These are located near the upper corners of the power plug.

P. Remove the four screws that mount the power plug, and remove the retaining ring from the back of the plug. When this ring is removed, the plug can be pulled back through the hole in the end shield. The plug must be handled carefully to avoid disturbing the arrangement of the component parts.

Q. The oscillator assembly can now be separated from the chassis assembly.

6-4-3. PROCEDURE FOR REMOVING BAND SWITCH MOTOR (Refer to Figures 2, 5, and 13)

If it is necessary to remove the band switch motor, B101, for servicing or repair, the following procedure should be used:

A. Disconnect the four wires that connect to the clutch field terminal board.

B. Remove the clutch field and armature assembly by taking out the four No. 4 screws which hold it in place.

C. Remove the four screws that hold the motor to its mounting bracket. The heads of these screws are on the opposite side of the bracket from the motor and the screws are tapped into the motor base. An offset screw driver is required to remove these screws.

D. After reassembling the motor on the chassis, check the operation to be sure the motor is properly installed. If the motor binds, loosen the mounting screws and shift the position of the motor to provide free operation.

6-4-4. PROCEDURE FOR REMOVING BAND SWITCH SHAFT (Refer to Figures 2, 5, and 13)

If it is necessary to replace any of the band switch sections, the shaft may be removed by the following procedure:

A. Remove the left side plate from the transmitter.

B. Disconnect the two wires that run from the main cable to the upper two terminals on the clutch field winding.

C. Remove the four screws that hold the switch assembly to the motor mounting bracket.

D. Remove the four screws that hold the motor mounting bracket on the chassis.

E. Remove the motor mounting bracket with the motor and clutch assembly.

F. Remove the pin that holds the spiral gear on the shaft. Also loosen the setscrew in this gear.

G. Remove the pin from the collar adjacent to the spiral gear.

H. The shaft may now be pulled out from the right end of the switch assembly. It is not necessary to remove the clutch yoke and pinion from the shaft.

I. When reassembling the switch, be sure the switch sections and rotors are properly oriented. The pins and setscrews should be coated with glyptal before tightening.

7. ELECTRICAL PARTS LIST

7-1. PARTS FOR TYPE TA-12B, REF. NO. 110D/101, AIRCRAFT TRANSMITTER UNIT

Symbol	Function	Description	Mfr's Desig.	Mfr.	Ref. No.	Bendix No.
		CAPACITORS				
C101	V101 Grid Blocking	500 Mmf, ±10%, 500V DCW, Mica	1467	2	110C/135	C56312-501
C102	V101 Voltage Divider Capacitor	.0015 Mfd, ±1%, 300V DCW, Zero temperature coefficient	1R	4	110C/136	BA30875
C103	V101 Voltage Divider Capacitor	.003 Mfd, ±1%, 300V DCW, Zero temperature coefficient	1R	4	110C/137	BA30876
C104	V101 Screen Bypass	.01 Mfd, ±10%, 300V DCW, Mica	1467	2	110C/26	C56312-103
C105	V101 Plate Coupling	.003 Mfd, ±10%, 300V DCW, Mica	1467	2	110C/66	C56312-302
C106	V101 Plate Bypass	Same as C104	.	.	.	.
C107	V102 Oscillator Grid Tank, Fixed	200 Mmf, ±1%, Zero temperature coefficient	816	8	110C/138	BA30907
C108	V102 Grid Tuning	400 Mmf, Max.	MC-400-S	16	110C/139	A28248
C109	V102 Grid Blocking	100 Mmf, ±10%, Zero temperature coefficient	910	8	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, ±10%, 600V DCW, Mica	4L-11010	4	110C/126	A13752-14
C123	V105 Screen Bypass	Same as C122	.	.	.	.
C124	V105 Plate Bypass	.01 Mfd, ±10%, 1200V DCW, Mica	4L-21010	4	110C/59	A13756-14
C125	V106 Grid Blocking	25 Mmf, ±10%, 600V DCW, Mica	4L-14025	4	110C/127	A13752-20
C126	V105 Plate Coupling	.005 Mfd, ±10%, 1200V DCW, Mica	4L-22050	4	110C/142	A13756-11
C127	V105 Plate Tuning Channel 2	100 Mmf Max., Variable	MC-100-S	16	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, ±10%, 1200V DCW, Mica	4L-22020	4	110C/144	A13756-8
C133	V106, V107 Plate Blocking	.002 Mfd, ±10%, 1200V DCW, Mica	9L-22020	4	110C/145	C55564-40
C134	V106, V107 Plate Bypass	Same as C133	.	.	.	.
C135	V106, V107 Plate Padding Channel 1	.002 Mfd, ±10%, 1200V DCW, Mica	9AL-22020	4	110C/146	C55611-39
C136	V106, V107 Plate Padding, Channel 1	.003 Mfd, ±10%, 1200V DCW, Mica	9AL-22030	4	110C/147	C55611-41
C137	V106, V107 Plate Padding, Channel 1	.001 Mfd, ±5%, 1200V DCW, Mica	9AL-22010	4	110C/148	C55611-37
C138	PA Output Tuning, Channel 4	365 Mmf Max., Variable	MR-365-BS	5	110C/149	A16522-1
C139	PA Output Compensating, Channel 4	300 Mmf, ±5%, 1200V DCW, Mica	9L-23030	4	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	.	.	.	.
C144	Antenna Coupling, Channel 4	100 Mmf, ±5%, 3000V DCW, Mica	583-15L	4	110C/57	A12282-2
C145	Antenna Coupling, Channel 3	Same as C144	.	.	.	.
C146	Antenna Coupling, Channel 2	Same as C144	.	.	.	.
C147	Filament Bypass	.03 Mfd, ±10%, 500 V DCW, Mica	4L-11030	4	110C/151	A13752-21
C148	V101 Oscillator, Temp. Compensation	30 Mmf, ±1 Mmf	913	8	110C/613	A28948
		RECEPTACLES				
J102	V105 Cathode Current Meter Jack	Single circuit, Closed	2A	7	110H/53	BA30024
J103	V106, V107 Cathode Current Meter Jack	Same as J102	.	.	.	.

Symbol	Function	Description	Mfr's Desig.	Mfr.	Ref. No.	Bendix No.
		RELAY				
K101	High Voltage and Antenna Relay	2P2T & 2PST, 270 Ω coil, 24V	.	18	110F/14	QB8416-1
		INDUCTORS				
L101	Osc. Tuning, Channel 1	Variometer	.	1	110C/208	AC56749-1
L102	RF Choke	6 section, 400 turns per section, Minimum Q25	.	1	110C/209	AA27573
L103	RF Choke	Same as L102	.	.	.	.
L104	Oscillator, Channel 2	19.35 μH, 44 turns, tapped at 10½ turns	.	1	110C/210	AA28706-1
L105	Oscillator, Channel 3	10.8 μH, 28 turns, tapped at 7½ turns	.	1	110C/211	AA28707-1
L106	Oscillator, Channel 4	9.1 μH, 26 turns, Tapped at 6½ turns	.	1	110C/212	AA28708-1
L107	IPA Impedance Coupling Choke	475 turns, #32 enamel wire, 5 sections	.	1	110C/213	AA28678-1
L108	IPA Plate, Channel 2	19.35 μH, 44 turns	.	1	110C/214	AA28706-2
L109	IPA Plate, Channel 3	10.8 μH, 28 turns	.	1	110C/215	AA28707-2
L110	IPA Plate, Channel 4	9.1 μH, 26 turns	.	1	110C/216	AA28708-2
L111	PA Plate Impedance Choke	Same as L107	.	.	.	.
L112	PA Variable Output, Channel 1	Variometer, 2 bank 55½ turn total	.	1	110C/217	AC56783-1
L113	PA Variable Output, Channel 2	50 turns #20 wire		1	110C/218	AC56964-2
L114	PA Variable Output, Channel 3	37 turns #20 wire		1	110C/219	AC56964-1
L115	PA Variable Output, Channel 4	30 turns #18 wire		1	110C/220	AA28581-1
		METER				
M101	Measurement of Antenna Current	O-5A RF Thermocouple, Aircraft movement, For typical service	507	25	110A/52	A100070
		SOLENOID				
O-101A	Channel Selector, Switch Clutch Control	Solenoid Assembly	.	1	110F/16	AA28664-1
		PLUG				
P101	Interconnecting Plug	16 contact, Wall mounting	NK-M16-32S	6	110H/52	BA30881
		RESISTORS				
R101	V101 Grid Leak	250,000 Ω, ±10%, 1W, Ceramic	Special	13	110C/332	A18009-254
R102	V101 Screen Dropping	50,000 Ω, ±10%, 1W, Ceramic	Special	13	110C/333	A18009-503
R103	V102 Grid Leak	100,000 Ω, ±10%, 1W, Ceramic	Special	13	110C/334	A18009-104
R104	V102 Screen Dropping	Same as R102	.	.	.	.
R105	T101 Loading	2,000 Ω, ±10%, 1W, Ceramic	Special	13	110C/335	A18009-202
R106	V103 Grid Leak	Same as R103	.	.	.	.
R107	V103 Screen Dropping	Same as R102	.	.	.	.
R108	T102 Loading	7000 Ω, ±10%, 1W, Ceramic	.	.	110C/355	A18009-702
R109	V104 Grid Leak	Same as R103	.	.	.	.
R110	V104 Screen Dropping	Same as R102	.	.	.	.
R111	T103 Loading	Same as R108	.	.	.	.
R112	V105 Grid Bias	10,000 Ω, ±10%, 1W, Ceramic	Special	13	110C/336	A18009-103
R113	V105 Cathode Bias	600 Ω, ±10%, 10W, Vitreous	Brown Devil	21	110C/337	A13945-29
R114	Filament Dropping	7 Ω, ±1%, 10W, Vitreous	Brown Devil	21	110C/338	A13945-72
R115	High Voltage Bleeder	25,000 Ω, ±10%, 20W, Vitreous	Brown Devil	21	110C/339	A28310-4
R116	High Voltage Dropping	12,000 Ω, ±10%, 20W, Vitreous	Brown Devil	21	110C/340	A28310-6
R117	V106, V107 Grid Leak	10,000 Ω, ±10%, 10W, Vitreous	Brown Devil	21	110C/341	A13945-53
R118	V107 Plate Parasitic Suppressor	50 Ω, ±10%, 1W, Ceramic	Special	13	110C/494	A18009-500
R119	V106 Plate Parasitic Suppressor	Same as R118	.	.	.	.
R120	V106, V107 Screen Dropping	15,000 Ω, ±10%, 20W, Vitreous	Brown Devil	21	110C/281	A28310-5
R121	Static Drain	2 megohm, ±20%, 2W	BT-2	17	110C/342	A4516-25
R122	Static Drain, Channel 4	500,000 Ω, ±10%, 1W, Ceramic	Special	13	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	5000 Ω, ±10%, 2W	BT-2	17	110C/343	A4516-17
R126	V106 Grid Parasitic Suppressor	50 Ω, ±10%, ½W, Ceramic	.	13	110C/495	A18150-500
R127	V107 Grid Parasitic Suppressor	Same as R126	.	.	.	.
		SWITCHES				
S101	Motor Starting	SPST Push Control, .75A, 125V, Normally open	8410	9	110F/62	A14164-1
S102A	Positioning Control for Channel Selector Motor	Motor Positioning, Stator	.	1	110F/63	AC56967-1
		Motor Positioning, Rotor	.	1	110F/64	AA28595-1
S102B	Oscillator Plate Supply Selector	Channel selector	.	20	110F/85	A28152
S102C	Oscillator Output Selector	Same as S102B	.	.	.	.
S102D	IPA Output Circuit Selector	4 position	.	1	110F/86	A28545
S102E	PA Output Circuit Selector	4 position, Stator	.	1	110F/87	AC56965-1
		4 position, Rotor	.	1	110F/88	AA28579-1
S102F	Antenna Circuit Selector	4 position, Stator	.	1	110F/87	AC56965-1
		4 position, Rotor	.	1	110F/89	AA28579-2
S102G	Antenna Loading	Same as S102B	.	.	.	.
S110	Antenna Relay Control	Same as S101	.	.	.	.

Symbol	Function	Description	Mfr's Desig.	Mfr.	Ref. No.	Bendix No.
		TRANSFORMERS				
T101	Channel 2 Band Pass	2 section, 70 turns per section	.	1	110K/85	AA27564-2
T102	Channel 3 Band Pass	Same as T101	.	.	.	.
T103	Channel 4 Band Pass	Same as T101	.	.	.	.
		VACUUM TUBES				
V101	Oscillator, Channel 1	Triple grid, Super control amplifier	12SK7	23	110E/28	.
V102	Oscillator, Channel 2	Same as V101	.	.	.	.
V103	Oscillator, Channel 3	Same as V101	.	.	.	.
V104	Oscillator, Channel 4	Same as V101	.	.	.	.
V105	IPA	Beam power amplifier	807	23	110E/8	.
V106	PA	Same as V105	.	.	.	.
V107	PA	Same as V105	.	.	.	.
		SOCKETS				
X101	Channel 1 Tube	Octal base, Steatite	RSS8	3	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	SS5	3	110H/104	A18168-2
X106	PA Tube	Same as X105	.	.	.	.
X107	PA Tube	Same as X105	.	.	.	.

7-2. PARTS FOR TYPE TA-12C, REF. NO. 110D/102 AIRCRAFT TRANSMITTING UNIT

The parts list for the Type TA-12C Transmitter is the same as that for the Type TA-12B Transmitter with the following exceptions:

		INDUCTORS				
L105	Oscillator, Channel 3	7.48 μH, Tap at 6½ turns, 23 turns total	.	1	110C/677	AC57555-1
L106	Oscillator, Channel 4	2.96 μH, Tap at 3½ turns, 12 turns total	.	1	110C/678	AC57555-3
L109	IPA Plate, Channel 3	7.48 μH, No tap, 23 turns total	.	1	110C/679	AC57555-2
L110	IPA Plate, Channel 4	2.96 μH, No tap, 12 turns total	.	1	110C/780	AC57555-4
T103	Channel 4, Band Pass	2 pie, 48 turns/pie	.	1	110K/138	AA100376-1
		RESISTOR				
R111	NOT USED	.	.	.	.	.

7-3. PARTS FOR TYPE MP-28B, REF. NO. 110K/3, POWER SUPPLY UNIT

		CAPACITORS				
C201	V202 Grid Coupling	100 Mmf, ±10%, 500V DCW, Mica	1468	2	110C/60	C56315-101
C202	V201 Cathode Bias	8 Mfd, 150V DCW, Electrolytic	.	4	110C/61	A29015
C204	V201 Plate Supply Filter	0.5 Mfd, +20 −10%, 600V DCW, Paper	DY-6050	4	110C/62	BA30879
C205	V202 Cathode Bias	Same as C202	.	.	.	.
C206	V202 Plate Supply	Same as C204	.	.	.	.
C207	K202 Surge Filter	0.5 Mfd, 400V DCW, Paper	ICH-2P-6A	4	110C/63	BA30880
C208	Grid Bias RF Bypass	.03 Mfd, ±10%, 600V DCW, Mica	9L-11030	4	110C/64	C55564-22
C209	Dynamotor High Voltage	2 Mfd, 600V DCW, Paper	TDFU-6020	4	110C/65	A14109-2
C210	Dynamotor High Voltage RF Filter	Same as C208	.	.	.	.
C211	V201 Bias Filter	.003 Mfd, ±10%, 500V DCW, Mica	1467	2	110C/66	C56312-302
C212	Commutator Ripple Filter	Same as C202	.	.	.	.
		DYNAMOTOR				
D201	High Voltage Source	Input 25V, 14.8A, Output 540V, .450A	4520	11	110K/21	L72079-2
.	Motor Brushes	Positive & negative HV brushes	.	11	110K/22	BA30946
.	Motor Brushes	Positive & negative LV brushes	.	11	110K/23	BA30906
		FUSES				
F201	Filament	10A, 25V	4AG-1095	19	110H/22	A12247-5
F202	Dynamotor, Low Voltage	60A, 25V	5AG-1222	19	110H/24	A28556-2
F203	Dynamotor, High Voltage	1A, 1000V	2104	19	110H/19	A8944-4
		PLUG				
J201	Connection to Transmitter & Remote Control	16 contact, 90°	NK-M16-23-3/4B	6	110H/71	BA30939

Symbol	Function	Description	Mfr's Desig.	Mfr.	Ref. No.	Bendix No.
		RELAYS				
K201	V201 Conversion	DPDT, 24V, 320 Ω coil	.	22	110F/6	A16440-4
K202	Dynamotor Start	24V	SS4502	12	110F/7	A28260-2
K203	Microphone Switching	Same as K201	.	.	.	.
K204	Cathode for CW Operation	SPST, 24V	.	18	110F/8	A28511-2
		RECEPTACLE				
P201	Interconnecting Cable	16 contact, Wall mounting	NK-M16-32SL	6	110H/40	BA30843
		RESISTORS				
R201	V201 Cathode Bias	1,000 Ω, ±10%, 1W, Ceramic	.	13	110C/275	A18009-102
R202	V201 Filament Dropping	63 Ω, ±1%, 10W, Vitreous	Brown Devil	21	110C/276	A13945-74
R203	V201 Plate Dropping	35,000 Ω, ±10%, 1W, Ceramic	Brown Devil	21	110C/277	A13945-67
R204	V202 Cathode Bias	650 Ω, ±10%, 10W, Vitreous	Brown Devil	21	110C/278	A13945-73
R205	V202 Filament Dropping	30 Ω, ±1%, 10W, Vitreous	Brown Devil	21	110C/279	A13945-13
R206	V202 Plate Dropping	7,500 Ω, ±10%, 20W, Vitreous	Brown Devil	21	110C/280	A28310-2
R207	High Voltage Bleeder	15,000 Ω, ±10%, 20W, Vitreous	Brown Devil	21	110C/281	A28310-5
R208	High Voltage Bleeder	15,000 Ω, ±10%, 20W, Vitreous	Brown Devil	21	110C/281	A28310-5
R209	V203, V204 Grid Bias	60 Ω, ±15%, 50W, 3 taps	4 1/8T	24	110C/282	A12875
R210	Side-tone Control	600 Ω potentiometer, Linear taper, Insulated shaft	W	17	110C/283	A28257-1
R211	V201 Grid Bias Filter	500,000 Ω, ±10%, 1W, Ceramic	.	13	110C/284	A18009-504
R212	V201 Grid Leak	Same as R211	.	.	.	.
R213	V202 Grid Leak	Same as R211	.	.	.	.
R214	V201 Osc. Feedback	1 Megohm, ±10%, 1/2W, Ceramic	.	13	110C/496	A18150-150
R215	V201 Osc. Feedback	25,000 Ω, ±10%, 1/2W, Ceramic	.	13	110C/269	A18150-253
		TRANSFORMERS				
T201	Interstage Between V201 and V202	1 to 2 ratio	.	1	110K/61	A27032
T202	Microphone Input	Pri. 600 Ω, Sec. 375,000 Ω	.	1	110K/62	A27030
T203	Driver Between V202 & Modulator	Pri. 6000 Ω, Sec. 6000 Ω	.	1	110K/63	A19770
T204	Modulator to Class C Load	Pri. 5700 Ω, Sec. 2280 Ω	.	1	110K/64	A19772
		VACUUM TUBES				
V201	Oscillator or Amplifier	Twin triode	6N7	23	110E/4	.
V202	Speech Amplifier	Pentode amplifier	6F6	23	110E/15	.
V203	Modulator	Beam power	807	23	110E/8	.
V204	Modulator	Beam power	807	23	110E/8	.
		SOCKETS				
X201	V201 Socket	Octal base, Phenolic	SS	3	110H/94	A18955-14
X202	V202 Socket	Same as X201	.	.	.	.
X203	V203 Socket	5 prong, Medium, Phenolic	RS5	3	110H/95	BA30846
X204	V204 Socket	Same as X203	.	.	.	.

7-4. PARTS FOR TYPE MT-51B, REF. NO. 110J/5, REMOTE CONTROL BOX

		RECEPTACLE				
	Control Interconnecting Cable	16 Contact, Wall mounting	SK-C16-32S	6	110H/29	BA30089
		RESISTORS				
R1	Lamp I1, Dropping	120 Ω, ±10%	MW-2	17	110C/274	BA30198
R2	Lamp I2, Dropping	Same as R1	.	.	.	.
		SWITCHES				
S1.1	Mod. Cathode Relay K201 for MCW Operation (Transmission Selector)	4P3T, Non-shorting	3100J	26	110F/81	BA31052
S1.2		Same as S1.1	.	.	.	.
S1.3	Key Relay (Transmission Selector)	Same as S1.1	.	.	.	.
S1.4		Same as S1.1	.	.	.	.
S2	Power	SPST, Toggle	GA1A3	15	110F/83	A10676-4
S3	Send	SPST, Momentary one side, Lock one side, Luminous tip	8208	9	110F/80	BA30996
S4	Channel Selector	SP4T, Non-shorting	3100J	26	110F/82	BA31053
		LAMPS				
I1	Power Supply Pilot Light	12-16V, Miniature bayonet	T3¼	15	105L/18	B7874
I2	High Voltage Pilot Light	Same as I1	.	.	.	.
		SOCKETS				
.	I1 Socket	Blue pilot light assembly	.	10	110H/110	A30202
.	I2 Socket	Red pilot light assembly	.	10	110H/111	A29351

7-5. PARTS FOR TYPE MT-53B, REF. NO. 110B/4, ANTENNA LOADING UNIT

Symbol	Function	Description	Mfr's Desig.	Mfr.	Ref. No.	Bendix No.
		RECEPTACLE				
P301	Interconnecting Cable	3 contact, Wall mounting	WK-C3-32S	6	110H/45	BA30868
		RELAY				
.	Antenna Loading Coil, shorting	Vacuum without coil		14	110F/15	A30870
		INDUCTOR				
L301	Antenna Loading Coil	277 turns, Bank wound	.	1	110C/182	AC56951-1
		SOLENOID				
K301	Solenoid For Vacuum Relay A30870	Relay coil	.	1	110C/226	AC56953-1
		PLUG				
.	Interconnecting Cable	3 contact, 90°	WK-C3-23-3/8B	6	110H/75	BA90940
		MISCELLANEOUS				
.	Antenna Lead-in Assembly	Dzus fastener assembly	.	1	110H/51	AB9542

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8. RECOMMENDED SPARE ELECTRICAL PARTS

(Recommended quantities of spare parts for each lot of ten equipments.)

8-1. TYPE TA-12B, REF. NO. 110D/101, AIRCRAFT TRANSMITTER UNIT

Rec. Quan.	Symbol	Description of Parts	Mfr's. Desig.	Mfr.	Ref. No.	Bendix No.
		MOTOR				
1	B101	12V, Windshield wiper	.	1	110K/9	AL72185-1
6 Sets	.	Positive & negative brushes	.	1	110K/10	BA30893
		CAPACITORS				
3	C101	500 Mmf, ±10%, 500V DCW, Mica	1467	2	110C/135	C56312-501
3	C102	.0015 Mfd, ±1%, 300V DCW, Zero temperature coefficient	1R	4	110C/136	BA30875
3	C103	.003 Mfd, ±1%, 300V DCW, Zero temperature coefficient	1R	4	110C/137	BA30876
4	C104, 106	.01 Mfd, ±10%, 300V DCW, Mica	1467	2	110C/26	C56312-103
7	C105, 110, 111, 115, 116, 120, 121	.003 Mfd, ±10%, 300V DCW, Mica	1467	2	110C/66	C56312-302
5	C107, 112, 117	200 Mmf, ±1% Zero temperature coefficient	816	8	110C/138	BA30907
3	C108, 113, 118	400 Mmf max., Variable	MC-400-S	16	110C/139	A28248
5	C109, 114, 119	100 Mmf, ±10% Zero temperature coefficient	910	8	110C/140	A28072-1
5	C122, 123, 130, 131	.01 Mfd, ±10%, 600V DCW, Mica	4L-11010	4	110C/126	A13752-14
4	C124	.01 Mfd, ±10%, 1200V DCW, Mica	4L-21010	4	110C/59	A13756-14
3	C125	25 Mmf, ±10%, 600V DCW, Mica	4L-14025	4	110C/127	A13752-20
3	C126	.005 Mfd, ±10%, 1200V DCW, Mica	4L-22050	4	110C/142	A13756-11
3	C127, 128, 129	100 Mmf max., Variable	MC-100-S	16	110C/143	A28255
3	C132	.002 Mfd, ±10%, 1200V DCW, Mica	4L-22020	4	110C/144	A13756-8
4	C133, 134	.002 Mfd, ±10%, 1200V DCW, Mica	9L-22020	4	110C/145	C55564-40
3	C135	.002 Mfd, ±10%, 1200V DCW, Mica	9AL-22020	4	110C/146	C55611-39
3	C136	.003 Mfd, ±10%, 1200V DCW, Mica	9AL-22030	4	110C/147	C55611-41
3	C137	.001 Mfd, ±5%, 1200V DCW, Mica	9AL-22010	4	110C/148	C55611-37
5	C138, 140, 142	365 Mmf max., Variable, Mycalex insulated	MR-365-BS	5	110C/149	A16522-1
5	C139, 141, 143	300 Mmf, ±5%, 1200V DCW, Mica	9L-23030	4	110C/150	C55564-56
5	C144, 145, 146	100 Mmf, ±5%, 3000 V DCW, Mica	583-15L	4	110C/67	A12282-2
3	C147	.03 Mfd, ±10%, 500V DCW, Mica	4L-11030	4	110C/151	A13752-21
3	C148	30 Mmf, ±1 Mmf	913	8	110C/613	A28948
		RECEPTACLES				
1	J102, 103	Single circuit jack, Closed	2A	7	110H/53	BA30024
		RELAYS				
2	K101	2P2T & 2PST, 270 Ω Coil, 24V	.	18	110F/14	QB8416-1

Rec. Quan.	Sym-bol	Description of Parts	Mfr's Desig.	Mfr.	Ref. No.	Bendix No.
		INDUCTORS				
1	L101	Variometer	.	1	110C/208	AC56749-1
2	L102, 103	6 section, 400 turns per section, Minimum Q25	.	1	110C/209	AA27573
1	L104	19.35 μH, 44 turns, Tapped at 10½ turns	.	1	110C/210	AA28706-1
1	L105	10.8 μH, 28 turns, Tapped at 7½ turns	.	1	110C/211	AA28707-1
1	L106	9.1 μH, 26 turns, Tapped at 6½ turns	.	1	110C/212	AA28708-1
2	L107,111	475 turns, #32 enamel wire, 5 sections	.	1	110C/213	AA28678-1
1	L108	19.35 μH, 44 turns	.	1	110C/214	AA28706-2
1	L109	10.8 μH, 28 turns	.	1	110C/215	AA28707-2
1	L110	9.1 μH, 26 turns	.	1	110C/216	AA28708-2
1	L112	Variometer, 2 bank, 55½ turns total	.	1	110C/217	AC56783-1
1	L113	50 turns, #20 wire	.	1	110C/218	AC56964-2
1	L114	37 turns, #20 wire	.	1	110C/219	AC56964-1
1	L115	30 turns, #18 wire	.	1	110C/220	AA28581-1
		METER				
2	M101	O-5A RF Thermocouple, Aircraft movement, For typical service, Case sealed for humidity protection	507	25	110A/52	A100070
		SOLENOID				
1	O-101A	Assembly	.	1	110F/16	AA28664-1
		PLUG				
1	P101	16 contact, Wall mounting	NK-M16-32S	6	110H/52	BA30881
		RESISTORS				
3	R101	250,000 Ω, ±10%, 1W, Ceramic	Special	13	110C/332	A18009-254
6	R102, 104, 107, 110	50,000 Ω, ±10%, 1W, Ceramic	Special	13	110C/333	A18009-503
5	R103, 106, 109	100,000 Ω, ±10%, 1W, Ceramic	Special	13	110C/334	A18009-104
3	R105	2,000 Ω, ±10%, 1W, Ceramic	Special	13	110C/335	A18009-202
4	R108, 111	7,000 Ω, ±10%, 1W, Ceramic	Special	13	110C/355	A18009-702
3	R112	10,000 Ω, ±10%, 1W, Ceramic	Special	13	110C/336	A18009-103
3	R113	600 Ω, ±10%, 10W, Vitreous	Brown Devil	21	110C/337	A13945-29
3	R114	7 Ω, ±1%, 10W, Vitreous	Brown Devil	21	110C/338	A13945-72
3	R115	25,000 Ω, ±10%, 20W, Vitreous	Brown Devil	21	110C/339	A28310-4
3	R116	12,000 Ω, ±10%, 20W, Vitreous	Brown Devil	21	110C/340	A28310-6
3	R117	10,000 Ω, ±10%, 10W, Vitreous	Brown Devil	21	110C/341	A13945-53
4	R118, 119	50 Ω, ±10%, 1W, Ceramic	Special	13	110C/494	A18009-500
3	R120	15,000 Ω, ±10%, 20W, Vitreous	Brown Devil	21	110C/281	A28310-5
3	R121	2 Megohm, ±20%, 2W	BT-2	17	110C/342	A4516-25
5	R122, 123, 124	500,000 Ω, ±10%, 1W, Ceramic	Special	13	110C/284	A18009-504
3	R125	5,000 Ω, ±10%, 2W	BT-2	17	110C/343	A4516-17
4	R126, 127	50 Ω, ±10%, ½W, Ceramic	.	13	110C/495	A18150-500
		SWITCHES				
1	S101, 110	SPST push control, .75A, 125V, Normally open	8410	9	110F/62	A14164-1
1	S102A	Motor positioning, Stator	.	1	110F/63	AC56967-1
1	S102A	Motor positioning, Rotor	.	1	110F/64	AA28595-1
2	S102B, 102C, 102G	Channel selector	.	20	110F/85	A28152
1	S102D	Channel selector	.	1	110F/86	A28545
1	S102E, 102F	Channel selector, Stator	.	1	110F/87	AC56965-1
1	S102E	Channel selector, Rotor	.	1	110F/88	AA28579-1
1	S102F	Channel selector, Rotor	.	1	110F/89	AA28579-2
		TRANSFORMERS				
2	T101, 102, 103	2 section, 70 turns per section	.	1	110K/85	AA27564-2
		VACCUM TUBES				
10	V101, 102, 103, 104	Triple grid, Super control amplifier	12SK7	23	110E/28	.
8	V105, 106, 107	Beam power	807	23	110E/8	.
		SOCKETS				
4	X101, 102, 103, 104	Octal base, Steatite	RSS8	3	110H/103	A16818-2
3	X105, 106, 107	5 Prong, Medium, Steatite	SS5	3	110H/104	A18168-2

8-2. TYPE TA-12C, REF. 110D/102 AIRCRAFT TRANSMITTER UNIT

The recommended spare parts for the Type TA-12C are the same as for the Type TA-12B with the following exceptions:

		INDUCTORS				
1	L105	7.48 μH, Tap at 6½ turns, 23 turns total	.	1	110C/677	AC57555-1
1	L106	2.96 μH, Tap at 3½ turns, 12 turns total	.	1	110C/678	AC57555-3
1	L109	7.48 μH, No tap, 23 turns total	.	1	110C/679	AC57555-2
1	L110	2.96 μH, No tap, 12 turns total	.	1	110C/680	AC57555-4
1	T103	2 pie, 48 turns/pie	.	1	110K/138	AA16376-1
		RESISTOR				
.	R111	Not Used				

8-3. TYPE MP-28B, REF. NO. 110K/3, POWER SUPPLY UNIT

Rec. Quan.	Symbol	Description of Parts	Mfr's Desig.	Mfr.	Ref. No.	Bendix No.
		CAPACITORS				
3	C201	100 Mmf, ±10%, 500V DCW, Mica	1468	2	110C/60	C56315-101
5	C202, 205, 212	8 Mfd, 150V DCW, Electrolytic	.	4	110C/61	A29015
4	C204, 206	0.5 Mfd, +20 −10%, 600V DCW, Paper	DY-6050	4	110C/62	BA30879
3	C207	0.5 Mfd, 400V DCW, Paper	ICH-2P-6A	4	110C/63	BA30880
4	C208, 210	.03 Mfd, ±10%, 600V DCW, Mica	9L-11030	4	110C/64	C55564-22
3	C209	2 Mfd, 600V DCW, Paper	TDFU-6020	4	110C/65	A14109-2
3	C211	.003 Mfd, ±10%, 500V DCW, Mica	1467	2	110C/66	C56312-302
		DYNAMOTOR				
1	D201	Input 25V, 14.8A, Output 540V, .450A, Continuous duty	4520	11	110K/21	L72079-2
6 Sets		Positive & negative HV brush	.	11	110K/22	BA30946
6 Sets		Positive & negative LV brush	.	11	110K/23	BA30906
		FUSES				
10	F201	10A, 25V	4AG-1095	19	110H/22	A12247-5
10	F202	60A, 25V	5AG-1222	19	110H/24	A28556-2
10	F203	1A, 1000V	2104	19	110H/19	A8944-4
		PLUG				
1	J201	16 contact, 90°	NK-M16-23-3/4B	6	110H/71	BA30939
		RELAYS				
2	K201, 203	DPDT, 24V, 320 Ω Coil	.	22	110F/6	A16440-4
2	K202	24V	SS4502	12	110F/7	A28260-2
2	K204	SPST, 24V	.	18	110F/8	A28511-2
		RECEPTACLE				
1	P201	16 contact, Wall mounting	NK-M16-32SL	6	110H/40	BA30843
		RESISTORS				
3	R201	1,000 Ω, ±10%, 1W, Ceramic	.	13	110C/275	A18009-102
3	R202	63 Ω, ±10%, 10W, Vitreous	Brown Devil	21	110C/276	A13945-74
3	R203	35,000 Ω, ±10%, 1W, Vitreous	Brown Devil	21	110C/277	A13945-67
3	R204	650 Ω, ±10%, 10W, Vitreous	Brown Devil	21	110C/278	A13945-73
3	R205	30 Ω, ±1%, 10W, Vitreous	Brown Devil	21	110C/279	A13945-13
4	R206	7,500 Ω, ±10%, 20W, Vitreous	Brown Devil	21	110C/280	A28310-2
3	R207, 208	15,000 Ω, ±10%, 20W, Vitreous	Brown Devil	21	110C/281	A28310-5
3	R209	60 Ω, ±15%, 50W, 3 Taps	4 1/8T	24	110C/282	A12875
3	R210	600 Ω, Potentiometer, Linear taper, Insulated shaft, (Bushing & shaft modified by Bendix)	W	17	110C/283	A28257-1
4	R211, 212, 213	500,000 Ω, ±10%, 1W, Ceramic	.	13	110C/284	A18009-504
3	R214	1 Megohm, ±10%, 1/2W, Ceramic	.	13	110C/496	A18150-105
3	R215	25,000 Ω, ±10%, 1/2W, Ceramic	.	13	110C/269	A18150-253
		TRANSFORMERS				
2	T201	Interstage, 1 to 2 ratio	.	1	110K/61	A27032
2	T202	Input: Pri. 600 Ω Sec. 375,000 Ω	.	1	110K/62	A27030
2	T203	Driver: Pri. 6000 Ω Sec. 3000 Ω	.	1	110K/63	A19770
2	T204	Modulation: Pri. 5700 Ω Sec. 2280 Ω	.	1	110K/64	A19772
		VACUUM TUBES				
5	V201	Twin triode	6N7	23	110E/4	.
5	V202	Pentode amplifier	6F6	23	110E/15	.
6	V203, 204	Beam power	807	23	110E/8	.
		SOCKETS				
1	X201, 202	Octal base, Phenolic, 3/32" thickness	SS	3	110H/94	A18955-14
1	X203, 204	5 prong, Medium, Phenolic	RS5	3	110H/95	BA30846

8-4. TYPE MT-51B, REF. NO. 110J/5, REMOTE CONTROL UNIT

		RECEPTACLE				
1	.	16 contact, Wall mounting	SK-C16-32S	6	110H/29	BA30089
		LAMPS				
7	I1, 2	12-16V, Miniature bayonet	T3 1/4	15	105L/18	B7874

Rec. Quan.	Symbol	Description of Parts	Mfr's Desig.	Mfr.	Ref. No.	Bendix No.
		RESISTOR				
4	R1, 2	120 Ω, ±10%	MW-2	17	110C/274	BA30198
		SOCKETS				
2	.	Blue pilot light assembly	.	10	110H/110	A30202
2	.	Red pilot light assembly	.	10	110H/111	A29351
		SWITCHES				
1	S1.1, 1.2, 1.3, 1.4	4P3T, Non-shorting	3100J	26	110F/81	BA31052
1	S2	SPST, Toggle	GA1A3	15	110F/83	A10676-4
1	S3	SPDT, Momentary one side, Lock one side, Luminous tip	8208	9	110F/80	BA30996
1	S4	SP4T, Non-shorting	3100J	26	110F/82	BA31053

8-5. TYPE MT-53B, REF. NO. 110B/4, ANTENNA LOADING UNIT

		INDUCTORS				
1	L301	Antenna loading assembly plug-in	.	1	110C/182	AC56951-1
		SOLENOID				
2	K301	Relay coil	.	1	110C/226	AC56953-1
		RECEPTACLE				
1	P301	3 contact, Wall mounting	WK-C3-32S	6	110H/45	BA30868
		RELAY				
2	.	Vacuum, Without coil	.	14	110F/15	BA30870
		PLUG				
1	.	3 contact, 90°	WK-C3-23-3/8B	6	110H/75	BA90940
		MISCELLANEOUS				
1	.	Antenna lead-in assembly	.	1	110H/51	AB9542

9. LIST OF MANUFACTURERS

1. Bendix Radio Corporation,
   E. Joppa Road,
   Towson, Md.
2. Aerovox Corporation,
   New Bedford, Mass.
3. American Phenolic Corporation,
   1250 W. Van Buren St.,
   Chicago, Ill.
4. Cornell-Dubilier Electric Corp.,
   1000 Hamilton Blvd.,
   South Plainfield, N. J.
5. Allen D. Cardwell Mfg. Corp.,
   81 Prospect St.,
   Brooklyn, N. Y.
6. Cannon Electric Development Company
   420 W. Avenue 33,
   Los Angeles, Calif.
7. Carter Radio Company,
   Div. Utah Radio Products,
   812 Orleans St.,
   Chicago, Ill.
8. Centralab—Central Radio Laboratory,
   900 E. Keefe Avenue,
   Milwaukee, Wis.
9. Cutler Hammer, Inc.,
   324 N. St. Paul Ave.,
   Milwaukee, Wis.
10. Drake Mfg. Company,
    1713 W. Hubbard St.,
    Chicago, Ill.
11. Eicor, Inc.,
    515 S. Laflin St.,
    Chicago, Ill.
12. Electric Auto-Lite Co.,
    4900 Chrysler Bldg.,
    New York, N. Y.
13. Erie Resistor Corp.,
    644 W. 12th Street,
    Erie, Pennsylvania.
14. Eitel-McCullough,
    San Bruno, Calif.
15. General Electric Company,
    1 River Rd.,
    Schenectady, N. Y.
16. Hammarlund Mfg. Co., Inc.
    424–438 West 33rd St.,
    New York, N. Y.
17. International Resistance Co.,
    401 N. Broad St.,
    Philadelphia, Pa.
18. Leach Relay Co.,
    5915 Avalon Blvd.,
    Los Angeles, Calif.
19. Littelfuse Laboratories,
    4557 Ravenswood Ave.,
    Chicago, Ill.
20. Oak Manufacturing Co.,
    1260 Clybourn Ave.,
    Chicago, Ill.
21. Ohmite Mfg. Co.,
    4835 W. Flournoy St.,
    Chicago, Ill.
22. Price Brothers,
    Frederick, Md.
23. RCA Radiotron Division,
    RCA Manufacturing Co.,
    401 Bergen St.,
    Harrison, N. J.
24. Ward Leonard Electric Co.,
    Mount Vernon, N. Y.
25. Weston Electrical Instrument Co.,
    578 Frelinghuysen Ave.,
    Newark, N. J.
26. Yaxley Mfg. Div., P.R. Mallory & Co., Inc.,
    3029 E. Washington St.,
    Indianapolis, Indiana.

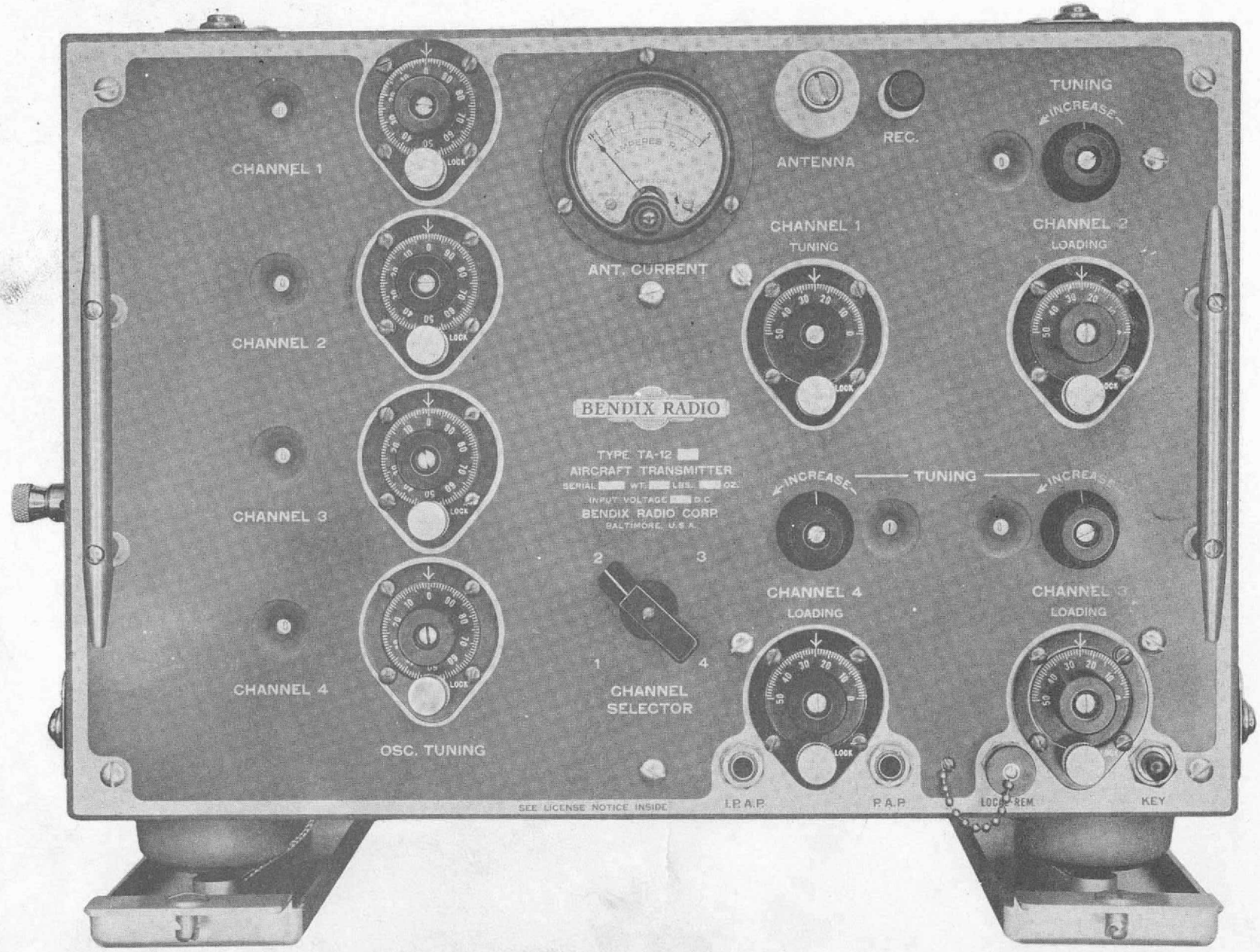

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FIG. 1 - FRONT VIEW TYPE TA-12B TRANSMITTER

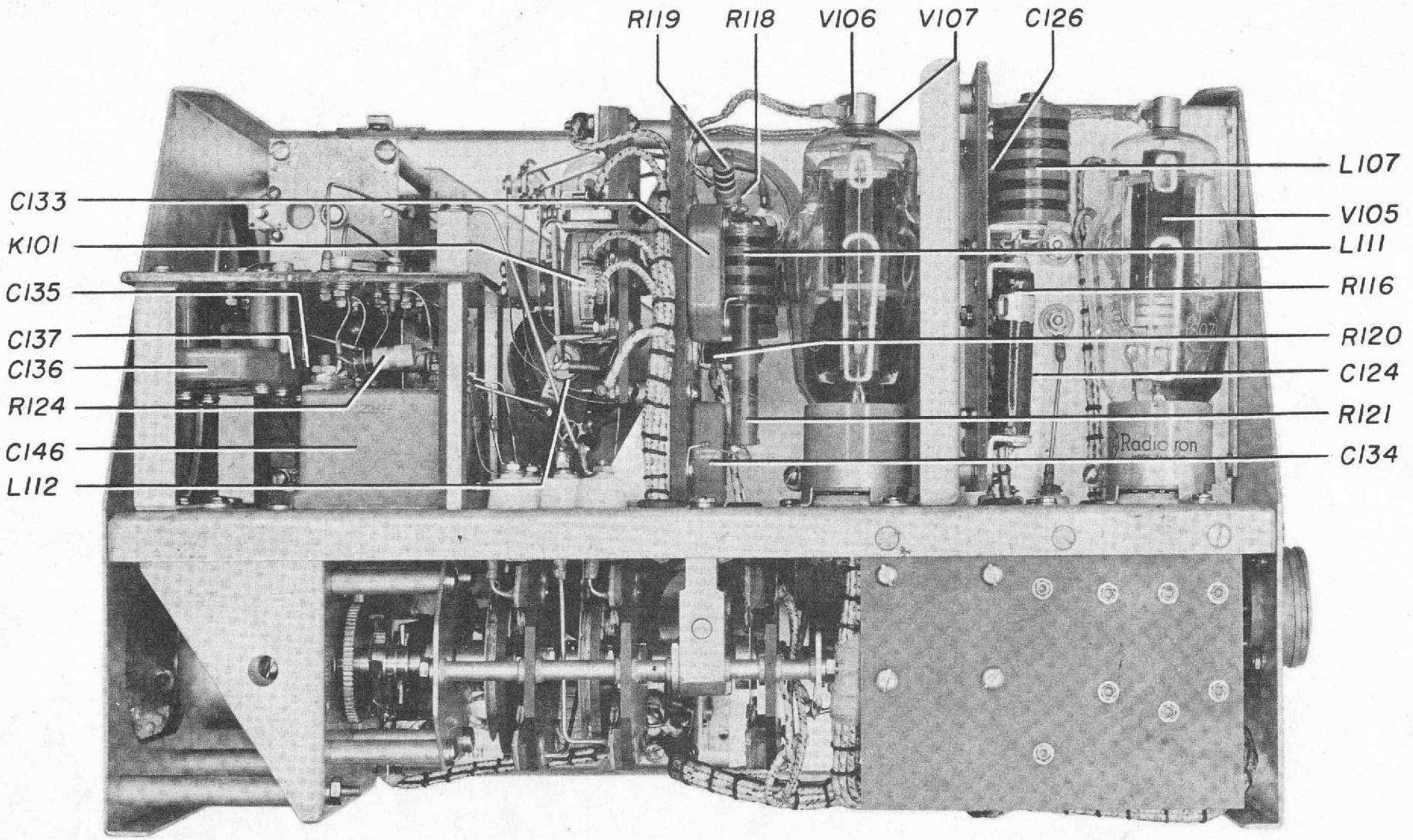

FIG. 2 – REAR VIEW TYPE TA-12B TRANSMITTER

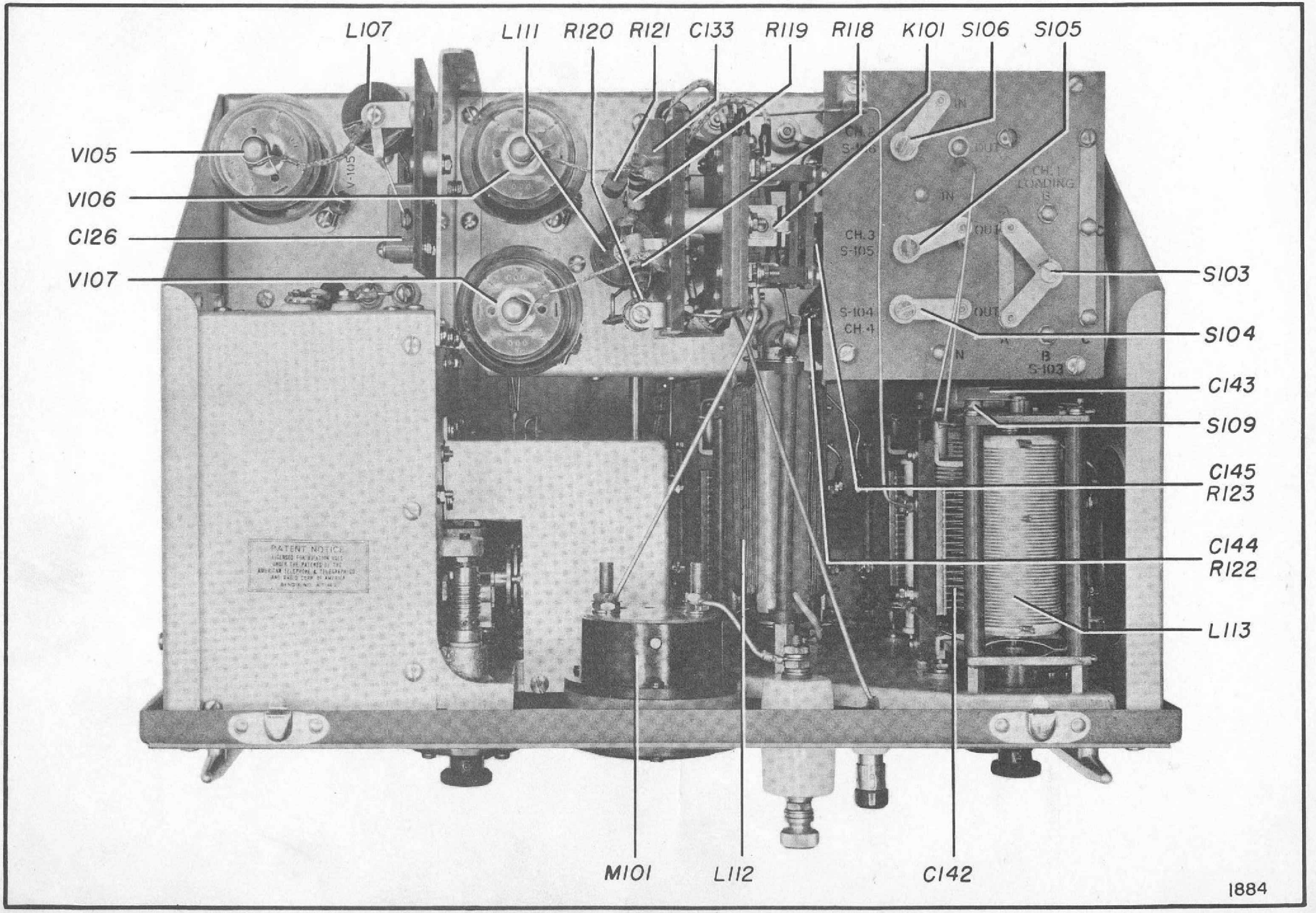

FIG. 3—TOP VIEW TYPE TA-12B TRANSMITTER

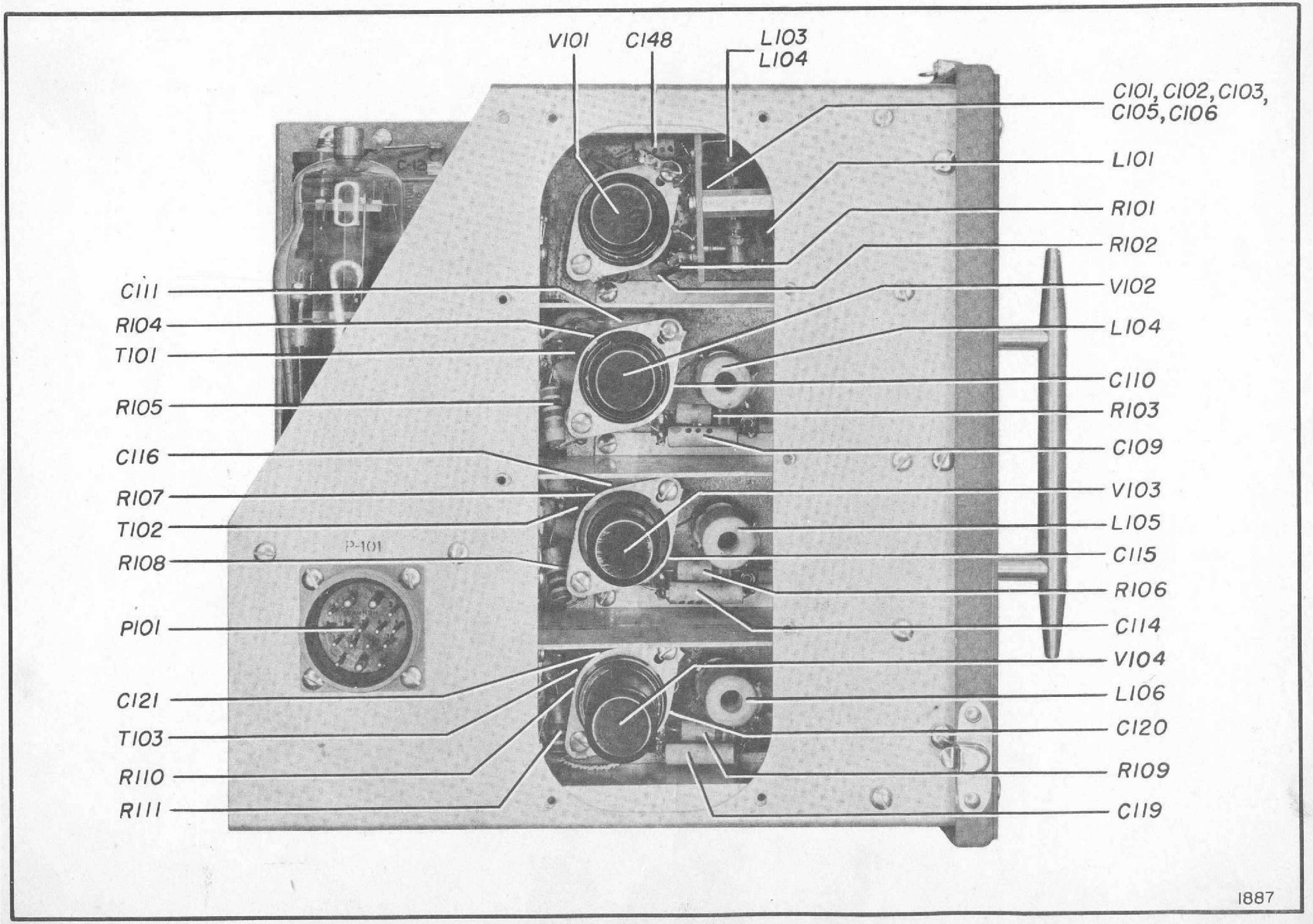

FIG. 4 - SIDE VIEW TYPE TA-12B TRANSMITTER

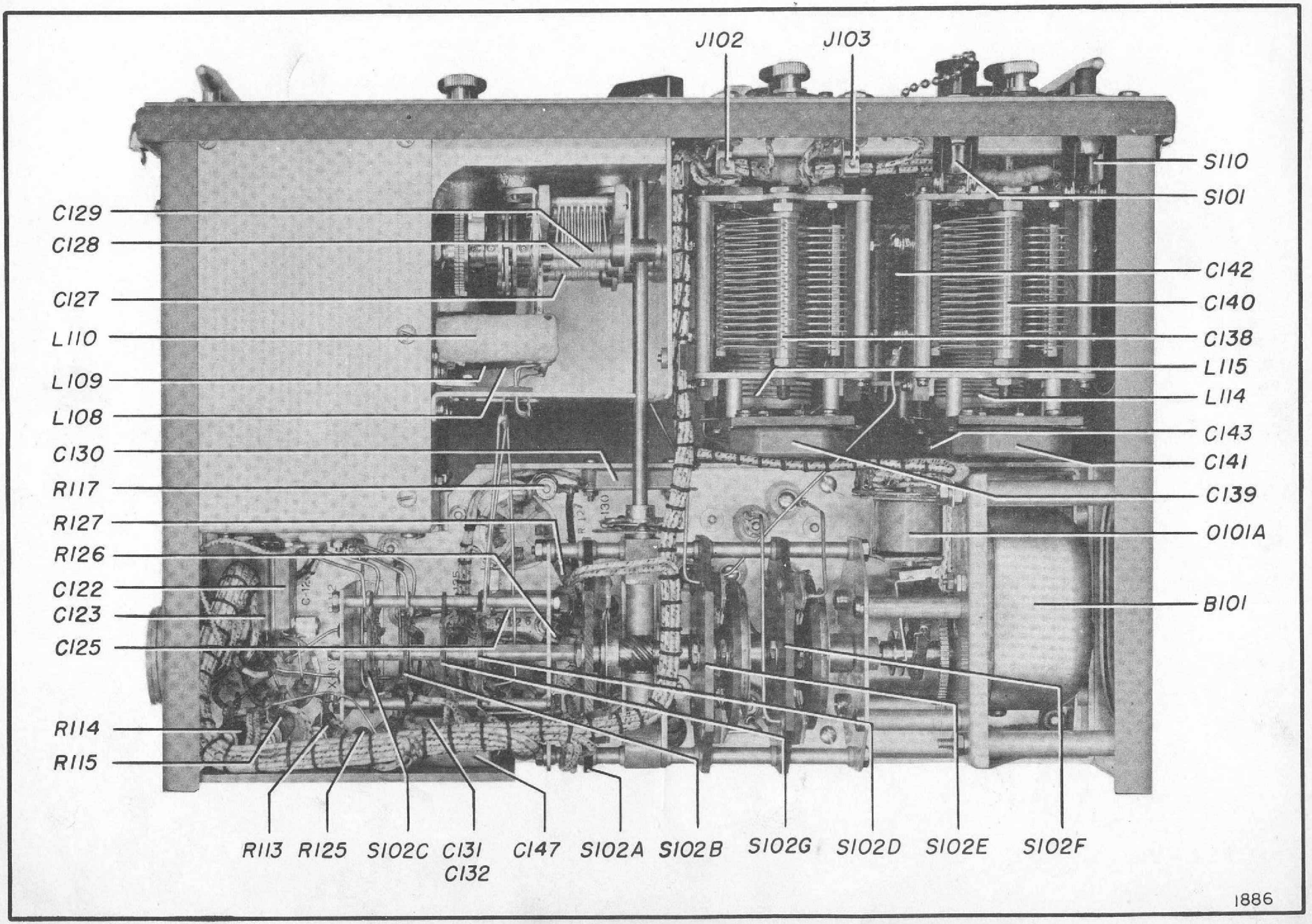

FIG.5-BOTTOM VIEW TYPE TA-12B TRANSMITTER

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FIG. 6 – SIDE VIEW TYPE MP-28B POWER SUPPLY UNIT

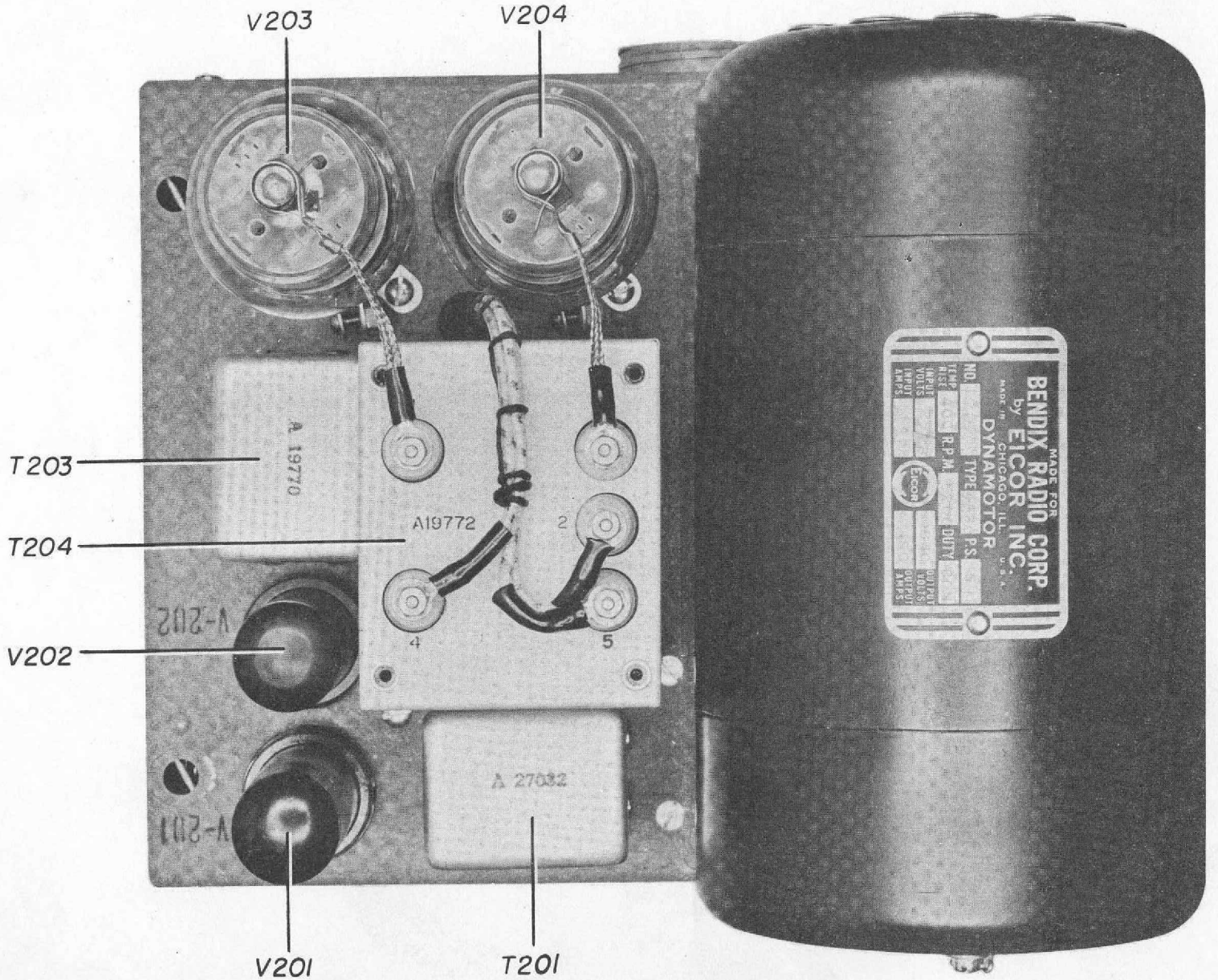


FIG. 7 - TOP VIEW TYPE MP-28B POWER SUPPLY UNIT

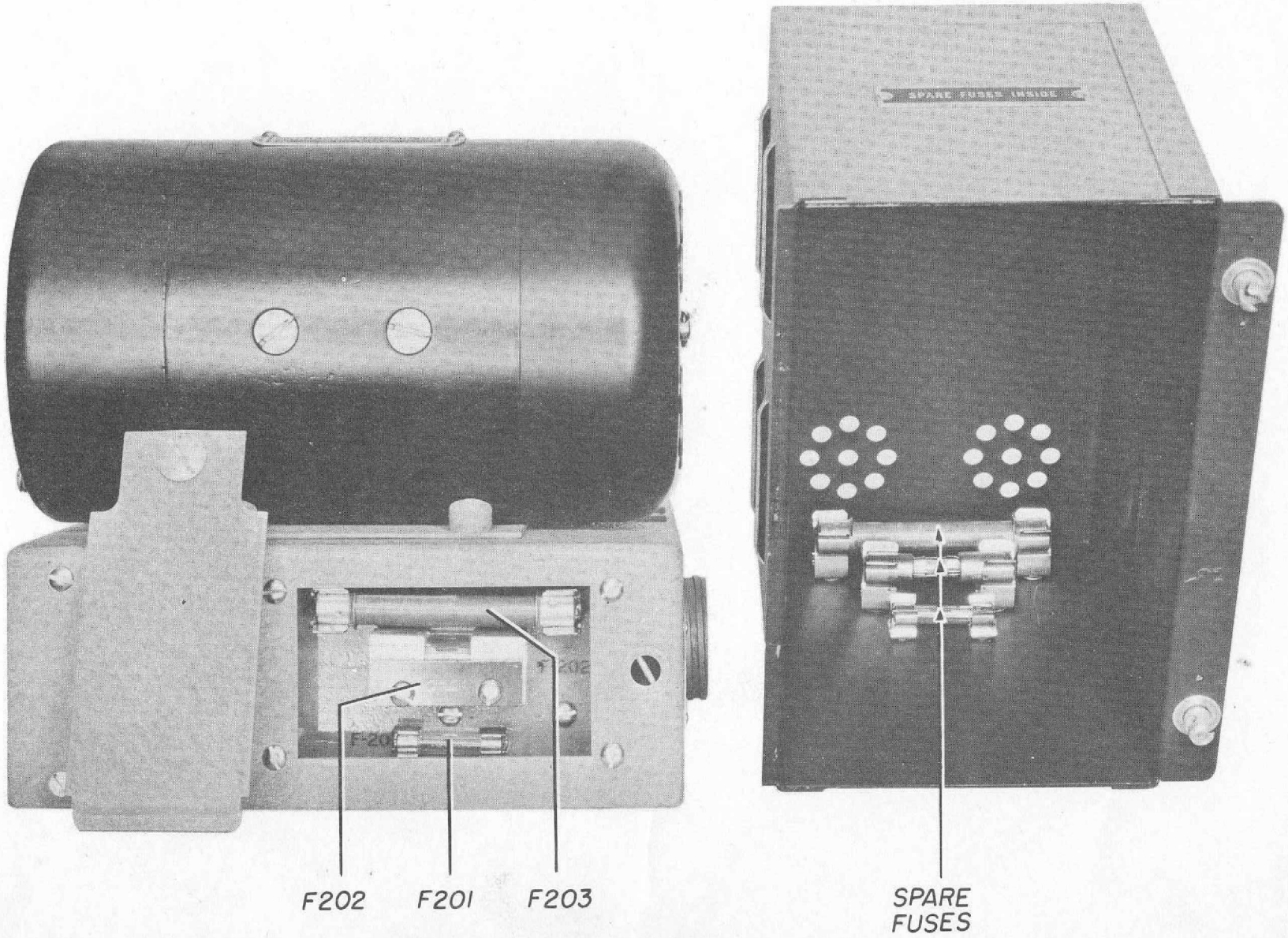
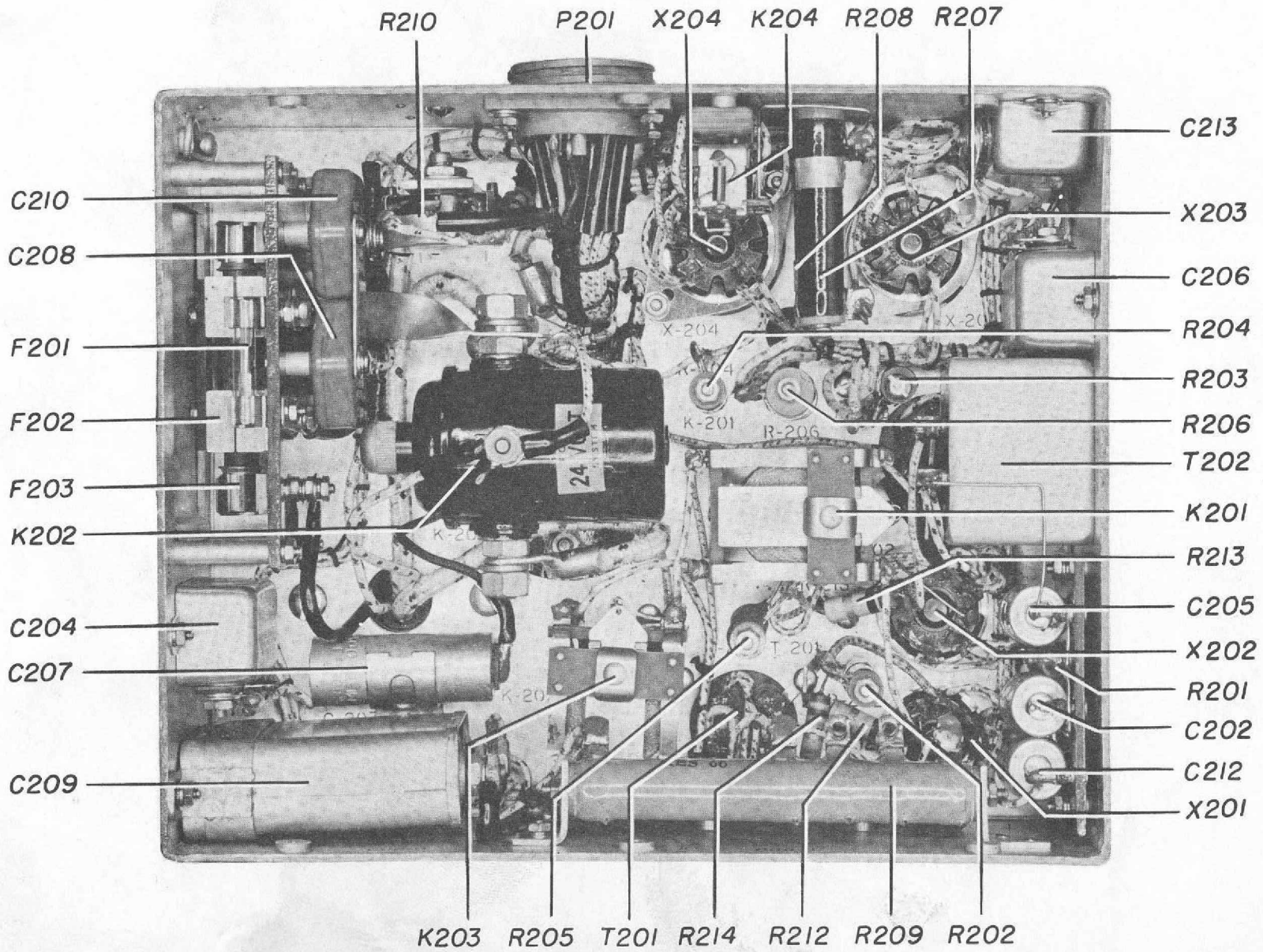
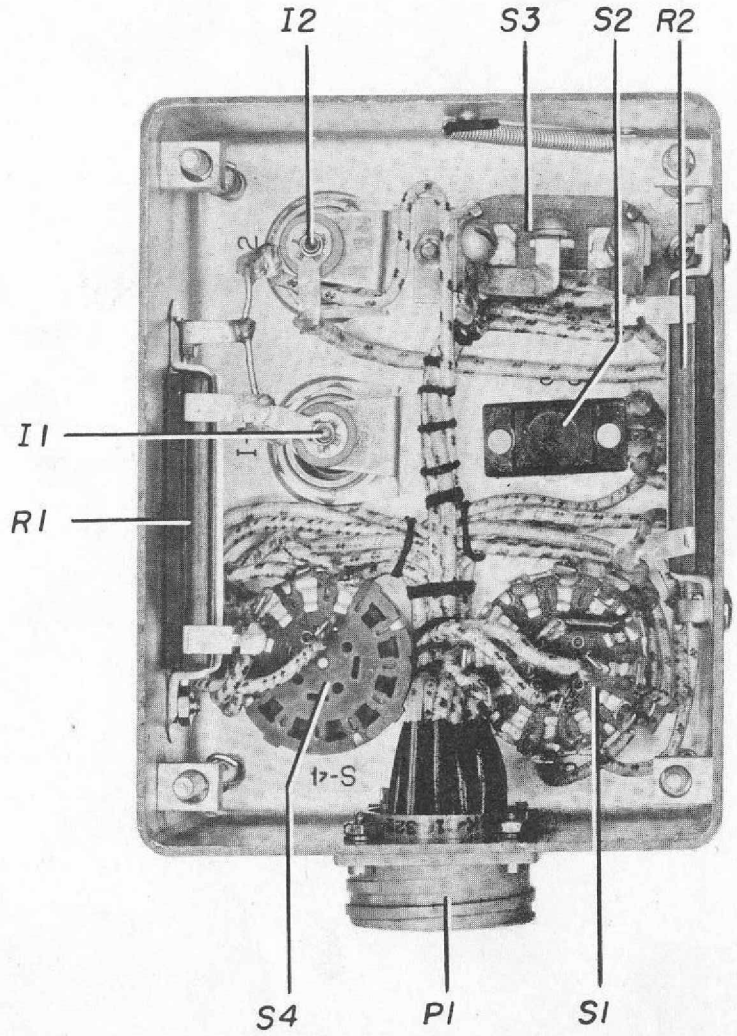


FIG. 8 – TYPE MP–28B POWER SUPPLY UNIT

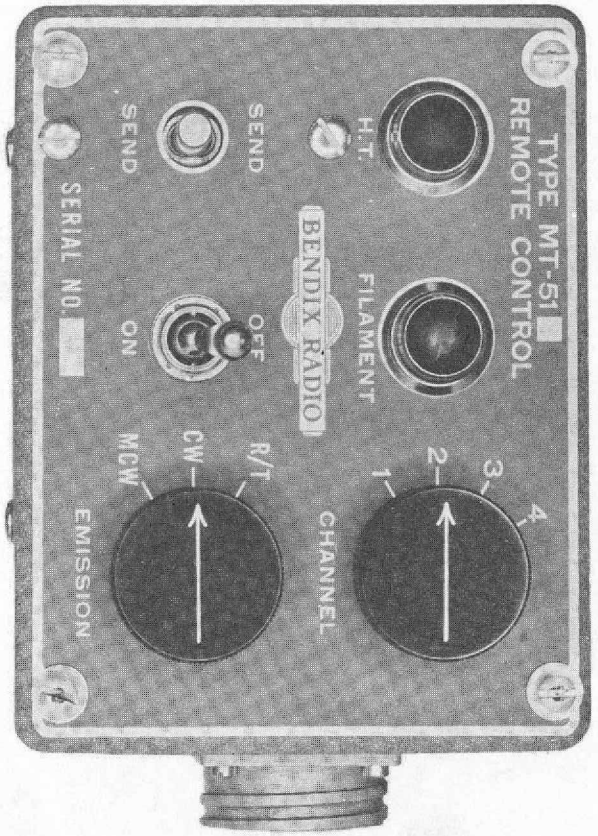


1891

FIG. 9–BOTTOM VIEW TYPE MP-28B POWER SUPPLY UNIT



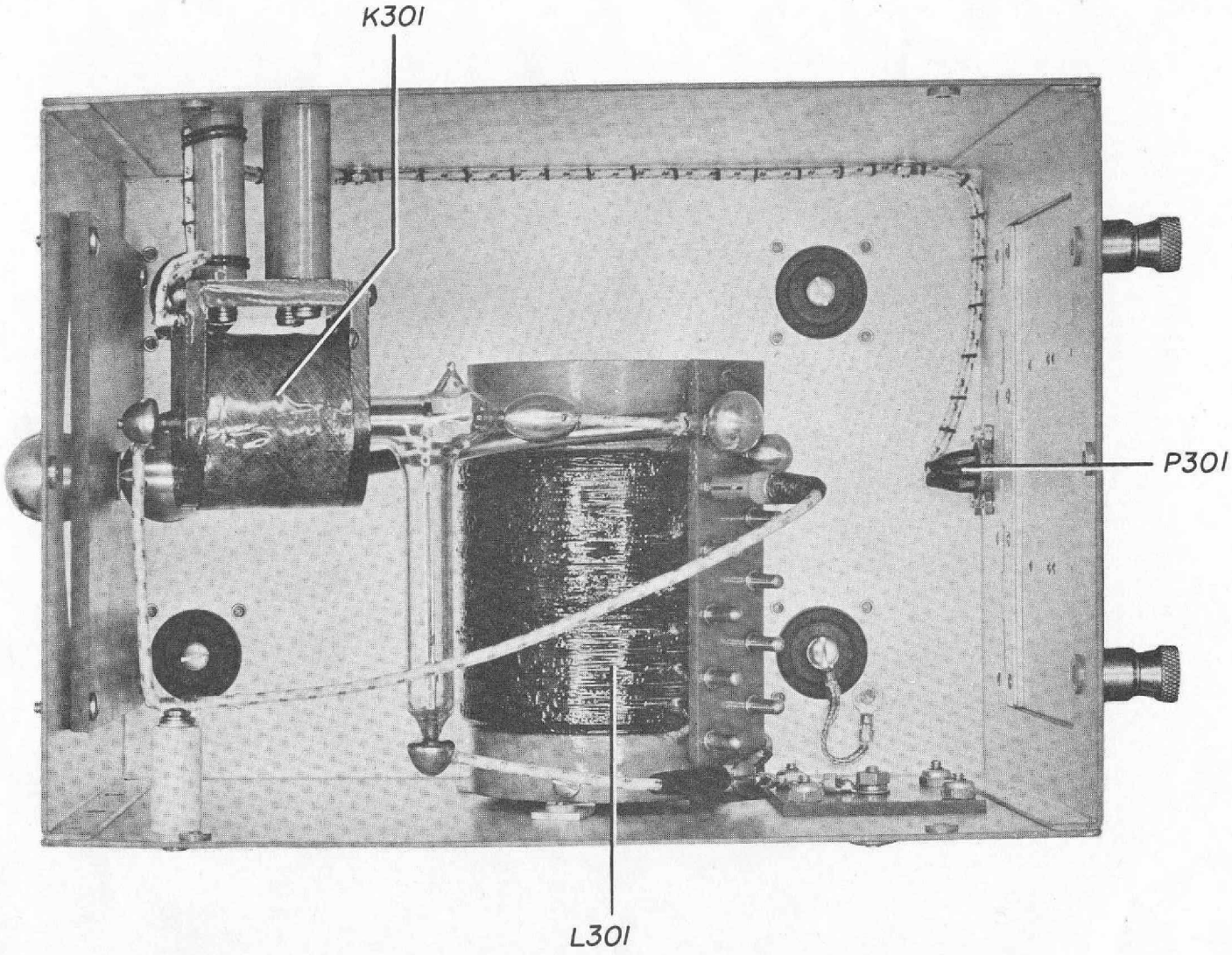
BOTTOM INTERIOR VIEW



FRONT PANEL

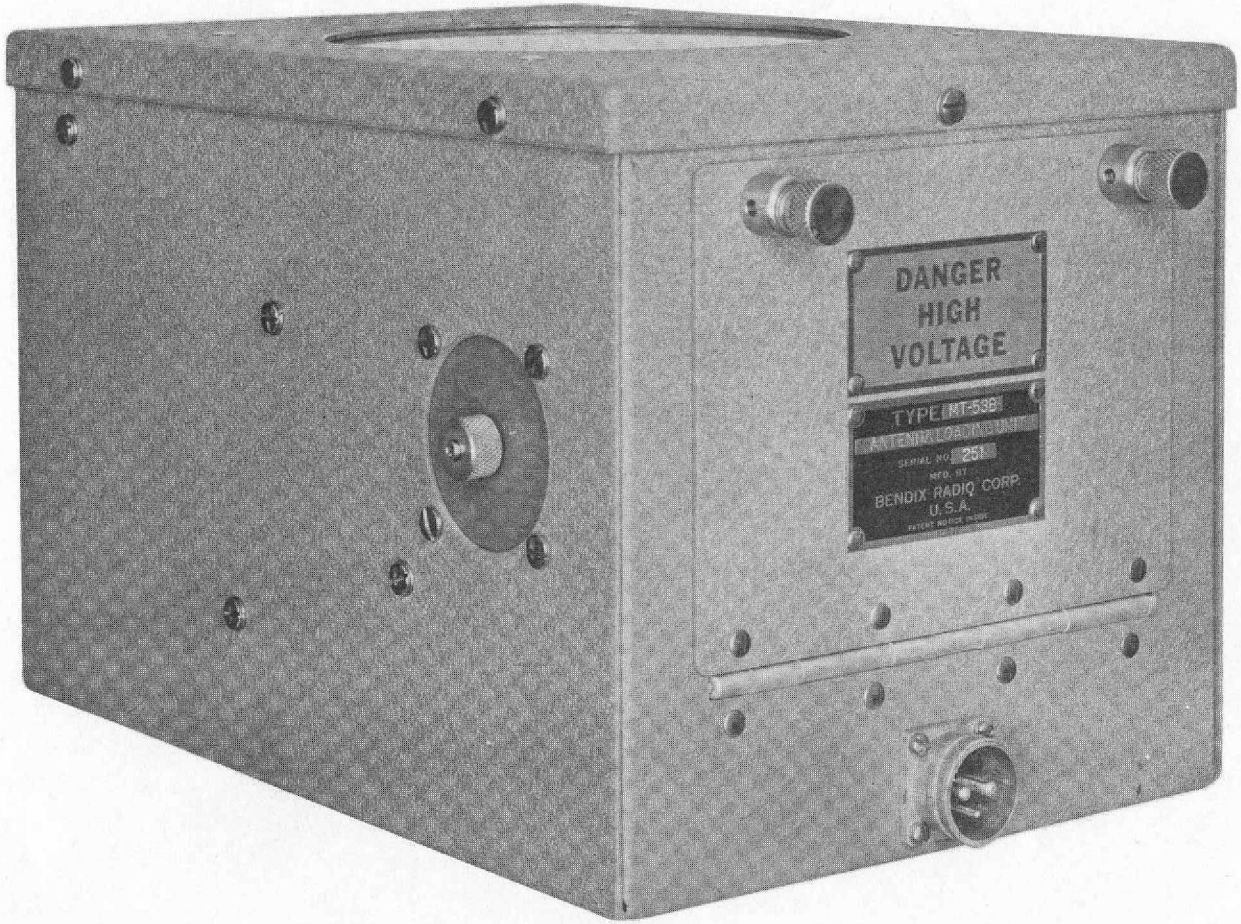
1892

FIG. 10 - TYPE MT-51B REMOTE CONTROL UNIT



1894

FIG. 11 – TOP VIEW TYPE MT-53B ANTENNA LOADING UNIT



1893

FIG.12-FRONT OBLIQUE VIEW TYPE MT-53B ANTENNA LOADING UNIT

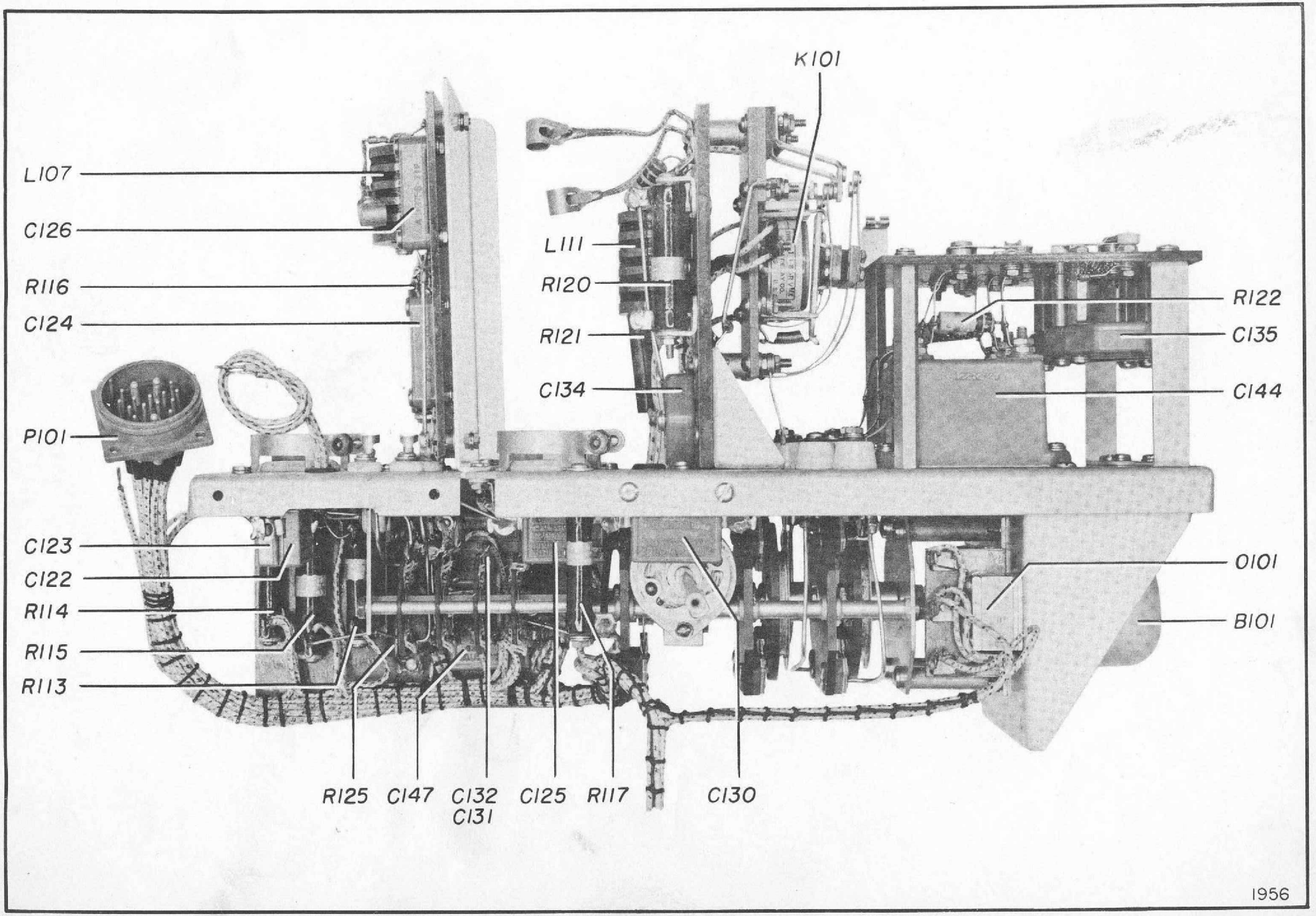
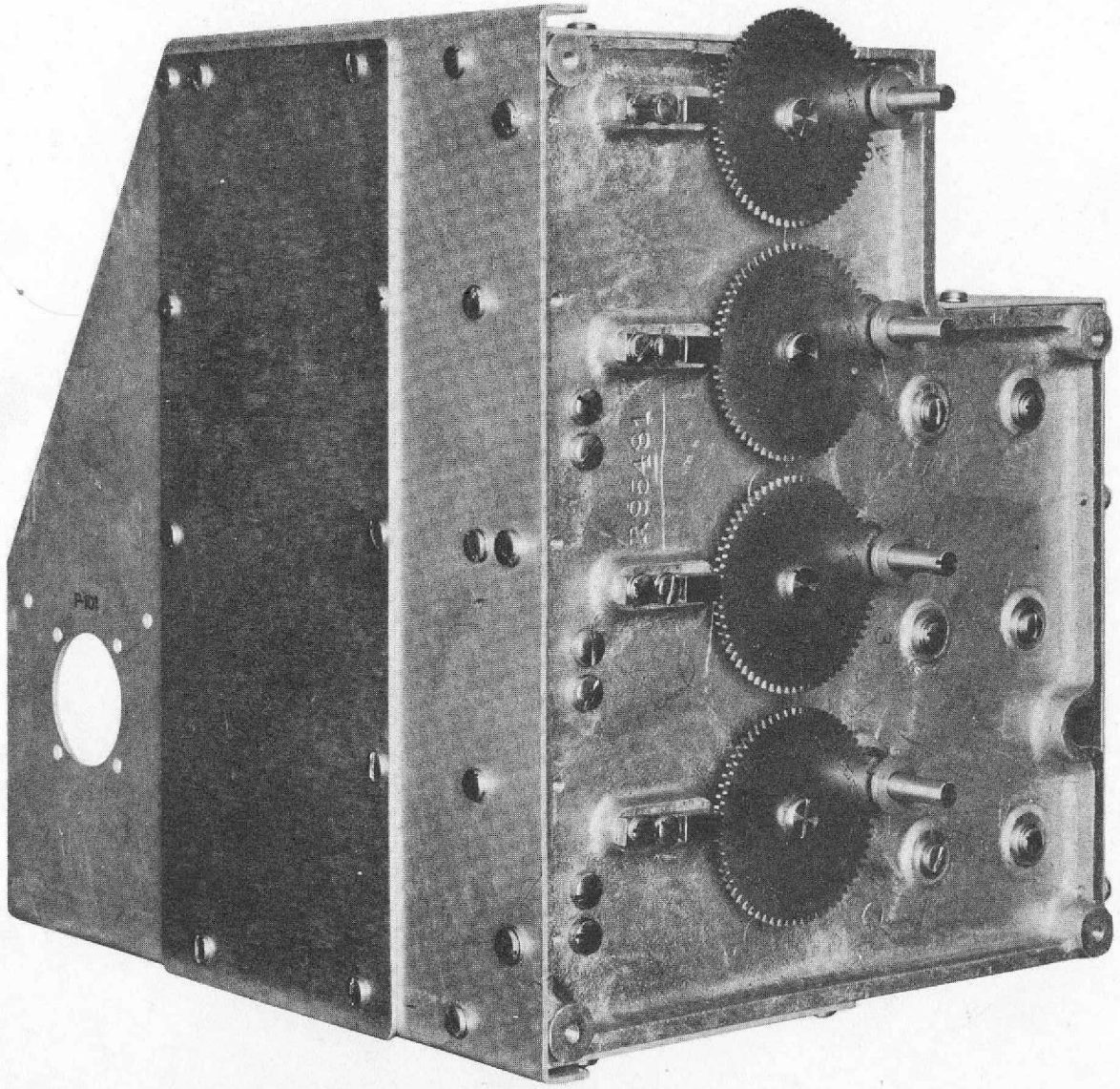


FIG. 13-FRONT VIEW CHASSIS ASSEMBLY



1958

FIG. 14 – FRONT VIEW OSCILLATOR ASSEMBLY

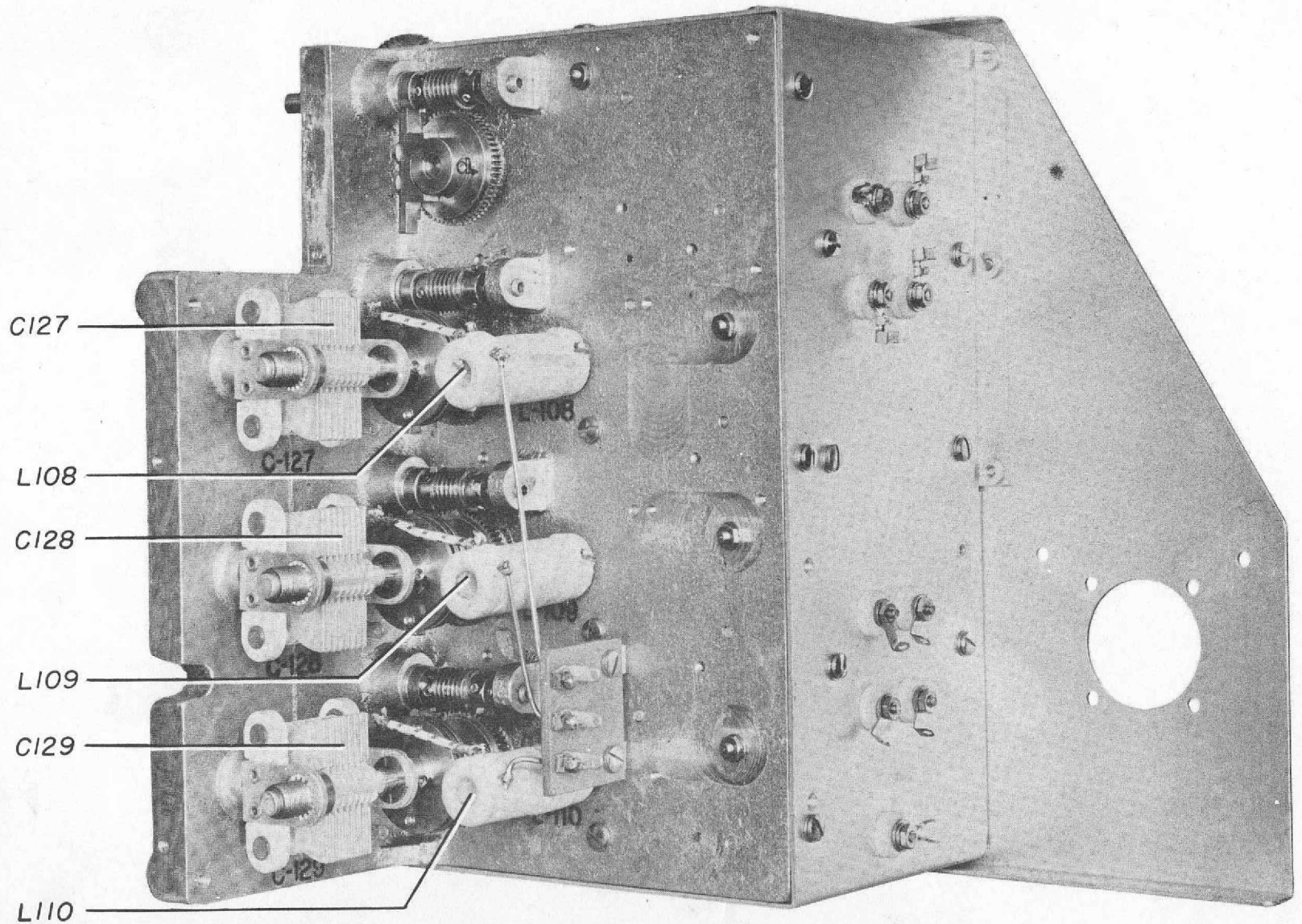


FIG. 15 - RIGHT SIDE VIEW OSCILLATOR ASSEMBLY

1960

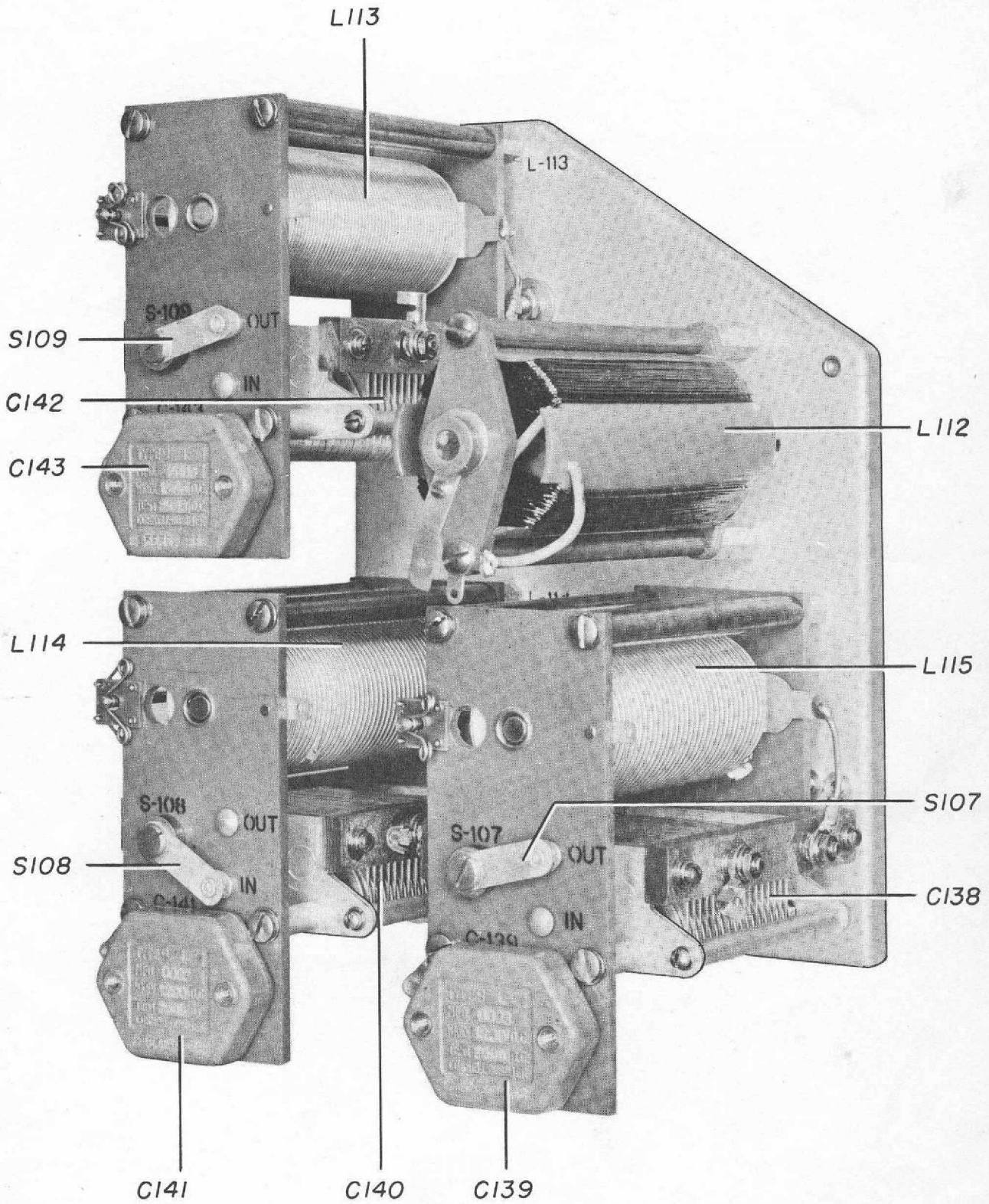
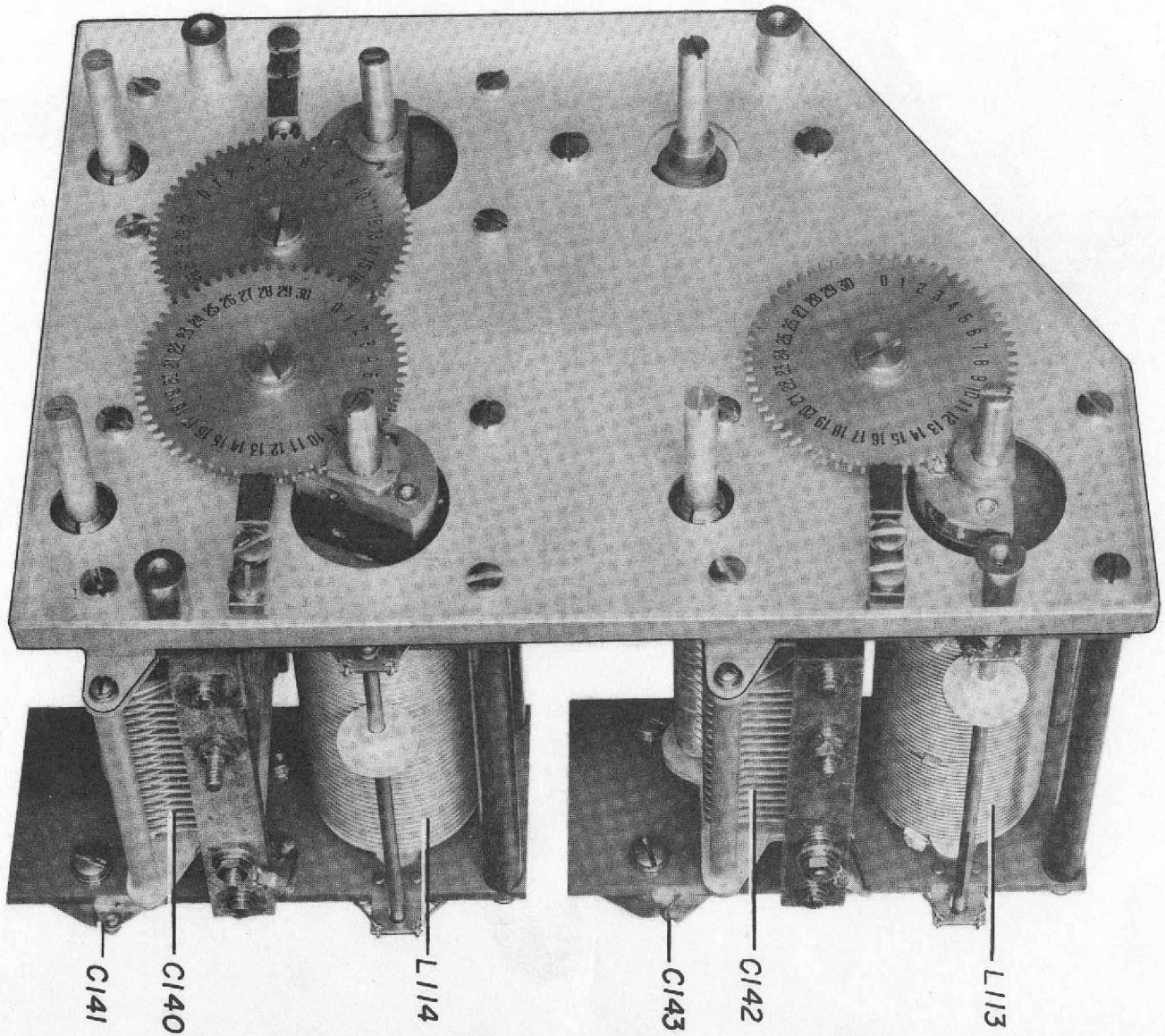
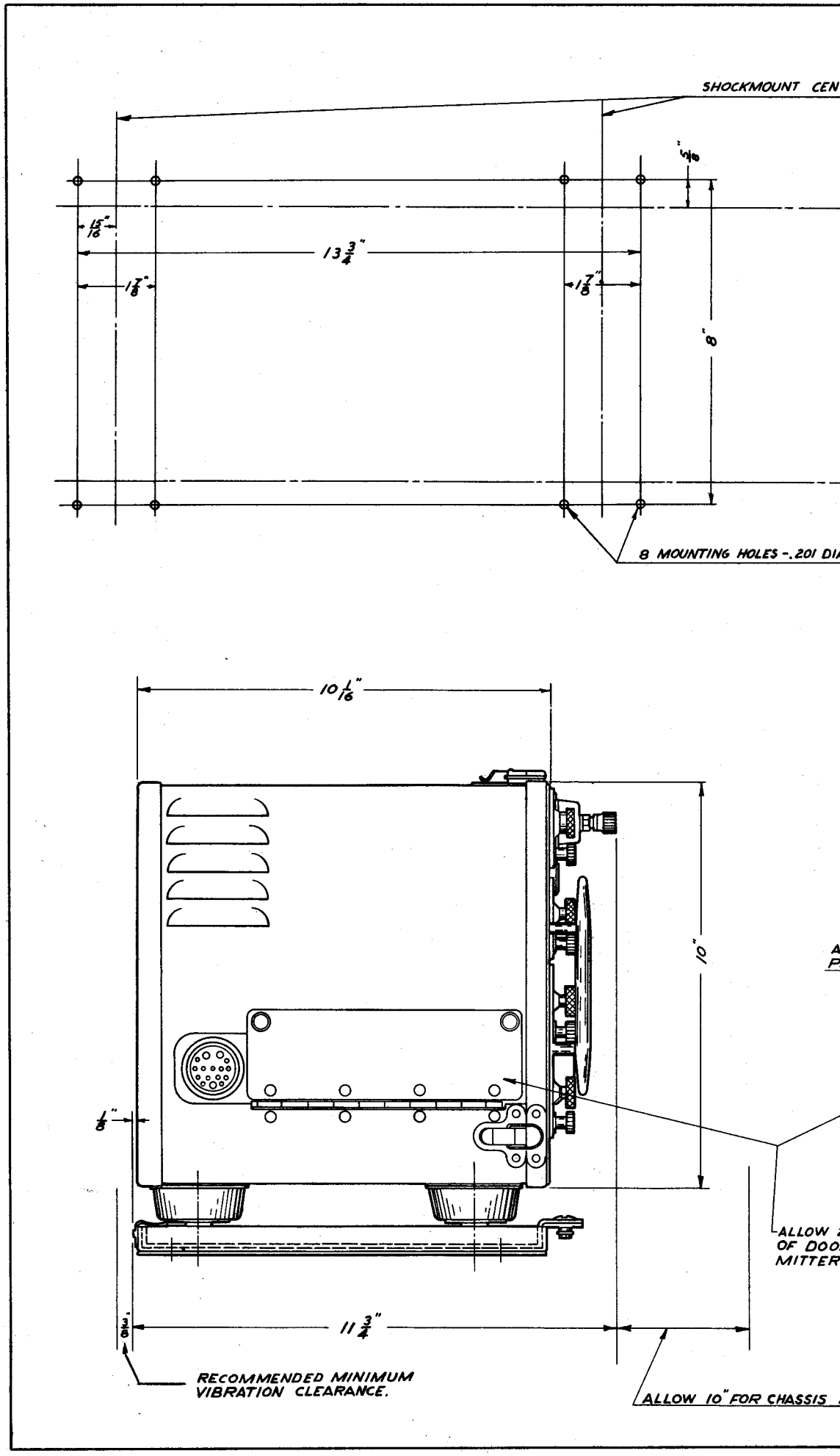


FIG. 16 - REAR VIEW COIL & CAPACITOR ASSEMBLY



1959

FIG.17-FRONT VIEW COIL & CAPACITOR ASSEMBLY


SHOCKMOUNT CEN
5/16"
15/16"
13 3/4"
1 7/8"
1 7/8"
8"
8 MOUNTING HOLES -.201 DI
10 1/16"
10"
1/8"
ALLOW
OF DOO
MITTER
3/8"
11 3/4"
RECOMMENDED MINIMUM
VIBRATION CLEARANCE.
ALLOW 10" FOR CHASSIS

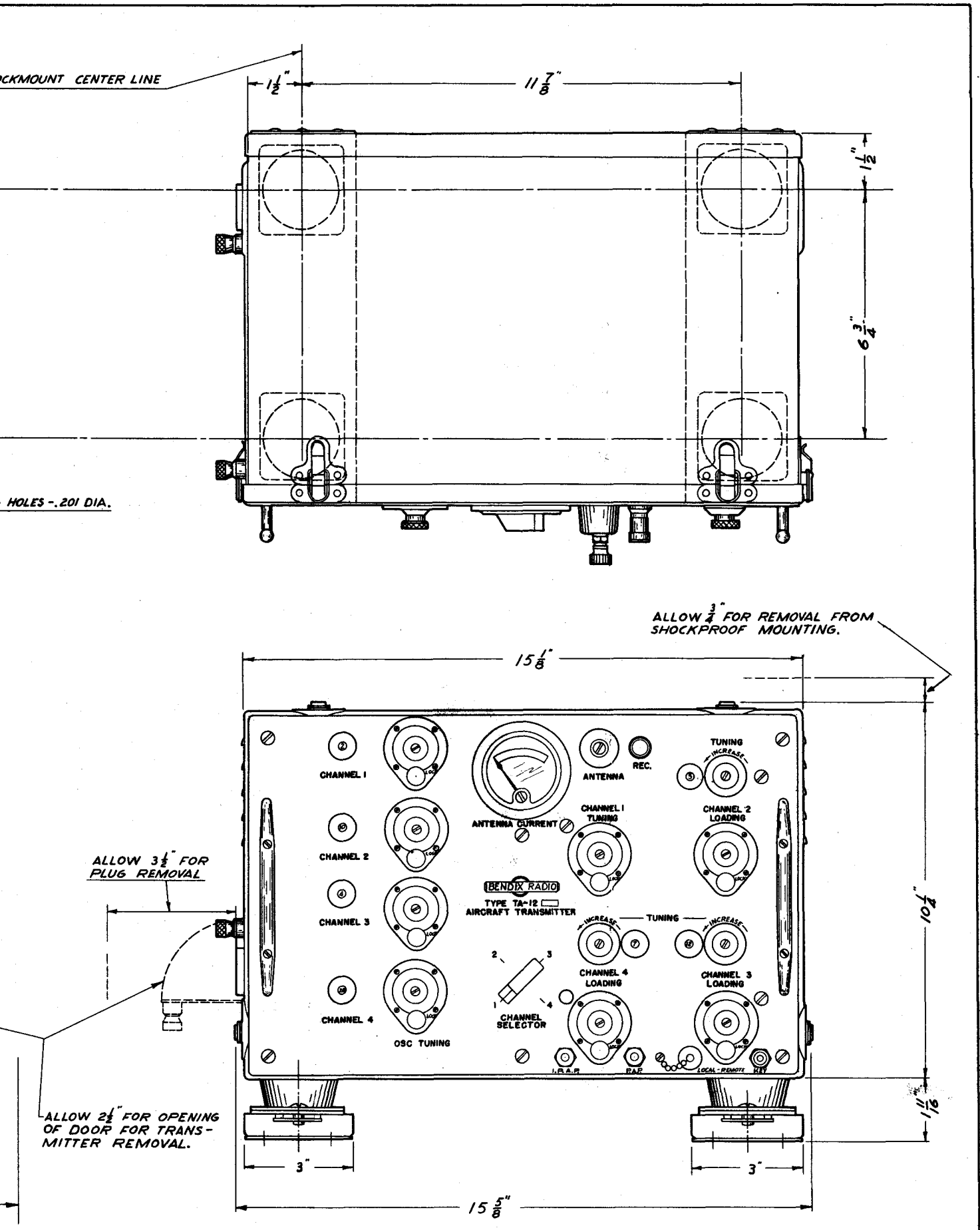


FIG. 18-OUTLINE & MOUNTING DIMENSIONS TYPE TA-12B TRANSMITTER

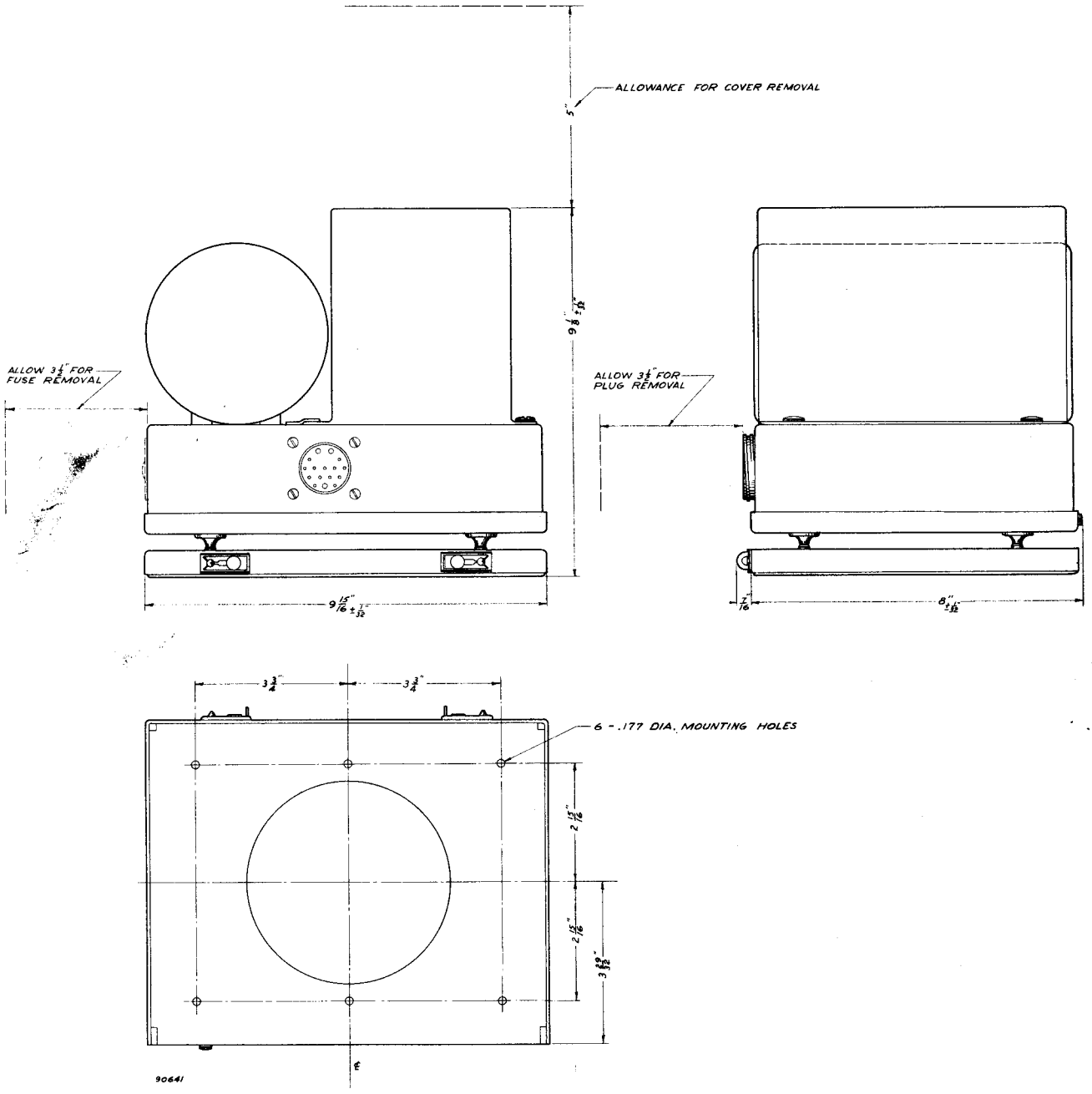
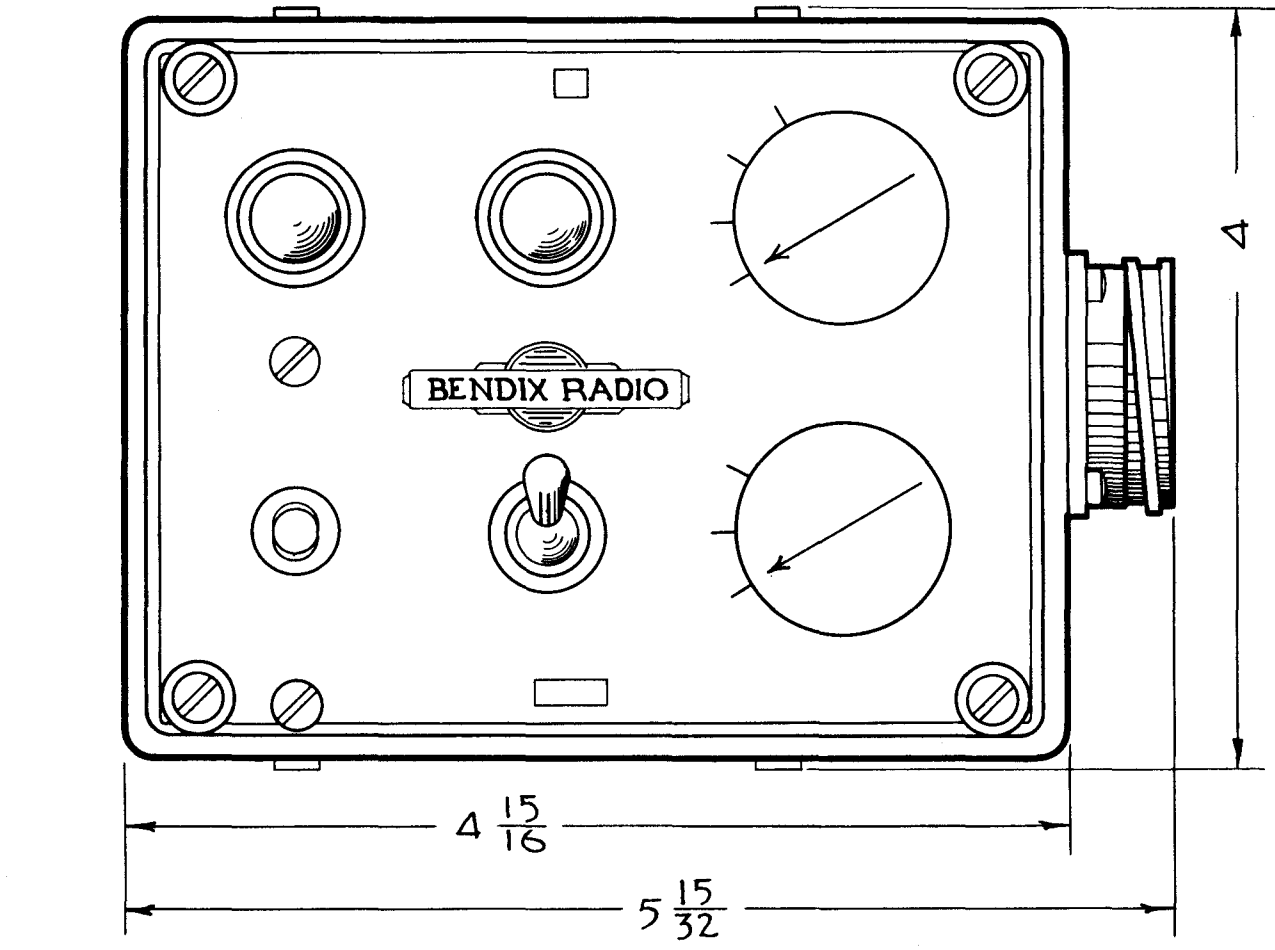
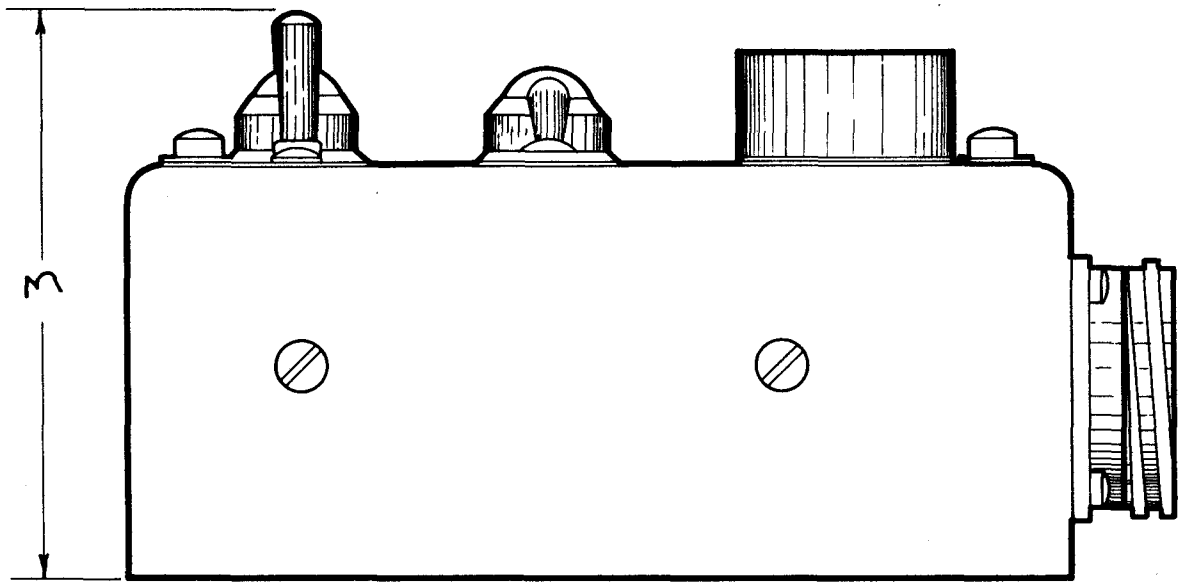
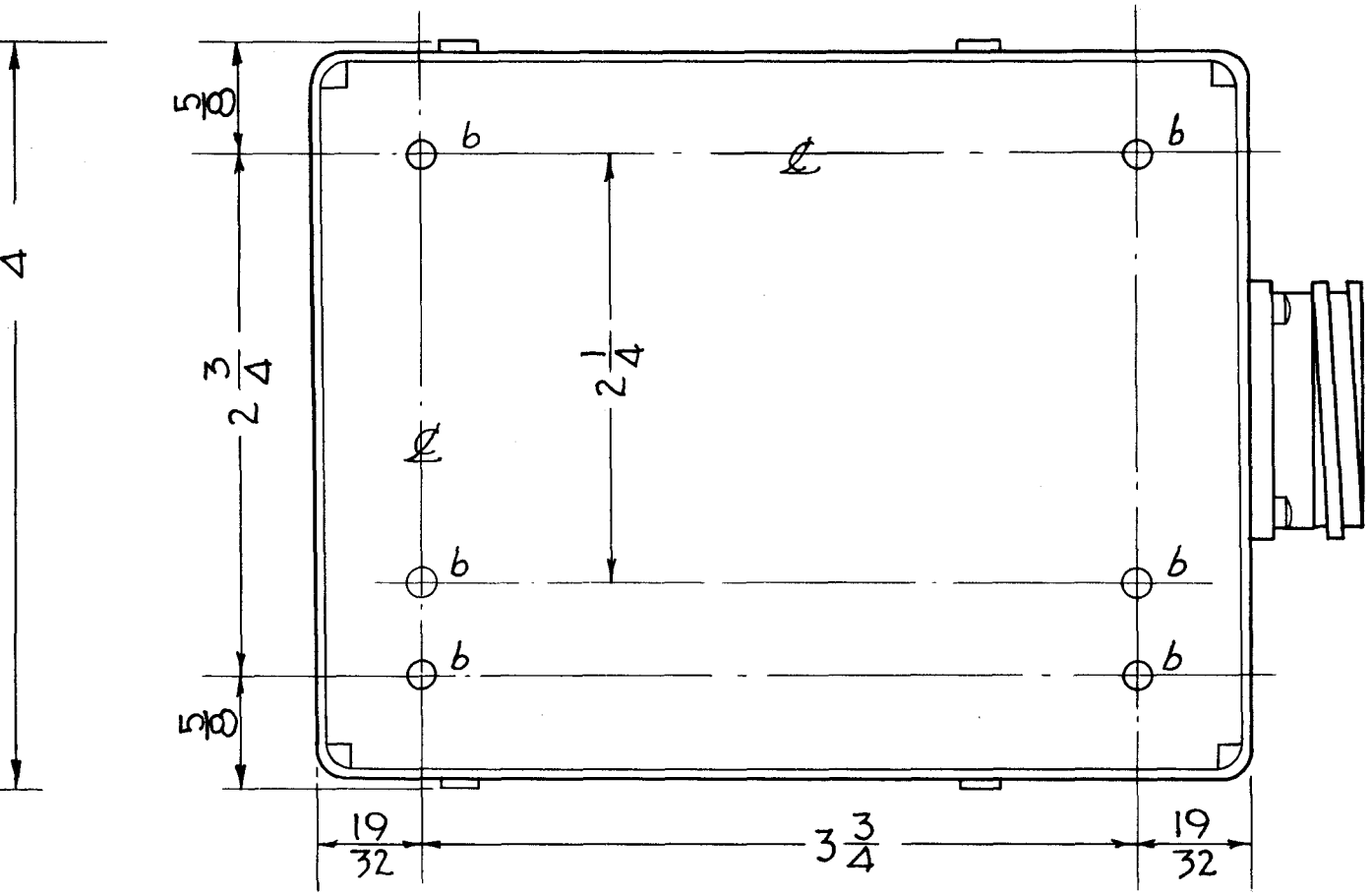


FIG. 19 – OUTLINE & MOUNTING DIMENSIONS TYPE MP-28B POWER SUPPLY UNIT



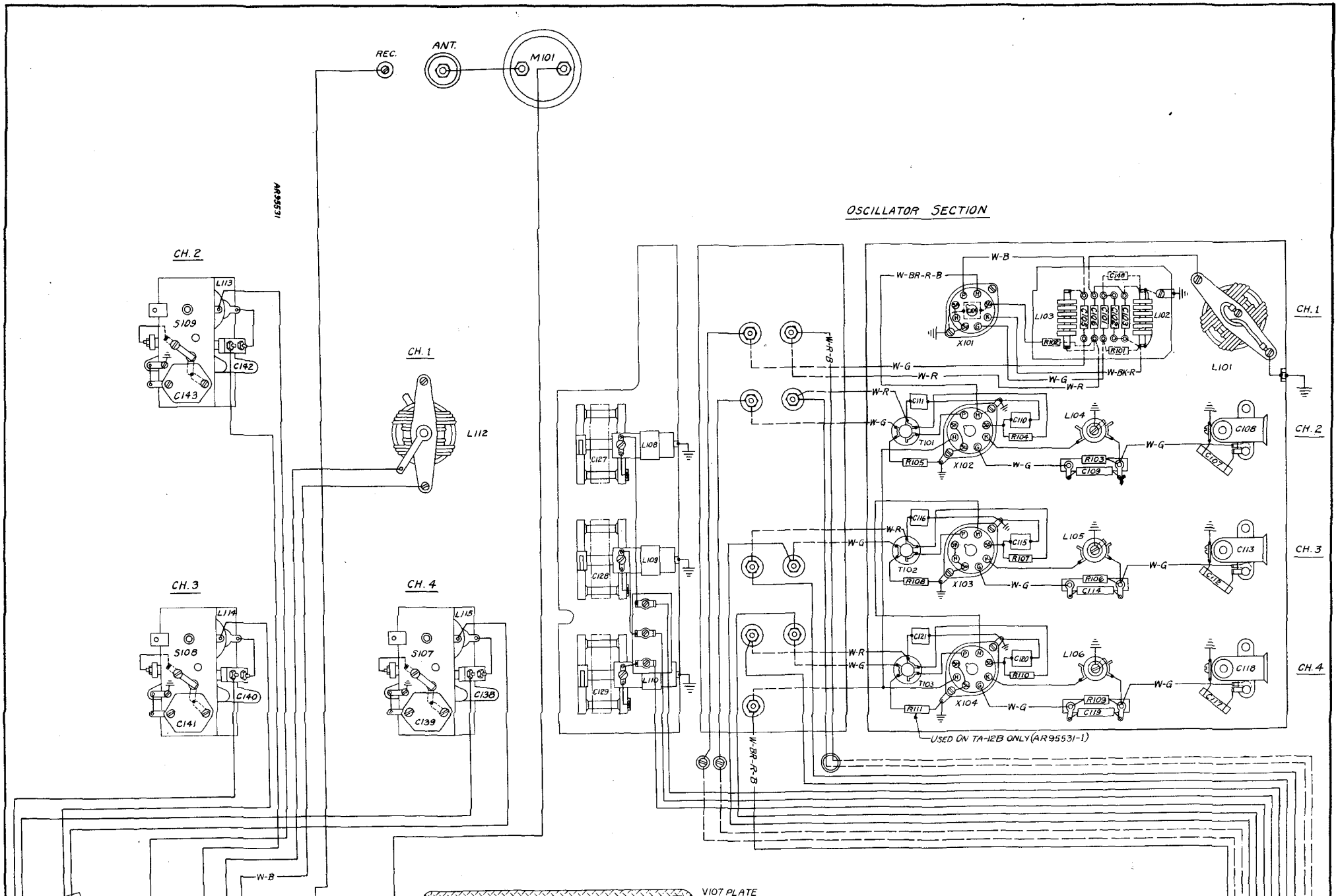


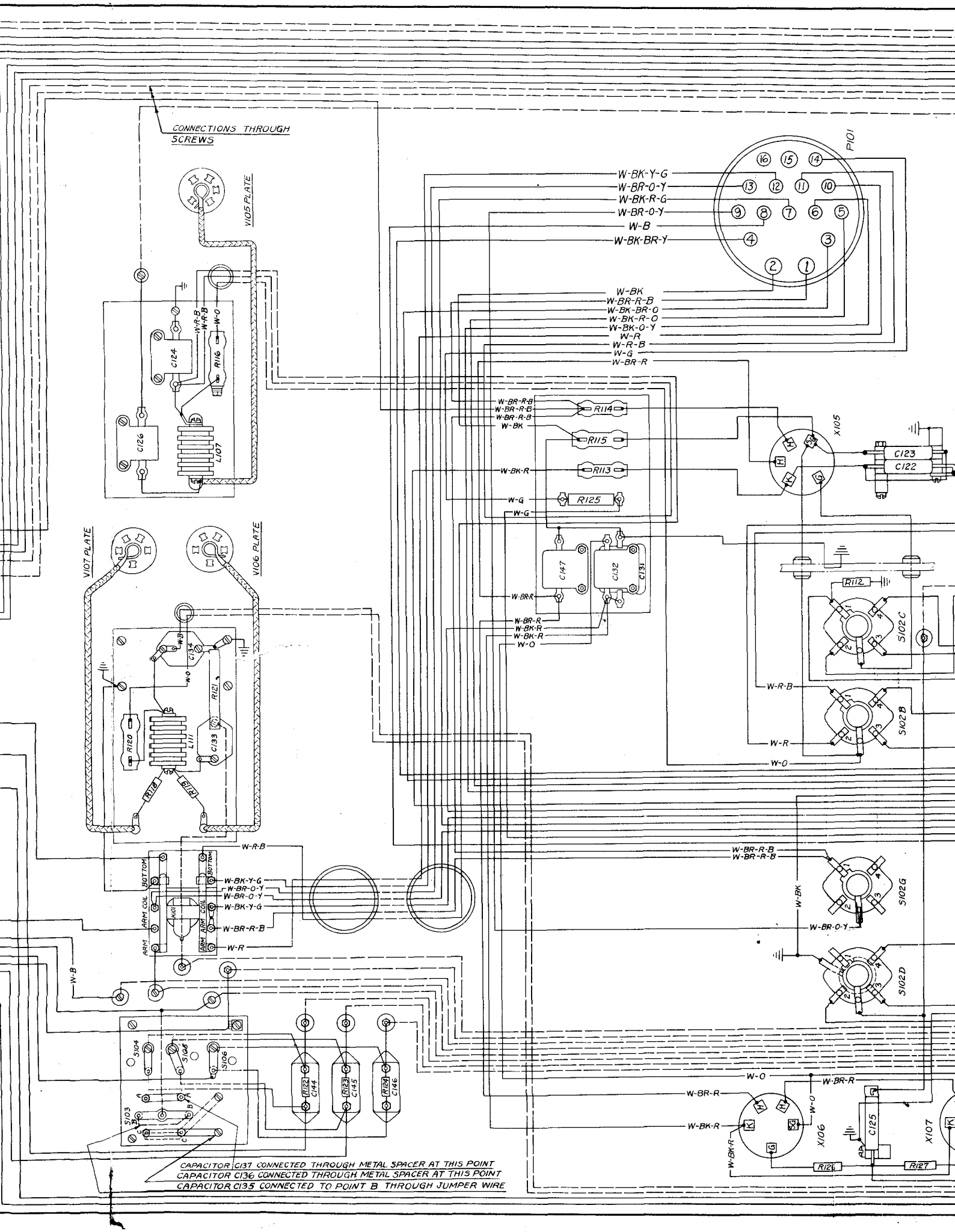
L72640



b = 3/16 DIA. (.187)

FIG.20-OUTLINE & MOUNTING DIMENSIONS TYPE MT-5IB REMOTE CONTROL UNIT


REC.
ANT.
M101
AR95531
OSCILLATOR SECTION
CH. 2
L113
S109
C142
C143
CH. 1
L112
CH. 3
L114
S108
C140
C141
CH. 4
L115
S107
C138
C139
C127
L108
C128
L109
C129
L110
W-B
W-BR-R-B
W-G
W-R
W-BK-R
X101
L103
L102
C148
C101
C102
C103
C104
C105
R102
R101
L101
CH. 1
C111
T101
C110
R104
L104
C108
CH. 2
R105
X102
R103
C109
C107
C116
T102
C115
R107
L105
C113
CH. 3
R108
X103
R106
C114
C112
C121
T103
C120
R110
L106
C118
CH. 4
R111
X104
R103
C119
C117
USED ON TA-12B ONLY (AR95531-1)
V107 PLATE


CONNECTIONS THROUGH SCREWS
V105 PLATE
V107 PLATE
V106 PLATE
P101
W-BK-Y-G
W-BR-O-Y
W-BK-R-G
W-BR-O-Y
W-B
W-BK-BR-Y
W-BK
W-BR-R-B
W-BK-BR-O
W-BK-R-O
W-BK-O-Y
W-R
W-R-B
W-G
W-BR-R
R114
R115
R113
R125
C147
C132
C131
X105
C123
C122
R112
S102C
S102B
S102G
S102D
C124
R116
C126
L107
C134
R121
R120
L111
C133
R118
R124
BOTTOM
ARM COIL
S101
S104
S105
S106
S103
R122
C144
R123
C145
R124
C146
X106
X107
C125
R126
R127
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

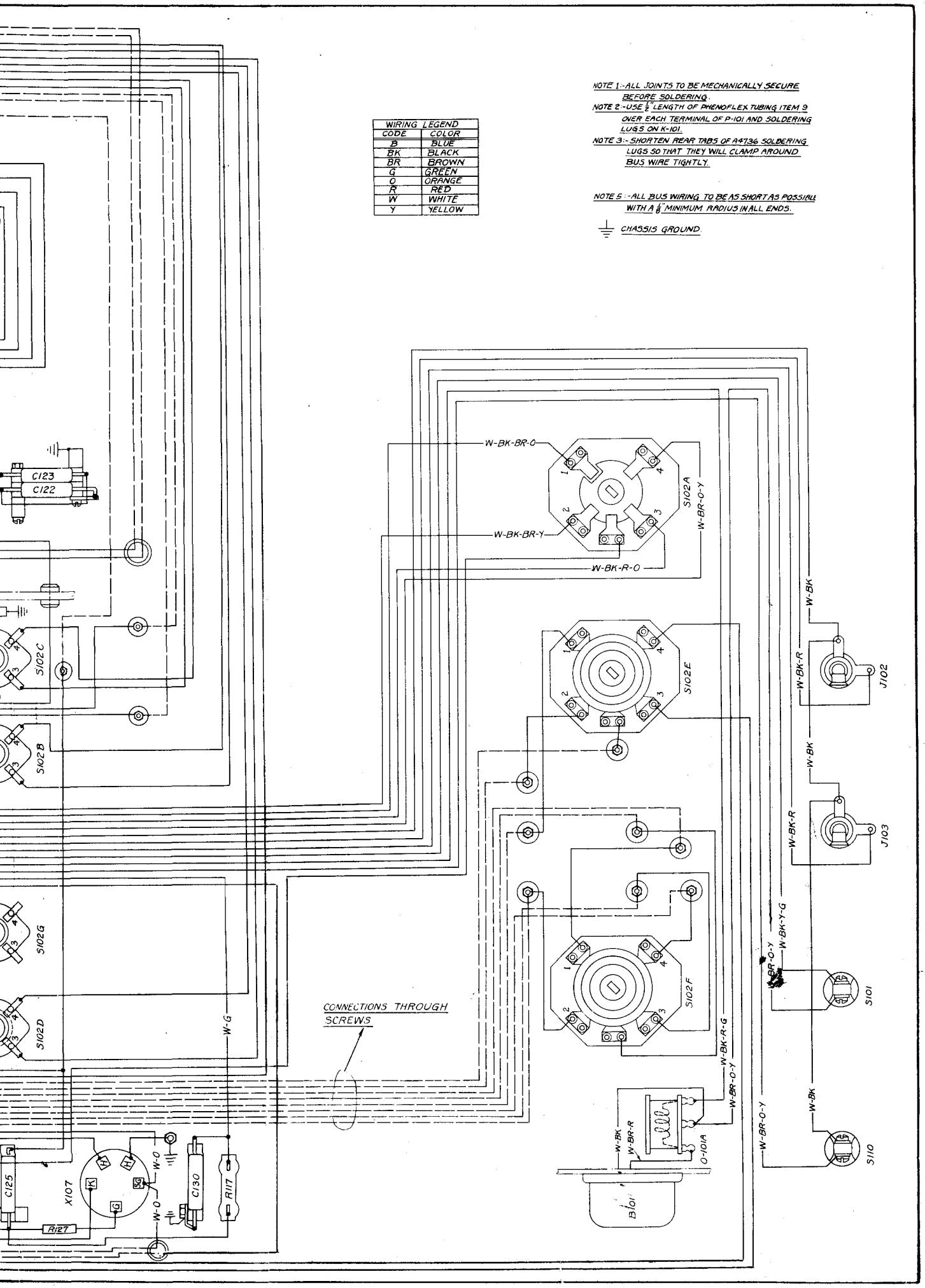
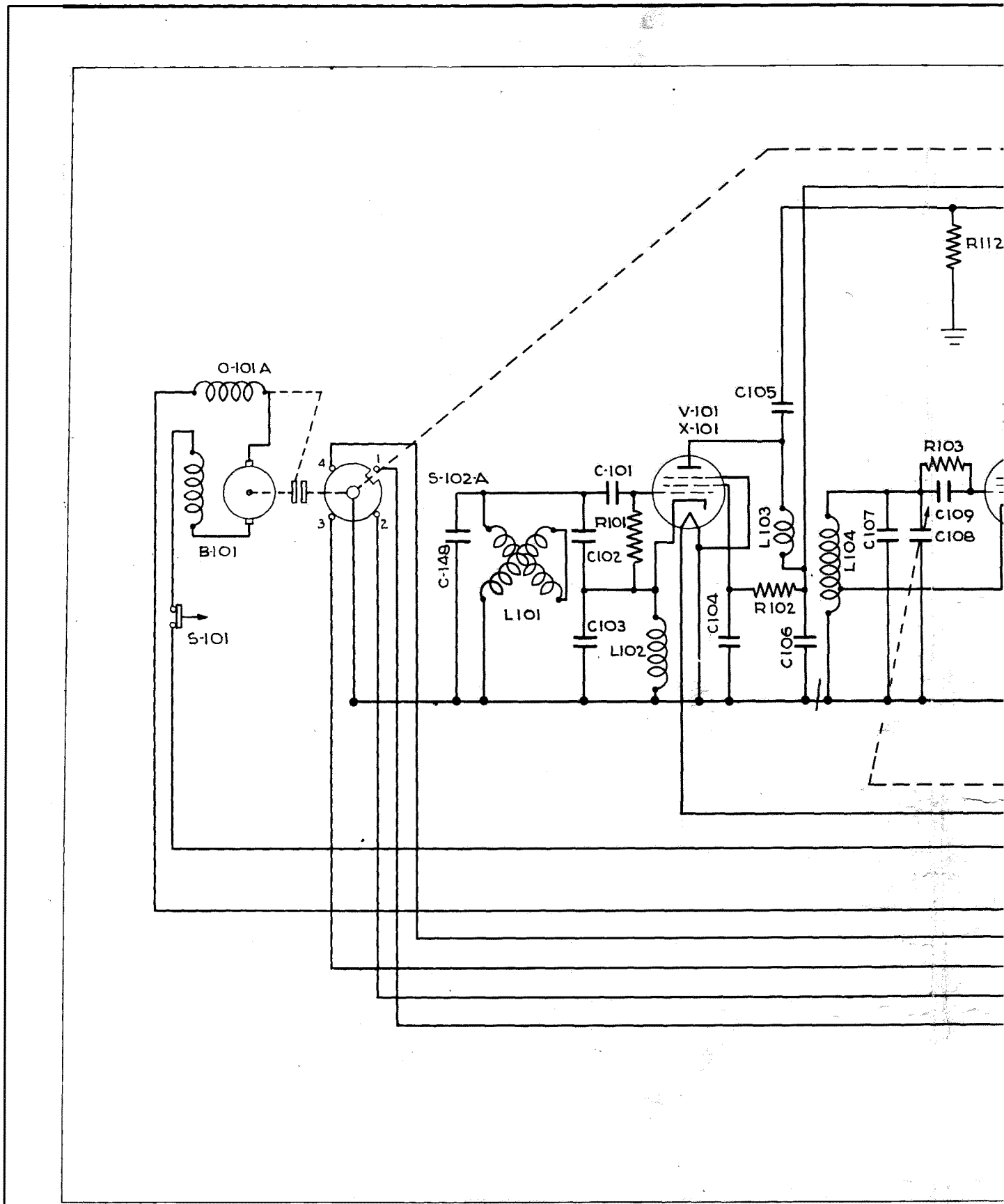
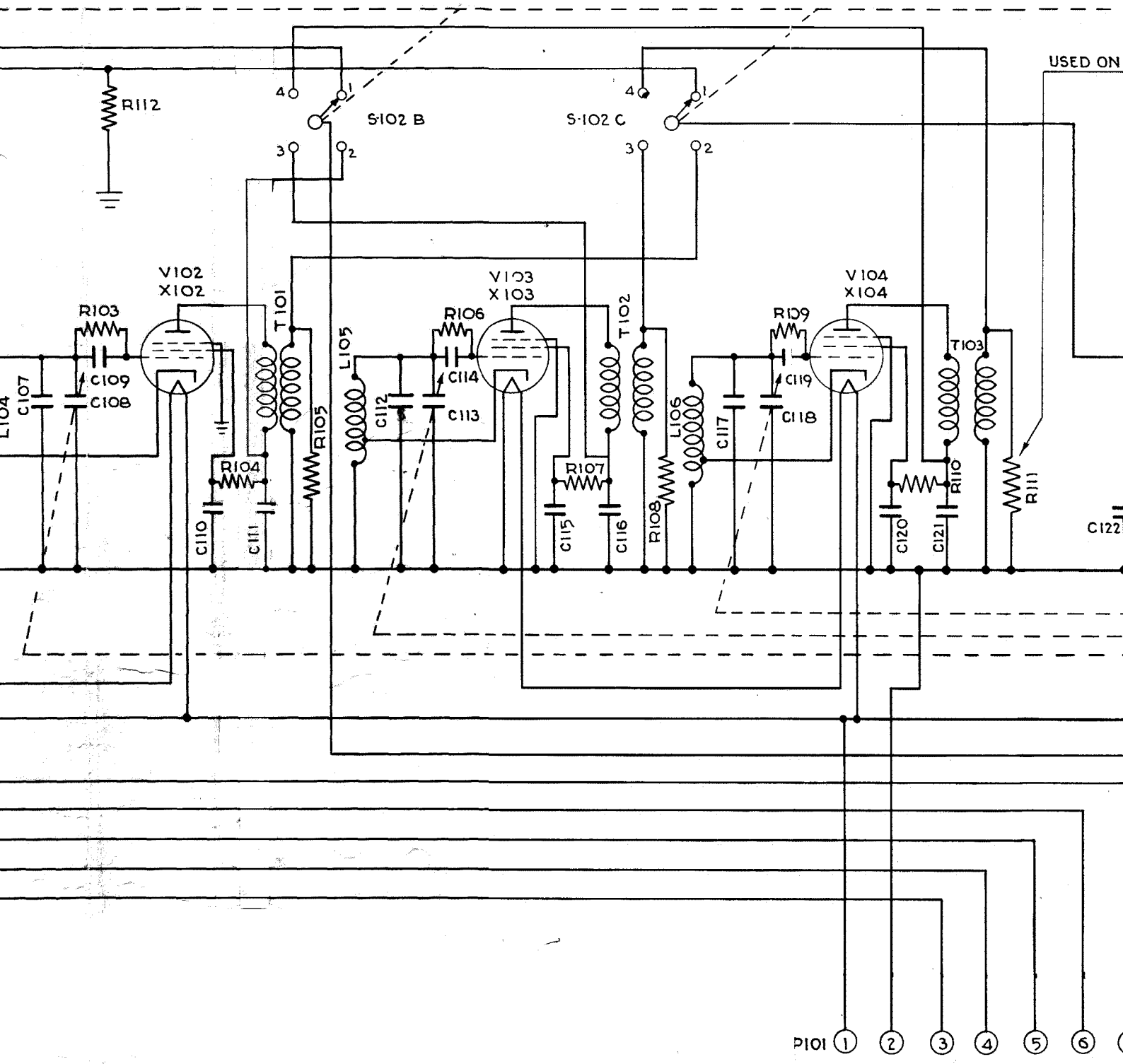
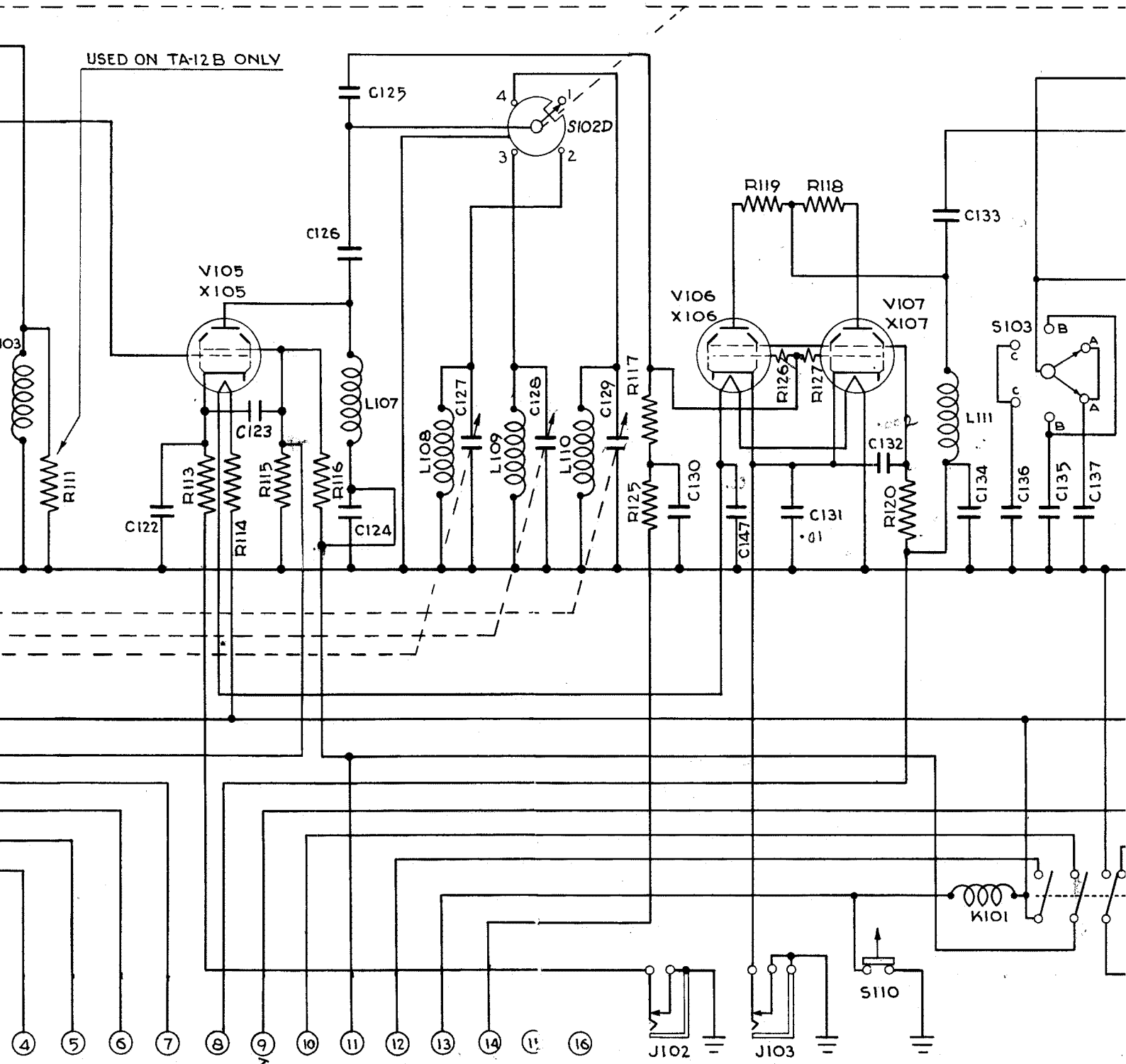


FIG. 22-WIRING DIAGRAM TYPE TA-12B TRANSMITTER


O-101 A
B-101
S-101
S-102-A
C-148
L101
C-101
R101
C102
C103
L102
V-101
X-101
C104
C105
R102
C106
L103
L104
C107
R103
C109
C108
R112

R95473


USED ON
R112
S-102 B
S-102 C
V102
X102
V103
X103
V104
X104
R103
R106
R109
T101
T102
T103
L104
L105
L106
C107
C108
C109
C110
C111
C112
C113
C114
C115
C116
C117
C118
C119
C120
C121
C122
R104
R105
R107
R108
R110
R111
P101
1
2
3
4
5
6
FILAMENT
GROUND
FREQ. No 1
FREQ. No 2
FREQ. No 3
FREQ. No 4


USED ON TA-12B ONLY
C125
S102D
C126
V105
X105
V106
X106
V107
X107
R119
R118
C133
S103
L107
C123
R111
R113
R114
R115
R116
C122
C124
L108
L109
L110
C127
C128
C129
R117
R125
C130
C147
C131
.01
R126
R127
C132
R120
L111
C134
C136
C135
C137
K101
S110
J102
J103
4
5
6
7
8
9
10
11
12
13
14
15
16
FREQ. No 2
FREQ. No 3
FREQ. No 4
MOTOR
AUDIO
ANT. LOAD RELAY
+B-IN
+B-OUT
DYN START
ANT RELAY
BIAS

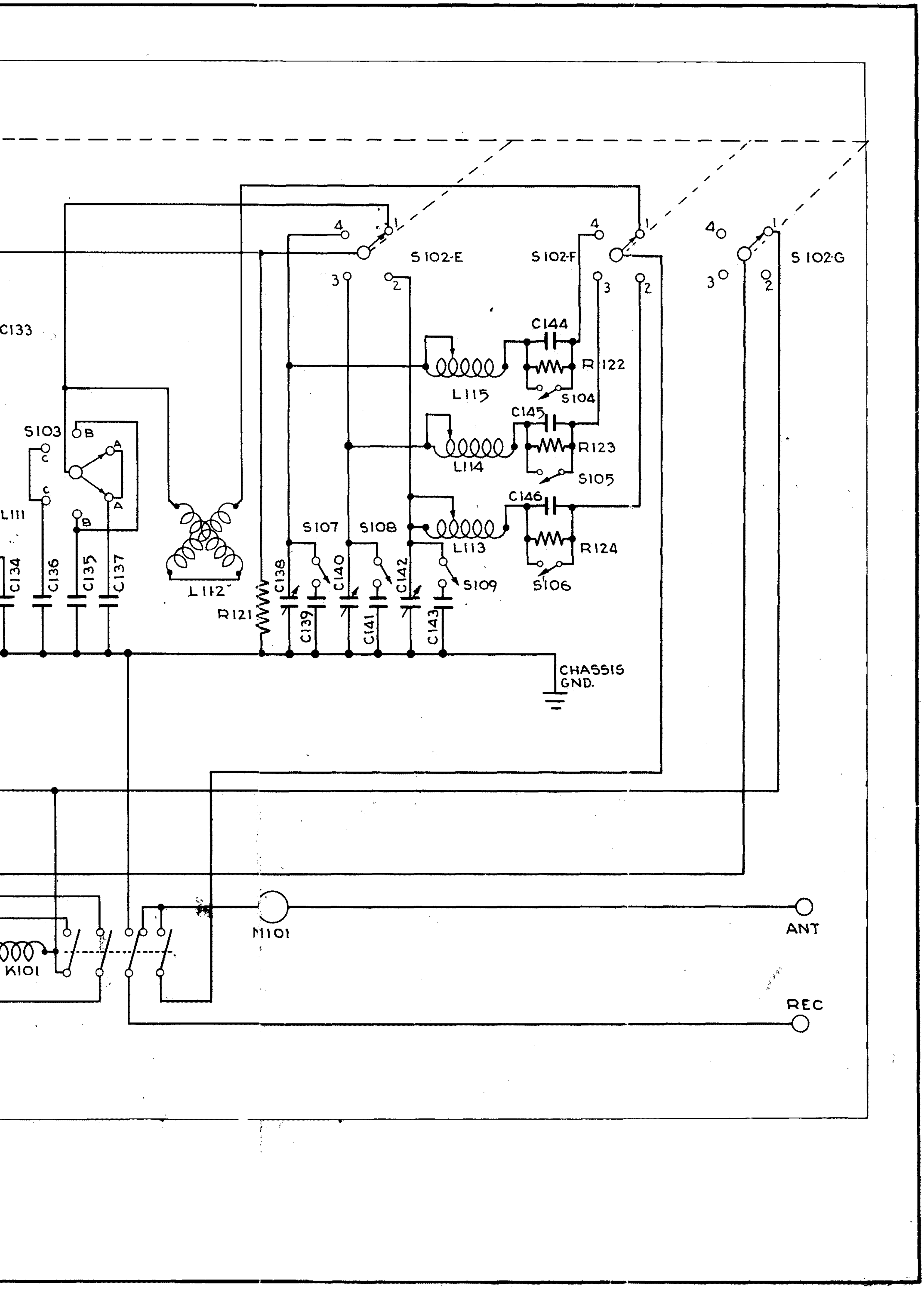
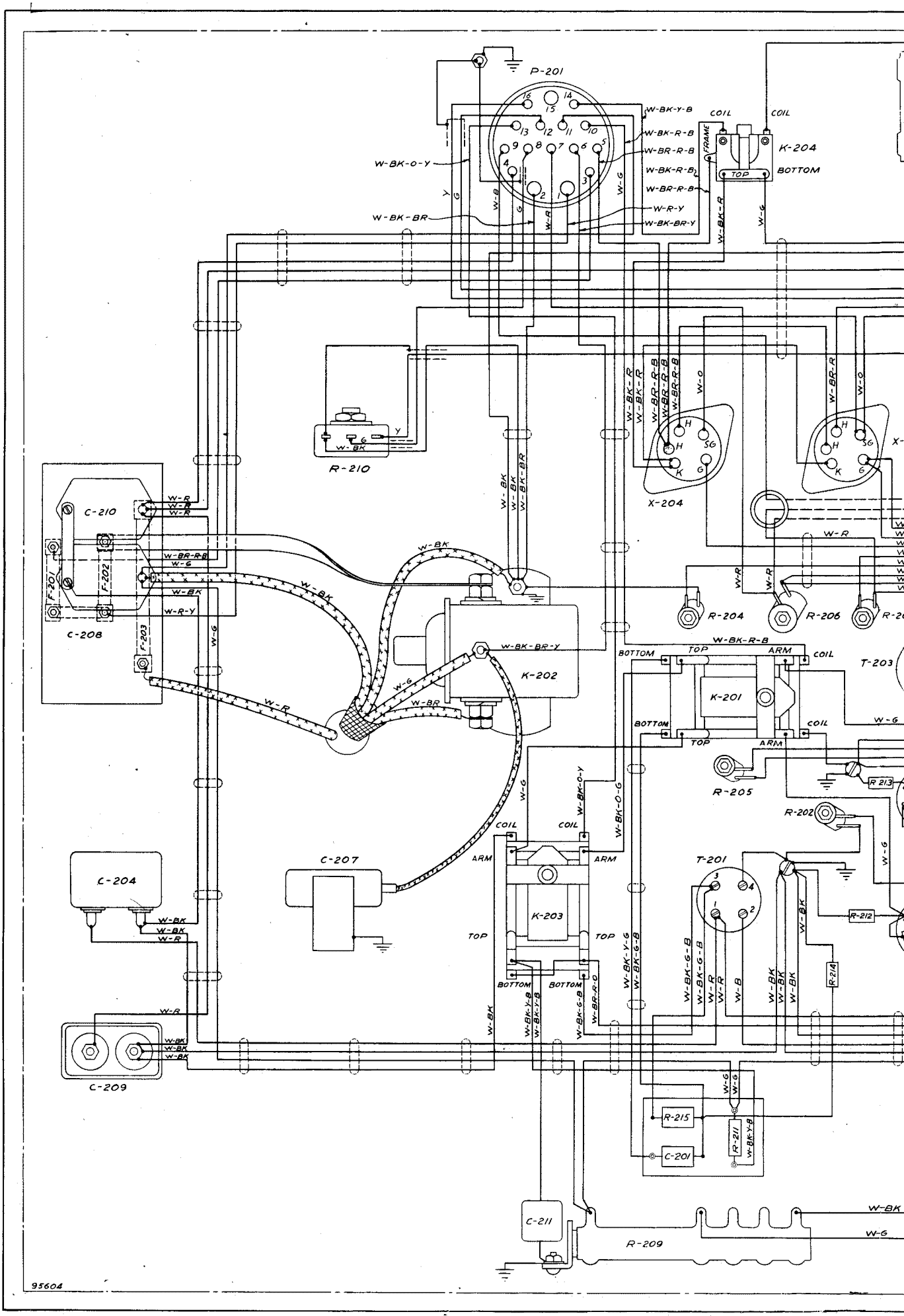
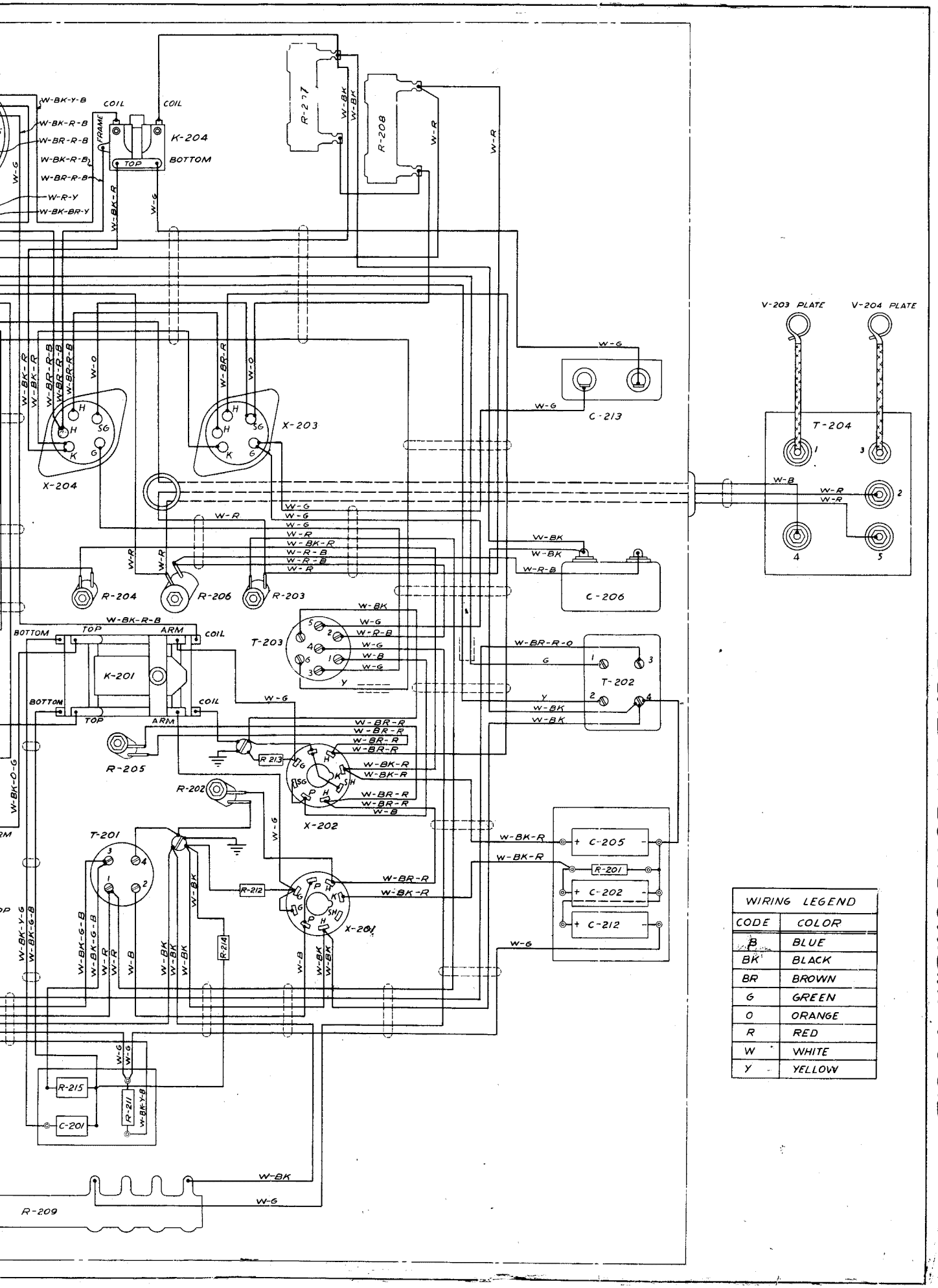


FIG.23-SCHEMATIC DIAGRAM TYPE TA-12B TRANSMITTER


P-201
W-BK-Y-B
W-BK-R-B
W-BR-R-B
W-BK-R-B
W-BR-R-B
W-R-Y
W-BK-BR-Y
W-BK-O-Y
W-BK-BR
COIL
FRAME
TOP
BOTTOM
K-204
W-BK-R
W-G
W-B
W-R
W-Y
G
R-210
W-BK
W-BK-BR
W-BK-R
W-BR-R-B
W-O
X-204
H
SG
K
G
X-
W-BR-R
R-204
R-206
C-210
C-208
F-201
F-202
F-203
W-BR-R-B
W-BK-R
W-R-Y
K-202
W-BK-BR-Y
W-BR
K-201
BOTTOM
TOP
ARM
COIL
T-203
R-205
R 213
R-202
W-BK-O-Y
W-BK-O-G
C-207
C-204
T-201
K-203
R-212
R-214
W-BK-G-B
W-BK-Y-G
W-BK-G-B
W-BK-Y-B
W-BR-R-G
C-209
R-215
R-211
C-201
W-BK-Y-B
C-211
R-209
95604



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

FIG.24-WIRING DIAGRAM TYPE MP-28B POWER SUPPLY UNIT

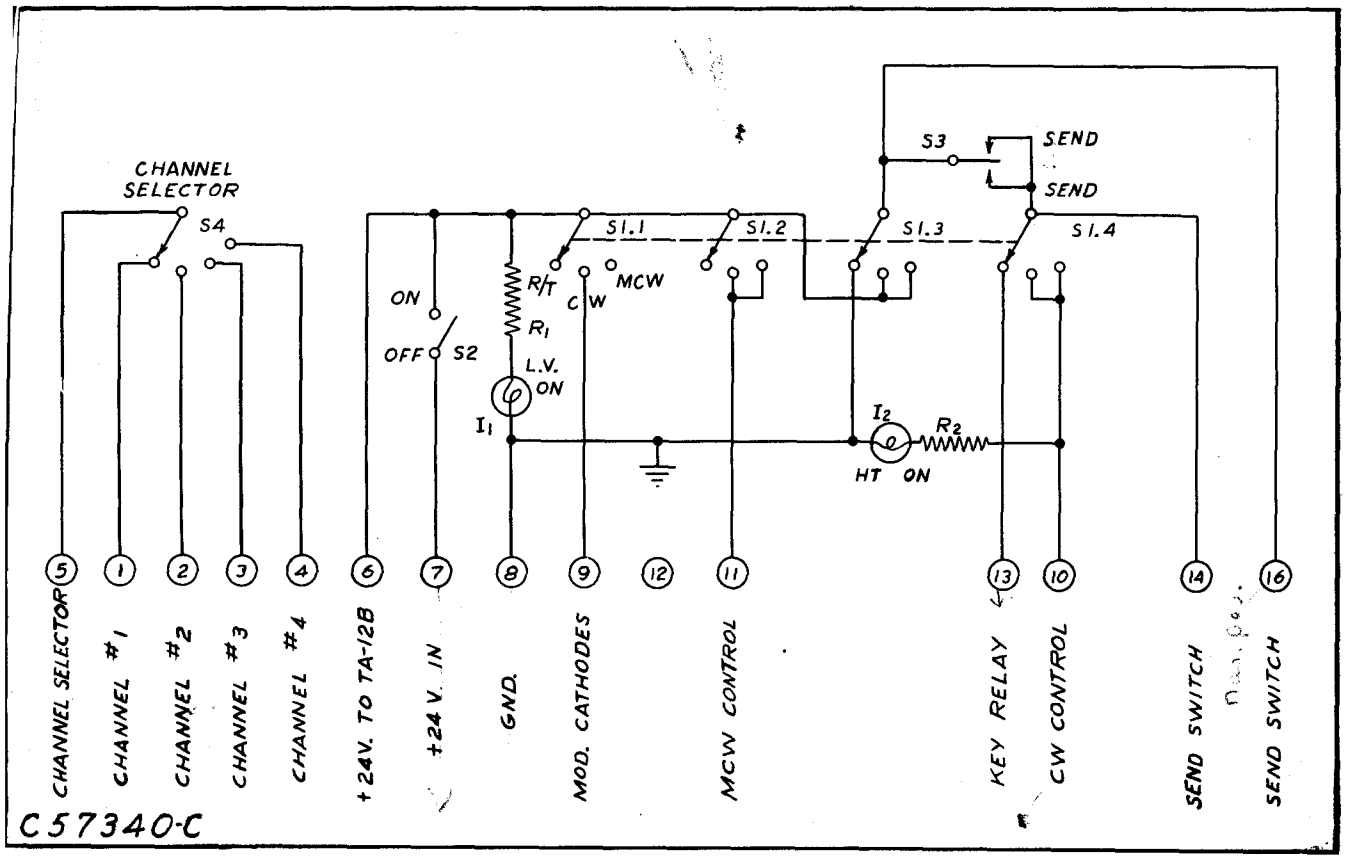


FIG. 26 - SCHEMATIC DIAGRAM
TYPE MT-51B REMOTE CONTROL UNIT

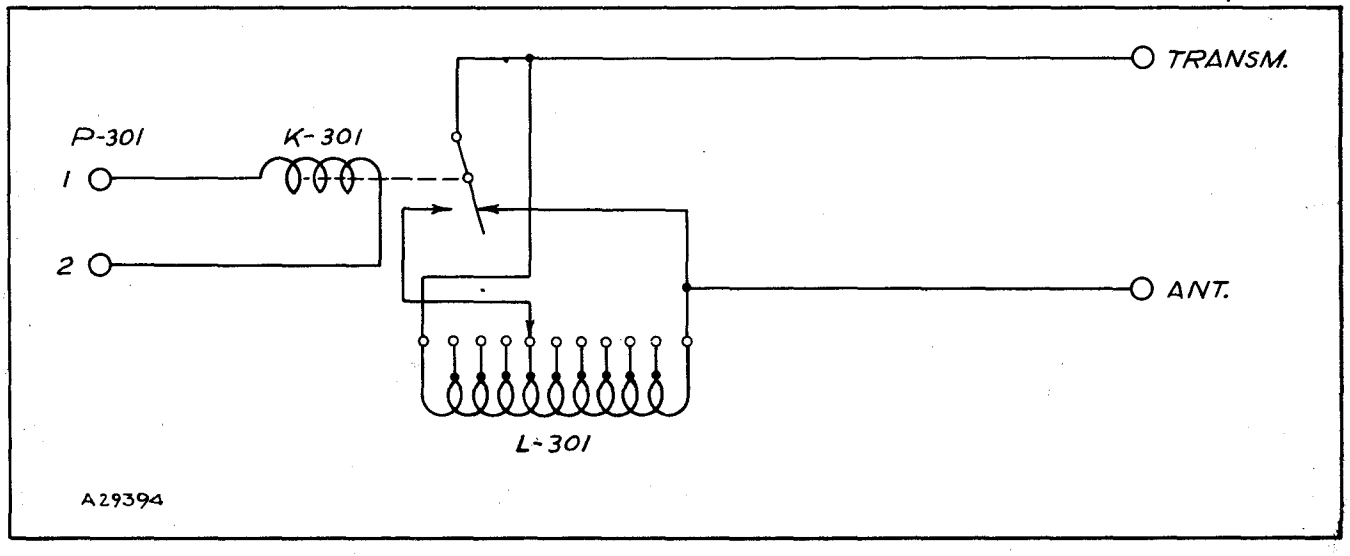


FIG. 27 - SCHEMATIC DIAGRAM
TYPE MT-53B ANTENNA LOADING UNIT

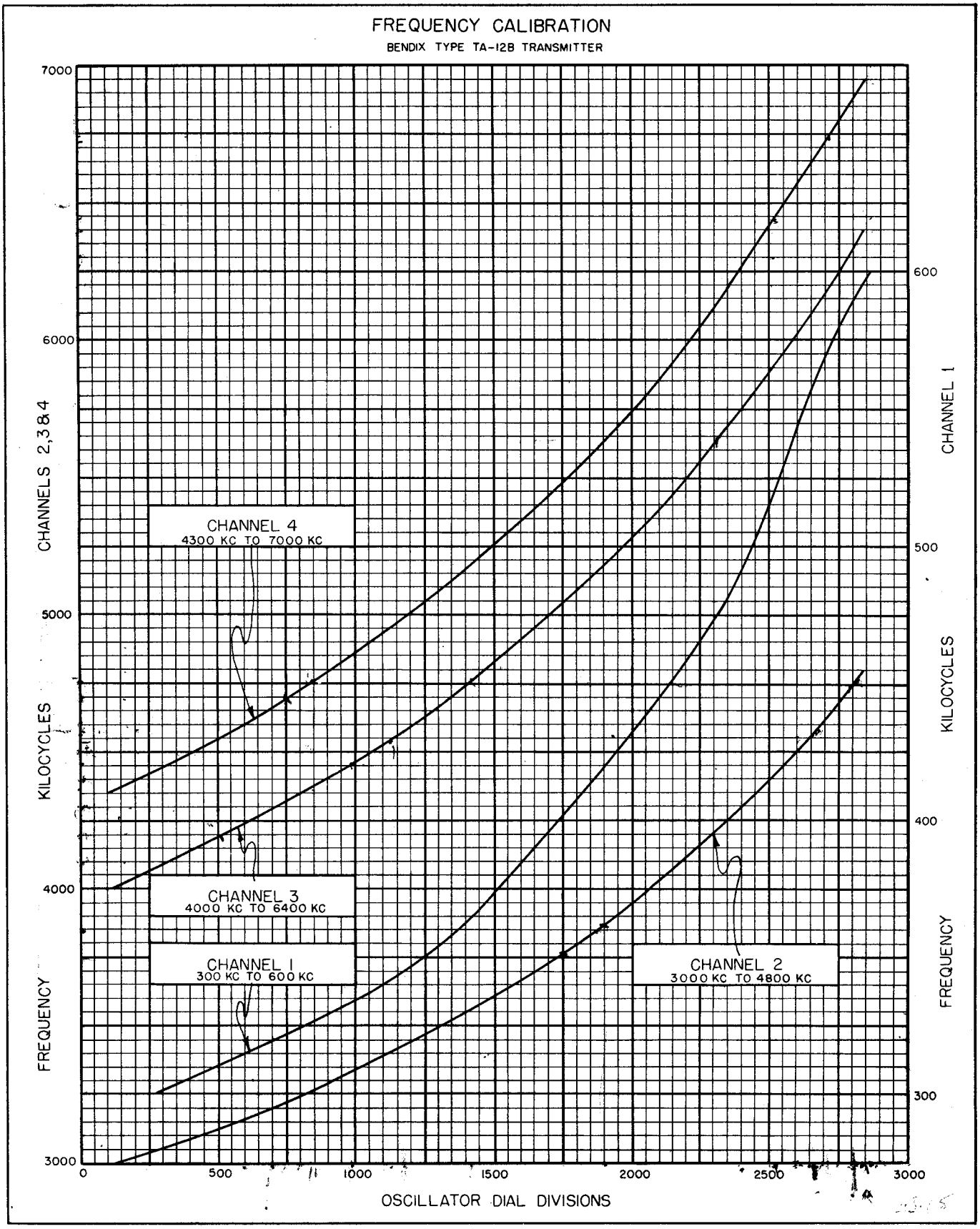


FIG. 28-FREQUENCY CALIBRATION TYPE TA-12B TRANSMITTER

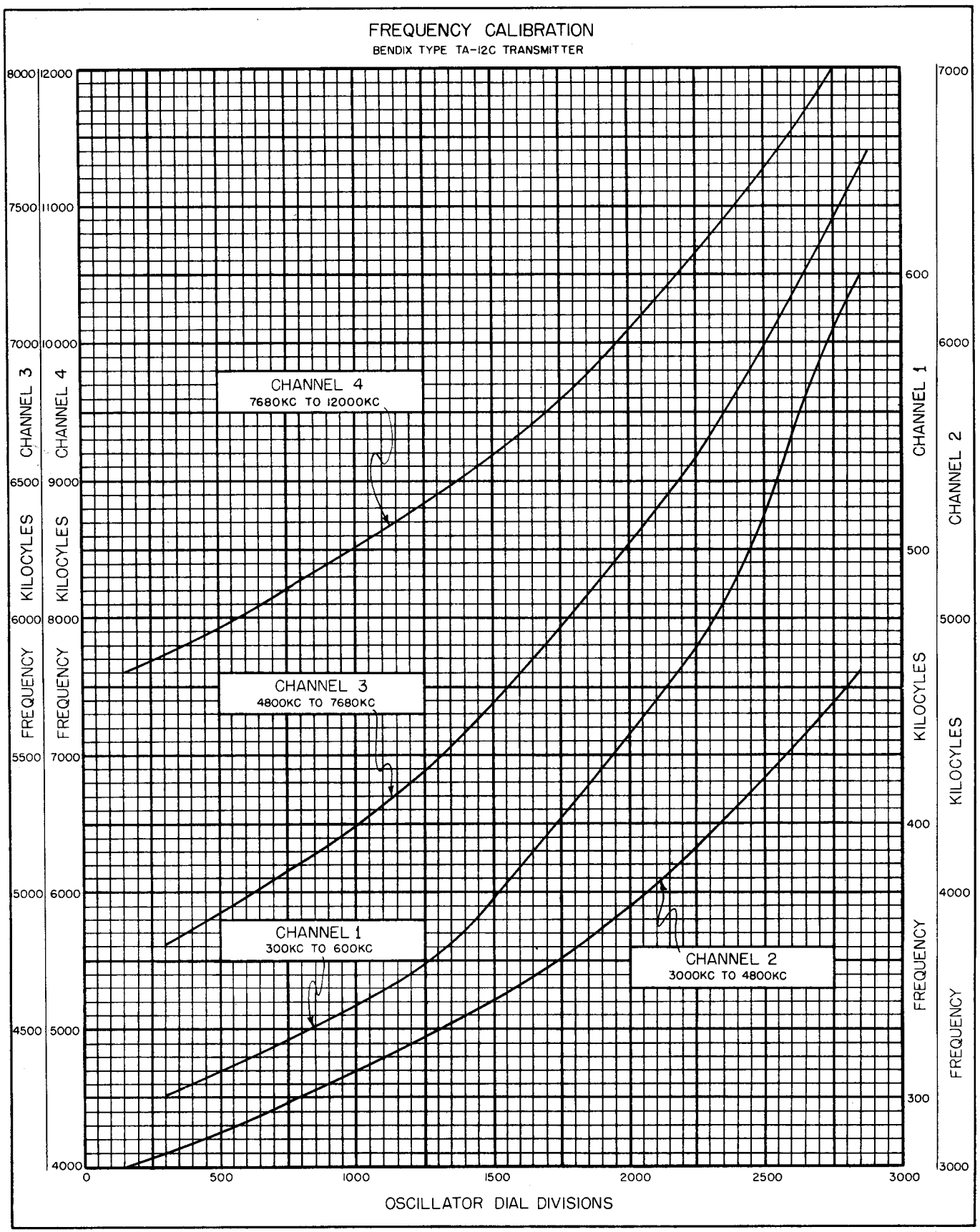


FIG. 29- FREQUENCY CALIBRATION TYPE TA-12C TRANSMITTER

Connect all terminals in a horizontal line together

TA-12B	MP-28B	MT-53B	MT-51B	Other
1	5 and 13	*	6	*
2	2	*	8	GND
3	*	*	1	*
4	*	*	2	*
5	*	*	3	*
6	*	*	4	*
7	*	*	5	*
8	9	*	*	*
9	*	1	*	*
10	4	*	*	*
11	7	*	*	*
12	6	*	10	*
13	*	2	13	SIDETONE RELAY, KEY
14	11	*	*	*
*	1	*	*	+24V
*	3	*	7	*
*	8	*	*	SIDETONE AUDIO
*	10	*	11	*
*	12	*	*	MICRO
*	14	*	9	*
*	16	*	*	MICRO

FIG. 30–SYSTEM WIRING CHART, MODEL TA-12B AND TA-12C TRANSMITTING EQUIPMENT