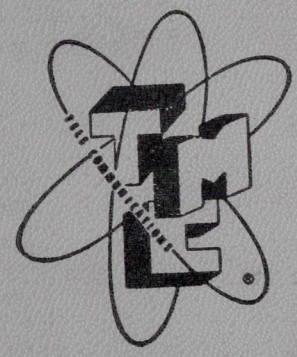
UNCLASSIFIED

TECHNICAL MANUAL

for

RADIO TRANSMITTER
MODEL GPT-750()-2



THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N. Y. OTTAWA, ONTARIO

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TECHNICAL MANUAL

for

RADIO TRANSMITTER MODEL GPT-750()-2

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IN-208

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This Instruction Manual is patterned after the building block priciple incorporated in the TMC Models GPT-750( )2. The General "G" Part covers only that material common to all combinations of the Transmitter. Parts A through D cover the material peculiar to the corresponding version of the Transmitter. For example: the neutralization procedure which is the same for all combinations is located in the General "G" Part. The tune-up procedure for the Model GPT-750D2 which is peculiar to that combination is located in the D Part of the manual. Part E is the Parts Lists and Illustrations for all combinations.

TMC No.	Name	Nomenclature	Noun
CAB-7	Cabinet/Frame Assembly	CY-2660/URT-17A	Cabinet, Electrical Equipment
RTF-2	Amplifier-Oscillator	AM-2271/URT-17A	Amplifier, Oscillator
RTP-2	Power Supply	PP-2396/URT-17A	Power Supply
RTM-2	Modulator-Power Supply		
RTS-2	Exciter Power Supply	MT-2193/URT-17A	Drawer, Electrical Equipment
RTX-2	Drawer, Electrical Equipment		
XFK	Frequency Shift Exciter	C-2749/URT	Control, Electrical Frequency
A-1516	Single Sideband Exciter	0-503A/URA-23	Oscillator, Radio Frequency
GPT-750 D2	Radio Transmitter	AN/URT-17A	Transmitting Set, Radio

Chart of Commercial Designation vs Nomenclature

WARNING NOTICE

Failure to follow safety precautions may result in serious injury, extreme shock, or death

SHOULD IT BECOME NECESSARY FOR ANY REASON TO MAKE REPAIRS OF ANY KIND ON THE TRANSMITTER TURN OFF THE MAIN POWER BREAKER AND PROCEED AS FOLLOWS:

1. USING A HIGHLY INSULATED SHORTING BAR, AND WITH EXTREME CAUTION, SHORT THE PLATES OF V102 OF THE RTF TO GROUND;

or

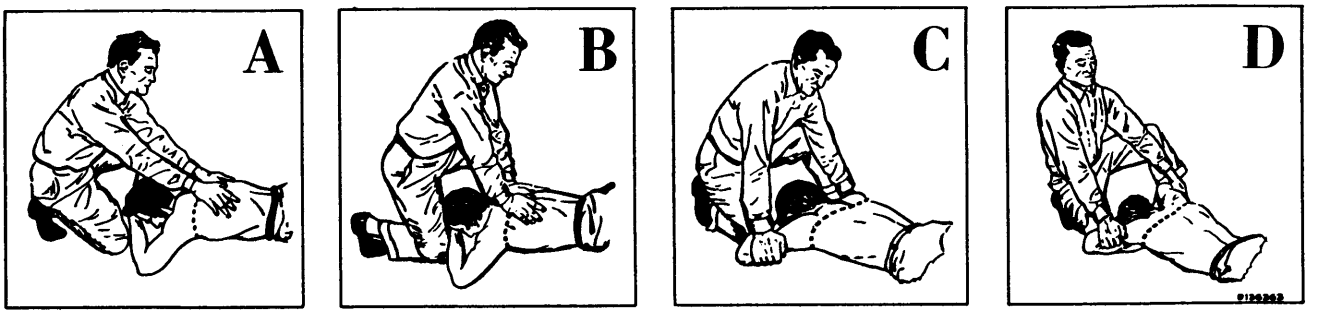
2. SHORT ONE OF THE HIGH VOLTAGE CONSENSERS, C610, C611 OR C612, TO GROUND.

THE ABOVE PERMITS IMMEDIATE DISCHARGE OF THE HIGH VOLTAGE AND INSURES SAFE HANDLING OF THE UNITS.

WHEN MAKING MEASUREMENTS OF HIGH VOLTAGE CIRCUITS, DO NOT HANDLE INSTRUMENTS OR THEIR LEADS WHILE POWER IS ON. PLACE LEADS ON COMPONENT TO BE MEASURED, WITH THE POWER TURNED OFF, THEN TURN THE POWER ON AND TAKE READING. TO REMOVE LEADS, TURN POWER OFF AGAIN.

FIRST AID IN CASE OF ELECTRIC SHOCK

1. PROTECT YOURSELF with dry insulating material.
2. BREAK THE CIRCUIT by opening the power switch or by pulling the victim free of the live conductor. DON'T TOUCH THE VICTIM WITH YOUR BARE HANDS until the circuit is broken.
3. START ARTIFICIAL RESPIRATION IMMEDIATELY, SECONDS COUNT. Do not wait to look for help, to loosen clothing, to warm the victim, or to apply stimulants.



4. LAY VICTIM ON HIS STOMACH, preferably with head downhill.
5. CHECK MOUTH FOR OBSTRUCTIONS, remove foreign objects, pull tongue forward.
6. PLACE VICTIM'S FOREHEAD on his crossed hands, face down.
7. KNEEL AT VICTIM'S HEAD on either knee. See (A)
8. PLACE HANDS, fingers spread with thumbs about two inches apart, heels of hands below line connecting armpits. See (A)
9. WITH ELBOWS STRAIGHT, ROCK FORWARD slowly until arms are vertical. See (B) Do not apply more than 35 pounds pressure.
10. ROCK BACK SLOWLY to release pressure.
11. GRASP VICTIM'S ARMS just above elbows and continue backward. See (C)
12. LIFT ARMS until tension is felt. See (D)
13. LOWER ARMS to complete the cycle.
14. AFTER TWO SECONDS, START AGAIN with step 6.
15. REPEAT THE CYCLE 12 to 15 times per minute.
16. WHILE ARTIFICIAL RESPIRATION IS CONTINUED, HAVE SOMEONE ELSE:
    (a) Loosen the victim's clothing. (b) Summon medical aid.
    (c) Keep the victim warm.
17. DON'T GIVE UP. Continue without interruption until the victim is breathing without help or is certainly dead.
    Four hours or more may be required.
18. REMAIN IN POSITION after victim revives. Be ready to resume artificial respiration if necessary.
19. DO NOT GIVE LIQUIDS WHILE VICTIM IS UNCONSCIOUS.

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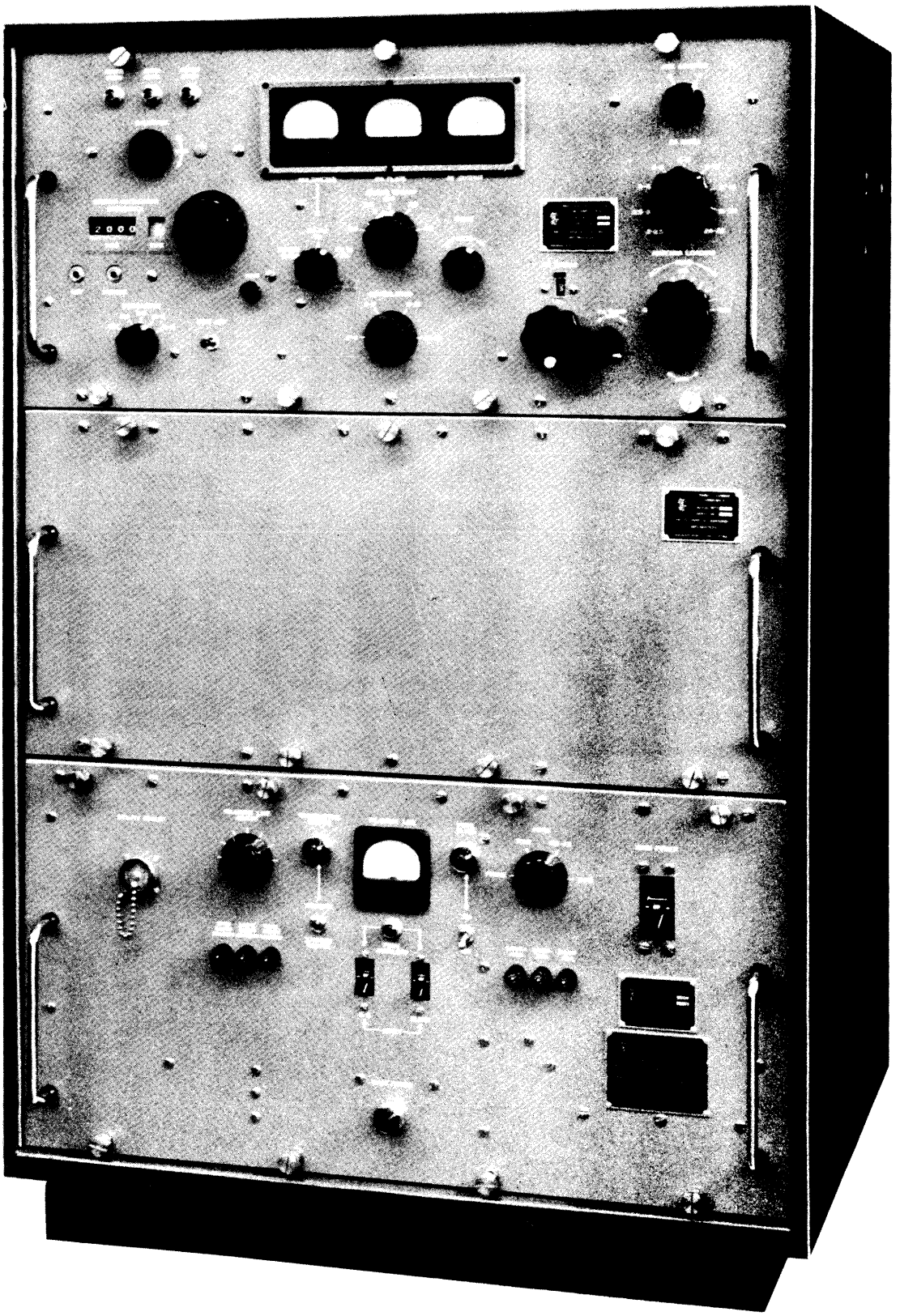

Figure G-1-1 Front View Model GPT-750A2

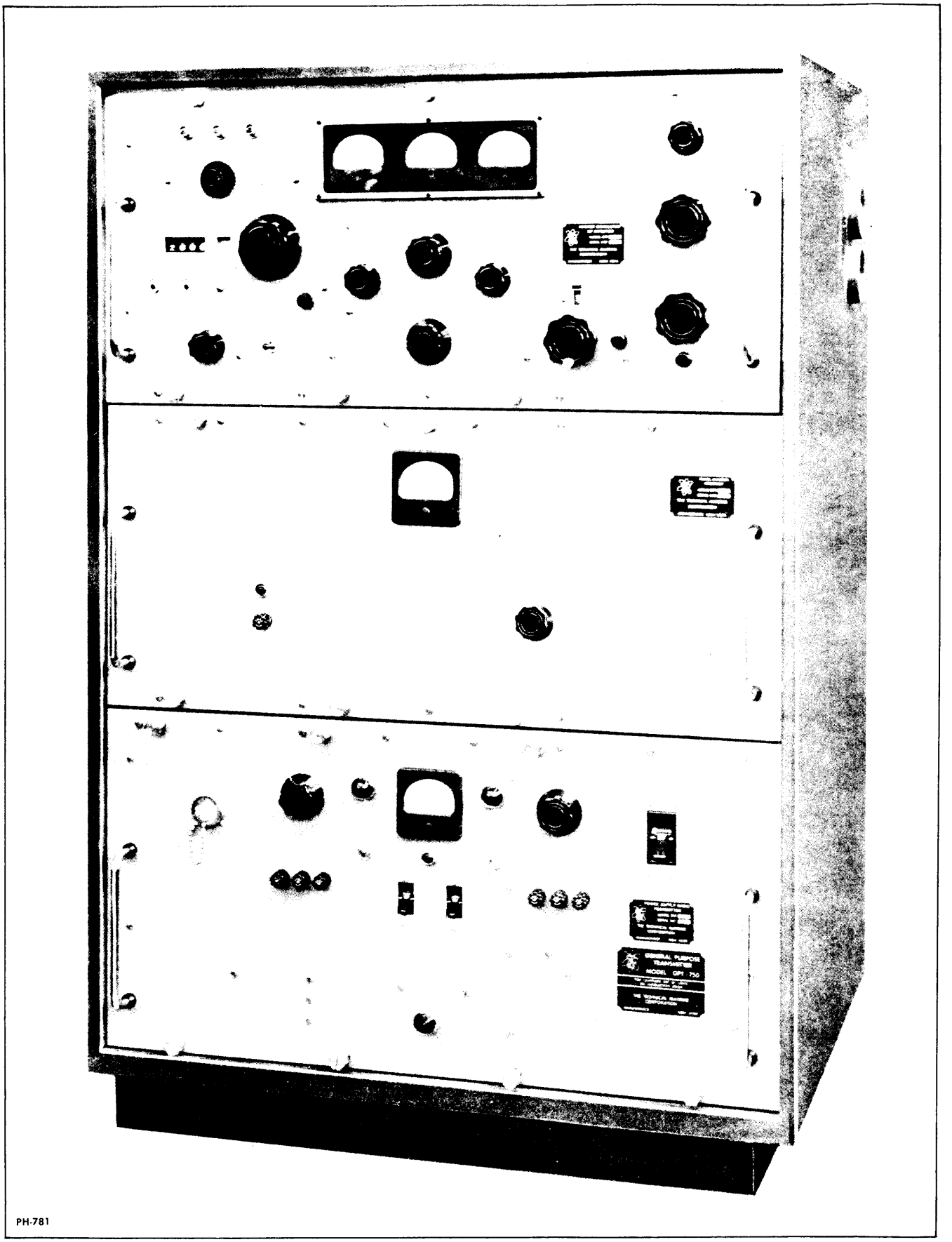

Figure G-1-2 Front View Model GPT-750B2

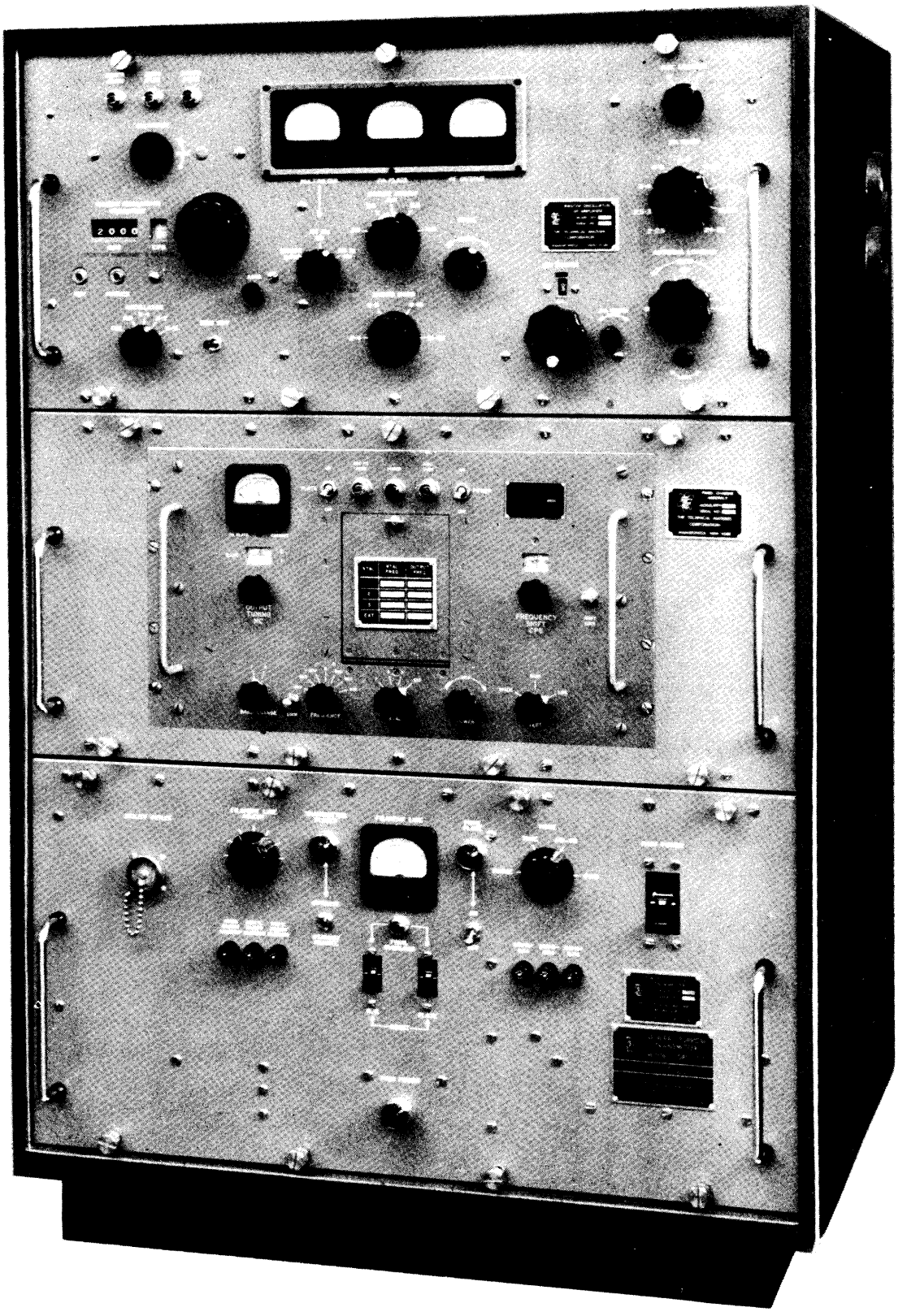

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Figure G-1-3 Front View Model GPT-750C2

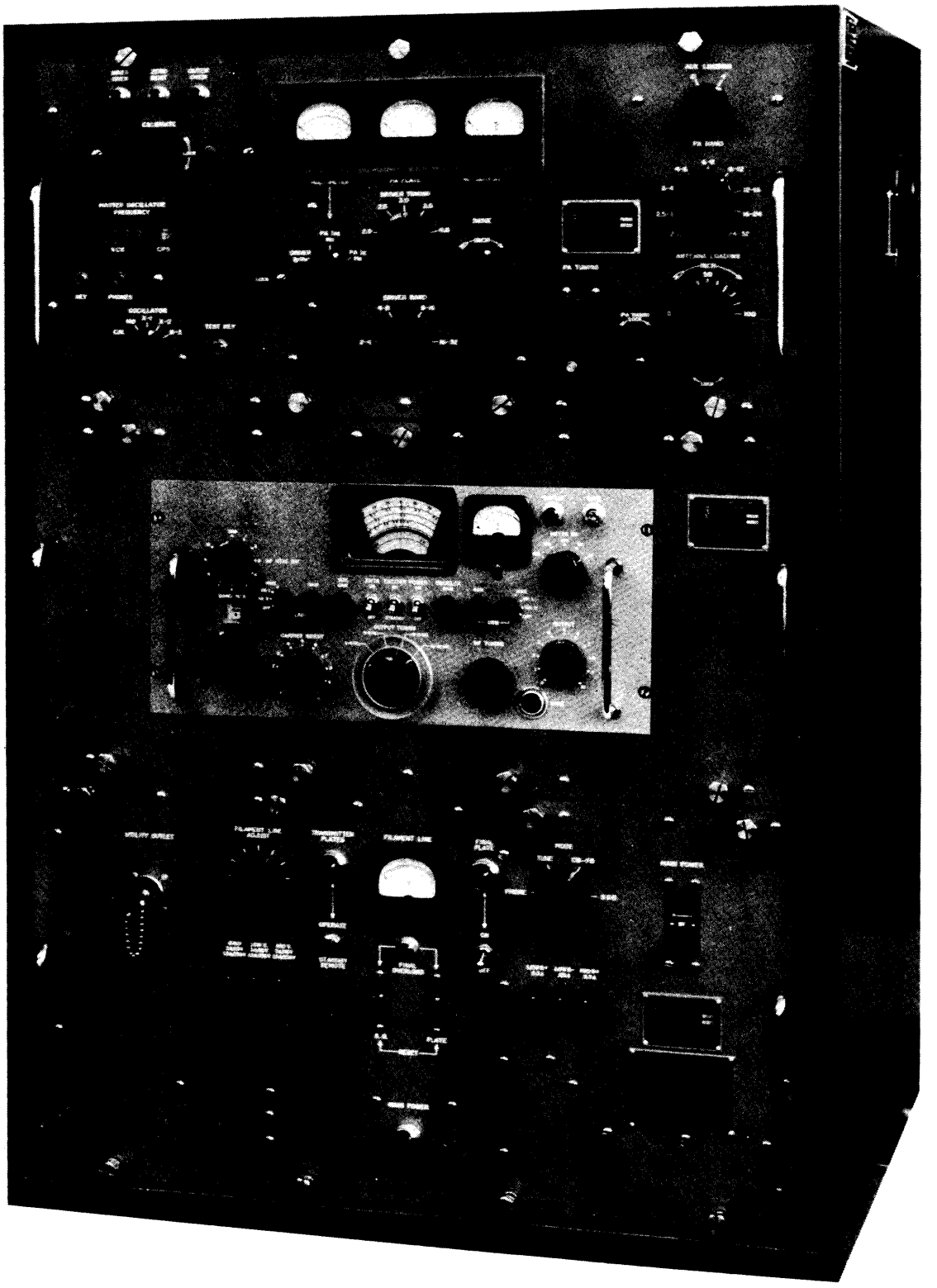

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Figure G-1-4 Front View Model GPT-750D2

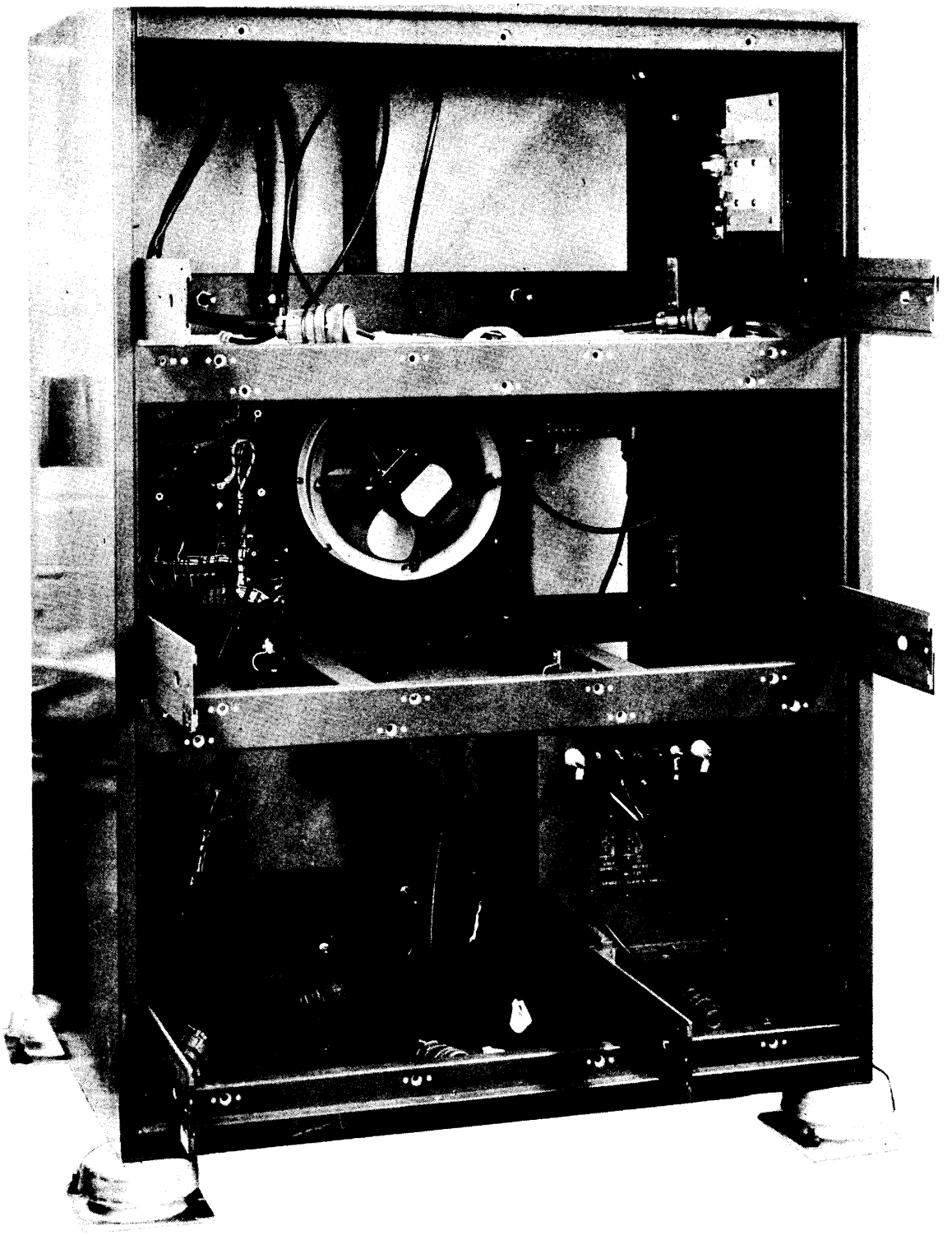

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Figure G-1-5 Front View Model CAB-7

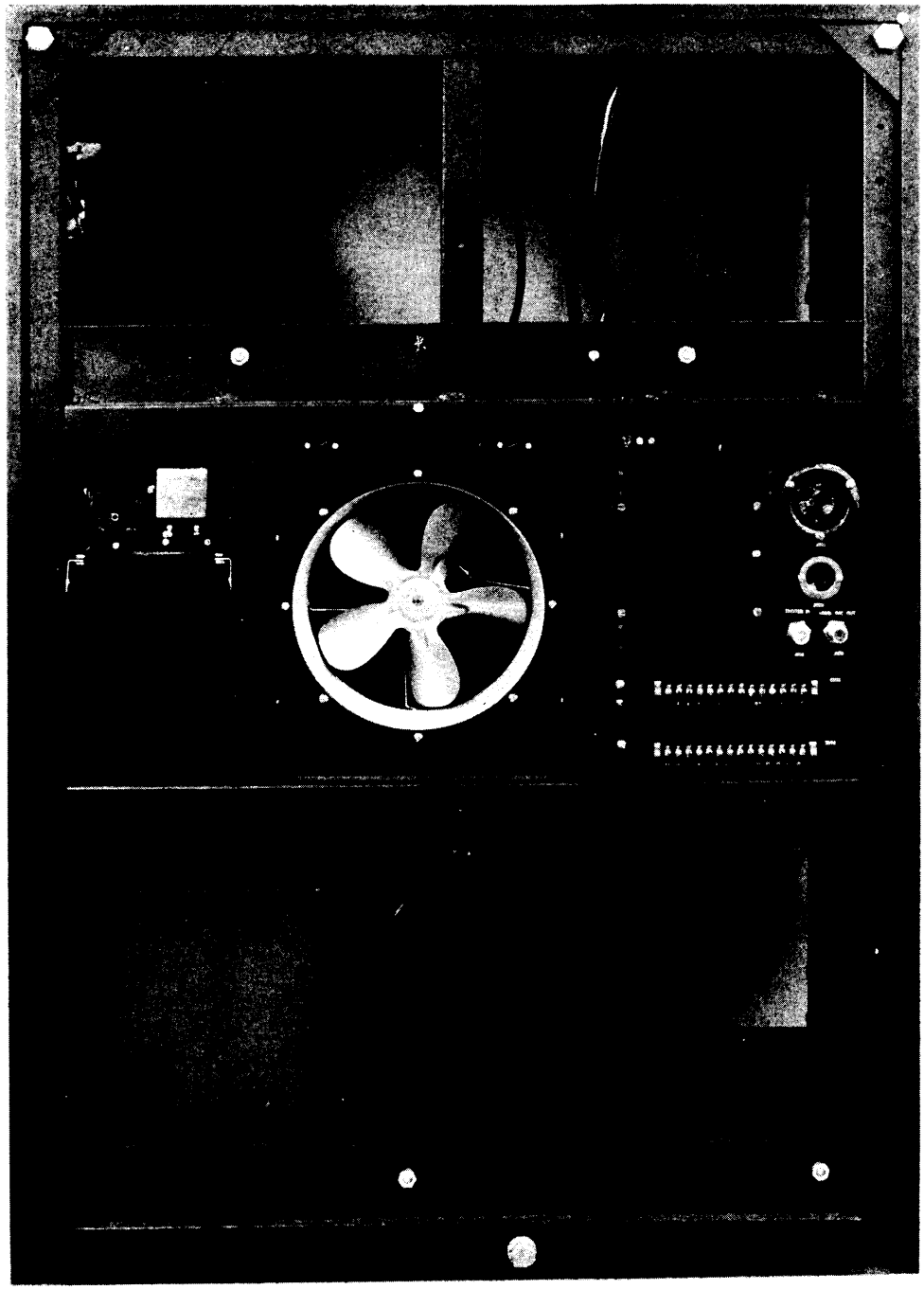

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Figure G-1-6 Rear View Model CAB-7

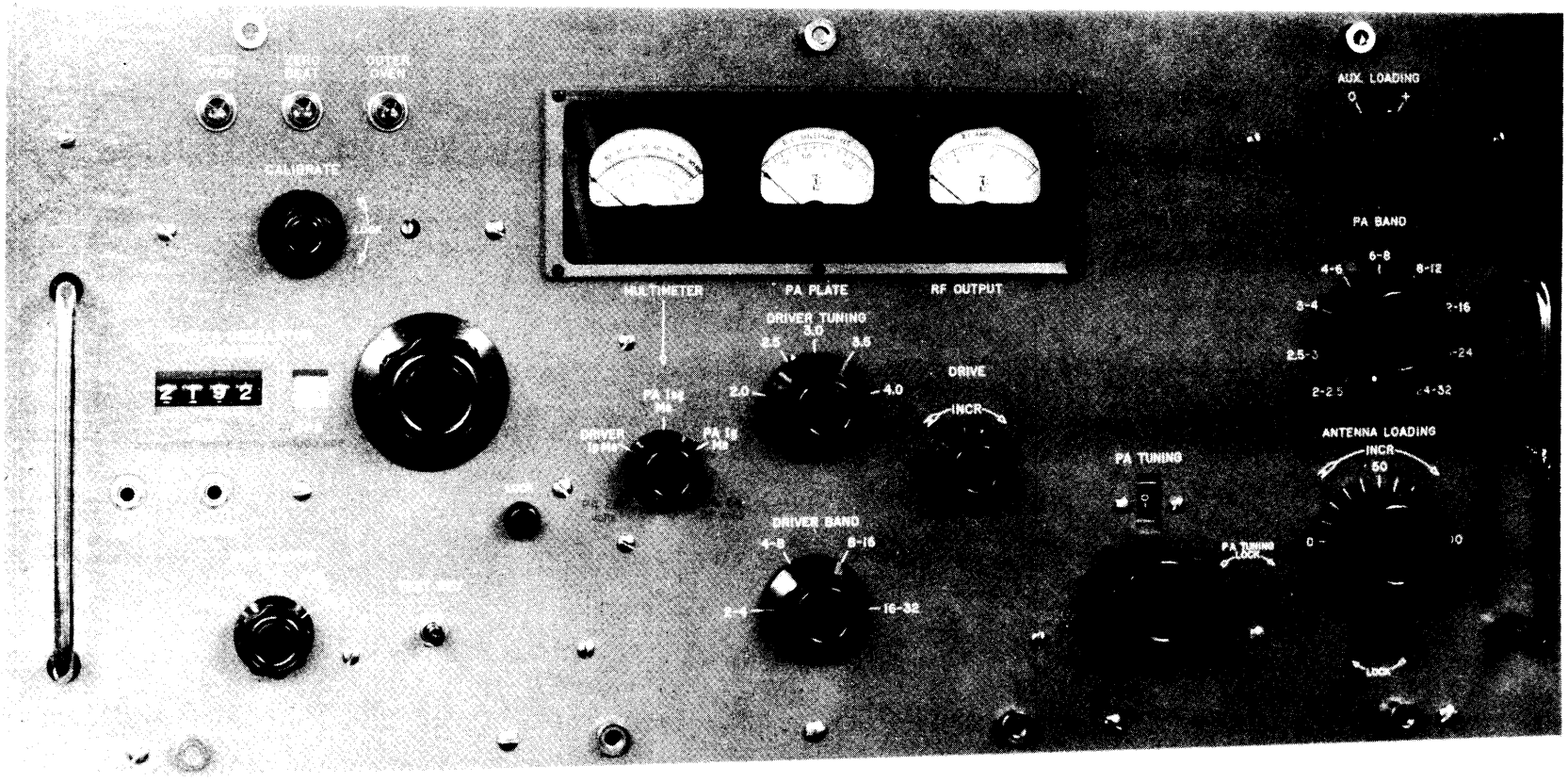

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Figure G-1-7 Front View Model RTF-2

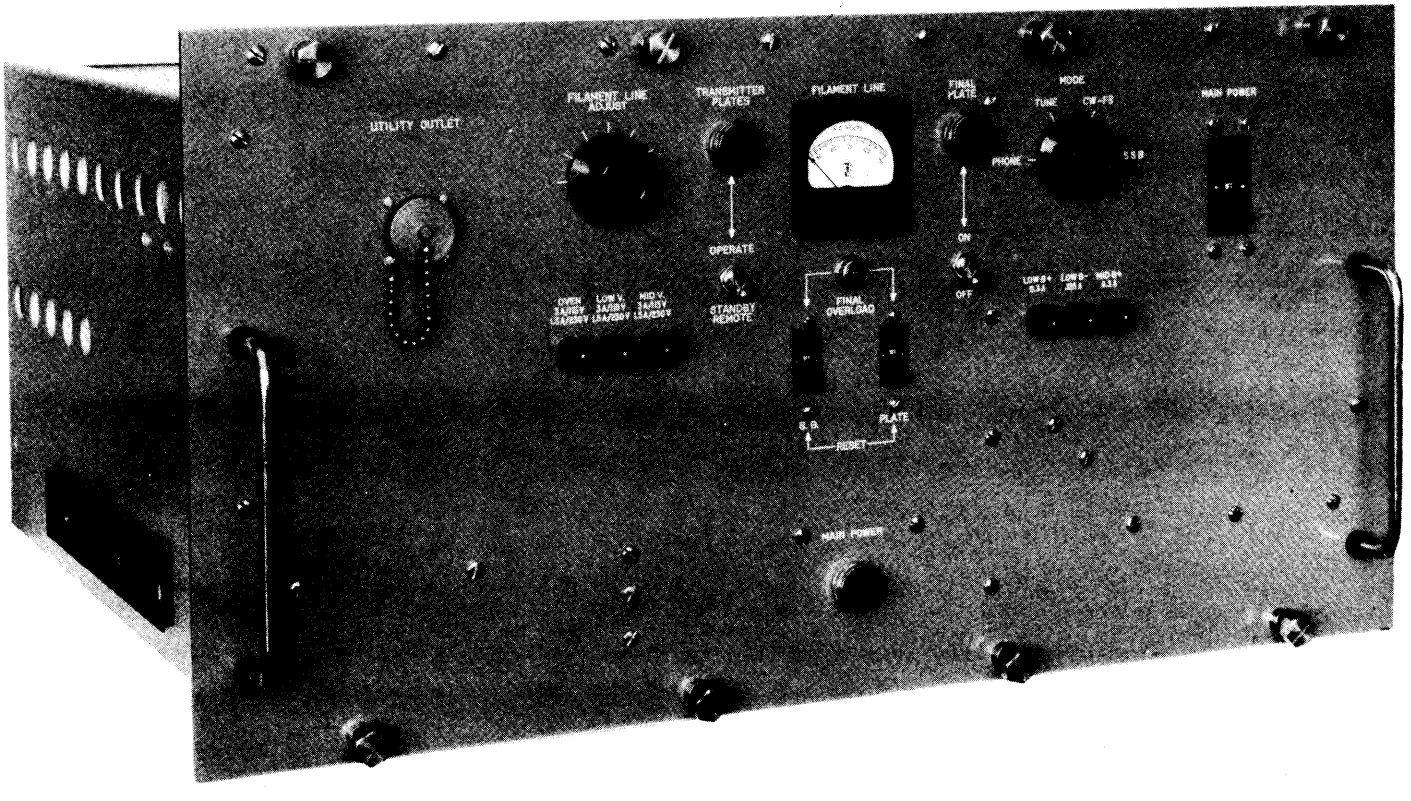


Figure G-1-8 Front View Model RTP-2

SECTION I
GENERAL DESCRIPTION

1-1 PURPOSE

1-1-1 The TMC Radio Transmitter, Model GPT-750( )2 is designed for general purpose communication service. The equipment is available in several combinations to provide operation in one or more of the following modes and power output levels throughout the frequency range of 2 to 32 Mc:

A1, F1, F4	1000 watts
A2, A3	750 watts
A3a, A3b	500 watts PEP

1-2 GENERAL DESCRIPTION OF COMBINATIONS

1-2-1 The equipment is constructed on a building block basis to provide for all of the commonly used services. Models of this transmitter are capable of operation in a variety of modes as follows:

1-3 TECHNICAL SPECIFICATIONS

1-3-1 GENERAL

	EMISSION							
MODEL	AM	CW	MCW	FAX	FS	ISB	DSB	SSB
GPT-750(A)-2		X						
GPT-750(B)-2	X	X	X*					
GPT-750(C)-2		X		X	X			
GPT-750(D)-2	X #	X	X*			X	X	X

Low Leve
*Using external source of keying tone such as supplied by the TMC Model RTC, Remote Control Amplifier.

The following basic models can be combined with external exciters to provide the modes of operation indicated:

MODEL	WITH EXTERNAL EXCITER	EMISSION							
		AM	CW	MCW	FAX	FS	ISB	DSB	SSB
GPT-750(A)-2	SBE-2	X #	X	X*			X	X	X
GPT-750(A)-2	XFK		X		X	X			
GPT-750(B)-2	SBE-2	X	X	X*			X	X	X
GPT-750(B)-2	XFK	X	X	X*	X	X			
GPT-750(C)-2	SBE-2	X #	X	X*	X	X	X	X	X
GPT-750(D)-2	XFK	X #	X	X*	X	X	X	X	X

Low Level
*Using external source of keying tone such as supplied by the TMC Model RTC, Remote Control Amplifier.

FREQUENCY RANGE:
2 to 32 Mc continuous by means of band-switching.

MASTER OSCILLATOR CHARACTERISTICS:
Frequency Range: 2 to 4 Mc continuously variable.
Oscillator Calibration: Direct reading in cps.
Readability: 20 cps/mc to a previously calibrated frequency.
Frequency Calibration: Oven controlled 100 Kc crystal oscillator provides check points. 100 Kc oscillator may be calibrated against a primary standard.
Zero-Beat Indication: 50 Kc check points on neon light null indicator. Additional aural check points are available by use of headphones.
Stability: Better than 20 cps/mc for a 30-degree change in ambient temperature.
Line Voltage Effect: Not more than 10 cps for a ±10% variation.

COOLING:
Forced filtered air. (Two separate blowers).

OVERLOAD AND BIAS PROTECTION:
Automatic protection.

PRIMARY POWER:
115/230 volts, 50/60 cps, single phase approximately 2600 watts at power factor - 0.87.

OUTPUT IMPEDANCE:
30 to 1000 ohms at angle 0° (equivalent SWR = 1). 50 to 700 ohms at angle ±45° (equivalent SWR = 4/1) all unbalanced to ground.

ACCESSIBILITY:
Tube changes and repairs accomplished from the front of the equipment.

CABINET:
Reinforced steel.

SIZE:
Height: 46-7/8" without base or shock mounts.
49-7/8" with base.
49-3/8" with shock mounts only.
Width: 34 inches.
Depth: 27 inches.

COMPONENTS AND CONSTRUCTION:
The equipment is manufactured in accordance with JAN/MIL specifications wherever practicable. All parts and assemblies meet or exceed the highest quality standards.

TUBE COMPLEMENT:

RTF-2 RF DECK

Symbol	Tube
Power Amplifier	
V101	4-250A
V102	4-250A
Multiplier	
V201	6CL6
V202	12AT7
V203	OA2
V204	6BF5
V205	6146
V206	12AT7
Master Oscillator	
V301	6AB4
V302	12AU7
Interconnect	
V401	OA2
V402	6C4
V403	6AH6
V404	12AU7
V405	6BE6
V406	12AU7

RTP-2 POWER SUPPLY

V601	OB2
V602	OB2
V603	6X4
V604	5R4GY
V605	5R4GY
V606	872A
V607	872A
V608	OA2
V609	OA2
V610	OA2
V611	OA2

RTM-2 MODULATOR AND POWER SUPPLY

V701	12AT7
V702	6L6
V703	6L6
V704	810
V705	810
V706	OA3
V707	5R4GY

RTS-2 SINGLE SIDEBAND EXCITER AND POWER SUPPLY

V101	6AB4
V102	6AB4
V103	6AB4
V104	6U8
V105	12AU7
V106	OA2
V107	12AT7

V108	12AT7
V109	12AT7
V110	6U8
V111	6AL5
V112	12AU7
V113	12AT7
V114	6AH6
V115	12AU7
V116	6CL6
V117	6U8
V118	6AH6
V119	6CL6
V120	6146
V401	5R4
V402	OA2

XFK FREQUENCY SHIFT EXCITER

V1	6J6
V2	12AU7
V3	6BE6
V4	6BE6
V5	2E26
V6	12AU7
V8	5U4G
V9	5U4G
V10	OB2
V11	OB2

COMPONENT DESIGNATION

CIRCUIT SYMBOL GROUP	DESCRIPTION	LOCATION	IDENTIFICATION
100 - 499	Amplifier-Oscillator	Upper Deck, CAB-7	RTF-2
100 - 199	Part of RTF-2	Upper Deck, CAB-7	Power Amplifier
200 - 299	Part of RTF-2	Upper Deck, CAB-7	Multiplier
300 - 399	Part of RTF-2	Upper Deck, CAB-7	Master Oscillator
400 - 499	Part of RTF-2	Upper Deck, CAB-7	Interconnect Chassis
600 - 699	Power Supply	Lower Deck, CAB-7	RTP-2
500 - 599	Cabinet/Frame Assembly	Enclosure for above decks	CAB-7
700 - 799	Modulator and Power Supply	Middle Deck, CAB-7 (Included in (B) Combination)	RTM-2
1 - 99	Frequency Shift	Middle Deck, CAB-7 (Included in (C) Combination	XFK
100 - 299	Sideband Exciter SBE-2	Middle Deck, CAB-7 (Included in (D) Combination)	Part of RTS-2
400 - 499	Exciter Power Supply	Middle Deck, CAB-7 (Included in (D) Combination)	RTS-2
	Drawer, Electrical Equipment	Middle Deck, CAB-7 (Included in (C) Combination)	RTX-2

SECTION II
THEORY OF OPERATION

2-1 GENERAL DESCRIPTION OF CIRCUITS

RTF-2

2-1-1 MASTER OSCILLATOR (V301) - The master oscillator (M.O.) stage of the transmitter uses a triode in a Colpitts circuit. Oscillator output is from 2 to 4 Mc and is controlled by a front panel MASTER OSCILLATOR FREQUENCY control C301 - C302. When crystal control of the transmitter frequency is selected by rotating the OSCILLATOR switch S401(c) to either the X1, X2 or X3 position, plate voltage is removed from V301 to disable the master oscillator stage.

2-1-1-1 To insure oscillator stability, the master oscillator has been placed in a temperature controlled double oven. In addition, plate and filament voltages are regulated to minimize the effects of line voltage variations.

2-1-2 CATHODE FOLLOWER (V302A) - To reduce the effect of load variations on oscillator frequency, a cathode follower isolation stage has been inserted between the output and the succeeding stage. One half of a triode is used as the cathode follower.

2-1-2-1 For added stability, the cathode follower V302A has also been placed in the oven.

2-1-3 100 Kc CALIBRATION OSCILLATOR (V302B) - The crystal controlled calibration oscillator makes use of the second half of V302 in a simple Pierce oscillator circuit. Output of the calibration oscillator is coupled to the grid of mixer tube (V405).

2-1-3-1 When the front panel OSCILLATOR switch S401(B) is rotated to the CAL position, plate voltage is applied to V302B. In any of the remaining four positions, plate voltage is removed from V302B to disable the tube.

2-1-3-2 Adjustment of the calibration oscillator frequency (100 Kc) is accomplished by varying the setting of capacitor C311. The calibration oscillator is also enclosed in the oven.

2-1-4 TEMPERATURE CONTROLLED OVEN - The oven mentioned in the proceeding paragraphs is composed of an inner and outer shell, each of which is in itself a temperature controlled entity. The outer shell is maintained, within small

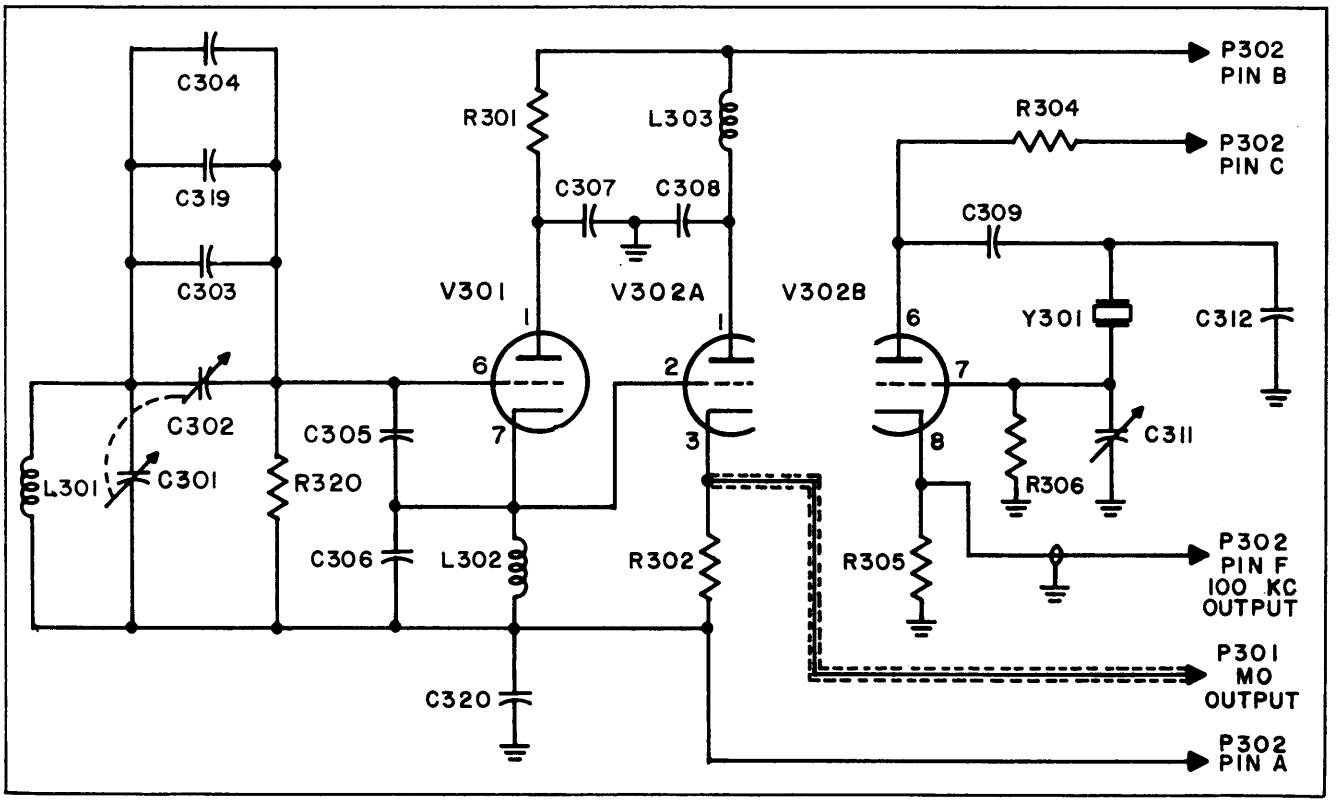


Figure G-2-1 Simplified Schematic Diagram Oscillator Circuits

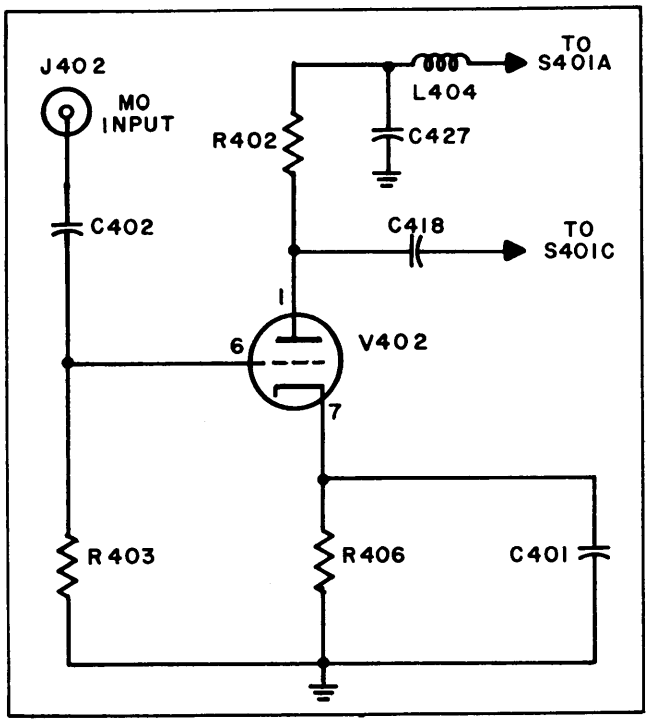


Figure G-2-2 Simplified Schematic Diagram Buffer Stage

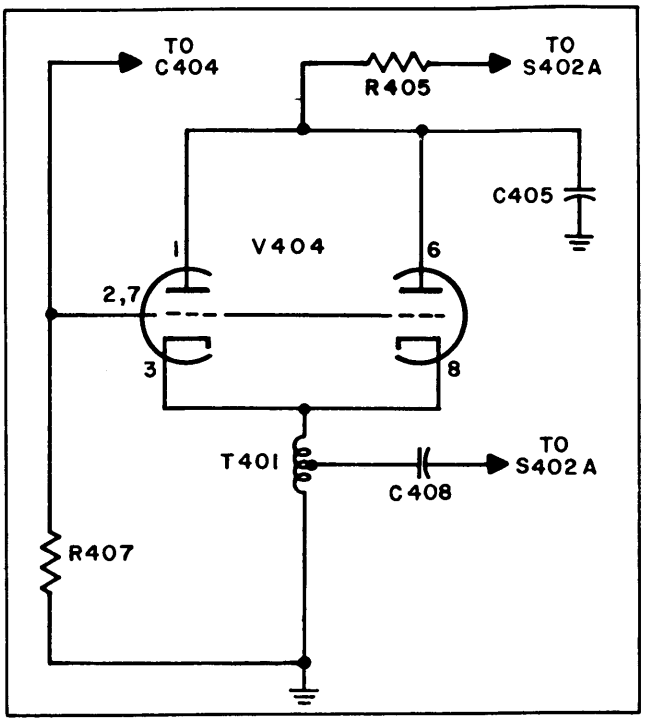


Figure G-2-4 Simplified Schematic Diagram Cathode Follower Output

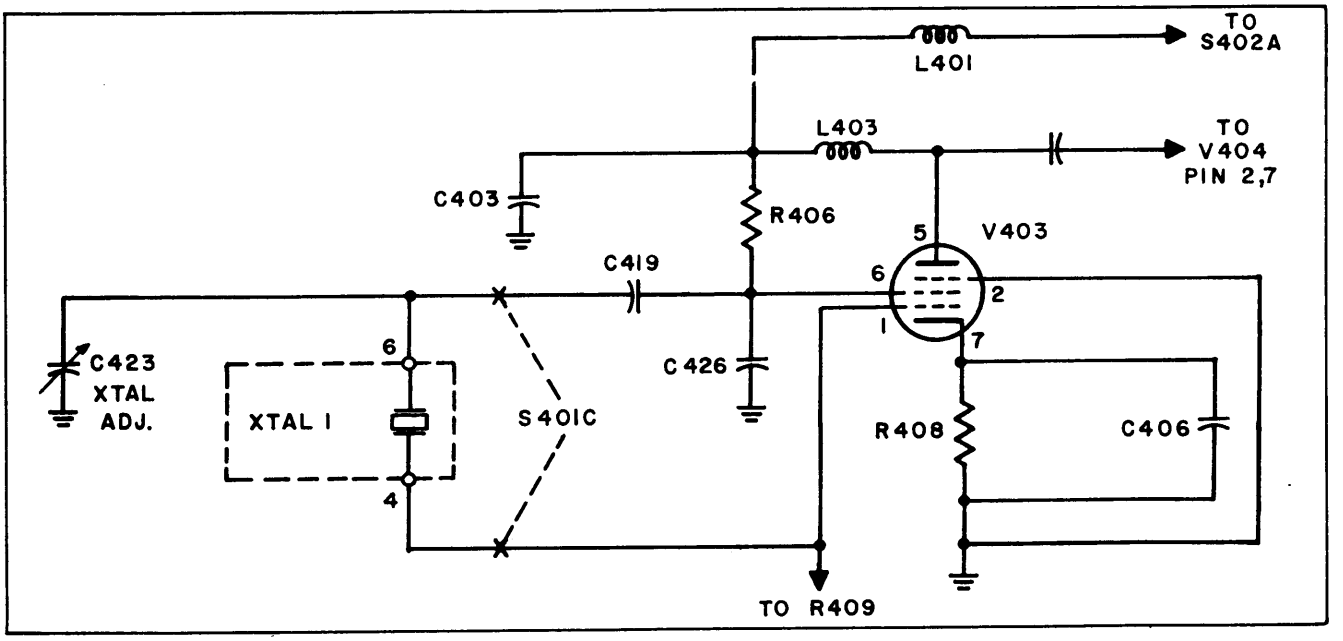


Figure G-2-3 Simplified Schematic Diagram Crystal Oscillator/Amplifier

limits, at a given temperature by the combination of S303 (a bimetallic temperature sensitive switch) and the heating blankets R308A and R308B. The inner oven is a vernier, so to speak, on the outer shell. The inner shell heating blankets, R307A and R307B, are controlled by an accurate bimetallic thermostat S301. The entire assembly contains a large mass of metal and insulation materials distributed throughout its cross section so that its heat inertia is high and, consequently, its temperature is extremely stable.

2-1-5 BUFFER (V402) - The buffer stage uses a triode in a conventional broadband amplifier circuit. This circuit also serves as an added step of master oscillator isolation.

2-1-6 CRYSTAL OSCILLATOR - AMPLIFIER (V403) - When the master oscillator stage of the transmitter is in use, V403 is operated as a broadband RF amplifier the purpose of which is to voltage amplify the buffer output to a point

where sufficient drive is obtained for the amplifier-doubler stage.

2-1-6-1 Putting the OSCILLATOR switch in any of the three available crystal positions disables the M.O. and converts V403 into an electron coupled Pierce oscillator. The output of V403 is coupled to the grid of V404 through capacitor C404.

2-1-7 CATHODE FOLLOWER OUTPUT (V404) - Two sections of a dual triode are connected in parallel and function as a conventional cathode follower, the output impedance of which is matched to a 70 ohm line by T401. This lower output impedance allows the use of longer transmission lines in the event an external frequency shift or sideband exciter is to be driven by the oscillator of the transmitter.

2-1-8 MIXER (V405) - A pentagrid converter is employed as a mixer tube to combine the M.O. signal with the calibration oscillator output and produce an audible beat note.

2-1-8-1 The mixer output is passed through a low pass filter consisting of C403, L401, C414, C415 and R416. This filter section is designed to pass only frequencies in the audio range, so that only when the calibration oscillator and master oscillator signals are within audio frequency range of each other is a voltage output obtained from the mixer stage. Plate voltage is applied to the mixer tube only when the OSCILLATOR switch is in the CAL position.

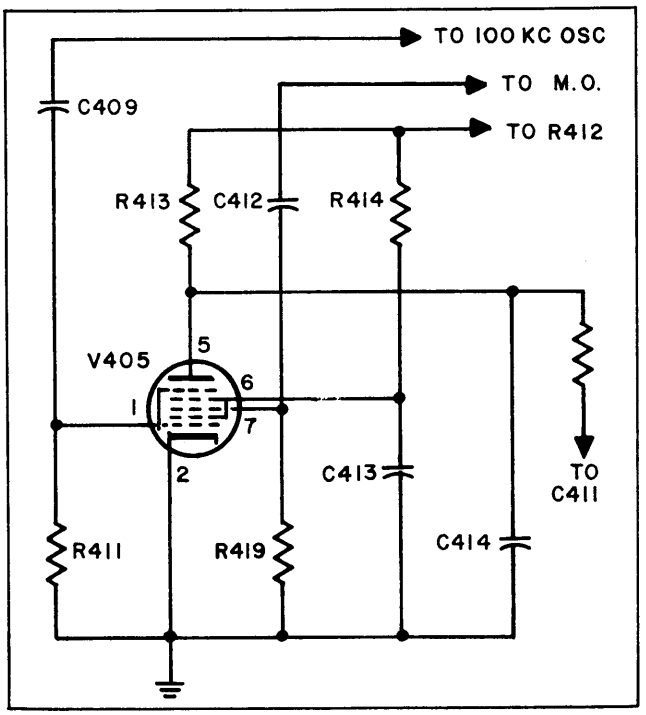


Figure G-2-5 Simplified Schematic Diagram Mixer Circuit

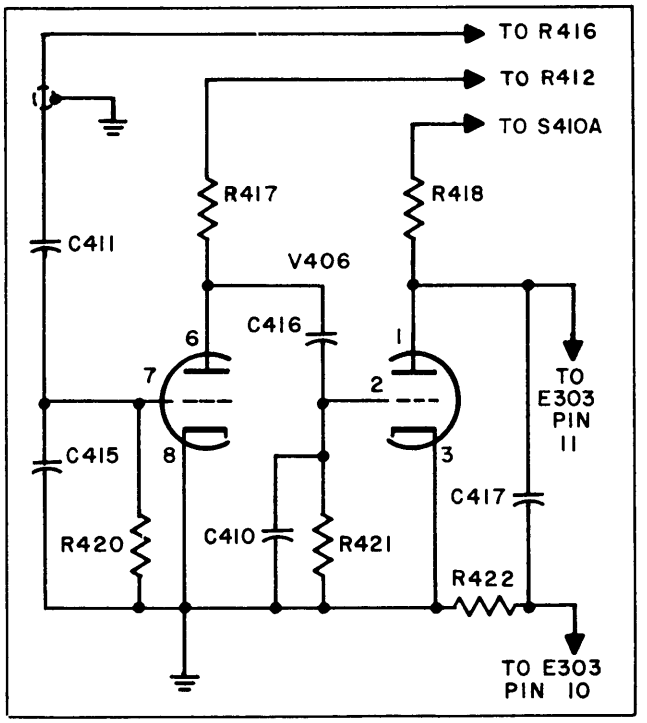


Figure G-2-6 Simplified Schematic Diagram Audio Amplifiers

2-1-9 AUDIO AMPLIFIERS (V406A, V406B) - A dual triode is used as a two stage audio amplifier to amplify the audio output of the mixer stage. The audio amplifier output may be monitored either aurally or visually through the front panel PHONES jack or ZERO BEAT indicator lamp. The ZERO BEAT lamp is a neon bulb inserted in the plate of the second audio amplifier, V406B.

2-1-9-1 Like the mixer tube, V406A and V406B are disabled by removing their plate voltages when the OSCILLATOR switch is moved out of the CAL position.

2-1-10 GROUNDED GRID AMPLIFIER-DOUBLER (V201) - This section acts as an amplifier when S204 is in the SSB position or when S204 is in the NORMAL position and the transmitter is operating in the 2-4 Mc range. At all other frequencies the stage acts as a doubler.

2-1-10-1 Plate tank coil L203 (2-4 Mc) is replaced by L204 at all frequencies above 4 Mc. This coil switching is accomplished by the S201 section of the DRIVER BAND switch.

2-1-11 DOUBLER (V204) - A pentode functions as a doubler at operating frequencies from 8 to 16 Mc. At operating frequencies below 8 Mc, V204 is not in the circuit and the output of the amplifier-doubler V201 is coupled directly to the grid of the driver V205. This section is not used when S204 is in the SSB position.

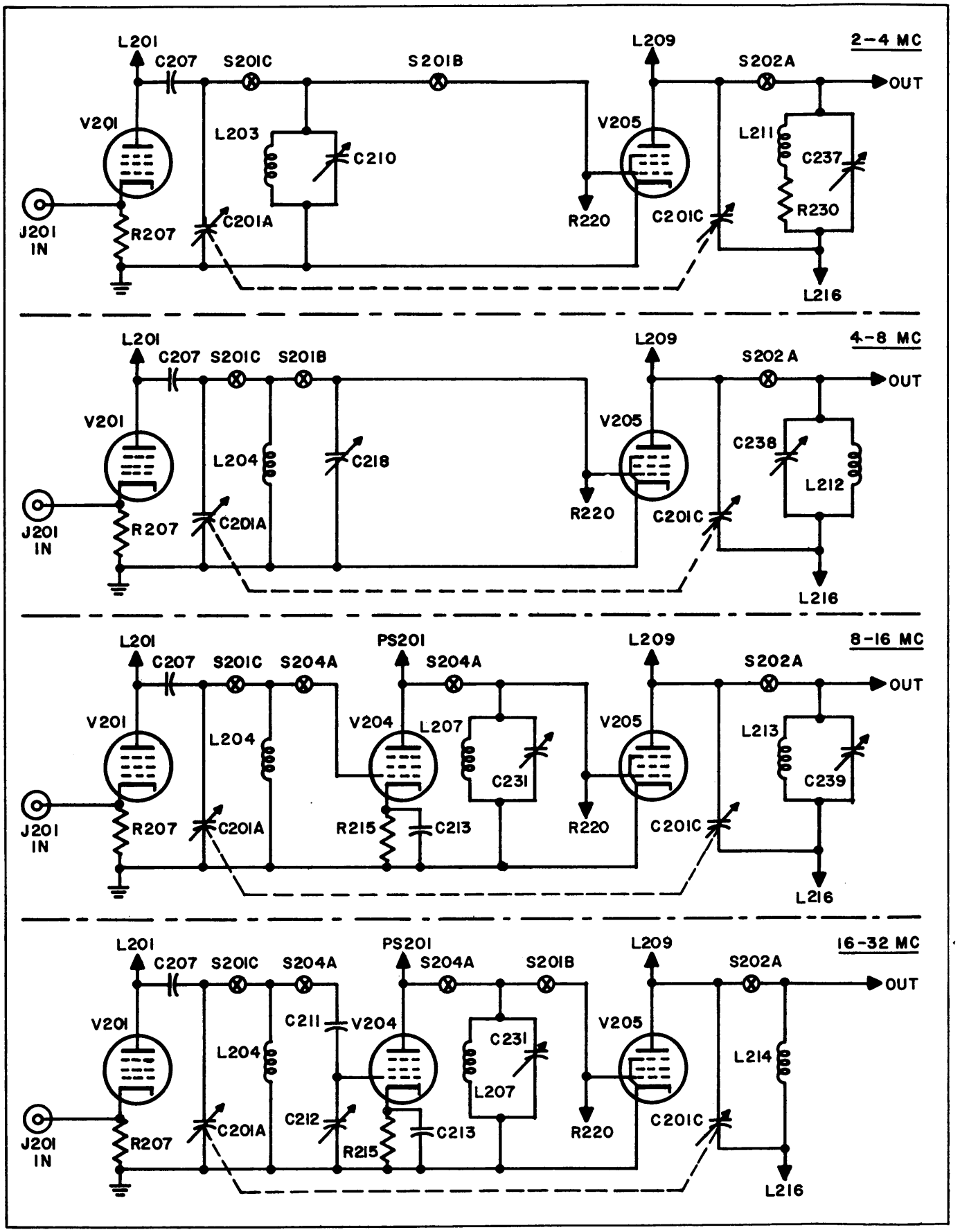


Figure G-2-7 Simplified Schematic Diagram Multiplier with Switch S204 in NORMAL Position

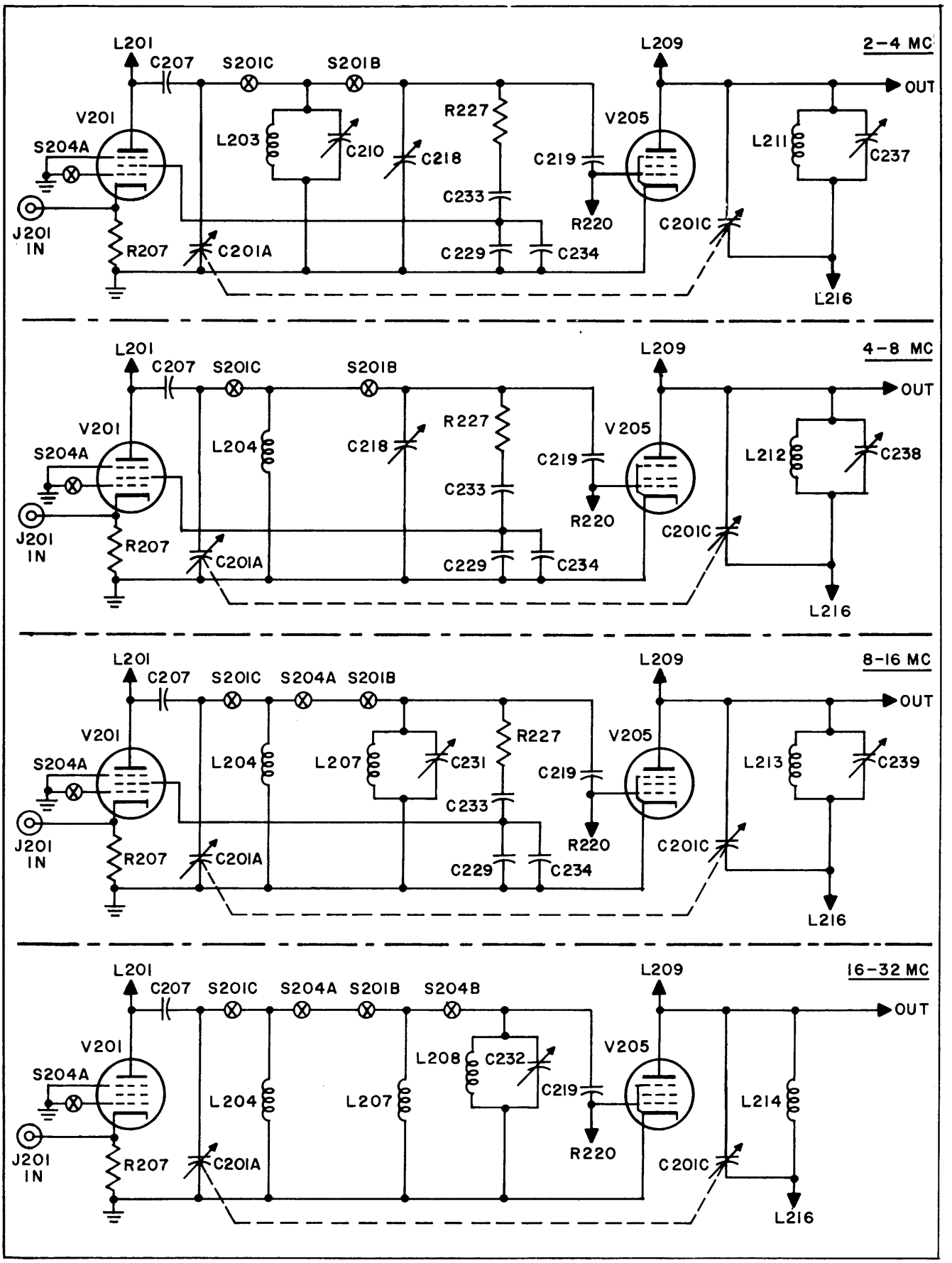


Figure G-2-8 Simplified Schematic Diagram Multiplier with Switch S204 in SSB Position

2-1-12 DRIVER (V205) - A pentode is employed as a conventional RF amplifier below 16 Mc, and as a doubler at frequencies above 16 Mc. The output of this stage is coupled to the grids of the final amplifier tubes V101 and V102. Drive level may be adjusted by operating the front panel DRIVE control, R211 which controls the screen voltage of V205. This section is not used when S204 is in the SSB position.

2-1-13 KEYER AND CLAMPER CIRCUITS (V202A, B and V206) - Keyer circuit V202A, B performs double duty. First, by properly selected time constants, it keys the first multiplier and driver in sequence to obtain a slightly integrated output pulse. This serves to keep keyer "clicks" to a minimum. Second, if the low voltage supply should be removed for any reason, the keyer circuit will automatically bias the amplifier-doubler and protect all stages.

2-1-13-1 The clamp tube, V206, serves to keep the keyer line above ground when the key is down.

2-1-14 POWER AMPLIFIER (V101, V102) AND Pi NETWORK - The power amplifier stage consists of two tetrodes connected in parallel. Plate tank coils for the frequency band in use are selected by the front panel PA BAND switch, S201. This stage is operated class AB with regulated control grid and screen supplies when the MODE switch is in the SSB position. All other operating modes are used with the finals operated as class C amplifiers without regulated screen supply.

2-1-14-1 The control grid bias is always adjusted with the MODE switch in SSB position, R605 (final bias adjust) is used to bring the plate current to 130 ma when no drive is applied. In class C operation an additional voltage drop appears across R605 to bring the bias beyond cutoff.

2-1-14-2 The Pi Network serves to match the power amplifiers (V101, V102) to the load, while serving as an effective means of harmonic rejection.

RTP-2

2-1-15 HIGH VOLTAGE SUPPLY (V606, V607) - Two mercury vapor rectifiers are employed in a choke input full wave rectifier circuit. The percentage of regulation is high, due to the low internal impedance of the rectifiers. Power from this stage is supplied to the modulator and RF amplifiers. Refer to Figure E48 for a schematic diagram of the power supply unit.

2-1-16 MID-VOLTAGE SUPPLY (V605) - This stage is similar to the high voltage supply described previously except that the output voltage is lower. This voltage is supplied to the RF amplifier and keying circuit.

2-1-17 LOW VOLTAGE SUPPLY (V601, V602, V603, V604) - The low power supply contains two rectifier stages: V604, full wave rectified positive voltage with choke input filter; and V603, half wave rectified negative voltage with condenser input filter. V601 and V602 regulate the bias voltage to the RF amplifiers.

2-1-18 CONTROL (OVERLOAD) CIRCUITS - All power amplifiers and high voltage regulators

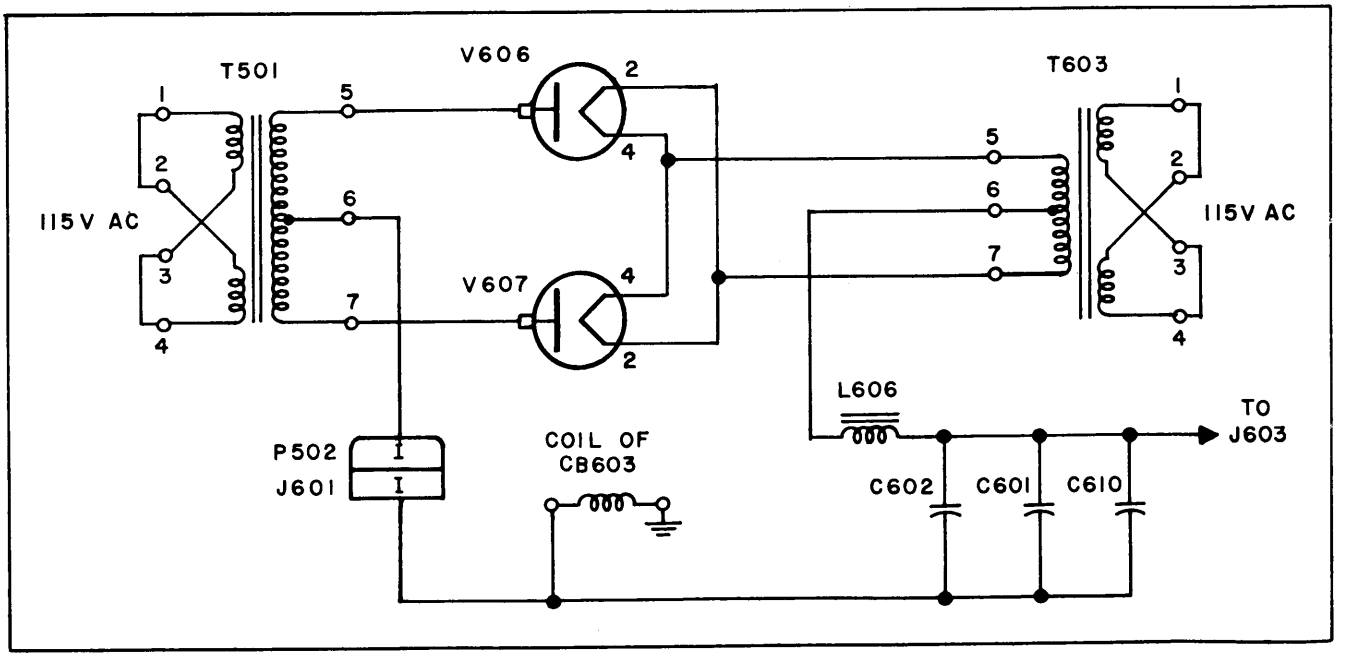


Figure G-2-9 Simplified Schematic Diagram High Voltage Supply

are thoroughly protected against overload. Refer to Figure E48.

2-1-18-1 Time delay relay K603 prevents the application of high voltage to the mercury vapor rectifiers before their filaments have been allowed to warm up sufficiently.

2-1-18-2 The power amplifier plate overload relay, CB603, and final screen overload relay, CB602, open the circuit to the transmitter plates relay, K601, when excessive current is drawn. K601 then removes all B+ voltages to protect the final amplifier and (when used) the modulator.

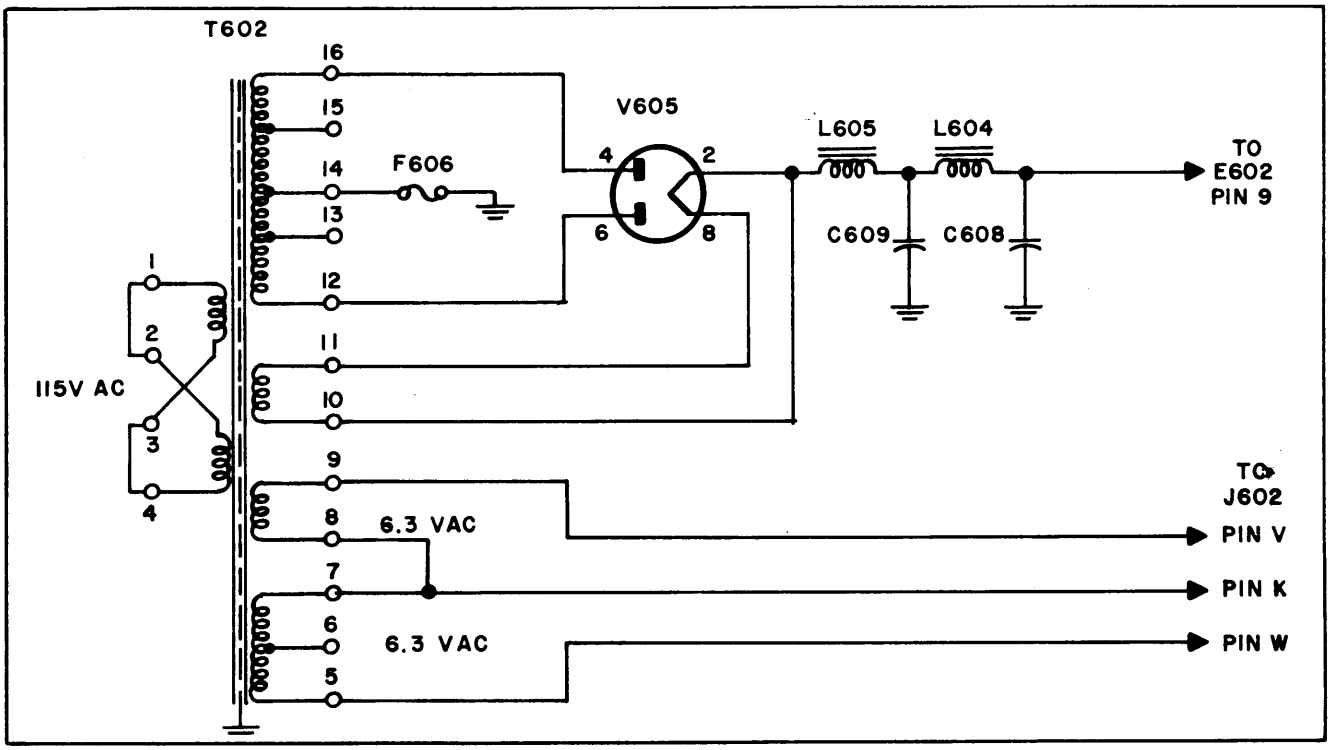


Figure G-2-10 Simplified Schematic Diagram Mid Voltage Supply

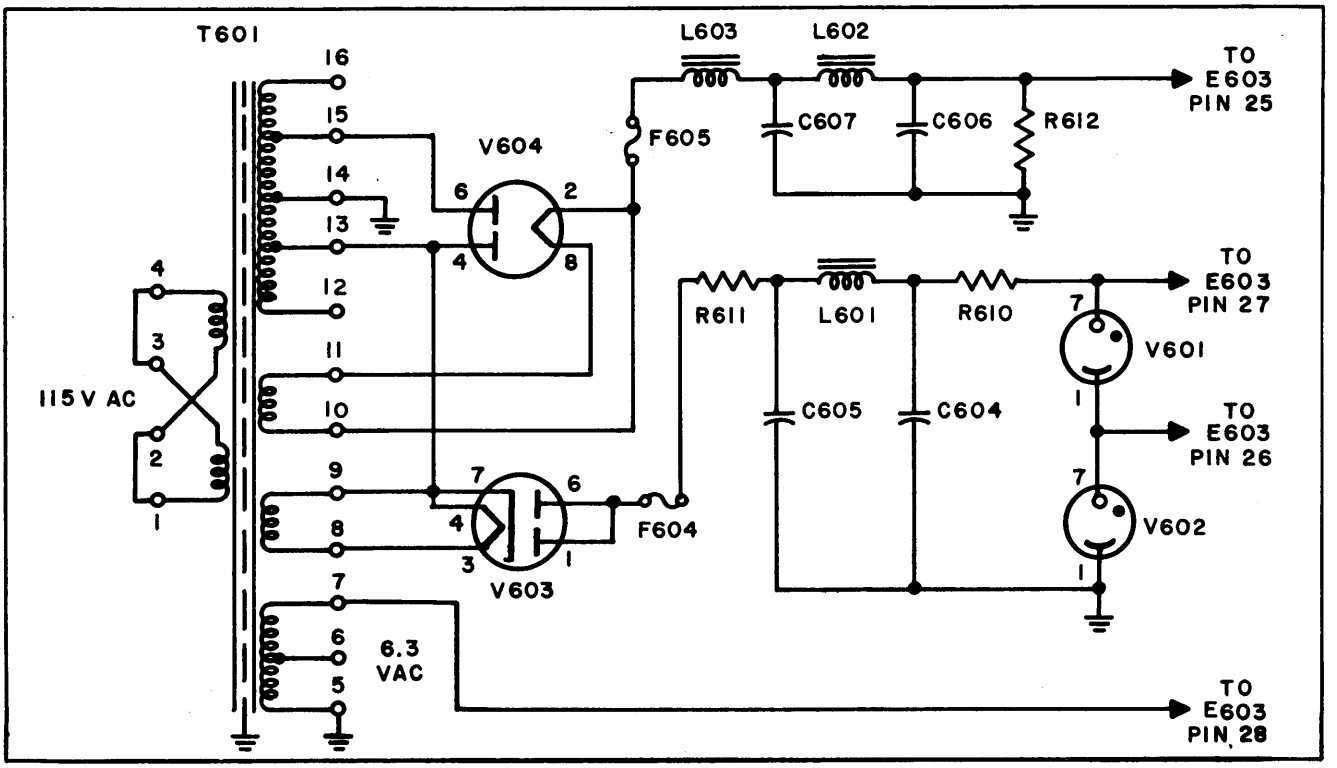


Figure G-2-11 Simplified Schematic Diagram Low Voltage Supply

SECTION III
INSTALLATION

3-1 GENERAL

3-1-1 The Model GPT-750( )2 will be shipped in several containers. Open each carefully and inspect for damage due to rough handling during shipment. If damage is found, notify the carrier immediately. Inspect all packing material for parts which may have been shipped as "loose items".

3-2 POWER REQUIREMENTS

3-2-1 All transmitters leave the factory wired for 115 volts 50/60 cycles. Change may be made to 230 volt, 50/60 cycles operation by making wiring alterations to T501, T601, T602, T705, CB601, E301 and E302 of the transmitter. Consult the respective schematic diagrams of the units involved for detailed information. ALL LINE FUSES WILL HAVE TO BE REDUCED TO ONE HALF THEIR RATED CURRENT VALUES TO ASSURE ADEQUATE CIRCUIT PROTECTION. Regulated and high voltage fuses, of course, remain the same with either line voltage.

3-3 INSTALLATION

3-3-1 Location of Transmitter

3-3-1-1 After unpacking and inspecting the CAB-7 Cabinet/Frame assembly place it in its operating location. It is advisable to do this now because the added weight of the assembled transmitter will make movement more difficult later. See Figure G-3-2 for shock mounting dimensions.

3-3-2 Installation of Drawers

3-3-2-1 Each cabinet compartment is equipped with slides which attach to the sides of the equipment drawers. To install any drawer in its compartment pull the center section of each slide out until it locks in an extended position. To insure against tipping of the cabinet install the lower (RTP-2) drawer first. Hold the drawer so that the rails on each side address the extended slides evenly and on the same plane. Engage the cabinet slides with drawer rails and ease the drawer forward into the cabinet. Hold the lock buttons on the sides of the rails depressed so that the rail will continue to move into the slide. The drawer rails will stop when the locking buttons engage the lock hole about three inches from the end of the cabinet slide. Again depress the lock buttons. The drawer will now close completely.

3-3-3 Electrical Connections (External)

3-3-3-1 RF Output, J505

3-3-3-1-1 Connect a suitable antenna or resistive dummy load to the HN type connector, UG-560/U on the side of the CAB-7. A mating coaxial plug (UG-59B/U) which is suitable for use with RG-8/U, RG-9/U, RG-11/U and RG-12/U coaxial cable is furnished with the equipment as a loose item.

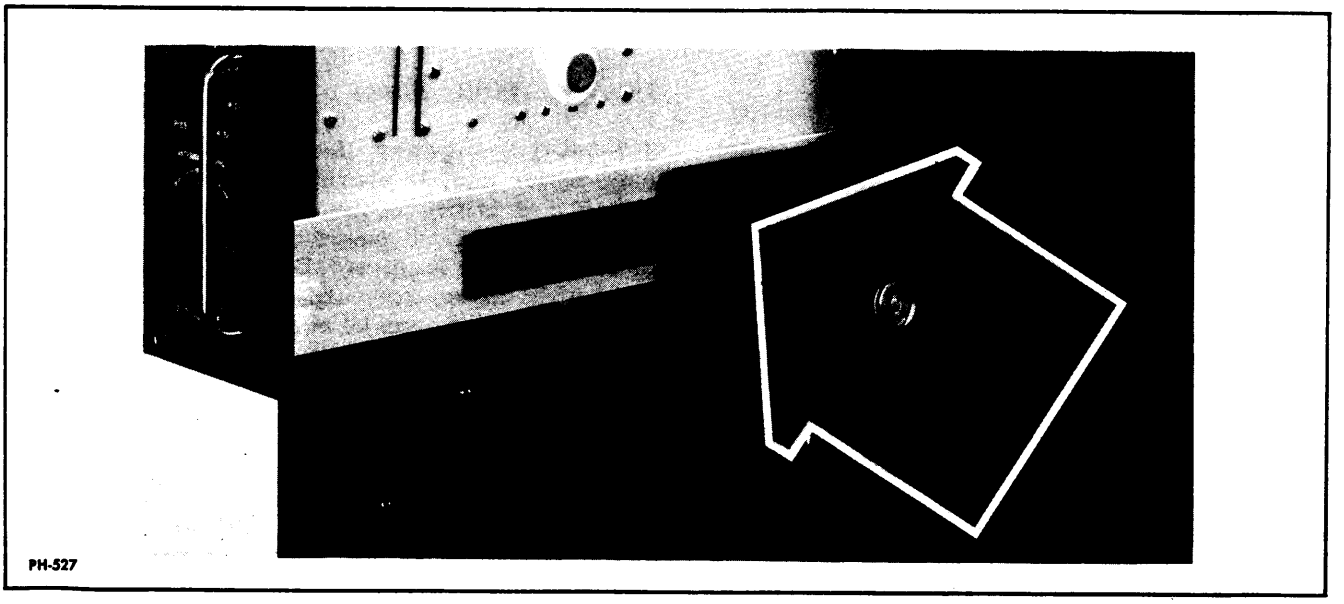


Figure G-3-1 Side View showing Slide Mechanism

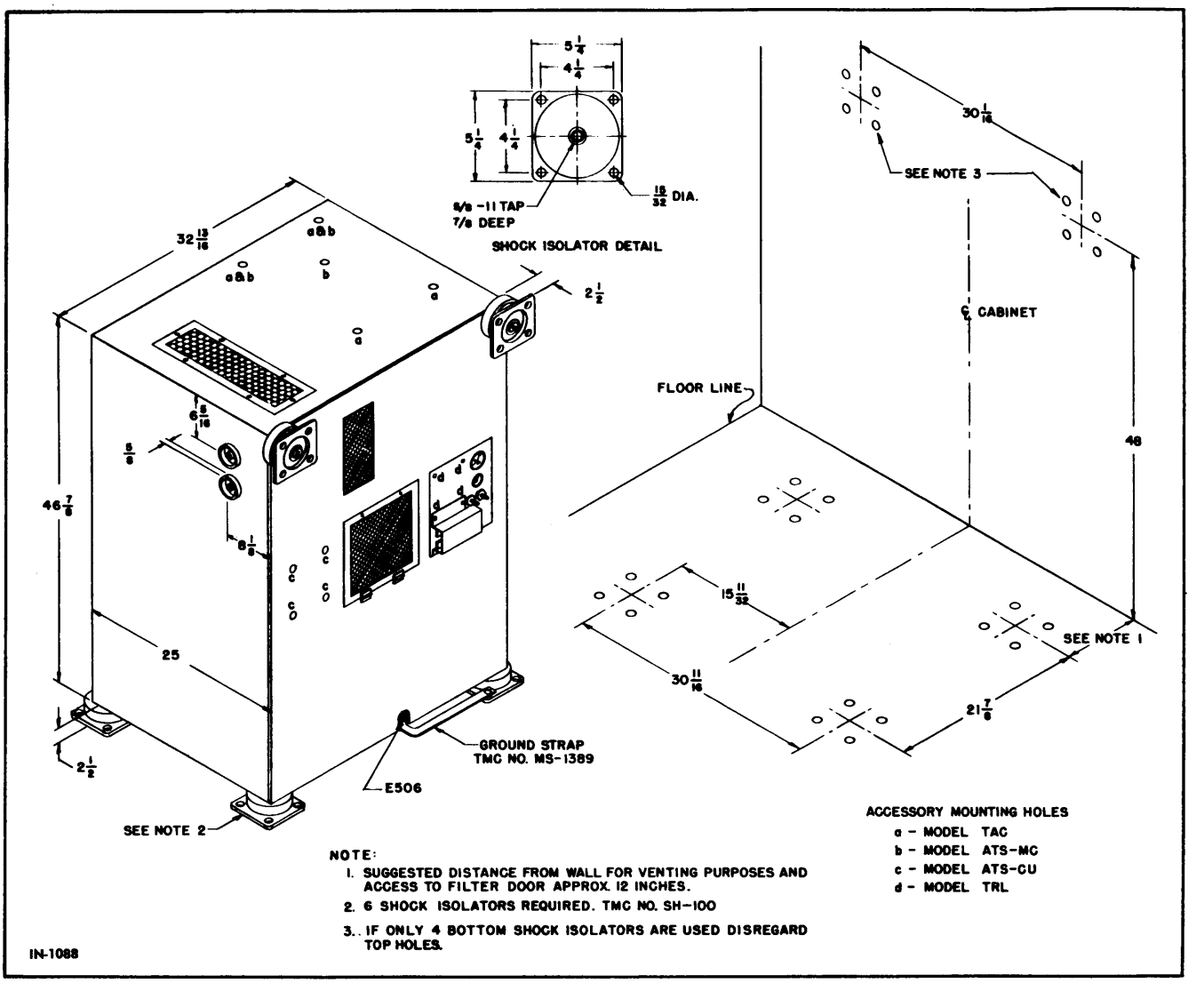


Figure G-3-2 Shock Mounting Details

3-3-3-2 RF Monitor Out, J506

3-3-3-2-1 This is a convenient outlet to which test equipment, etc., can be connected for the purpose of monitoring the RF output of the transmitter at a reduced level.

3-3-3-3 AC Power Input, J501

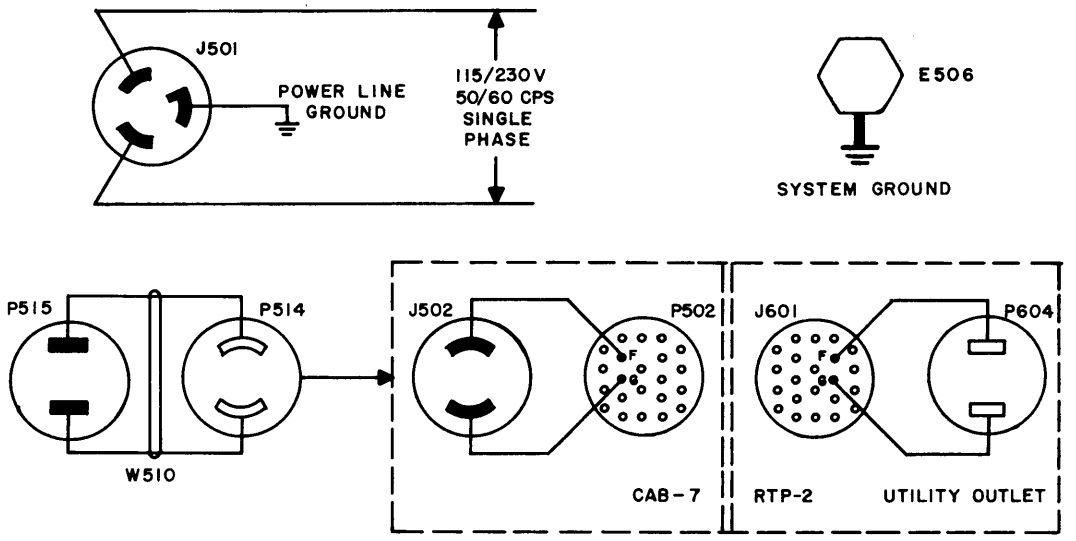
3-3-3-3-1 This equipment may be operated on 115-230 volts 50/60 cps single phase only. The power source must be capable of providing 3000 watts at a power factor of 87%. A three conductor power cable (not supplied) of sufficient current carrying ability and length must be connected between the power source and J501, the three conductor twist-lock connector on the rear of the CAB-7. A mating plug, PL-134-N6 is furnished with the equipment as a loos item. Connections to the plug are as shown below.

3-3-3-4 Utility Power

3-3-3-4-1 A power line, independent of the main power line, is provided to permit operation of test and utility equipment from J506 on the front of the RTP-2 power supply. The input to this line can be from any DC or single phase 60 cps or 400 cps source. Appropriate loads drawing up to 10 amps can be accommodated.

3-3-3-5 Station Ground

3-3-3-5-1 The Transmitter must be connected to the station ground system by a heavy copper strap (supplied) attached to E506 located at the lower rear of the CAB-7. E506 is a hex head bolt with a diameter of 5/8 inch and bearing 11 threads per inch. Figure G-3-2 illustrates a typical installation.



3-4 ACCESSORIES

3-4-1 Coaxial Antenna Switching Relays, TRL-3 and TRL-4

3-4-1-1 These units are available as accessory items. The Model TRL-3 has been designed for use with coaxial transmission lines of 70 ohms characteristic impedance while the Model TRL-4 has been designed for use with coaxial transmission line of 50 ohms characteristic impedance.

3-4-1-2 The TRL-3 and TRL-4 models each feature a second relay which acts to remove the high voltage from the plates of the transmitter finals before the antenna circuit is switched. This arrangement adds a marked improvement in the contact life of the coaxial relay.

3-4-1-3 Installation of the TRL-3 or TRL-4 assembly is made on the rear of the CAB-7 cabinet/frame. Either unit is mounted by means of mating cam lock fasteners provided for the purpose. A 70 or 50 ohm coaxial cable is supplied as a loose item to connected the transmitter RF output jack to the coaxial relay.

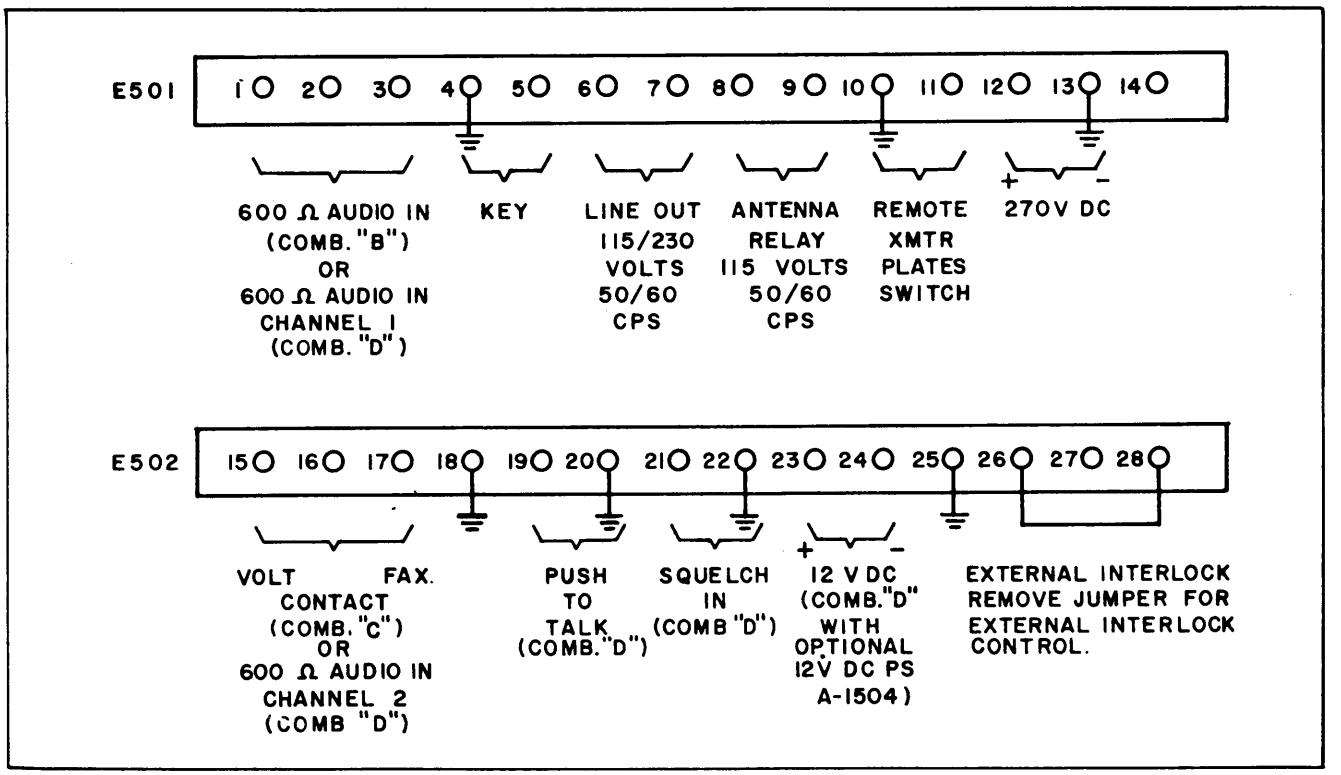


Figure G-3-3 Terminal Board Connections CAB-7

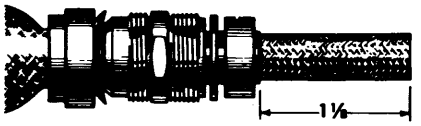
SERIES HN CONNECTOR ASSEMBLY INSTRUCTIONS

*GLAND *GASKET NUT #1 CAP NUT #2 WASHER GASKET CLAMP MALE CONTACT PLUG BODY FEMALE CONTACT JACK BODY

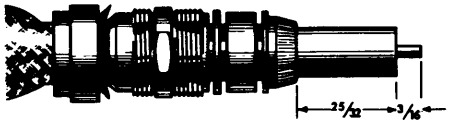
(CROSS SECTION VIEWS)

*REPLACE WASHER AND GASKET IN:
UG-59B/U (82-804)
UG-60B/U (82-814)
UG-61B/U (82-815)

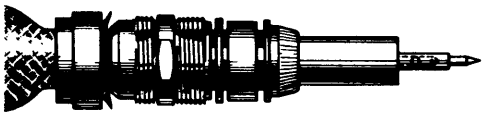
Cut end of cable even. Insert cap over cable armor. Bulge armor braid by pushing armor back on cable 6". Push nut #2, washer and gasket over cable jacket. When assembling connectors with gland, be sure knife-edge is toward end of cable and groove in gasket is toward the gland.



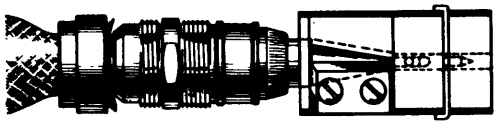
Remove vinyl jacket 1⅛" from end of cable. For double shield cables, remove vinyl jacket 1³⁄₁₆" from end of cable.



Push clamp over copper braid, flush against cable jacket. Cut exposed copper braid so that approximately 3⁄16" remains and fan over clamp. Trim braid even with end of taper. Cut cable dielectric 25⁄32" from braid. Tin exposed conductor.

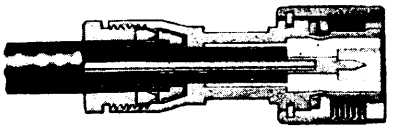


Solder contact pin to conductor. Do not overheat dielectric. Do not use excess solder. Wipe clean; see that dielectric is free from solder, resin and foreign material.



Taper dielectric with AMPHENOL 103-301 (MX-103/U) trimming tool. When tapering dielectric of cable for plug assembly, push contact stop of tool to bottom of slot. Tool will stop cutting when shoulder of contact butts against stop. For jack assembly see that stop is at top of slot. Cable will be properly tapered when end of center contact is flush with end of trimmer body. (Omit this operation for UG-59B, -60B, -61B/U.)

UG-59A/U illustrated



UG-59B/U illustrated

Apply small amount of AMPHENOL 307 Silicone Compound on tapered surface of dielectric. Insert assembly into connector body. Tighten Nut #1 (or Nut #2 if cable is armored) securely with wrench. Straighten bulge in armor. Cut armor so that it can be clamped between Nut #2 and cap. Tighten cap securely on Nut #2 with wrench. In connectors with gland, knife-edge should cut gasket in half by tightening sufficiently.

NOTE: When cable without armor is used, the cap and Nut #2 (Armor Clamps MX-564/U and MX-564A/U, AMPHENOL 82-48 and 82-109 respectively) are not required. Instead Nut #1 as supplied with connector is used and instructions pertaining to armor disregarded.

Figure G-3-4 Connector Assembly Instructions

SECTION IV
MAINTENANCE

4-1 PREVENTIVE MAINTENANCE

WARNING

TURN THE MAIN BREAKER OFF; DISCHARGE THE HIGH VOLTAGE CAPACITORS C610, C611 AND C612 BY CONNECTING A HEAVILY INSULATED SHORTING LEAD FIRST TO GROUND AND THEN TO THE TERMINALS OF ONE OF THE ABOVE CAPACITORS OR TO THE PLATES OF V101 AND V102.

4-1-1 Preventive maintenance schedules should be arranged with regard to the type of service required of the equipment and with consideration of the environment in which it is to be operated.

A. TO BE CLEANED WITH A SOFT BRUSH AND/OR A VACUUM CLEANER

1. CHASSIS SURFACES
2. TUBES AND SOCKETS
3. CABLES
4. TERMINAL STRIPS, INSULATORS, BARRIERS
5. SWITCHES
6. CABINET
7. INSULATORS

B. TO BE CLEANED WITH A SOFT, NON-ABRASIVE CLOTH

1. METER GLASSES
2. FRONT PANELS
3. DRAWER SLIDES, CONTACTS, WIPERS
4. BLOWER BLADES, MOTOR HOUSING

C. LUBRICATE SPARINGLY AFTER WIPING CLEAN; DO NOT DISASSEMBLE

1. HEAVY GEARS - w/light grease
2. LIGHT DIAL GEARS, ETC. - w/light oil
3. DRAWER SLIDES (NOT CONTACTS OR WIPERS)

CAUTION

DO NOT LUBRICATE FRICTION DRIVE MECHANISMS SUCH AS DIAL DRIVES, ETC.

D. TIGHTEN

1. TUBE SHIELDS, CLAMPS
2. CABLE CONNECTORS, CLAMPS
3. GROUND LUGS, MOUNTING SCREWS, TERMINAL STRIP SCREWS, ETC.
4. MECHANICAL COUPLINGS, SET SCREWS
5. BLOWER MOUNTS
6. DRAWER SLIDES
7. STATION GROUND STRAP
8. COVERS AND ATTACHMENTS

E. INSPECT (FOR SIGNS OF)

1. EXCESSIVE HEAT - MELTING, CHARRING, BURNING
2. ARCING - SOMETIMES EVIDENCED BY PITTING
3. LOOSE SOLDER AND OTHER FOREIGN PARTICLES
4. DAMAGED (CRACKED, ETC.) COMPONENTS
5. CORROSION - WATER, ACID
6. WORN, FRAYED, BURNED INSULATION
7. FATIGUED CONNECTIONS (WIRE STRANDS BROKEN AT TERMINALS)
8. METERS OFF MECHANICAL ZERO
9. POWER LINE CORD DAMAGE
10. AIR FILTERS LOADING WITH DIRT
11. ALL FUSES INTACT - PROPER VALUES (INCLUDING SPARES)

4-2 METHODS

4-2-1 Air Filter Service

4-2-1-1 All equipments are equipped with filters ready for use. Filters which have become dirty should be cleaned by immersion in a pan of solvent. Suitable solvents are gasoline, benzine, kerosene, methyl alcohol, and similar materials. Unsuitable solvents are acids, paint removers, and toxics like carbon tetrachloride. For faster cleaning move the filter through the solvent so as to create an agitated current through the filter passages.

4-2-1-2 After cleaning, allow the filter to dry. When drying is completed dip the filter in a pan of oil and allow it to drain, face downward, until dripping ceases. The oil used for this process should be one that will not run at the highest, nor solidfy at the lowest temperatures of the incoming air.

4-2-2 Tightening Set Screws

4-2-2-1 A set of Allen Wrenches for this purpose is attached to the side of the RTF-2 (upper drawer) chassis.

4-2-2-2 All set screws tighten with clockwise rotation. Do not loosen set screws unless recalibration is intended.

4-2-3 Adjustments

4-2-3-1 PA Grid Bias Adjustment

4-2-3-1-1 Although the grid bias is correctly set at the factory it is advisable to check it occasionally to assure optimum service. This check should also be made at the time of initial installation. Follow instructions carefully.

A. Set the MODE switch to the SSB position.
B. Turn the DRIVE control fully counterclockwise.
C. If an exciter is in use turn its OUTPUT control to minimum.
D. Turn the TRANSMITTER PLATES switch to the OPERATE position.
E. Turn the FINAL PLATES switch ON.
F. The PA PLATE current meter should indicate 130 ma. This is the correct no-signal reading.
G. If reading is not correct adjust R605, FINAL BIAS ADJ., located on the regulator chassis of the RTP-2 deck.
H. Turn the FINAL PLATES switch OFF when the adjustment is completed.

4-2-3-2 Calibration of the Master Oscillator

4-2-3-2-1 The Master Oscillator, when used, should be calibrated from time to time and for each change of frequency exceeding 25 Kc. The calibration procedure is very simple and easily accomplished within a few moments. No test equipment or attachments are required but a set of headphones may be used if desired.

A. Warm-up

(1) Allow a twenty-four hour warm-up before use if optimum stability is desired. Transmitters in regular service should be kept with the master oscillator ovens always turned on. It is possible to operate these ovens independently by turning the MO BYPASS switch (located in the RTP-2) to the BYPASS position. This action in no way affects the normal functioning of any other transmitter controls.

(2) The master oscillator will function, of course, without a twenty-four hour warm-up period when conditions demand. It will be necessary to check the calibration frequently, however, until, both INNER and OUTER OVEN lamps are seen to be cycling regularly.

B. Calibration

(1) Turn the OSCILLATOR switch to the CAL position.

(2) Turn the MASTER OSCILLATOR FREQUENCY knob until the dial rests on the check point nearest the desired operating frequency. Check points are frequencies at every multiple of 50 Kc from 2.0 to 4.0 Mc. For example, principal check points are found at the following frequencies:

CYCLES PER SECOND

2,000,000	2,300,000	2,600,000 etc.
2,050,000	2,350,000	2,650,000 etc.
2,100,000	2,400,000	2,700,000 etc.
2,150,000	2,450,000	
2,200,000	2,500,000	
2,250,000	2,550,000	

(3) Accurate calibration extends at least 25 Kc on either side of the check point so that if a frequency of 3.626 Mc is desired, for example, the check point will be 3.650 Mc.

(4) Rotate the CALIBRATE knob until a beat frequency of five or less cycles per second is indicated by slow flashing of the ZERO BEAT lamp or zero beat in the headset if one is used. This completes the MASTER OSCILLATOR calibration.

4-2-3-3 Calibration of 100 Kc and Master Oscillators

4-2-3-3-1 Relatively little rotation of the CALIBRATE control is ordinarily required to calibrate the master oscillator at any of the many check points. In time, however, this required CALIBRATE control rotation may increase. When more than two turns are needed to calibrate at any check point from a previous calibration setting, the master and 100 Kc oscillators should be readjusted. For example, if the master oscillator dial is calibrated at 2 Mc but must be changed to a setting of 2.5 Mc, a new check point will be used. If the CALIBRATE control is then rotated more than two full turns for recalibration at this new check point, the following corrective procedure should be used:

A. This procedure calls for the use of a communications receiver tuneable to WWV and equipped with an "S" meter. If an "S" meter is not built into the receiver, a DC microammeter with a suitable series resistor connected across the output of the detector will be an effective substitute.

B. Allow the transmitter a twenty four hour warm-up period.

C. Tune the receiver to the highest WWV frequency obtainable in your area. Use no BFO. WWV transmits at 2.5 Mc, 5 Mc, 10 Mc, 15 Mc, 20 Mc and 25 Mc.

D. Disconnect the transmitting antenna Connect a dummy load, if available, to the RF OUTPUT jack. Attach a short length of hook-up wire to the transmitter RF MONITOR jack. This arrangement will provide enough local radiation for the purpose of calibration.

E. Tune the transmitter at a low level to the frequency of the WWV signal being monitored. It is essential that care and precision be used when placing the master oscillator dial at the proper setting. The actual frequency indication at any dial setting may not be exact but the correction of this frequency-to-dial setting relationship is the object of this section. Be sure that the final frequency setting of the dial is approached from the same direction of rotation as was the check point.

CAUTION

DO NOT ATTEMPT TO CORRECT ANY MASTER OSCILLATOR FREQUENCY-TO-DIAL DEVIATION BY MECHANICAL MEANS SUCH AS SLIPPING CONTROL SHAFT COUPLINGS, ETC.

F. Tune the transmitter at a low output level to the frequency of the WWV signal being monitored. Be sure that the OSCILLATOR switch is in the MO position. When the transmitter frequency approaches that of WWV the "S" meter will be seen to pulse at a rate proportionate to the difference between the two frequencies. Adjust the transmitter frequency until the "S" meter rate of pulsation is brought to a minimum. The transmitter frequency will then match that of WWV which, in turn, is exactly the frequency of one of the master oscillator check points. Lock the MASTER OSCILLATOR and CALIBRATE CONTROLS. Turn the FINAL PLATE switch OFF. Turn the OSCILLATOR switch to CAL. Open the RTF-2 drawer for access to C311, a trimmer capacitor located in a part near the thermostat on the rear of the oscillator ovens. Adjust C311 until the ZERO BEAT lamp flashes at a minimum rate. The 100 Kc crystal oscillator is now properly adjusted.

G. To adjust the master oscillator first tune the transmitter to 2 Mc keeping the DRIVE control set a minimum. This initial tuning should be done with care that the MASTER OSCILLATOR and CALIBRATE controls are used accurately. LOCK the CALIBRATE control. Tune the receiver to 4 Mc. Tune the transmitter to 4 Mc using the C303 in place of the CALIBRATE control. Use the receiver to be sure that C303 is being adjusted to 4 Mc rather than some nearby check point. Repeat this entire process several times until the master oscillator is at zero beat calibration at the 2 and 4 Mc ends of its range with adjustment of the CALIBRATE control or C303 no longer being necessary. Replace the cover over the C303 access hole. The master oscillator is now properly adjusted.

4-2-3-4 Multiplier and Driver Alignment

4-2-3-4-1 Realignment of this stage will seldom be required and should be considered only when proven necessary. It is very important that the procedure given here be followed closely. The success of many adjustments depends heavily upon the accuracy and sequence with which earlier adjustments have been made.

4-2-3-4-2 As explained in the theory of operation section of this manual, the positions of S201-S202, the DRIVER BAND switch, and S204, the SSB switch, jointly determine the function of the driver-multiplier section. When S204 is in the NORMAL position, S201-S202 selects V201, V204, V205 and various tuned circuits to serve progressively as doublers as the carrier frequency requirements increase from the basic master oscillator range of 2 to 4 Mc up to 32 Mc. When S204 is in the SSB position, however, it is assumed that an exciter such as the AN/URA-23A (SBE-2) with an output range of 2 to 32 Mc will replace the master oscillator in its normal function and no doubling will be required. In this latter instance V201, V204 and V205, of course, are not tuned as doublers.

4-2-3-4-3 The following is an outline of the variable tuned circuit elements which affect the alignment of the multiplier and driver stages according to the positions of S201-S202, the DRIVER BAND switch, and S204, the SSB switch.

4-2-3-4-4 A reliable 2-32 Mc RF generator must be used throughout the following alignment procedure. If the TMC Model SBE exciter is available, it can be used in place of the RF generator.

WARNING

THE FINAL PLATE SWITCH MUST BE IN THE OFF POSITION THROUGHOUT THIS PROCEDURE. SERVICING PERSONNEL ARE WARNED, HOWEVER, THAT DANGEROUSLY HIGH VOLTAGES EXIST IN THE AREA OF OPERATION

SUMMARY OF TUNEABLE ELEMENTS USED IN MULTIPLIER AND DRIVER TUNED SECTIONS

S201 & S202 POSITION	S204 POSITION	V201	V204	V205
2 - 4 Mc.	NORMAL	L203, C210	-	L211, C237
4 - 8 Mc.	NORMAL	L204, C218	-	L212, C238
8 - 16 Mc.	NORMAL	L204	L207, C213	L213, C239
16 - 32 Mc.	NORMAL	L204	L207, C213	L214
2 - 4 Mc.	SSB	L203, C210	-	L211, C237
4 - 8 Mc.	SSB	L204, C218	-	L212, C238
8 - 16 Mc.	SSB	L207, C213	-	L213, C239
16 - 32 Mc.	SSB	L208, C232	-	L214

AND THAT EVERY NORMAL PRECAUTION SHOULD BE OBSERVED.

4-2-3-4-5 The alignment procedure for the GPT-750( )2 Transmitter is as follows:

A. Connect the output of the RF generator to J201 of the RTF deck. (If the SBE is used in place of the generator connect it in the same manner as usually used for transmitting. (See Part D.)

(1) Turn the MODE switch to the TUNE position.
(2) Turn S204, the SSB switch, to the SSB position.
(3) Turn the EXCITATION switch to the SSB LO OFF position.
(4) Turn the DRIVER BAND switch to the 4-8 Mc position.
(5) Turn the MULTIMETER switch to the DRIVER Ip Ma position.
(6) Turn the MAIN POWER and TRANSMITTER PLATES switches ON.
(7) Tune the RF generator for an output of 4 Mc, keeping the OUTPUT control at the minimum setting.
(8) Turn the DRIVER TUNING control for a setting of 2 Mc.
(9) Advance the RF generator OUTPUT control until some increase in current is shown by the MULTIMETER.
(10) Adjust L204 for a peak indication on the MULTIMETER. Reduce the exciter OUTPUT control setting if the meter tends to read off scale.
(11) Turn the MULTIMETER switch to the PA EG RF volts position.
(12) Tune L212 for maximum deflection of the MULTIMETER while using the exciter OUTPUT control to maintain a reading of about 50 v.
(13) Retune the RF generator for an output of 8 Mc.
(14) Turn the DRIVER TUNING control for a setting of 4 Mc.
(15) Tune C218 and C238 for maximum deflection on the MULTIMETER.
(16) Repeat steps 7 through 15 until no further adjustments are necessary.
(17) Set the DRIVER BAND switch to the 8-16 Mc position.
(18) Turn the DRIVER TUNING control for a setting of 2 Mc.
(19) Turn the MULTIMETER switch to the DRIVER Ip Ma position.
(20) See that the RF generator is tuned to 8 Mc.
(21) Advance the RF generator OUTPUT control until some increase in current is shown by the MULTIMETER.
(22) Adjust L207 for a peak reading on the MULTIMETER. Reduce the setting of the exciter OUTPUT control if the meter tends to read off scale.
(23) Turn the MULTIMETER switch to the PA Eg RF volts position.
(24) Adjust L213 for maximum deflection of the MULTIMETER while using the exciter OUTPUT control to maintain a reading of approximately 50 v.
(25) Turn the DRIVER TUNING control to 4 Mc.
(26) Retune the RF generator for an output at 16 Mc.
(27) Tune C231 and C239 for maximum deflection of the MULTIMETER.
(28) Repeat steps 17 through 27 until no more adjustments are necessary.
(29) Turn the DRIVER BAND switch to the 16-32 Mc position.
(30) See that the RF generator is tuned to 16 Mc.
(31) Turn the DRIVER TUNING control to the 2 Mc position.
(32) Tune L208 for a maximum voltage indication on the MULTIMETER.
(33) Tune L214 for a maximum reading on the multimeter.
(34) Retune the RF generator for an output of 32 Mc.

(35) Turn the DRIVER TUNING control to 4 Mc.

(36) Tune C232 and the DRIVER TUNING control for maximum indication on the MULTIMETER.

(37) Repeat steps 29 through 36 until no further adjustments are necessary. Carefully lock all coil tuning slugs.

(38) Set the DRIVER TUNING control to 2 Mc and the DRIVER BAND switch to the 16-32 Mc position.

(39) Turn S204, the SSB switch, to the NORMAL position.

(40) Turn the MULTIMETER switch to the PA Ig Ma position.

(41) Turn the EXCITATION switch located on the interconnect chassis to the CW-FS position.

(42) Turn the OSCILLATOR switch to the MO position and set the MASTER OSCILLATOR to 2 Mc.

(43) Turn the EXCITATION switch to the CW-PHONE position.

(44) Turn the DRIVER control fully clockwise.

(45) Tune L205 for maximum indication on the MULTIMETER.

(46) Turn the EXCITATION switch to the SSB LO OFF position and the SSB switch to the SSB position.

(47) Tune the RF generator to an output of 32 Mc.

(48) Set the DRIVER BAND switch to the 16-32 Mc range and adjust the DRIVER TUNING control for maximum indication on the MULTIMETER.

(49) Turn the EXCITATION switch to the CW-PHONE position, turn the SSB switch to the NORMAL position, turn the RF generator OFF, and turn the OSCILLATOR switch to the MO position.

(50) Adjust the MASTER OSCILLATOR for an output of 4 Mc.

(51) Tune C212 for maximum indication on the MULTIMETER.

(52) If the MULTIMETER now indicates less than 30 Ma Pa Ig Ma use L205 to bring the reading to exactly 30 Ma. If the MULTIMETER indicates something more than 30 Ma, however, do not disturb the setting of L205.

(53) Adjust the MASTER OSCILLATOR for an output of 2 Mc.

(54) Adjust the DRIVER TUNING for a maximum indication on the MULTIMETER.

(55) Once again adjust L205 if necessary to raise the MULTIMETER reading to 30 Ma Pa Ig Ma.

(56) Adjust the MASTER OSCILLATOR for an output of 4 Mc and tune the DRIVER at 32 Mc for a reading of 30 Ma on the MULTIMETER.

(57) If 30 Ma was not reached in the last step tune C212 for a peak MULTIMETER reading.

(58) Turn the DRIVER BAND switch to the 8-16 Mc band.

(59) With the MASTER OSCILLATOR at 4 Mc check the overall results of the previous steps by tuning the DRIVER to 16 Mc in the 8-16 Mc band to 8 Mc in the 4-8 Mc band, checking the MULTIMETER for a reading of 30 Ma in each case.

(60) Retune the MASTER OSCILLATOR to 2 Mc and check the overall results as before by tuning the DRIVER first to 8 Mc in the 8-16 Mc band and then to 4 Mc in the 4-8 Mc band, checking the MULTIMETER for a reading of 30 Ma in each case.

(61) Turn the DRIVER BAND switch to the 2-4 Mc range.

(62) Turn the DRIVER TUNING control to the 2 Mc mark.

(63) Tune L203 for maximum indication on the MULTIMETER.

(64) Tune L211 for maximum indication on the MULTIMETER.

(65) Readjust the MASTER OSCILLATOR for an output of 4 Mc.

(66) Set the DRIVER TUNING control to 4 Mc and tune C210 and C237 for maximum output as indicated by the MULTIMETER.

(67) Repeat steps 61 through 66 as often as necessary to bring the MULTIMETER reading to 30 Ma at each tuned position.

(68) Set the MASTER OSCILLATOR output to 3 Mc.

(69) Set the DRIVER TUNING control to 3 Mc.

(70) Turn the DRIVER BAND switch to each of the four ranges and check the MULTIMETER for a reading of 30 Ma at each.

4-2-3-5 PA Neutralization

WARNING

ALTHOUGH THE FINAL PLATE SWITCH IS KEPT IN THE OFF POSITION THROUGHOUT THIS PROCEDURE, SERVICING PERSONNEL ARE WARNED THAT DANGEROUSLY HIGH VOLTAGES EXIST IN THE AREA CONCERNED AND THAT EVERY NORMAL PRECAUTION MUST BE OBSERVED.

4-2-3-5-1 PA neutralization adjustment is usually required when either V101 or V102 PA tubes have been replaced, or an erratic display by the PA PLATE current meter indicates oscillation in the final stage when excitation is removed.

4-2-3-5-1 Equipment Required

Vacuum tube voltmeter and RF Probe
Open-end 7/16 inch wrench

4-2-3-5-3 Procedure

CAUTION

THE FINAL PLATE SWITCH MUST BE IN THE OFF POSITION THROUGHOUT THIS PROCEDURE.

A. Clip the VTVM RF probe to the clamp on top of the variable vacuum tuning capacitor, C113. Connect the probe grounding clip to the chassis.

B. Tune the driver stages for output on 8 Mc by observing a maximum on the PA Eg RF volts indication of the MULTIMETER. Adjust the DRIVE control for a DRIVER Ip Ma reading of 20. Tune the final amplifier for maximum indication on the VTVM.

C. Adjust C104, neutralizing capacitor for minimum voltage indication on VTVM. The reading must be less than 10 volts. Usually a reading of 6 to 8 volts can be obtained.

D. Retune the driver stages for output on 16 Mc as in step B above.

E. Set PA BAND switch for 12-16 Mc. Tune C113, PA TUNING, for a maximum indication of VTVM.

F. If this voltage is appreciably greater than that obtained on 8 Mc or 10 volts, readjust the neutralizing capacitor slightly to reduce the voltage. By switching alternately between 8 Mc and 16 Mc, a neutralizing capacitor setting can be found where little or no difference exists between the voltage indications, and they must be less than 10 volts.

G. Tighten neutralizing capacitor lock nuts with the open end wrench.

H. Adjust the driver stages for output on 32 Mc as in step B above.

J. Set PA BAND switch for 32 Mc. Observe that from the driver stage (V205) tuning capacitor, C201, a piece of bare tinned wire is connected to a button capacitor, C128, located on the wall of the final amplifier compartment. By varying the size of the loop formed by this wire, the inductance in the circuit is changed. Tune the final plate tuning capacitor for a maximum VTVM indication. Adjust the loop size in small increments. Continue adjustments until a minimum reading is indicated by the VTVM.

4-2-3-6 Adjustment of Final Plates Overload Reset, CB603

CAUTION

THE TRANSMITTER SHOULD NOT BE OPERATED IN THE CONDITION OUTLINED BELOW FOR PROLONGED PERIODS BECAUSE OF THE EXCESSIVE MODULATOR PLATE DISSIPATION.

A. Tune and load the transmitter for CW operation.

B. Readjust the ANTENNA LOADING control slightly so that the DRIVE control can be used to bring the PA plate current to 600 Ma.

C. Unlock and adjust R609 to the point where a slight rise in PA plate current beyond 600 Ma will cause CB603, the FINAL PLATES OVERLOAD RESET breaker, and K601, the TRANSMITTER PLATES relay to open.

D. Repeat if necessary. Lock R609.

4-2-3-7 Adjustment of the Final Screen Grid Overload Reset, CB602

4-2-3-7-1 The threshold or activating point of the screen grid overload circuit is controlled by R603, the FINAL SCREEN GRID OVERLOAD ADJUST potentiometer. Any adjustment should be made as follows:

A. Tune and load the transmitter for CW operation, using the DRIVE control to bring the PA screen grid current to 100 Ma.

B. Unlock and adjust R603 to the point where a slight rise in current will cause CB602, the FINAL SCREEN GRID OVERLOAD RESET, and K601, the TRANSMITTER PLATES RELAY to open.

C. Repeat, if necessary. Relock R603.

4-3 CORRECTIVE MAINTENANCE

4-3-1 Vacuum Tube Checks

4-3-1-1 Vacuum tubes should be checked regularly (according to the amount of use received) on a reliable tube tester.

4-3-1-2 An indication of "GOOD" on a tube tester does not necessarily mean that a tube will function properly in its circuit, but a "REPLACE", "BAD" or borderline indication frequently means that better service will result if the tube is replaced. The average commercial tube tester should not be called upon to give more information than this.

4-3-1-3 All questions regarding the condition of a particular tube in a given circuit can be answered by trying a good tube in the same location.

4-3-1-4 Many circuits are adjusted with a particular tube in place. Always put tubes back in their original locations if they are found to be good. Consult the Instruction Manual and the Schematic Diagram to see if circuit readjustment is needed when replacement tubes are used.

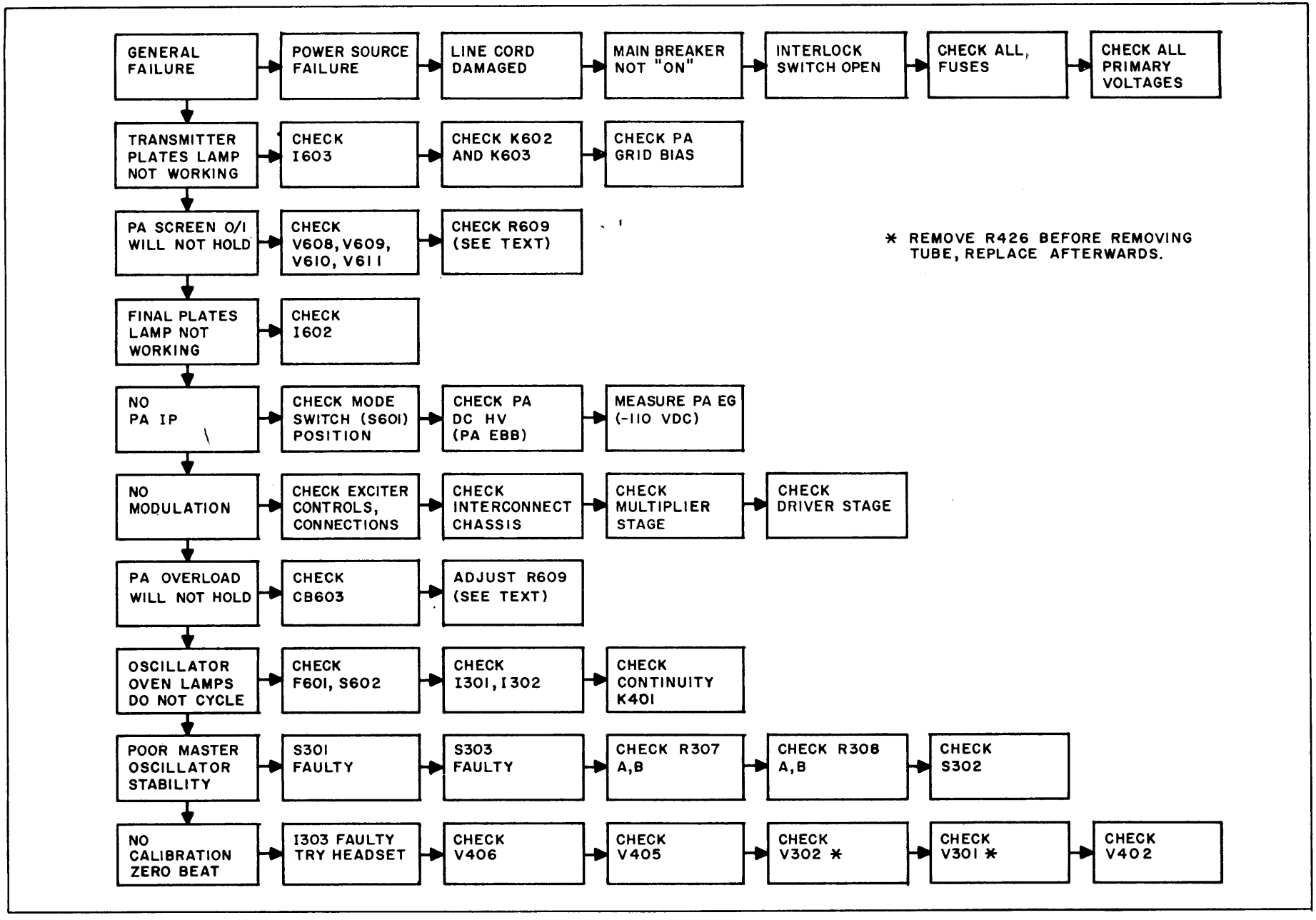


Figure G-4-1 Simplified Trouble Shooting Guide

CAUTION

NEVER REMOVE V301 OR V302 WITHOUT FIRST REMOVING R426, BALLAST, OR TURNING MAIN BREAKER OFF.

4-4 REPLACEMENT OF VACUUM CAPACITOR, C113

4-4-1 Turn the PA TUNING control clockwise until against the stop and the counter reads 000.

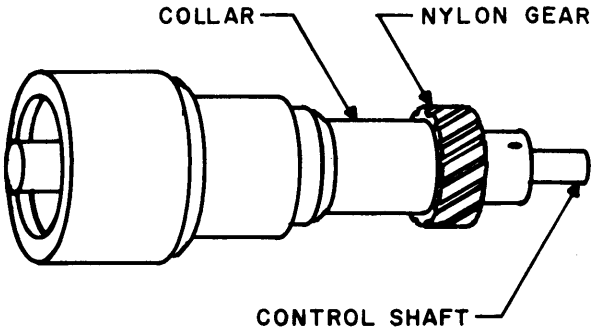
4-4-2 Remove the top connector from C113 and loosen the clamp at the base of the glass envelope.

4-4-3 Lift the old capacitor from place carefully. The counter reading will change as the old capacitor is withdrawn but will return to 000 as the replacement is installed.

4-4-4 Turn the control shaft and nylon gear on the new capacitor clockwise so that the collar no longer turns freely. Add one quarter more turn.

4-4-5 Lower the new capacitor SLOWLY into place. The nylon drive gear will engage the counter limit stop mechanism and turn the counter back to 000.

4-4-6 Reclamp the capacitor in place and restore the top connection.



THE FOLLOWING TABLES G-4-1 AND G-4-2 ARE FOR MEASURING TRANSMITTER VOLTAGES. THE VOLTAGES SHOWN ARE TYPICAL VOLTAGES AND MAY VARY AS MUCH AS ±10% FOR ANY PARTICULAR TRANSMITTER.

Before taking voltage readings, set transmitter controls as follows:

Line Voltage 115 v, 50/60 cycle, 1 ø.
TRANSMITTER PLATES switch to OPERATE
FINAL PLATE switch to OFF.
MODE switch to CW-FS.
OSCILLATOR switch to X-1. (no xtal).
EXCITATION switch to CW/PHONE.
SSB switch to NORMAL.
DRIVE control fully clockwise.

Abbreviations and symbols

K.U. - Key Up
K.D. - Key Down
NC - No connection
\# - FINAL PLATE switch ON
ac - AC volts. All ac voltages are measured with respect to terminal 30 of E603 unless otherwise indicated.
** - MODE switch in PHONE position
1v - Equal to voltage of power line source

TABLE G-4-1 TERMINAL STRIP VOLTAGES

E601 TERMINAL	VOLTS K. U.	E602 TERMINAL	VOLTS K. U.	E603 TERMINAL	VOLTS K. U.
1	300	9	600	21	NC
2	-150	10	600	22	NC
3	580	11	0	23	NC
4	1000	12	0	24	-105
5	-210	13	1v	25	350
6	600	14	1v	26	-105
7	600	15	1v	27	-210
8	600	16	1v	28	6 ac
		17	350	29	600 #
		18	350	30	115 ac
		19	0	31	0
		20	-105	32	-2 #

TABLE G-4-2 TYPICAL TUBE SOCKET VOLTAGES (±10%)

	Pin 1		Pin 2		Pin 3		Pin 4		Pin 5		Pin 6		Pin 7		Pin 8		Pin 9		Plate Cap		Remarks
	K.U.	K.D.	K.U.	K.D.	K.U.	K.D.	K.U.	K.D.	K.U.	K.D.	K.U.	K.D.	K.U.	K.D.	K.U.	K.D.	K.U.	K.D.	K.U.	K.D.	
V101	GND	-	-115	-115	-120	-120	-115	-115	4.4 ac	4.4 ac	-	-	-	-	-	-	-	-	-	-	Final Plate OFF
	-	-	600	600	-120	-120	600	600	4.4 ac	4.4 ac	-	-	-	-	-	-	-	-	3000	-	Final Plate ON
V102	4.4 ac	4.4 ac	-115	-115	-120	-120	-115	-115	GND	GND	-	-	-	-	-	-	-	-	-	-	Final Plate OFF
	-	-	600	600	-120	-120	600	600	GND	GND	-	-	-	-	-	-	-	-	3000	-	Final Plate ON
V201	-	±3.3	-70	±.05	±150	±150	6ac	6ac	GND	GND	±350	280	GND	GND	150	150	-70	±.05	-	-	
V202	115	400	23	0	23	13	GND	GND	GND	GND	150	150	-65	±.05	-65	±1.8	6.0 ac	6.0 ac	-	-	
V203	150	150	NC	NC	NC	NC	NC	NC	150	150	NC	NC	GND	GND	-	-	-	-	-	-	
V204	-100	-100	±1.6	1.6	6ac	6ac	GND	GND	340	320	150	150	-20	-20	-	-	-	-	-	-	
V205	GND	GND	GND	GND	150	150	GND	GND	-90	-40	GND	GND	6.0 ac	6.0 ac	GND	GND	-	-	600	600	
V206	-70	0	-70	0	GND	GND	GND	GND	GND	GND	-70	0	-70	0	GND	GND	-	-	-	-	
V301	120	120	NC	NC	GND	GND	6ac	6ac	120	120	-3.3	-3.3	0.13	0.13	-	-	-	-	-	-	Oscillator Switch in CAL Position
V302	150	150	0.2	0.2	5.2	5.2	6ac	6ac	6ac	6ac	75	75	-12	-12	7	7	GND	GND	-	-	
V401	150	150	NC	NC	NC	NC	NC	NC	150	150	NC	NC	GND	-	-	-	-	-	-	-	
V402	155	150	NC	NC	6ac	6ac	GND	GND	NC	NC	0	0	5	5	-	-	-	-	-	-	
V403	-70	0	GND	GND	6ac	6ac	GND	GND	310	300	310	155	0	2.2	-	-	-	-	-	-	
V404	310	300	-18	-18	0	0	6ac	6ac	GND	GND	310	300	-18	-18	0	0	GND	GND	-	-	
V405	-0.5	-0.5	GND	GND	6ac	6ac	GND	GND	0	0	0	0	0	0	-	-	-	-	-	-	Oscillator Switch to CAL Position
V406	-1.5	-1.5	-.5	-.5	GND	GND	6ac	6ac	GND	GND	-1.5	-1.5	-.8	-.8	GND	GND	GND	GND	-	-	
V601	-105	-105	-210	-210	-90	-90	-210	-210	-105	-105	-85	-85	-210	-210	-	-	-	-	-	-	Pins 2,3,4,5,6 not connected
V602	GND	GND	-105	-105	-20	-20	-105	-105	0	0	-20	-20	-105	-105	-	-	-	-	-	-	Pins 2,3,4,5,6 not c nnected
V603	-500	-500	NC	NC	420 ac	420 ac	420 ac	420 ac	NC	NC	-500	-500	420 ac	420 ac	-	-	-	-	-	-	
V604	NC	NC	350	340	NC	NC	420 ac	420 ac	NC	NC	420 ac	420 ac	NC	NC	350	340	-	-	-	-	
V605	NC	NC	640	640	NC	NC	720 ac	720 ac	NC	NC	720 ac	720 ac	NC	NC	640	640	-	-	-	-	
V606	NC	NC	3000	3000	NC	NC	3000	3000	-	-	-	-	-	-	-	-	-	-	-	2800 ac	
V607	NC	NC	3000	3000	NC	NC	3000	3000	-	-	-	-	-	-	-	-	-	-	-	2800 ac	
V608	150	150	GND	GND	NC	NC	NC	NC	150	150	NC	NC	GND	GND	-	-	-	-	-	-	V608,609,610 & 611 are not active only wh n Final Plate Switch is ON
V609	300	300	150	150	NC	NC	NC	NC	300	300	NC	NC	150	150	-	-	-	-	-	-	
V610	450	450	300	300	NC	NC	NC	NC	450	450	NC	NC	300	300	-	-	-	-	-	-	
V611	600	600	450	450	NC	NC	NC	NC	600	600	NC	NC	450	450	-	-	-	-	-	-	
V701	-1.5	-1.5	-270	-270	-267	-267	-270	-270	-270	-270	-1.5	1.5	-235	-235	-267	-267	-270	-270	-	-	
V702	NC	NC	-270	-270	2.1	2.1	0	0	-270	-270	NC	NC	-270	-270	-240	-240	-	-	-	-	
V703	NC	NC	-270	-270	2.1	2.1	0	0	-270	-270	NC	NC	-270	-270	-255	-255	-	-	-	-	
V704	grid -75	cap -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2800	2800	
V705	-75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2800	2800	
V706	NC	NC	-75	-75	NC	NC	NC	NC	GND	GND	NC	NC	NC	NC	NC	NC	-	-	-	-	
V707	NC	NC	0	0	NC	NC	470 ac	470 ac	NC	NC	470 ac	470 ac	NC	NC	0	0	-	-	-	-	

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LIST OF ILLUSTRATIONS

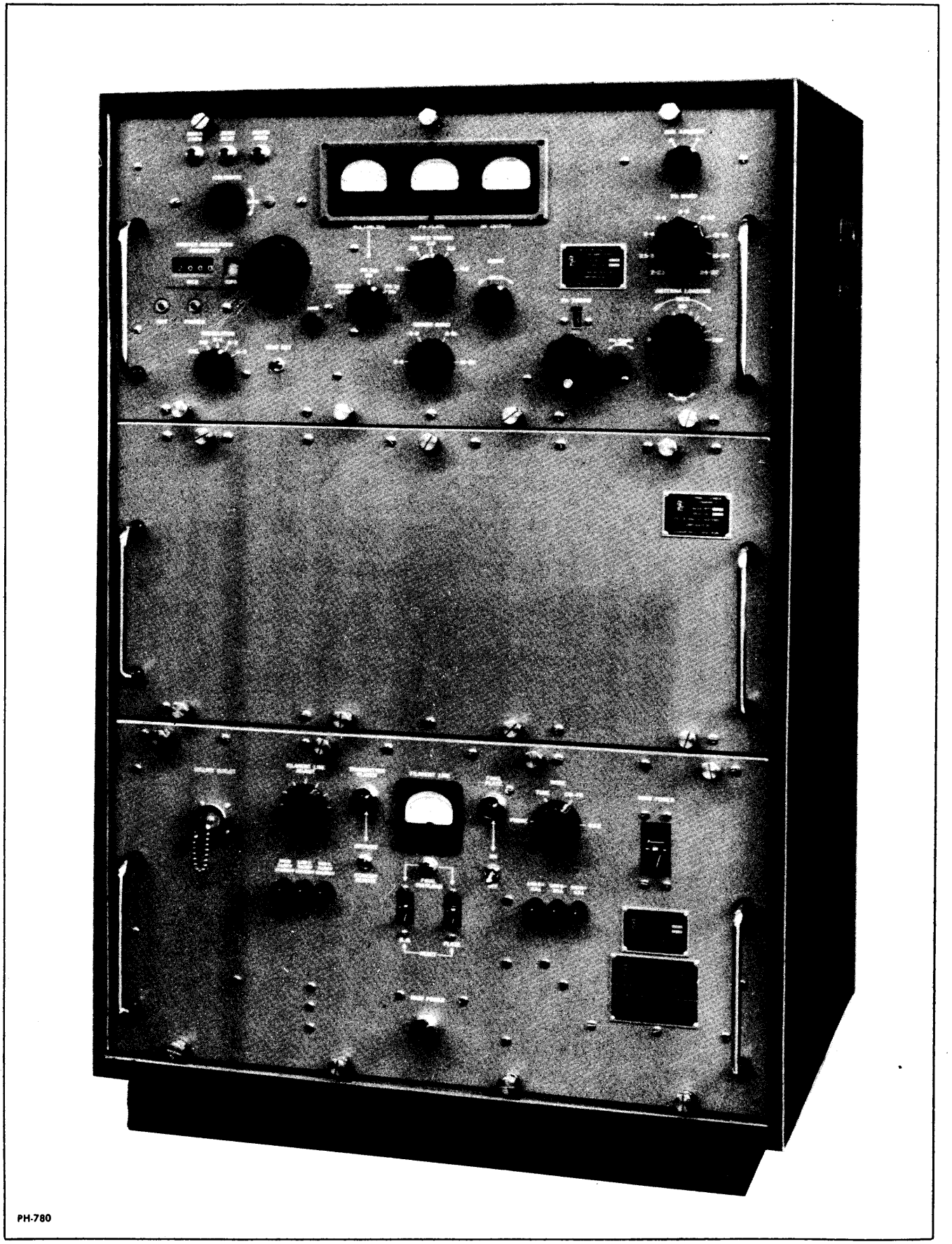

Figure A-1-1 Front View Model GPT-750A2

SECTION I
GENERAL

A-1-1 DESCRIPTION

A-1-1-1 The "A" combination of the transmitter consists of the RF Deck and Power Supply. The middle section is covered by a blank panel. (Note that for correct ventilation of the transmitter the blank panel MUST BE kept in place.) CW and several other modes of operation are possible with this unit. This mode and modes using accessory exciters are outlined in Part "GENERAL".

A-1-2 TECHNICAL SPECIFICATIONS

(See Part "GENERAL" for General Specifications)

CRYSTAL OSCILLATOR CHARACTERISTICS:
Frequency Range: 2 to 4 Mc.
Crystal Used: CR-18/U in HC-6/U Holder.
Number of Positions: 3, selectable from front panel.

OUTPUT POWER:
1000 watts Al.

WEIGHT:
800 pounds.

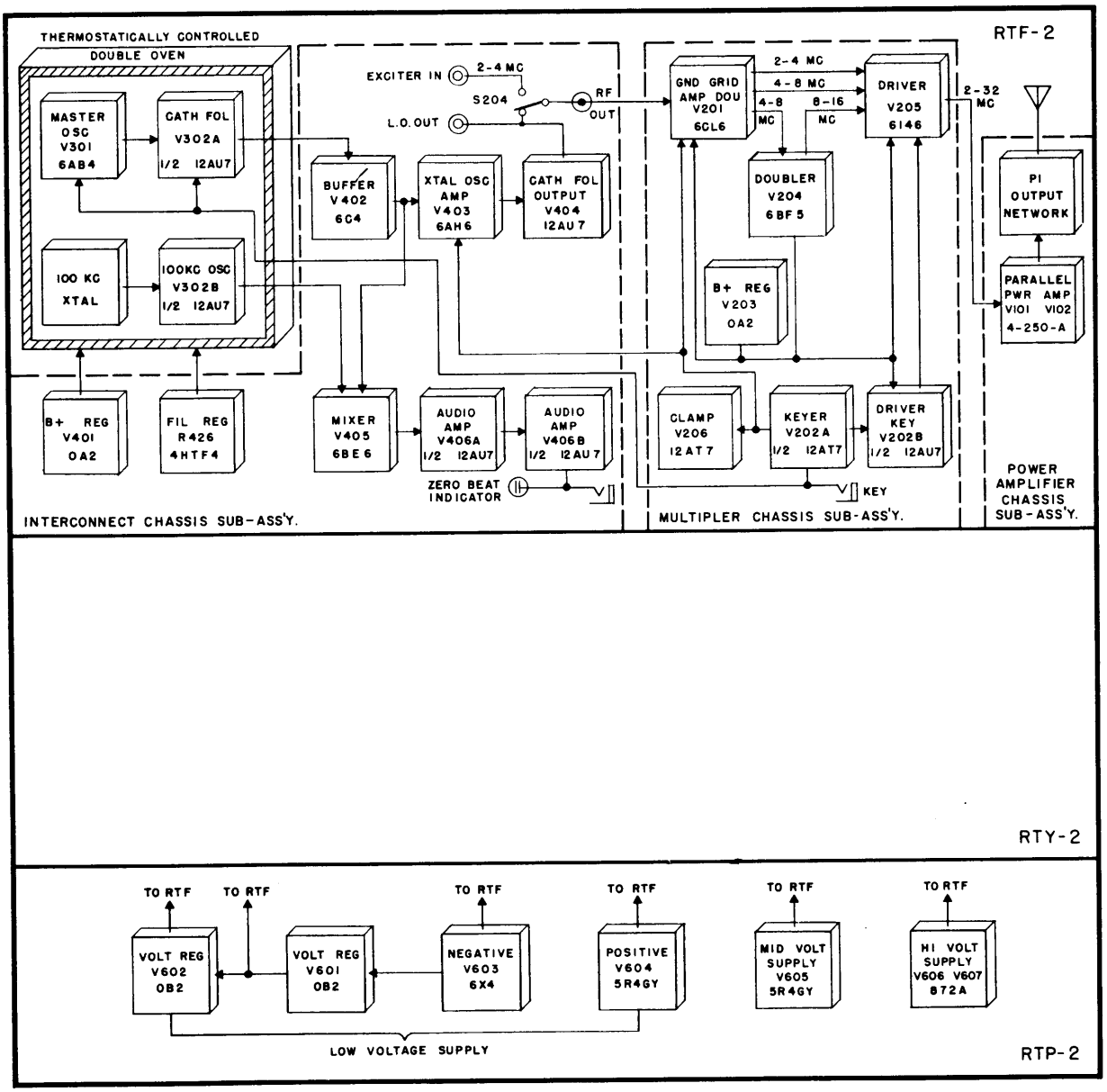

Figure A-1-2 Block Diagram Model GPT-750A2

SECTION II
THEORY OF OPERATION

(See Part "GENERAL)

SECTION III
INSTALLATION AND OPERATION

A-3-1 ELECTRICAL CONNECTIONS, INTERNAL

Refer to Figure A-3-1

A. Pull out the RTP-2 (Transmitter Power Supply) drawer for access to connectors at rear.

B. Connect P502 of CA-402 to J601 of the RTP-2.

C. Connect P503 of CA-408 to J602 of the RTP-2.

D. Insert both rectifier tubes into their respective sockets in the RTP-2 deck and connect one high voltage lead to each plate cap.

E. Connect P512 of CA-417-2 to J603 of the RTP-2.

F. Remove the long cover from the regulator deck of the RTP-2 by loosening the twist-lock fasteners and insert the time delay relay, K603, and its shield. Install V608, V609, V610, and V611. Replace cover.

G. Install the remainder of the tubes in the RTP-2 deck.

H. Connect P506 of CA-417-1 to J303 of the RTF-2.

J. Connect P504 of CA-408 to J405 of the RTF-2.

K. Make the following intra-chassis connections on the RTF-2.

(1) J402 to P301
(2) J401 to P302
(3) J201 to P401

L. Install all tubes in the RTF-2 deck.

M. Check all cable connections for secure attachment.

N. Replace all covers.

P. Install all fuses. Proper values are engraved on the respective panels near the fuses.

A-3-2 OPERATION

A-3-2-1 Description of Controls and Indicators

RTP-2

CONTROL	FUNCTION
MAIN POWER ON/OFF	Applies AC voltage to the transmitter and provides automatic overload protection.
FILAMENT LINE (meter)	Indicates Voltage at primary of filament transformer, T603.
FILAMENT LINE ADJUST	Selects taps on the filament transformer to maintain the desired 115 VAC.
UTILITY OUTLET	Convenience power outlet.
TRANSMITTER PLATES	Applies plate voltage to the low level stages and high voltage to the PA stage when the FINAL PLATE switch is ON.
FINAL OVERLOAD (SG/PLATE)	Resets overload relay system when tripped by excessive PA plate or screen grid currents.
MODE	Selects PHONE, TUNE, CW-FS or SSB operation.
FINAL PLATES	Applies high voltage to the PA stage when transmitter PLATES switch is ON.
MO NORM/BYPASS (Inside Drawer)	Allows Master Oscillator oven to continue operation when transmitter main breaker is off.

RTF-2

EXCITATION SW. (On Top of Interconnect)	Selects and routes oscillator for SSB, FS and CW/PHONE
SSB/NORMAL Switch (On Top of Multiplier)	Changes multiplier to straight-through frequency for SSB operation.
INNER OVEN (Lamp)	Lights when inner oven is warming.
OUTER OVEN (Lamp)	Lights when outer oven is warming.
ZERO BEAT (Lamp)	Indicates ZERO BEAT in calibration of Master Oscillator during calibration procedure.

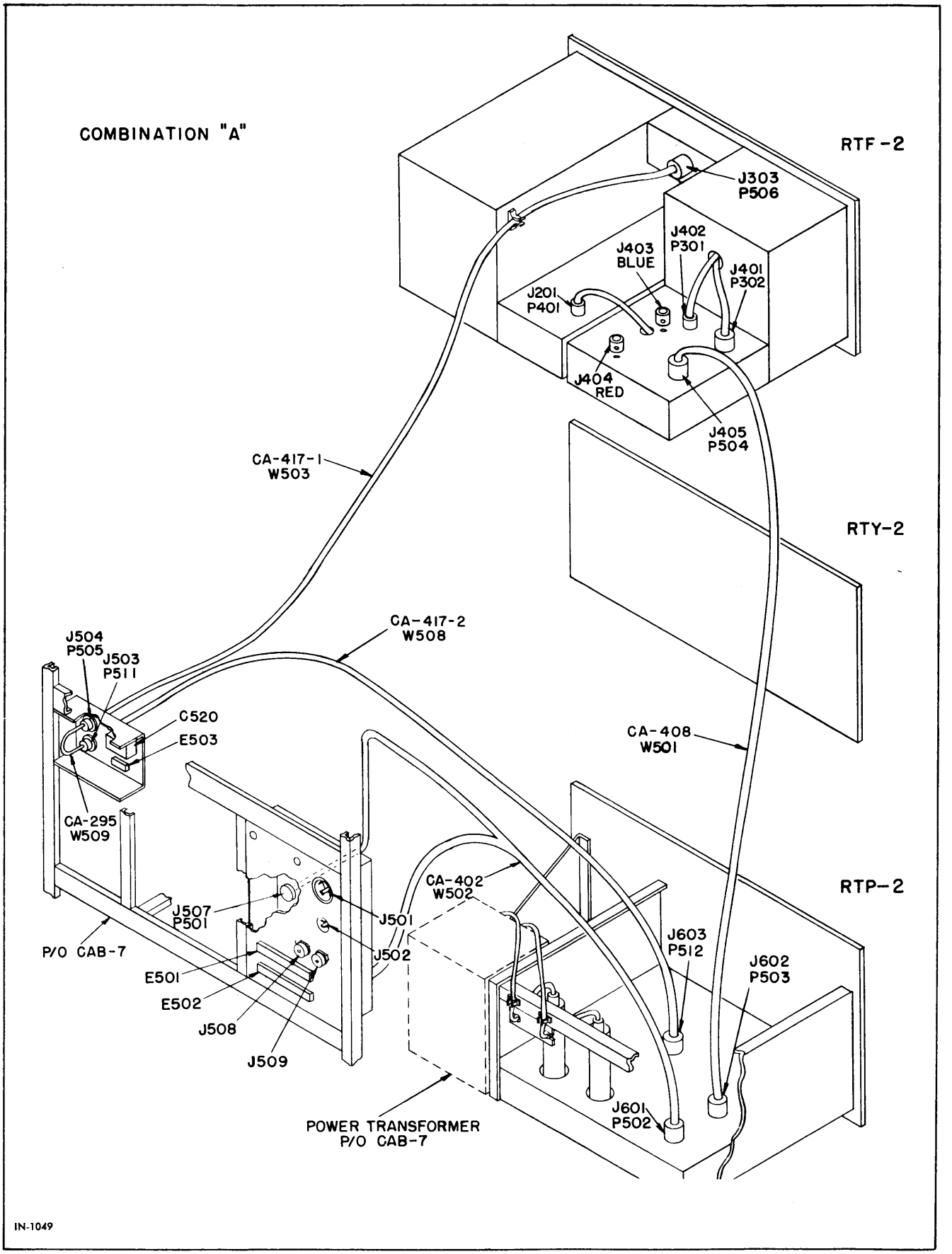

Figure A-3-1 Cabling Diagram Model GPT-750A2

CALIBRATE	Used to bring the Master Oscillator to calibration during the calibration procedure.
MASTER OSCILLATOR FREQUENCY	Tunes Master Oscillator to frequency indicated on the dial.
KEY	Can be used for ON/OFF keying of transmitter during CW operation.
PHONES	Audible monitoring of ZERO BEAT during MO calibration.
OSCILLATOR	Selects source of frequency control for transmitter or calibration of MO.
MULTIMETER	Measures points selected by associated switch.
MULTI-METER (switch)	Selects measurement of: PA ebb DRIVER Ip PA Isg PA Ig PA Eg RF
PA PLATE (meter)	Indicates PA Plate current.
RF OUTPUT	Indicates RF Output current.
DRIVER TUNING	Varies the multiplier and driver tuning capacitors.
DRIVE	Varies the amount of drive to the PA grids.
DRIVER BAND	Changes frequency range of the driver and multiplier tuning.
PA TUNING	Varies the main tuning vacuum capacitor which is an integral part of the PA PI tank.
PA BAND	Sets the PA tank to the proper output frequency band by tapping of the output coil.
ANTENNA LOADING	Adjusts the amount of coupling to the load.
AUX. LOADING	Switches in an additional loading capacitor for loads of lower impedance.
TEST KEY	Provides emergency and test keying.

A-3-2-2 Preliminary Power - Off Adjustments

A. Place the following controls in the positions indicated before applying power to the transmitter:

RTF-2

DRIVE	Fully counter-clockwise.
EXCITATION (S402)	CW - PHONE
SSB/NORMAL	NORMAL

RTP-2

FILAMENT LINE ADJUST	Position 2 from full counter-clockwise.
TRANSMITTER PLATES	Standby Remote
FINAL PLATE	OFF
MODE	TUNE
MAIN POWER	OFF
MO BYPASS	Normal

A-3-2-3 Preliminary Power - On Adjustments

A. See that all previous steps have been accomplished.

B. Connect a 1000 watt resistive 70 or 50 ohm load or antenna to J505, the RF output jack.

C. Connect power line from appropriate source to J501.

D. Turn MAIN POWER switch ON.

E. The MAIN POWER indicator lamp should light.

F. Check the FILAMENT LINE Meter for a reading of 115 volts.

G. Use FILAMENT LINE ADJUST control for correction if necessary.

A-3-2-4 Choosing the Master Oscillator or Xtal Frequency

A. Divide the desired output carrier frequency by the number given below to find the correct MASTER OSCILLATOR setting.

MO OR XTAL	FREQ.	EQUALS	CARRIER FREQ.	DIVIDED BY
,,	,,	,,	2 to 4 Mc	1
,,	,,	,,	4 to 8 Mc	2
,,	,,	,,	8 to 16 Mc	4
,,	,,	,,	16 to 32 Mc	8

B. When the MO frequency has been chosen be sure that the final frequency is approached from the same direction of knob rotation as was the check point. (See Section I). If by mistake, the dial should be turned too fast and the proper point is passed, go back at least 1 Kc and again approach the point from the original direction.

C. If crystal operation is desired, the crystal frequency must be chosen according to the above instructions and plugged into one of the three sockets on the top of the interconnect chassis. The front panel OSCILLATOR switch is then turned to the correct crystal position.

A-3-2-5 Tuning the GPT-750A2 for CW Operation

A. Do not alter control setting made in previous steps.

B. Rotate the DRIVE control fully clockwise.

C. Turn the DRIVER BAND switch to the range which includes the final carrier frequency.

D. Set the MULTIMETER switch to the PA Ig position.

E. Turn the DRIVER TUNING control to the frequency of the oscillator. A peak in PA grid current will indicate the correct point.

F. Turn the DRIVE control fully counter-clockwise.

CAUTION

BE SURE AN ANTENNA OR 1000 WATT 50 OR 70 OHM DUMMY LOAD IS CONNECTED TO J505

G. Turn the PA BAND switch to the range which includes the final frequency.

H. Set the ANTENNA LOADING control to its fully counter-clockwise position or roughly pre-set it according to Figure A-3-2.

J. Set the AUX. LOADING control to the + (plus) position or as indicated in Figure A-3-2.

K. Turn the FINAL PLATE switch ON.

L. Advance the DRIVE control until the PA PLATE current meter indicates 120 Ma.

M. Turn the PA TUNING control until a definite plate current dip is obtained.

N. The RF OUTPUT meter may be used as an aid in tuning but it must be understood that it is an output indicator and does not necessarily give absolute values of RF current.

CAUTION

A SHUNTING BAR HAS BEEN PROVIDED WITHIN THE PA COMPARTMENT FOR SHUNTING THE AMMETER THERMOCOUPLE. THIS WILL BE USEFUL WHEN A LOAD WITH LOW IMPEDANCE AND HIGH REACTANCE (HIGH STANDING WAVE RATIO) IS TO BE MATCHED. UNDER THESE CONDITIONS THE UNSHUNTED CIRCUIT WOULD CAUSE THE METER TO "PIN" DUE TO THE HIGH REACTIVE CURRENT IN THE LOAD.

P. Turn the MULTIMETER switch to the PA Isg position.

Q. Advance the DRIVE control until the screen current is about 10 Ma.

R. Turn the ANTENNA LOADING control clockwise until the screen current drops to almost zero and the plate current begins to rise.

S. Adjust the PA TUNING control until the plate dips again and the screen current rises. Continue to advance the ANTENNA LOADING and DRIVE controls (each time redipping the plate current with the PA TUNING as before) until the screen current is 10 Ma, the plate current is 250 Ma.

CAUTION

THE PLATE CURRENT DIPS MUST BE OBTAINED AT THE LOWEST PA TUNING READING TO AVOID DOUBLING IN THE FINAL. IF FIGURE A-3-2 IS FOLLOWED, NO SUCH TROUBLE WILL OCCUR.

T. Turn the MODE switch to the CW-FS position.

U. Key the transmitter by either pressing the TEST KEY or by using an external key connected to the KEY jack. The plate current should rise to about 500 Ma while the PA Isg current becomes 90 Ma. The PA Ig will be between 15 and 30 Ma depending upon the operating frequency.

V. If the above results are not obtained the PA Isg can be increased by advancing the DRIVE control while the PA plate current can be increased by slight advancement of the ANTENNA LOADING control.

W. Make a final adjustment of the PA TUNING control for a peak in the PA Isg and a corresponding peak in RF OUTPUT. If the transmitter is fully loaded in this manner, it is much easier to

adjust the PA TUNING for a screen current peak. The transmitter is now fully prepared to be placed in operation.

X. For simple ON/OFF control of the transmitter leave the FINAL PLATE switch in the ON position and the TRANSMITTER PLATES switch in the STANDBY/REMOTE position. To operate under these conditions one need only throw the TRANSMITTER PLATES switch to the ON position and key the transmitter.

Y. If the overload protective system throws the transmitter OFF at any time it will probably be because excessive screen or plate currents have been drawn. The OVERLOAD RESET controls should then be used to restore operation so correction can be made.

A-3-3 ADDITIONAL INFORMATION

A. The absolute settings of the ANTENNA LOADING and AUX. LOADING controls is shown in Figure A-3-2 are approximate because these controls serve to balance out reactance in the antenna system. For this reason the antenna and frequency used will influence the final settings of these controls. The AUX. LOADING switch will seldom be used in the zero (0) position at frequencies above the 2 to 4 Mc band.

B. When tuning the upper end of the two highest bands (24 to 32 Mc), it will be necessary to advance the ANTENNA LOADING control to almost its fully clockwise position in order to obtain a plate current dip with the PA TUNING control.

A-3-4 SETTING THE TRANSMITTER TO THE FREQUENCY OF A RECEIVED SIGNAL

A-3-4-1 In some cases the operator may want to set the transmitter exactly on the same frequency as a signal being received. This is particularly useful in amateur communication. To set the transmitter to the frequency of a received signal, proceed as follows:

A. Tune up the transmitter with the exception of the final amplifier (leave the FINAL PLATE switch OFF). The master oscillator should be set so that the multiplier output frequency is close to frequency of the desired signal.

B. Tune the receiver to the desired signal.

C. Turn on the receiver BFO and vary the BFO frequency until a zero beat is obtained with the received signal carrier.

D. Pick up the transmitter on the receiver and readjust the master oscillator until a zero beat is heard. The master oscillator is now aligned with the received signal, and the remainder of the transmitter may now be properly tuned. If the master oscillator signal cannot be picked up on the receiver, insert about one foot of a four-foot length of insulated wire inside the top drawer and close the drawer. This will serve to radiate some of the master oscillator signal into the receiver. It will be possible in some cases, depending upon the strength of the received signal, to directly beat the transmitter with the received signal and leave the receiver BFO off.

A-3-5 REDUCED POWER OPERATION

A-3-5-1 The power output of the transmitter is readily adjustable from a minimum of a few watts to its maximum output of 1000 watts CW. To operate at reduced power, proceed as follows:

A. Tune the transmitter as prescribed for CW operation. Output power is now approximately 1000 watts.

B. Adjust the DRIVE control so that screen current drops to approximately 45 Ma.

C. Decrease the antenna loading until the screen current rises again to 90 Ma after the final amplifier has been reset for resonance. The power output is now approximately 500 watts. For an output power of less than 500 watts, screen current should be proportionately reduced.

SCREEN CURRENT VALUES FOR REDUCED POWER OPERATION

OUTPUT POWER (W)	SCREEN CURRENT (MA)
500 (and above)	90
400	70
300	55
200	35

D. Repeat step C until the desired power output is obtained.

SECTION IV
MAINTENANCE

(See Part "GENERAL")

FREQ MC	VMO FREQ	DRIVER		POWER AMPLIFIER						
		BAND	TUNING	PA BAND	PA TUNING	PA LOADING	PA IG	PA IP	PA ISG	ANTENNA CURRENT
2.0	2000	2-4	2.0	2-2.5	063	38	12	460	73	4.45
2.5	2500	2-4	2.5	2-2.5	123	100	10	440	78	"
2.5	2500	2-4	2.5	2.5-3	070	10	10	470	50	"
3.0	3000	2-4	3.0	2.5-3	114	50	5	460	50	"
3.0	3000	2-4	3.0	3.0-4	065	2	10	450	70	"
4.0	4000	2-4	4.1	3.0-4	131	51	7	450	63	"
4.0	2000	4-8	1.9	4-6	055	100	12	460	80	"
6.0	3000	4-8	3.0	4-6	141	52	5	450	50	"
6.0	3000	4-8	3.0	6-8	110	35	5	450	57	"
8.0	2000	4-8	4.1	6-8	134	50	8	450	52	"
8.0	4000	8-16	2.0	6-8	153	68	5	440	60	"
8.0	4000	8-16	2.0	8-12	134	50	5	440	65	"
10.0	2500	8-16	2.5	8-12	159	71	5	440	50	"
12.0	3000	8-16	3.0	8-12	174	83	5	450	50	"
12.0	3000	8-16	3.0	12-16	166	50	5	440	57	"
14.0	3500	8-16	3.5	12-16	179	70	5	450	52	"
16.0	4000	8-16	4.0	12-16	196	80	6	450	65	"
16.0	2000	16-32	2.0	16-24	160	40	6	450	50	"
18.0	2250	16-32	2.25	16-24	169	53	6	470	62	"
20.0	2500	16-32	2.5	16-24	176	66	5	450	40	"
22.0	2750	16-32	2.7	16-24	184	72	4	450	42	"
24.0	3000	16-32	2.9	16-24	197	78	5	450	55	"
24.0	3000	16-32	2.9	24-32	173	57	6	450	60	"
26.0	3250	16-32	3.2	24-32	178	67	4	460	37	"
28.0	3500	16-32	3.4	24-32	184	70	3	460	35	"
30.0	3750	16-32	3.65	24-32	192	72	4	450	50	"
32.0	4000	16-32	3.9	24-32	206	77	3	450	42	4.45

TEST CONDITIONS:

a. 50 OHM NON-REACTIVE DUMMY LOAD.

b. POWER OUTPUT 1000 WATTS (4.5 AMPS AT 50 OHMS) MINIMUM.

Figure A-3-2 Tuning Chart Model GPT-750A2

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LIST OF ILLUSTRATIONS

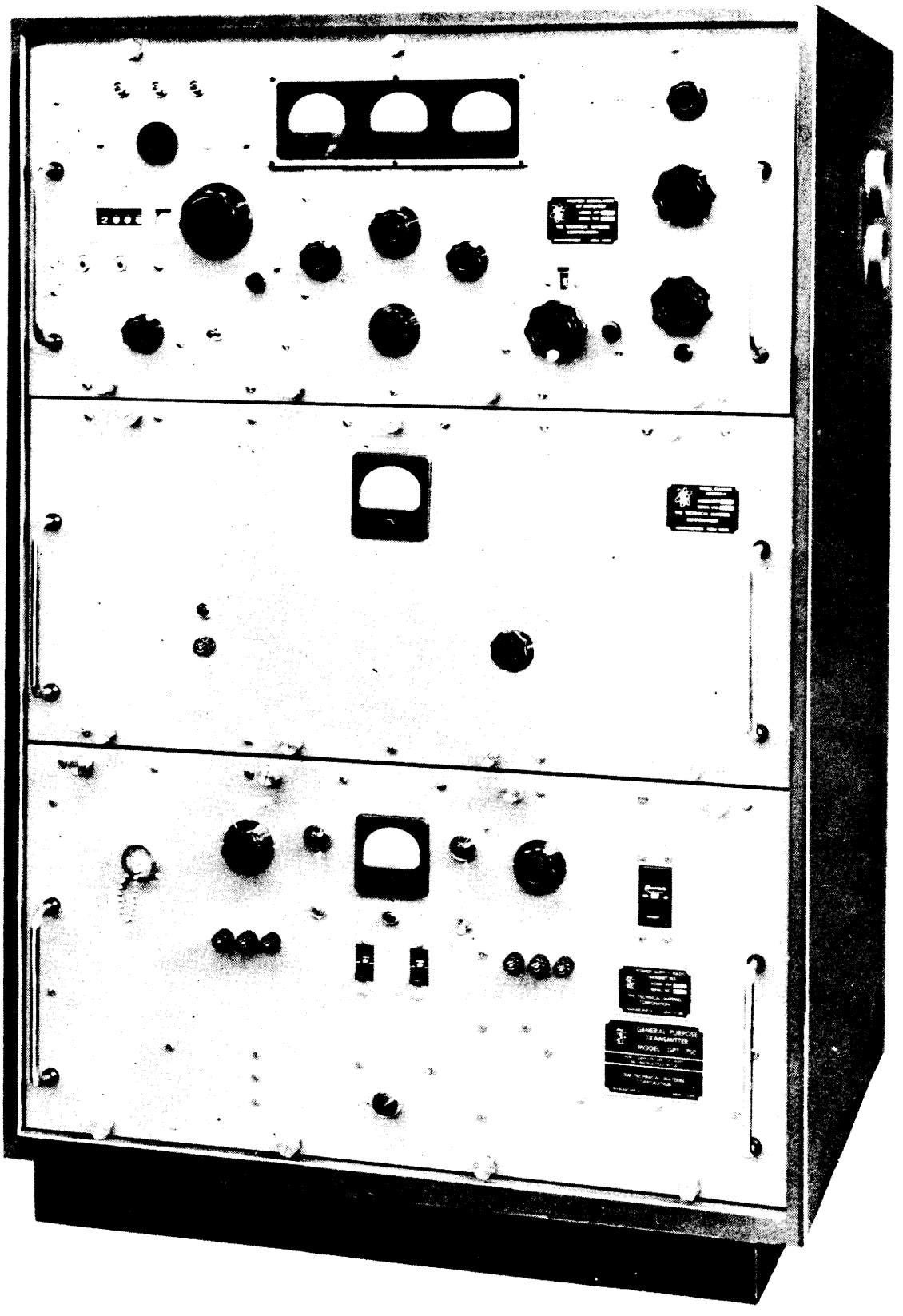
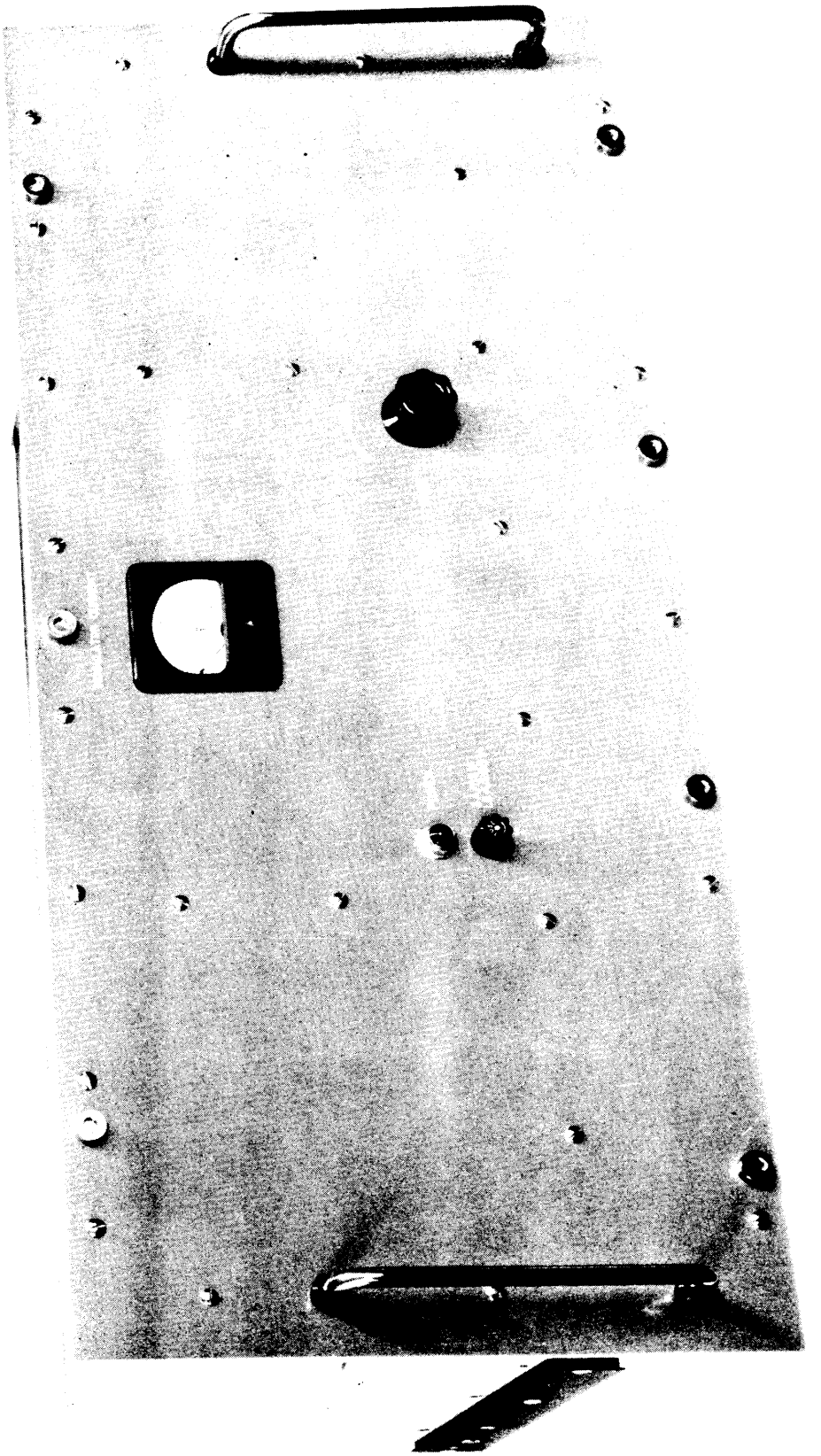


Figure B-1-1 Front View Model GPT-750B2



PH-725

Figure B-1-2 Front View Model RTM-2

SECTION I
GENERAL

B-1-1 DESCRIPTION

B-1-1-1 The "B" combination of the transmitter consists of the RF Deck (RTF-2), Modulator (RTM-2), and Power Supply (RTP-2). Several modes of operation are possible with this unit. These modes and modes using accessory exciters are outlined in Part "GENERAL".

B-1-2 TECHNICAL SPECIFICATIONS

(See Part "GENERAL" for General Specifications)

CRYSTAL OSCILLATOR CHARACTERISTICS:
Frequency Range: 2 to 4 Mc.
Crystal Used: CR-18/U in HC-6/U Holder
Number of Positions: 3, selectable from front panel.

MODULATION CHARACTERISTICS:
Capable of 100% sine-wave plate modulation with less than 10% distortion.
Noise Level: Better than 40 db down.
Frequency Response: Uniform within ±1.5 db from 100 to 5000 cps.
Audio Input: 1. 600 ohm balanced or carbon microphone.
2. Low level microphone when used with the RTC amplifier.

OUTPUT POWER:
1000 watts A1
750 watts A2 and A3

AVERAGE PLATE EFFICIENCY:
Better than 70%.

WEIGHT:
895 pounds.

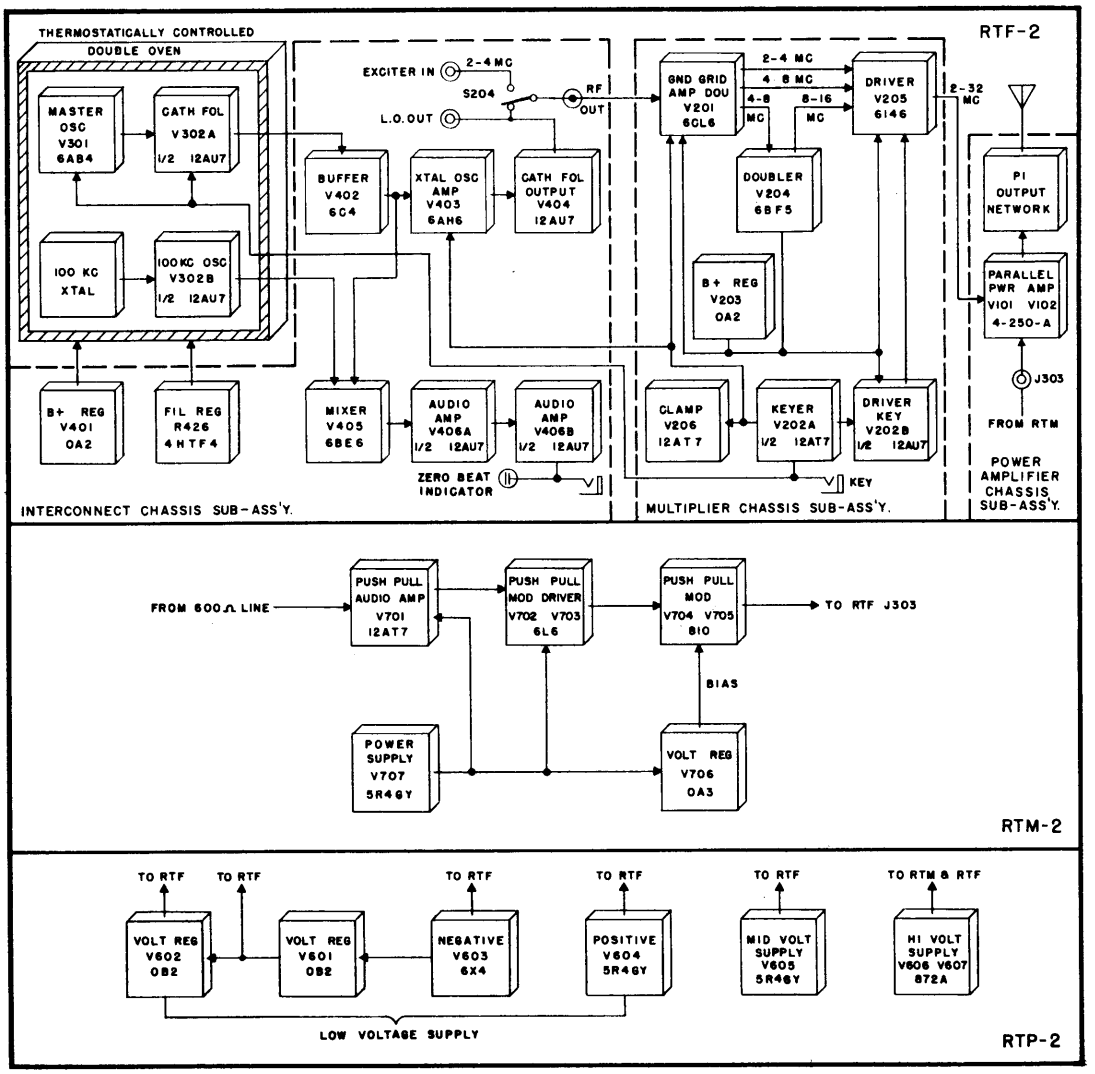


Figure B-1-3 Block Diagram Model GPT-750B2

SECTION II
THEORY OF OPERATION

B-2-1 MODULATOR (RTM-2)

B-2-1-1 AUDIO AMPLIFIER (V701) - A dual triode is employed in this stage as a Class A push-pull amplifier. The output of V701 is transformer coupled to the modulator drivers V702 and V703. Almost all of the voltage gain in the modulator is obtained in this stage.

B-2-1-2 MODULATOR DRIVER (V702, V703) - The drivers are operated in a conventional Class A push-pull amplifier circuit. Their output is transformer coupled to the grids of V704 and V705.

B-2-1-3 MODULATORS (V704, V704) - This stage employs a pair of triods in a push-pull Class AB circuit and develops sufficient power to plate modulate the final RF amplifiers. The application of voltage to the modulator plates is controlled by the relay K701, which in turn is controlled from the RTP-2 Power Supply. To

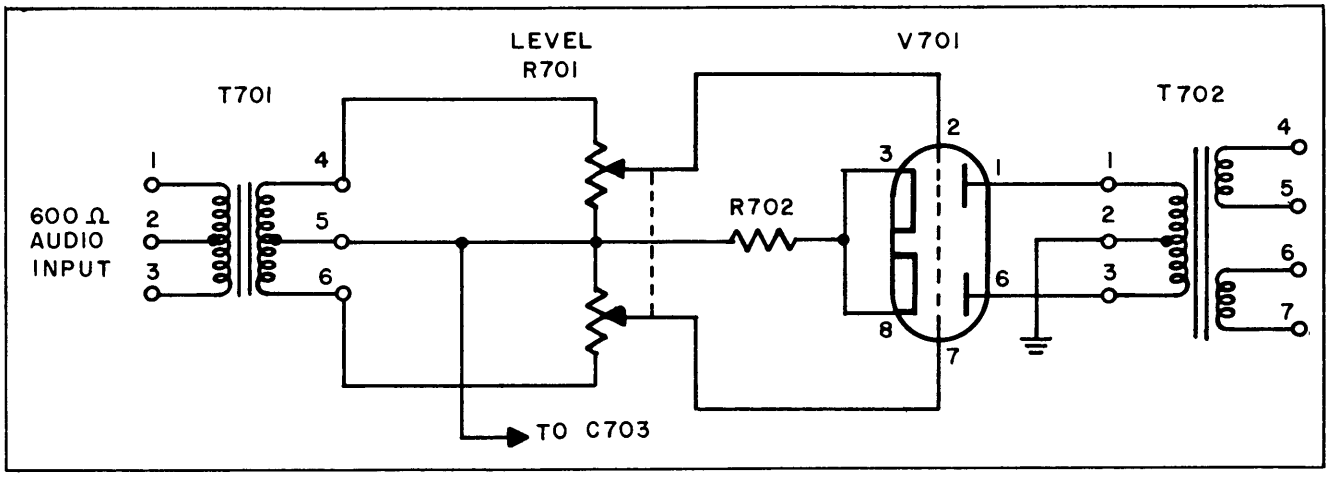


Figure B-2-1 Simplified Schematic Diagram Audio Amplifier

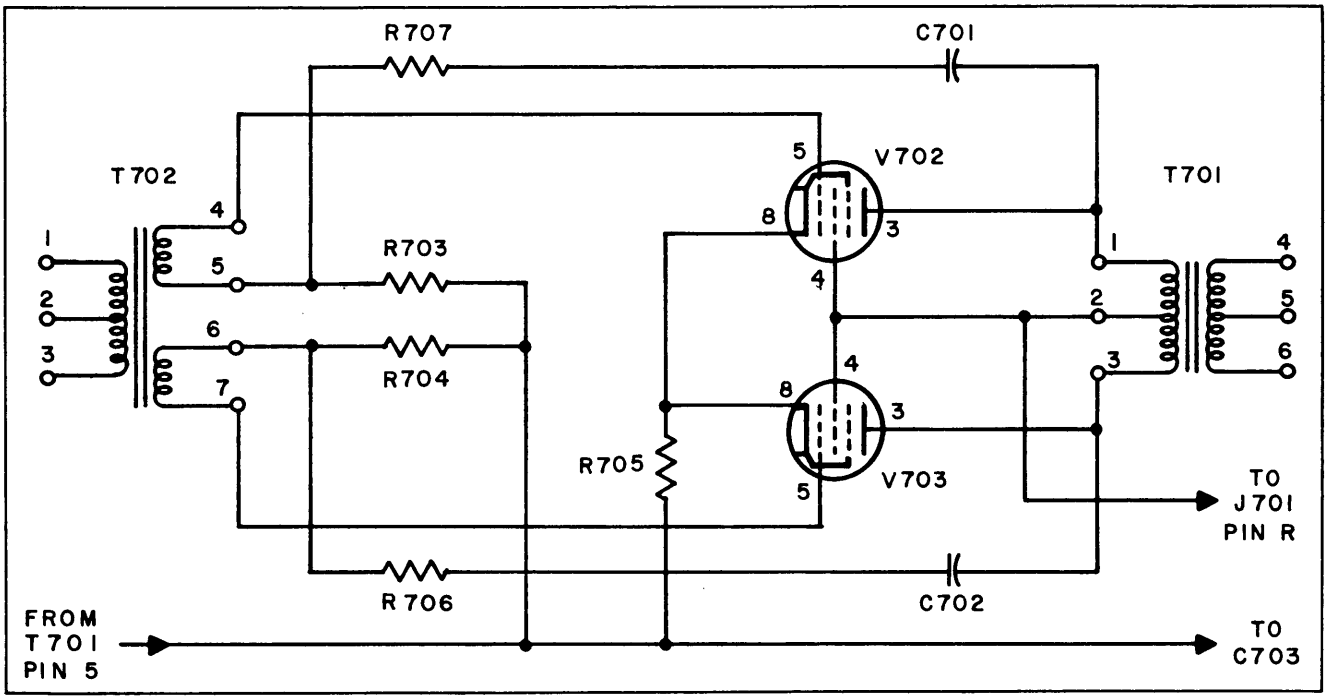
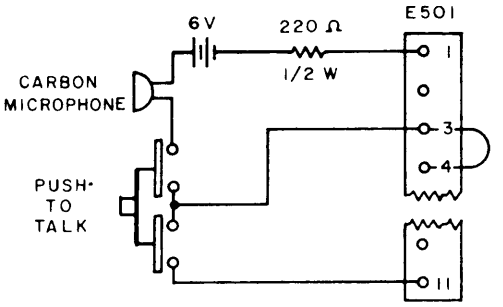


Figure B-2-2 Simplified Schematic Diagram Modulator Driver

protect the modulator transformer in the absence of load, a spark gap (0.203 in.) is installed across the secondary winding.

B-2-1-4 MODULATOR POWER SUPPLY (V706, V707) - Rectifier V707 supplies bias to the modulators. Voltage regulator V706 maintains the bias at a fixed value. If, for any reason, the modulator power supply should fail, and bias be removed from the modulators, the plate voltage will also be automatically cut off by relay K701, which is energized by the bias supply.

Carbon Microphone Connections



This circuit shows the use of 6 volts D.C. in conjunction with a 220 ohm resistor to maintain a D.C. microphone current of 20-30 ma. If a lower D.C. voltage is used, the resistance value must be lowered to maintain the 20-30 ma D.C. current rating which energizes the microphone. Since most carbon microphones have a built-in "push-to-talk switch, this switch is also shown in the circuit. The transmitter may now be operated on a push-to-talk basis from the microphone.

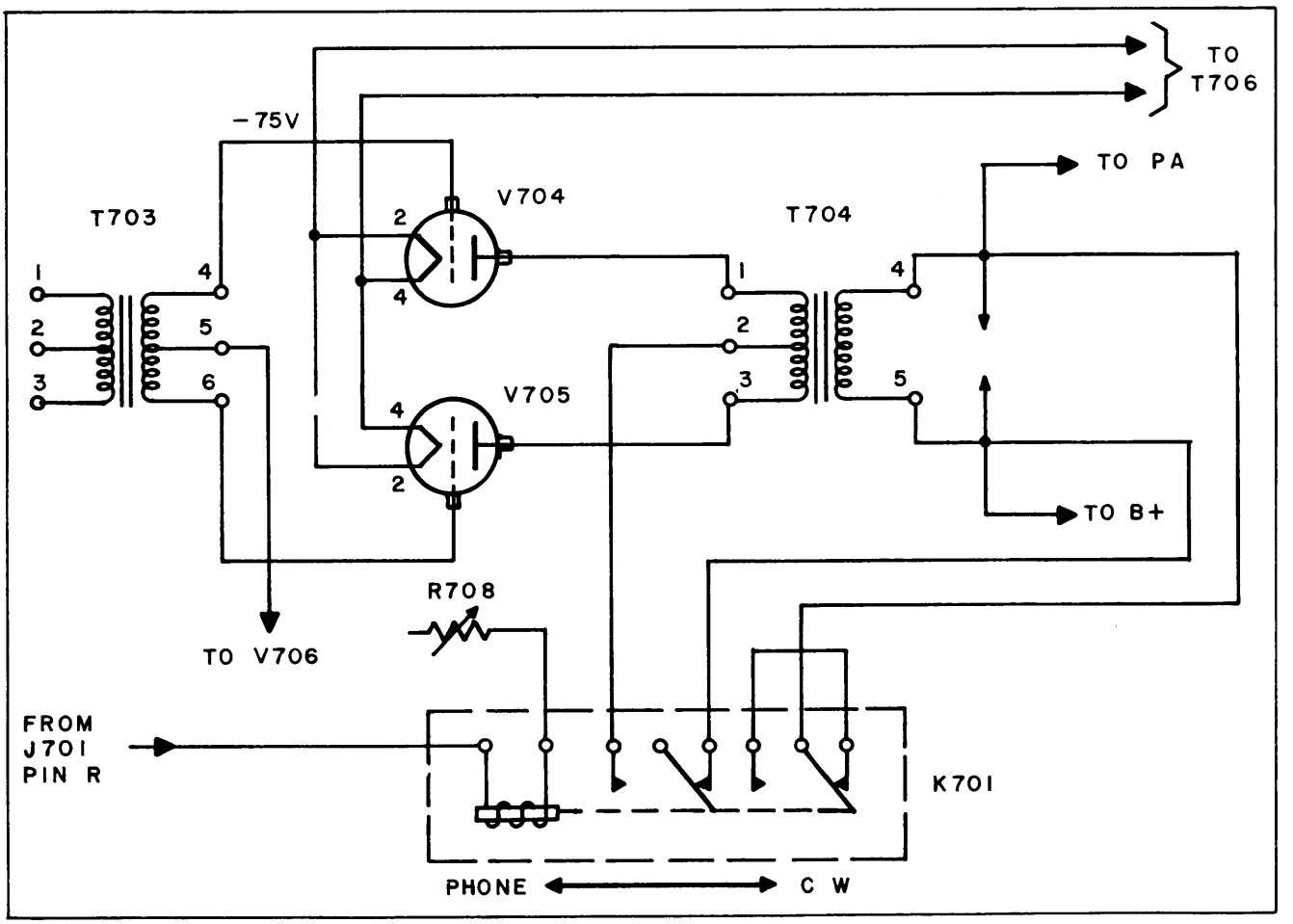


Figure B-2-3 Simplified Schematic Diagram Modulators

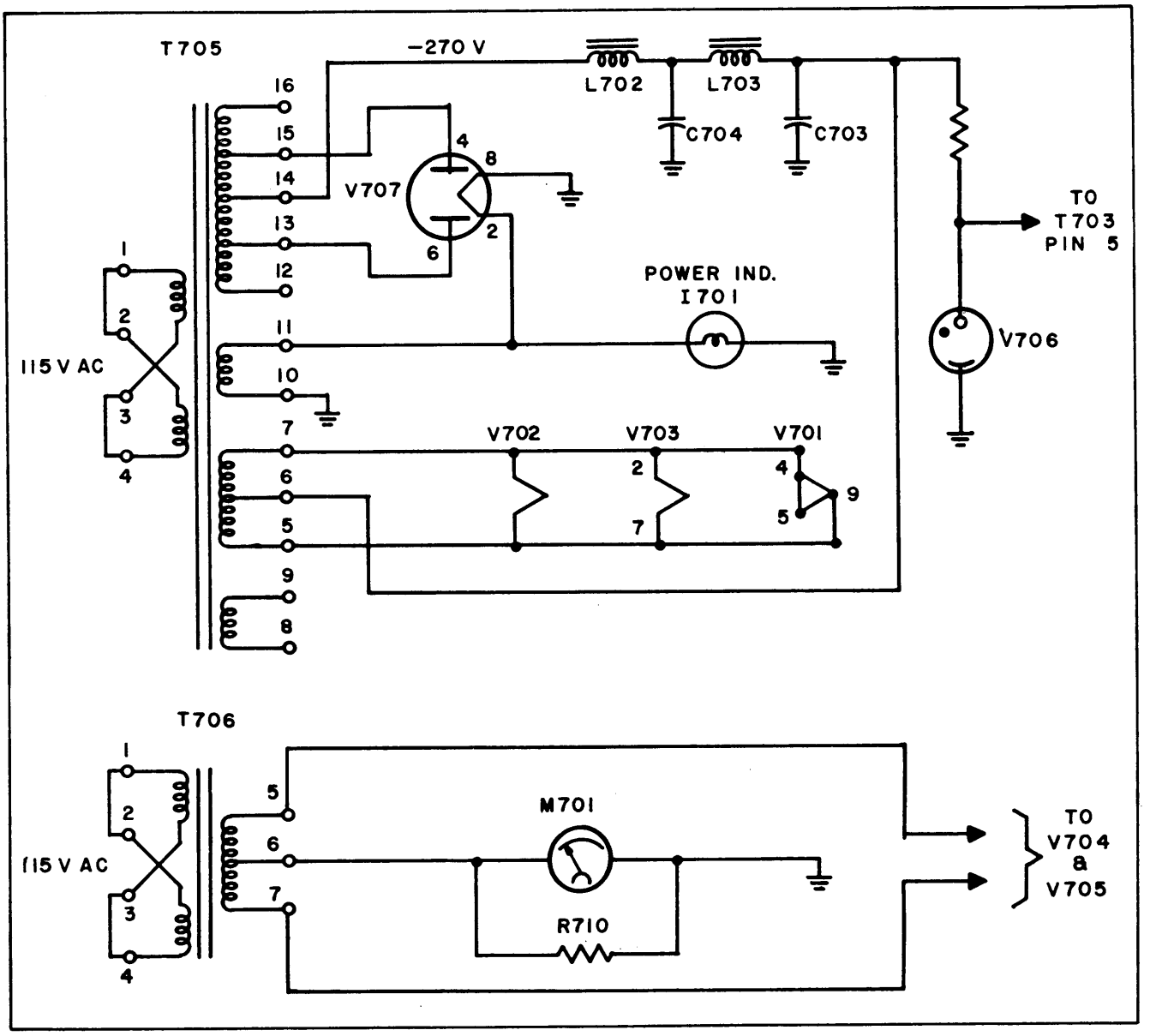


Figure B-2-4 Simplified Schematic Diagram Modulator Power Supply

SECTION III
INSTALLATION AND OPERATION

B-3-1 ELECTRICAL CONNECTIONS, INTERNAL

A. Pull out the RTP-2 (Transmitter Power Supply) drawer for access to connectors at rear. (See Figure B-3-1)

B. Connect P502 of CA-402 to J601 of the RTP-2.

C. Connect P503 of CA-408 to J602 of the RTP-2.

D. Insert both Rectifier tubes into their respective sockets in the RTP-2 deck and connect one high voltage lead to each plate cap.

E. Connect P512 of CA-417-2 to J603 of the RTP-2.

F. Connect P511 of CA-417-2 to J703 of the RTM-2.

G. Remove the long cover from the regulator deck of the RTP-2 by loosening the twist-lock fasteners and insert the time delay relay, K603, and its shield. Install V608, V609, V610 and V611. Replace cover.

H. Install the remainder of the tubes in the RTP-2 deck.

J. Connect P506 of CA-417-1 to J303 of the RTF-2.

K. Connect P504 of CA-408 to J405 of the RTF-2.

L. Make the following intra-chassis connections on the RTF-2.

(1) J402 to P301
(2) J401 to P302
(3) J201 to P401

M. Connect P508 (red) of CA-288-1 to J404 (red) of the RTP-2.

N. Connect P509 (blue) of CA-288-2 to J403 (blue) of the RTF-2.

P. Install all tubes in the RTF-2 deck.

Q. Connect P505 of CA-417-1 to J702 of the RTM-2.

R. Connect P501 of CA-402 to J701 of the RTM-2.

S. Check all cable connections for secure attachment.

T. See that all tubes have been installed.

U. Replace all covers.

V. Install all fuses. Proper values are engraved on the respective panels near the fuses.

B-3-2 OPERATION

B-3-2-1 Description of Controls and Indicators

RTP-2

CONTROL	FUNCTION
MAIN POWER ON/OFF	Applies AC voltage to the transmitter and provides automatic overload protection.
FILAMENT LINE (meter)	Indicates voltage at primary of filament transformer, T603.
FILAMENT LINE ADJUST	Selects taps on the filament transformer to maintain the desired 115 VAC.
UTILITY OUTLET	Convenience power outlet.
TRANSMITTER PLATES	Applies plate voltage to the low level stages and high voltage to the PA stage when the FINAL PLATE switch is ON.
FINAL OVERLOAD (SG/PLATE)	Resets overload relay system when tripped by excessive PA plate or screen grid currents.
MODE	Selects PHONE, TUNE, CW-FS or SSB operation.
FINAL PLATES	Applies high voltage to the PA stage when transmitter PLATES switch is ON.
MO BYPASS NORM/BYPASS	Allows Master Oscillator oven to continue operation when transmitter main breaker is off.

RTM-2

POWER (Lamp)	Lights when modulator power supply is ON.
MODULATOR CURRENT (meter)	Indicates cathode current.
GAIN	Varies voltage input to grids of modulator drivers.

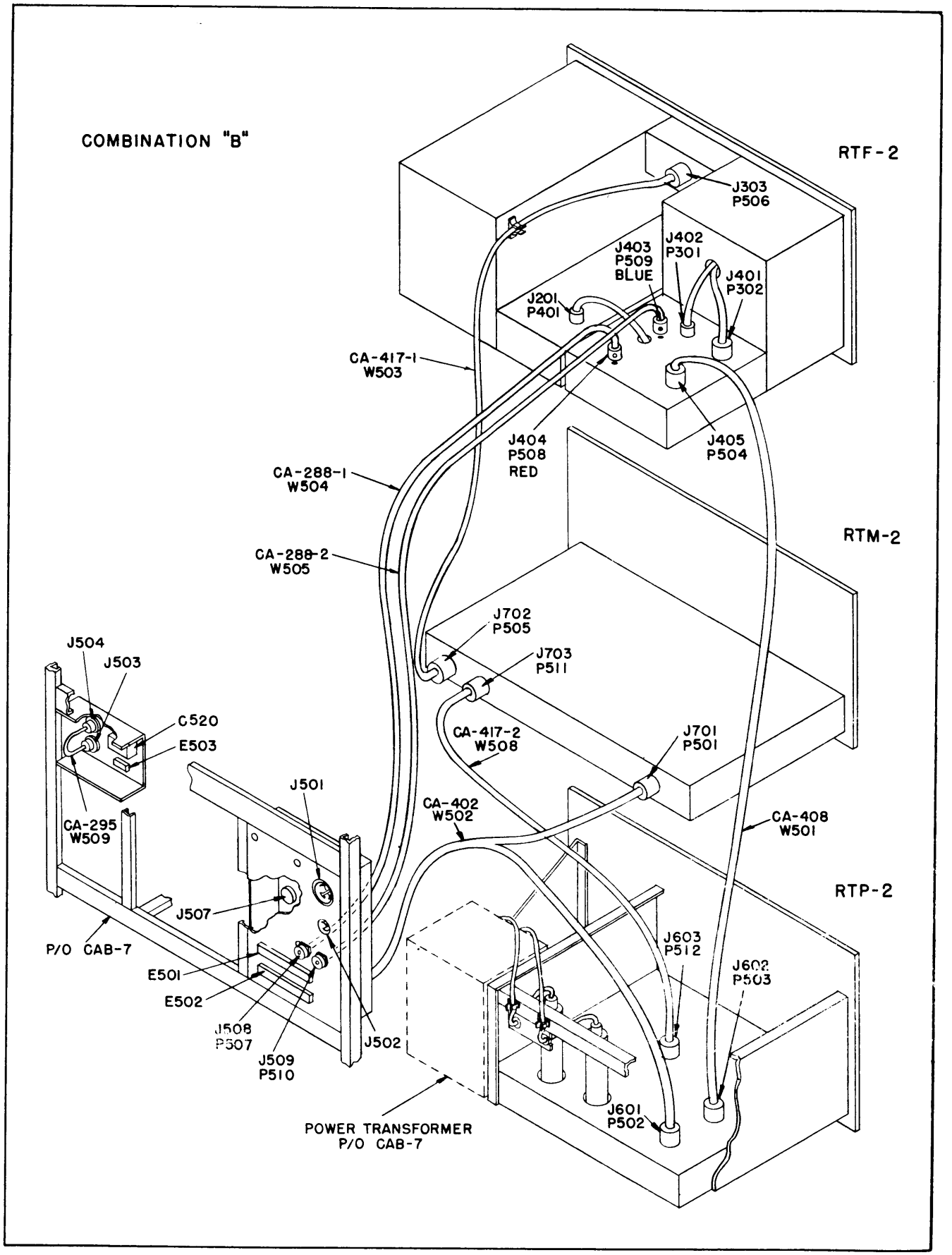


Figure B-3-1 Cabling Diagram Model GPT-750B2

RTF-2

EXCITATION SW. (On top of Interconnect)	Selects and routes oscillator for SSB, FS and CW/PHONE.
SSB/NORMAL (On top of Multiplier)	Changes multiplier to straight-through frequency for SSB operation.
INNER OVEN (Lamp)	Lights when inner oven is warming.
OUTER OVEN (Lamp)	Lights when outer oven is warming.
ZERO BEAT (Lamp)	Indicates ZERO BEAT in calibration of Master Oscillator during calibration proceedure.
CALIBRATE	Used to bring the Master Oscillator to calibration during the calibration procedure.
MASTER OSCILLATOR FREQUENCY	Tunes Master Oscillator to frequency indicated on the dial.
KEY	Can be used for ON/OFF keying of transmitter during CW operation.
PHONES	Audible monitoring of ZERO BEAT during MO calibration.
OSCILLATOR	Selects source of frequency control for transmitter or calibration of MO.
MULTIMETER	Measures points selected by associated switch.
MULTI-METER (switch)	Selects measurement of: PA ebb DRIVER Ip PA Isg PA Ig PA Eg RF
PA PLATE (meter)	Indicates PA plate current.
RF OUTPUT	Indicates RF output current.
DRIVER TUNING	Varies the multiplier and PA driver tuning capacitor.
DRIVE	Varies the amount of drive to the PA grids.
DRIVER BAND	Changes tuned frequency range of the driver and multiplier.
PA TUNING	Varies the main tuning vacuum capacitor which is an integral part of the PA Pi tank.
PA BAND	Set the PA tank to the proper output frequency band by tapping of the output coil.
ANTENNA LOADING	Adjusts the amount of coupling to the load.
AUX. LOADING	Switches in an additional loading capacitor for loads of lower impedance.
TEST KEY	Provides emergency and test keying.

B-3-3 PRELIMINARY POWER - OFF ADJUSTMENTS

B-3-3-1 Place the following controls in the positions indicated before applying power to the transmitter:

RTF-2

DRIVE	Fully counter-clockwise
EXCITATION (S402)	CW - PHONE
SSB/NORMAL	NORMAL

RTM-2

GAIN	Fully counter-clockwise

FILAMENT LINE ADJUST	Position 2 from full counter-clockwise
TRANSMITTER PLATES	Standby Remote
FINAL PLATE	OFF
MODE	TUNE
MAIN POWER	OFF
MO BYPASS	Normal

B-3-4 PRELIMINARY POWER - ON ADJUSTMENTS

A. See that all previous steps have been accomplished.

B. Connect a 1000 watt resistive 70 or 50 ohm load or antenna to J505, the RF output jack.

C. Connect power line from appropriate source to J501.

D. Turn MAIN POWER switch ON.

E. The MAIN POWER indicator lamp should light.

F. Check the FILAMENT LINE meter for a reading of 115 volts.

G. Use FILAMENT LINE ADJUST control for correction if necessary.

B-3-5 TUNING THE GPT-750(B)-2 FOR CW OPERATION

A. Do not alter control setting made in previous steps unless instructed to do so.

B. Rotate the DRIVE control fully clockwise.

C. Turn the DRIVER BAND switch to the range which includes the final carrier frequency.

D. Set the MULTIMETER switch to the PA Ig position.

E. Turn the DRIVER TUNING control to the frequency of the oscillator. A peak in PA grid current will indicate the correct point.

F. Turn the DRIVE control fully counter-clockwise.

CAUTION

BE SURE AN ANTENNA OR 1000 WATT 50 OR 70 OHM DUMMY LOAD IS CONNECTED TO J505.

G. Turn the PA BAND switch to the range which includes the final frequency.

H. Set the ANTENNA LOADING control to its fully counter-clockwise position or roughly pre-set it according to Figure B-3-2.

J. Set the AUX. LOADING control to the + (plus) position or as indicated in Figure B-3-2.

K. Turn the FINAL PLATE switch ON.

L. Advance the DRIVE control until the PA PLATE current meter indicates 120 Ma.

M. Turn the PA TUNING control until a definite plate current dip is obtained.

N. The RF OUTPUT meter may be used as an aid in tuning but it must be understood that it is an output indicator and does not necessarily give absolute values of RF current.

CAUTION

A SHUNTING BAR HAS BEEN PROVIDED WITHIN THE PA COMPARTMENT FOR SHUNTING THE RF AMMETER THERMOCOUPLE. THIS WILL BE USEFUL WHEN A LOAD WITH LOW IMPEDANCE AND HIGH REACTANCE (HIGH STANDING WAVE RATIO) IS TO BE MATCHED. UNDER THESE CONDITIONS THE UNSHUNTED CIRCUIT WOULD CAUSE THE METER TO "PIN" DUE TO THE HIGH REACTIVE CURRENT IN THE LOAD.

P. Turn the MULTIMETER switch to the PA Isg position.

Q. Advance the DRIVE control until the screen current is about 10 Ma.

R. Turn the ANTENNA LOADING control clockwise until the screen current drops to almost zero and the plate current begins to rise.

S. Adjust the PA TUNING control until the plate dips again and the screen current rises. Continue to advance the ANTENNA LOADING and DRIVE controls (each time redipping the plate current with the PA TUNING as before) until the screen current is 10 Ma while the plate current is 250 Ma.

CAUTION

THE PLATE CURRENT DIPS MUST BE OBTAINED AT THE LOWEST PA TUNING READING TO AVOID DOUBLING IN THE FINAL. IF FIGURE B-3-2 IS FOLLOWED, NO SUCH TROUBLE WILL OCCUR.

T. Turn the MODE switch to the CW-FS position.

U. Key the transmitter by either pressing the TEST KEY or by using an external key connected to the KEY jack. The plate current should rise to about 500 Ma while the PA Isg current becomes 90 Ma. The PA Ig will be between 15 and 30 Ma depending upon the operating frequency.

V. If the above results are not obtained the PA Isg can be increased by advancing the DRIVE control while the PA plate current can be increased by slight advancement of the ANTENNA LOADING control.

W. Make a final adjustment of the PA TUNING control for a peak in the PA Isg and a corresponding peak in RF OUTPUT. If the transmitter is fully loaded in this manner, it is much easier to adjust the PA TUNING for a screen current peak. The transmitter is now fully prepared to be placed in operation.

X. For simple ON/OFF control of the tuned transmitter leave the FINAL PLATE switch in the ON position and the TRANSMITTER PLATES switch in the STANDBY/REMOTE position. To operate under these conditions one need only throw the TRANSMITTER PLATES switch to the ON position and key the transmitter.

Y. If the overload protective system throws the transmitter OFF at any time it will probably be because excessive screen or plate currents have been drawn. The OVERLOAD RESET controls should then be used to restore operation so correction can be made.

B-3-6 ADDITIONAL INFORMATION

A. The absolute settings of the ANTENNA LOADING and AUX. LOADING controls is shown in Figure B-3-2 are approximate because these controls serve to balance out reactance in the antenna system. For this reason the antenna and frequency used will influence the final settings of these controls. The AUX. LOADING switch will seldom be used in the zero (0) position at frequencies above the 2 to 4 megacycle band.

B. When tuning the upper end of the two highest bands (24 to 32 Mc), it will be necessary to advance the ANTENNA LOADING control to almost its fully clockwise position in order to obtain a plate current dip with the PA TUNING control.

B-3-6-1 Setting the Transmitter to the Frequency of a Received Signal

B-3-6-1-1 In some cases the operator may want to set the transmitter exactly on the same frequency as a signal being received. This is particularly used in amateur communication. To set the Transmitter to the frequency of a received signal, proceed as follows:

A. Tune up the transmitter with the exception of the final amplifier (leave the FINAL PLATE switch OFF). The master oscillator should be set so that the multiplier output frequency is close to frequency of the desired signal.

B. Tune the receiver to the desired signal.

C. Turn on the receiver BFO and vary the BFO frequency until a zero beat is obtained with the received signal carrier.

D. Pick up the transmitter on the receiver and readjust the master oscillator until a zero beat is heard. The master oscillator is now aligned with the received signal, and the remainder of the transmitter may now be properly tuned. If the master oscillator signal cannot be picked up on the receiver, insert about one foot of a four-foot length of insulated wire inside the top drawer and close the drawer. This will serve to radiate some of the master oscillator signal into the receiver. It will be possible in some cases, depending upon the strength of the received signal, to directly beat the transmitter with the received signal and leave the receiver BFO off.

B-3-7 TUNING THE TRANSMITTER FOR PHONE AND MCW OPERATION

B-3-7-1 Tuning procedures for phone operation of the transmitter are identical to those set forth for CW operation, except: With the MODE switch in the TUNE position, the final amplifier screen current should be 5 Ma and plate current should be 200 Ma. This will result in a final amplifier screen current of 90 Ma and a plate current of 300 Ma, when the MODE switch is returned to the PHONE position. If these values are not quite obtained, the DRIVE and PA TUNING controls should be retouched as described in the CW tuning procedure.

B-3-8 REDUCED POWER OPERATION

B-3-8-1 The power output of the transmitter is readily adjustable from a minimum of a few watts to its maximum output of 1000 watts CW. To operate at reduced power, proceed as follows:

A. Tune the transmitter as prescribed for CW or phone operation. Output power is now approximately 1000 watts CW or 750 watts phone.

B. Adjust the DRIVE control so that screen current drops to approximately 45 Ma.

C. Decrease the antenna loading until the screen current rises again to 90 Ma after the final amplifier has been reset for resonance. The power output is now approximately 500 watts. For an output power of less than 500 watts, screen current should be proportionately reduced.

SCREEN CURRENT VALUES FOR REDUCED POWER OPERATION

OUTPUT POWER (W)	SCREEN CURRENT (MA)
500 (and above)	90
400	70
300	55
200	35

D. Repeat step C until the desired power output is obtained.

E. For phone operation, the modulator current should be adjusted so that on voice peaks or with steady tone input it is approximately equal to the final amplifier plate current.

SECTION IV
MAINTENANCE

(See Part "GENERAL")

FREQ MC	VMO FREQ	DRIVER		POWER AMPLIFIER							
		BAND	TUNING	PA BAND	PA TUNING	PA LOADING	PA I G	PA I P	PA I SG	MODULATOR I P	ANTENNA CURRENT
2.0	2000	2-4	2.0	2-2.5	063	38	9	300	90	300	3.9
2.5	2500	2-4	2.5	2-2.5	123	100	6	"	"	"	"
2.5	2500	2-4	2.5	2.5-3	070	10	6	"	"	"	"
3.0	3000	2-4	3.0	2.5-3	114	50	4	"	"	"	"
3.0	3000	2-4	3.0	3.0-4	065	2	6	"	"	"	"
4.0	4000	2-4	4.1	3.0-4	131	51	5	"	"	"	"
4.0	2000	4-8	1.9	4-6	055	100	9	"	"	"	"
6.0	3000	4-8	3.0	4-6	141	52	4	"	"	"	"
6.0	3000	4-8	3.0	6-8	110	35	4	"	"	"	"
8.0	2000	4-8	4.1	6-8	134	50	6	"	"	"	"
8.0	4000	8-16	2.0	6-8	153	68	4	"	"	"	"
8.0	4000	8-16	2.0	8-12	134	50	4	"	"	"	"
10.0	2500	8-16	2.5	8-12	159	71	4	"	"	"	"
12.0	3000	8-16	3.0	8-12	174	83	4	"	"	"	"
12.0	3000	8-16	3.0	12-16	166	50	4	"	"	"	"
14.0	3500	8-16	3.5	12-16	179	70	4	"	"	"	"
16.0	4000	8-16	4.0	12-16	196	80	4	"	"	"	"
16.0	2000	16-32	2.0	16-24	160	40	4	"	"	"	"
18.0	2250	16-32	2.25	16-24	169	53	4	"	"	"	"
20.0	2500	16-32	2.5	16-24	176	66	4	"	"	"	"
22.0	2750	16-32	2.7	16-24	184	72	3	"	"	"	"
24.0	3000	16-32	2.9	16-24	197	78	4	"	"	"	"
24.0	3000	16-32	2.9	24-32	173	57	4	"	"	"	"
26.0	3250	16-32	3.2	24-32	178	67	3	"	"	"	"
28.0	3500	16-32	3.4	24-32	184	70	2	"	"	"	"
30.0	3750	16-32	3.65	24-32	192	72	3	"	"	"	"
32.0	4000	16-32	3.9	24-32	206	77	2	300	90	300	3.9

TEST CONDITIONS:

a. 50 OHM NON REACTIVE DUMMY LOAD.

b. POWER OUTPUT 750 WATTS (3.9 AMPS AT 50 OHMS) MINIMUM.

c. AUDIO TONE OF 1000 CYCLES APPLIED TO AUDIO INPUT TERMINALS OF RTM.

Figure B-3-2 Tuning Chart Model GPT-750B2

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LIST OF TABLES

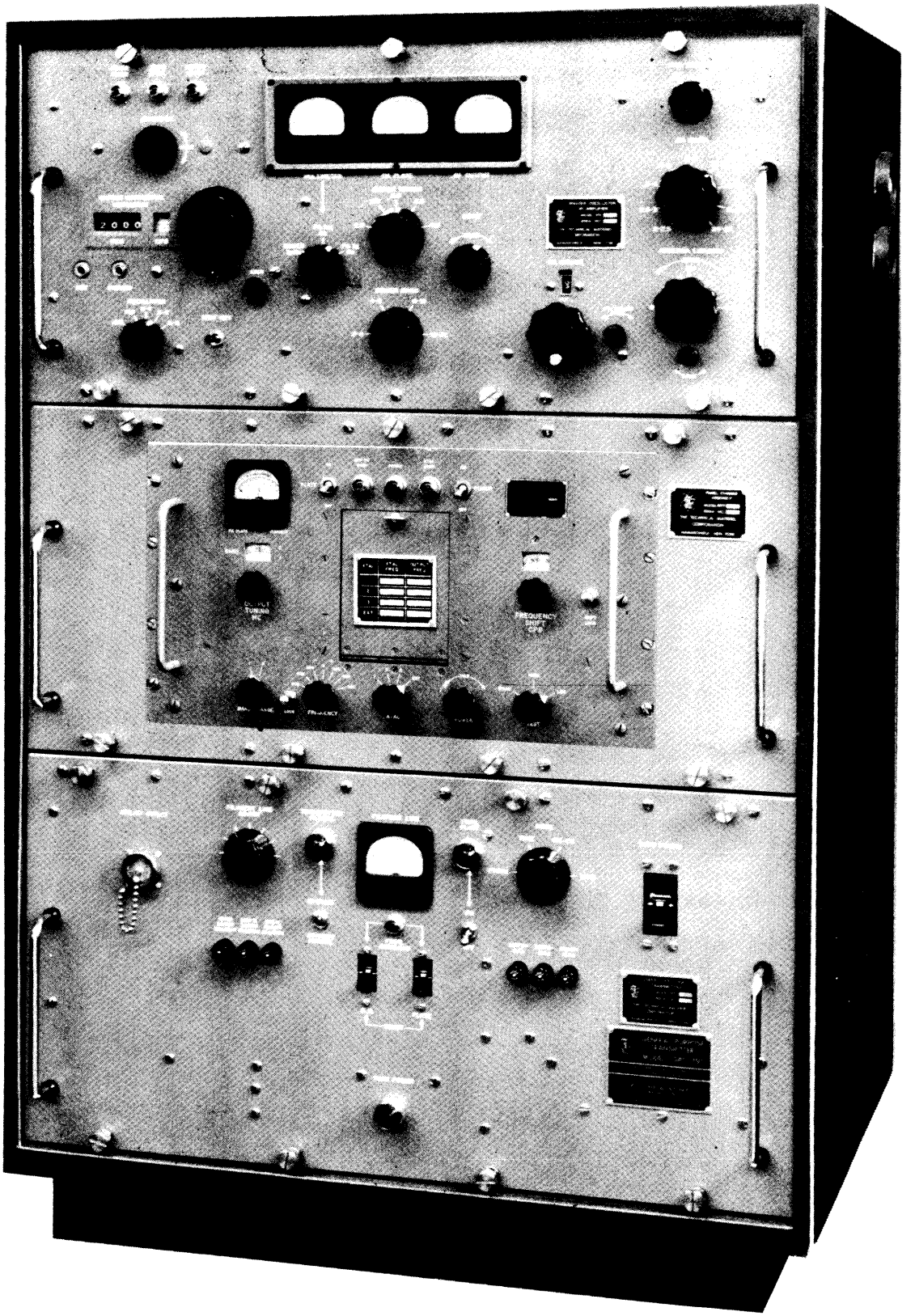
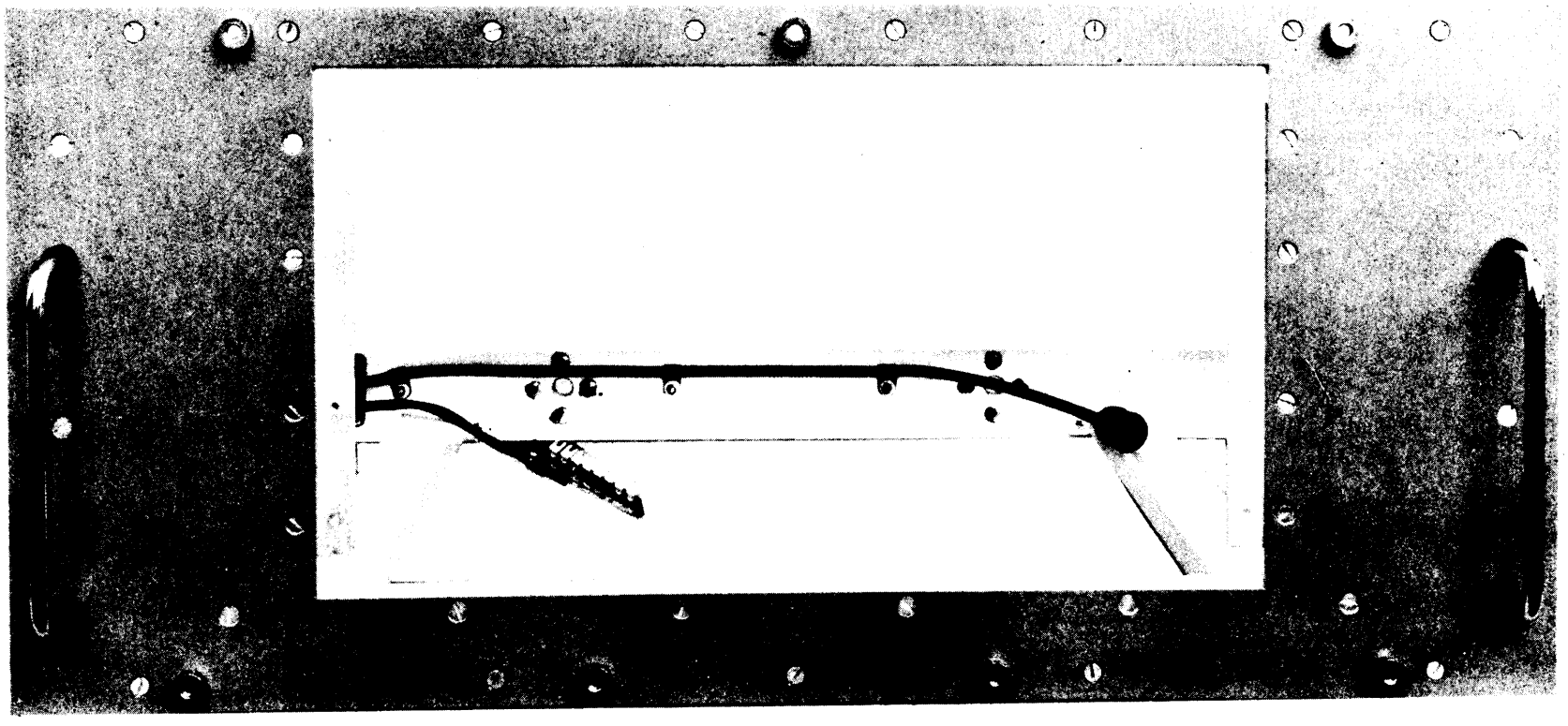


Figure C-1-1 Front View Model GPT-750C2



PH-729

Figure C-1-2 Front View Model RTX-2

PH-592

Figure C-1-3 Front View Model XFK

SECTION I
GENERAL

C-1-1 DESCRIPTION

C-1-1-1 The "C" combination of the transmitter consists of the RF Deck (RTF-2), Frequency Shift Drawer (RTX-2), with Frequency Shift Exciter Model XFK, and Power Supply (RTP-2). Several modes of operation are possible with this unit. These modes and modes using accessory exciters are outlined in Part "GENERAL".

C-1-2 TECHNICAL SPECIFICATIONS

(See Part "GENERAL" for General Specifications)

RTF-2

CRYSTAL OSCILLATOR CHARACTERISTICS:
Frequency Range: 2 to 4 Mc.
Crystal Used: CR-18/U in HC-6/U Holder.
Number of Positions: 3, selectable from front panel.

OUTPUT POWER:
1000 watts A1, F1 and F4.

AVERAGE PLATE EFFICIENCY:
Better than 70%.

WEIGHT:
895 pounds.

RTX-2 & XFK

OUTPUT FREQUENCY RANGE:
1-2.5 Mc on Band 1.
2.5-6.9 Mc on Band 2.

FREQUENCY SHIFT:
Linear to 1,000 cycles.

OUTPUT IMPEDANCE:
50 to 70 ohms.

KEYING SOURCES:
(1) Contact closing to ground.
(2) Polar or neutral positive.
(3) Linear input 30,000 ohms impedance.

KEYING SPEED:
1,000 w.p.m. maximum.

KEYING BIAS:
Not greater than 10% at 1,000 wpm.

KEYING INPUT IMPEDANCE:
Polar or neutral operation 100,000 ohms, may be bridged by external 1800 ohms loop resistance. Contact closing to ground must be open circuit.

RF SOURCE:
Internal crystal oscillator or
VMO in RTF.

INPUT IMPEDANCE FOR EXTERNAL RF SOURCE:
70 ohms, 6 to 8 volts RMS.

FREQUENCY:
High frequency crystal oscillator 0.8 to 6.7 Mc. High stability 200 Kc osc.

CRYSTAL HOLDERS:
FT-243 three positions and HC-6/U three positions.

OVEN TEMPERATURE:
70 degrees Centigrade held constant within plus or minus 0.1 degrees C.

OVERALL STABILITY:
(1) 10 cps for ambient temperature change of 0 to 50 degrees C.
(2) 10 cps for line voltage change of 10%.
(3) No drift for input signal variations of plus 25 volts to plus 150 volts (mark frequency).

CRYSTAL FREQUENCY:

ASSIGNED XMITTER FREQ. minus 200 Kc Xmitter Multiplication

METERING:
PA plate current (tuning).

MONITORING:
100 millivolts across 70 ohm coaxial connector.

SECTION II
THEORY OF OPERATION

MODEL XFK

C-2-1 GENERAL DESCRIPTION OF CIRCUITS

C-2-1-1 Figure C-2-2 illustrates a block diagram of the Exciter showing the routing of a signal from input to output. Constant reference will be made during the following discussion to tubes and points designated in Figure C-2-2. Readers' reference to this figure should be made when necessary without further direction.

C-2-1-2 The Exciter, Model XFK will generally be used for radio-teletype operation and for the purpose of this discussion it will be assumed that the Exciter is being used for the transmission of teleprinter signals and that a keyed d-c signal is being applied to the input circuit.

C-2-1-2-1 For radio-teletype operation, a sequence of two frequencies is transmitted corresponding to "mark" (closed key) and "space" (open key) conditions of the teletypewriter. The assigned frequency of the radio-transmitter is the mean of the mark and space frequencies. The mark frequency is higher than the assigned frequency, and the space frequency is lower. The difference between the mark and space frequencies is termed "shift". Usually the XFK Exciter will be used to produce a total shift of 850 cycles. The mark frequency will be 425 cycles higher than the assigned frequency and the space frequency will be 425 cycles lower than the assigned frequency.

C-2-1-3 Assuming teleprinter operation and a d-c input signal, the keying input signal will cause the keyer tube V-7, to key the reactance tube, V-2, on and off.

(1) 200 kc Oscillator - V1 is a push pull modified Colpitts oscillator operating at 200 kc. The major part (95%) of its tank circuit is located within a temperature stabilized oven with a fast heating characteristic. Even this portion of the tank circuit is temperature compensated and utilizes only components having very uniform retrace characteristics. In addition, the plate voltage is regulated and the oscillator is compensated external to the oven for changes in ambient temperature. External to the oven are two air spaced, ceramic supported, trimmers C7 and C8 used respectively as fine and coarse frequency adjustments.

(2) Reactance Tube - The reactance tube V2 receives the modulating intelligence (audio or pulse signal) at the grid of section 1 (pins 1, 2, 3) and changes the reactance across the 200 kc oscillator tank, and therefor the frequency of the 200 kc oscillator in accordance with this intelligence. The reactance tube is a push push balanced circuit and operates in the following manner. Normally, (i.e. -0 voltage at grid) a small capacitive current flows through section 1 of V2 because of the phase shift through R5 and C14, C2 and the inversion across the 200 kc tank. Conversely, a small inductive current flows through section 2 of V2 because of the phase shift through C12 and R4 and the inversion across the tank. When a positive voltage is applied to the grid of section 1, this causes an increase in the plate current of section 1 and therefore an increase in the capacitive current in this section thereby lowering the frequency of the 200 kc OSC. At the same time, the increase in plate current of section 1 causes a decrease in plate current of section 2 of V2 through the mutual cathode resistor R7, thus causing a decrease in the inductive current and therefore also lowering the frequency of the 200 kc OSC. Over a narrow frequency range (200 kc ±500 cps), this frequency change will be linear with respect to applied voltage (pos. or neg.). This system provides the advantage of having the reactance tube currents contribute a negligible amount to the center frequency of the 200 kc oscillator. C2 adjusts the phase shift of section 1 so that for a given positive or negative signal voltage the amount of shift will be equal.

(3) Xtal Osc. & Buffer - One section of V6 is used as a modified "Pierce" crystal controlled oscillator while the second section is used as a cathode follower buffer. Since the output frequency of the frequency shift exciter, Model XFK, is determined by the sum frequency of the 200 kc Osc. and the crystal oscillator, the crystals are temperature controlled in an oven and the plate voltage of the osc. section is stabilized. Crystals may be easily exchanged as the oven is easily accessible through a small door in the front panel. A crystal selector switch allows selection of any one of three crystals or an external signal. The crystals may be either type FT243 or the new CR27/U as sockets are provided for either type. The crystal selector switch also selects the multiplication ratio which is set at the rear of the unit as discussed in paragraph (7) of this section.

(4) Mixer - V3 and V4 together operate as a balanced mixer to add the crystal frequency and the 200 kilocycles from the reactance tube oscillator. Since the crystal frequency is fed in phase to both grids of V3 and V4, it is cancelled in the plates by transformers T2 and T1 on bands 1 and 2 respectively. To obtain exact cancellation in the plates, balancing adjustment R14, which varies

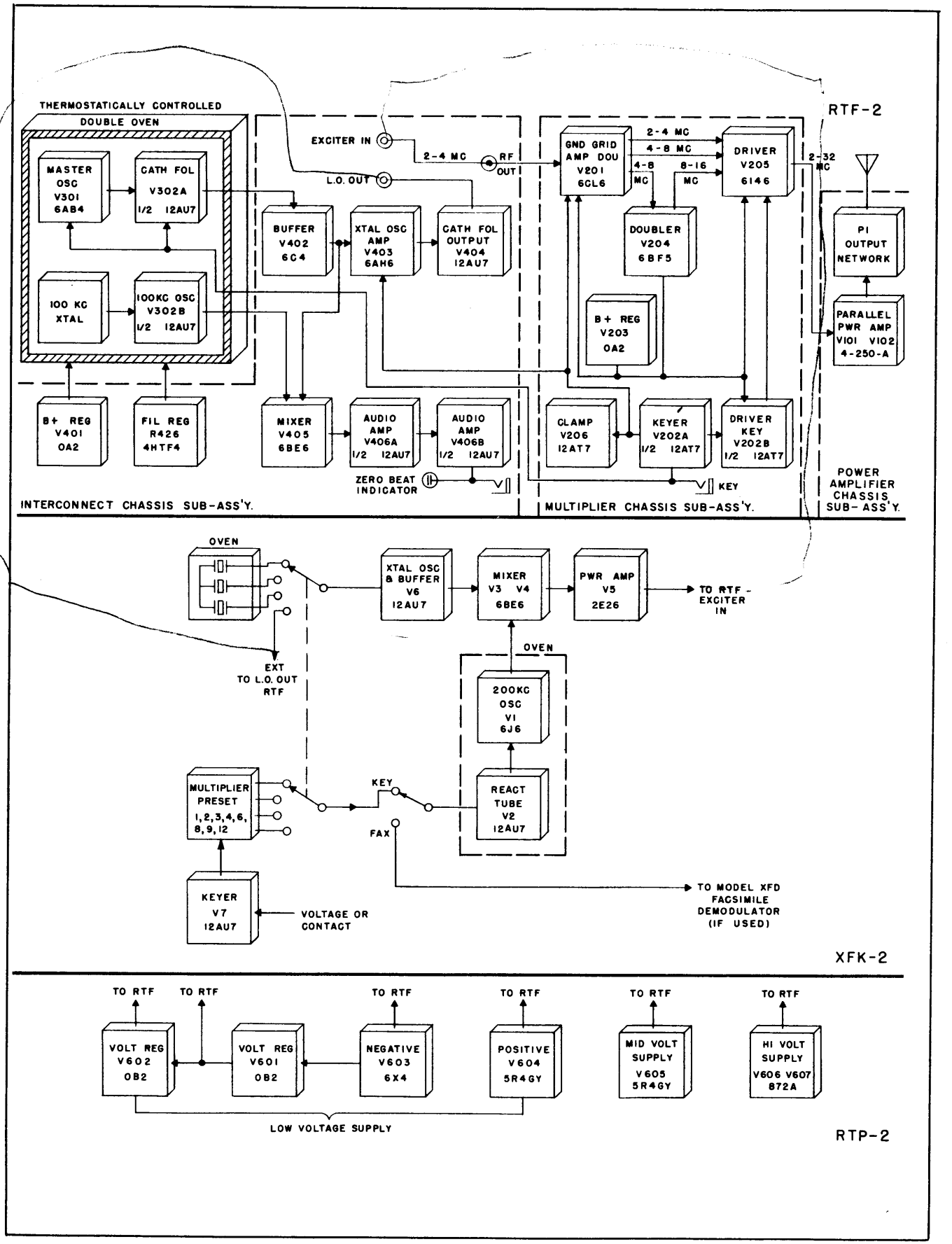


Figure C-2-1 Block Diagram Model GPT-750C2

the relative gains of V3 and V4, is provided. The input from the crystal oscillator is tuned by C18A and the output, or sum frequency, is tuned by C18B. Band switching is used to cover two frequency ranges, .8-2.3 mc and 2.3-6.7 mc for the crystal frequencies and 1-2.5 mc and 2.5-6.9 mc for the output frequencies. These are Bands 1 and 2 respectively. Condensers C59 and C40 track the output frequency with the input frequency on Bands 1 and 2 respectively.

(5) Power Amplifier - V5 is a 2E26 class B tuned radio frequency power amplifier fed from the output of Mixers V3 and V4. Fixed bias is used and power output is controlled by adjusting bias voltage by means of potentiometer R22. Plate current is metered and Tuning is indicated by a 50 milliampere meter M1. A small portion of the output voltage is fed back to the grid in proper phase and amplitude to neutralize the amplifier should the load be removed. Its amplitude is adjusted by means of C27. The output is tuned by C18C which is ganged along with C18B and C18A.

(6) Keyer Tube - The keying tube, V7, is used where a definite and fixed amount of frequency shift is desired in accordance with some nature of an on-off signal. The types of on-off signals which the keyer must accomodate are (a) positive voltage, either polar or neutral and (b) contact keying. For either type of keying it is necessary that the same voltage be consistently impressed upon the reactance tube for any given shift. Since this voltage must be polar and perfectly balanced, the keyer tube V7 generates the actual internal keying voltage for either type of external keying (a) or (b). This is accomplished in the following fashion:

When using voltage keying, space voltage (either O or neg. volt.) is applied to the grid of section 1 of V7 (pin 2). This section will then be cut off due to the cathode bias applied through voltage divider R33 and R34. This in turn impresses a high positive voltage to the grid of section 2 of V7 (pin 7) through R35. This causes the second section to draw current and to act as a low resistance across R36. V7 plate resistance, R37, R38 and R39 in series act as a voltage divider from ±105 volts to -105 volts. This will then apply a small positive voltage to R40 and R41. When Mark voltage (plus 25 to plus 150 volts) is applied to the grid of section 1, the tube will conduct and its plate voltage will drop. Since the grid of section 2 is tied directly to the plate, section 2 will cease to conduct. R36, R37, R38 and R39 in series then act as a voltage divider, this will then apply a small negative voltage to

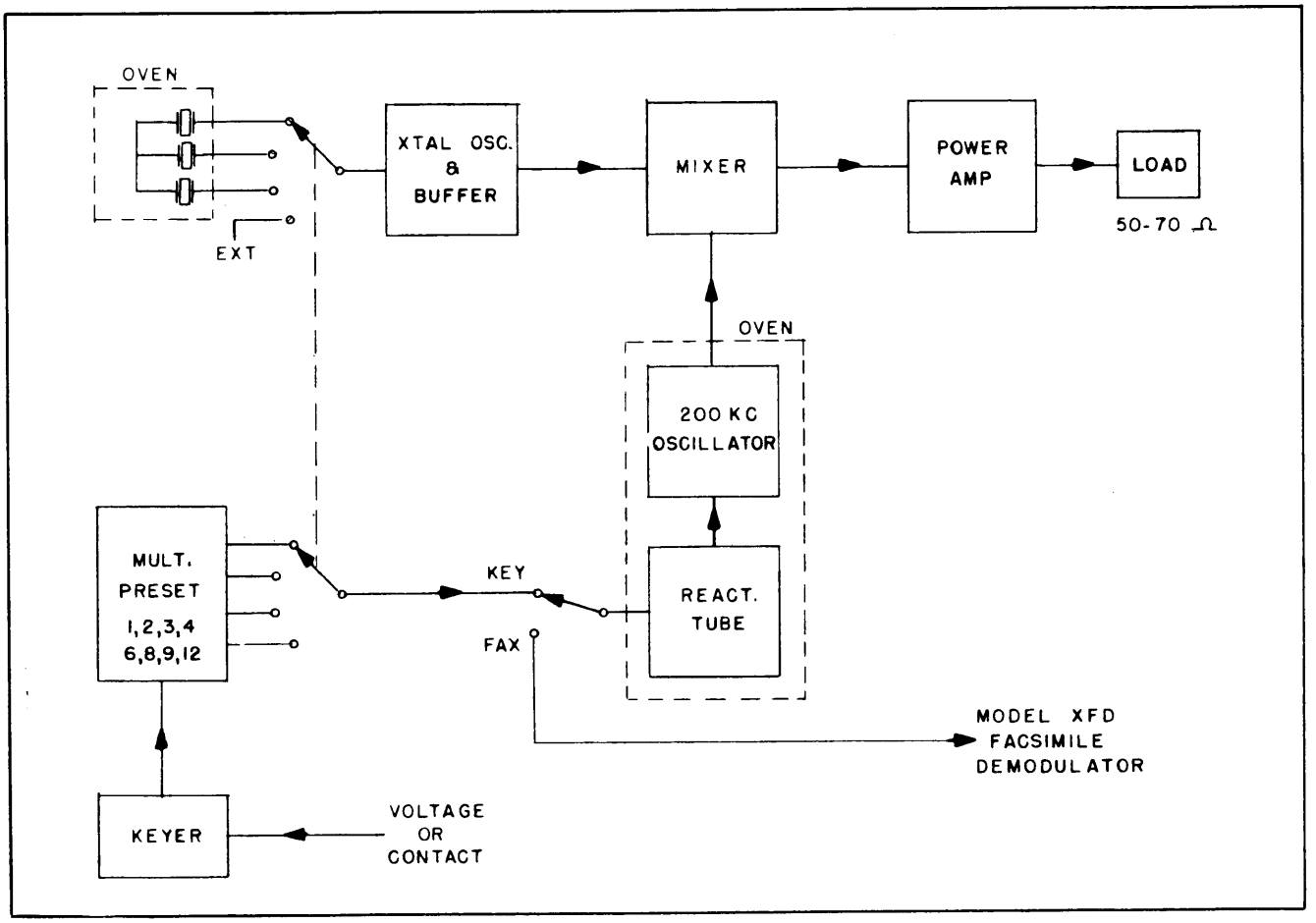


Figure C-2-2 Block Diagram

R40 and R41. R38 is an adjustment to balance the pos. and neg. voltage while R40 regulates the amplitude of pos. or neg. voltage fed to the reactance tube.

When using contact keying, the operation of the second section is identical but the grid is directly controlled by grounding for the "mark" condition.

Provision is made for test purposes to set "space" by grounding the grid of Section 1 or "mark" by putting B± on the same grid.

(7) Multiplier Preset Section - The multiplier preset plugs and jacks are a series of voltage dividers which may be inserted between the keyer and the reactance tube. There is a separate jack for each multiplication ratio commonly used between the output frequency of the exciter Model XFK and the output frequency of the associated transmitter, namely 1,2,3,4,6,8,9, and 12. Each divider consists of two resistors, one reducing the output from the keyer tube to the reactance tube by exactly the multiplication ratio, the other resistor shunting the original tap from R40 so as to maintain a constant input resistance of 10,000 ohms. For each position of the crystal selector switch, there is a small cable which may be plugged into any mult. ratio desired. Should it be required that two or more crystals require identical multiplication ratios, a jack is provided in parallel with each cable. If the desired shift at the output of the transmitter is now directly set on the dial, the proper shift of the Model XFK will be set automatically.

(8) Ovens - Two separate ovens are used in Model XFK. One is used for the 200 kc reactance osc. while the other is used for the crystals. They are both very similar in design with the main difference being that the cover of the crystal oscillator is hinged and may be opened from the front panel. The oven design is of a simple and rugged yet highly satisfactory design. Two cartridge type heaters are used in each oven, sunk into a well at the bottom of a thick aluminum casting. The thermostat is sunk in the same well as one of the heaters insuring close thermal coupling. The thermostat is a bimetallic strip with high sensitivity and extremely long life. Replacement of either heaters or thermostats is a very simple operation. The thermostat is set at 70°C to allow for a 15°C rise within the equipment above a 50°C ambient. Heater operation may be observed by means of neon lamps in parallel with either set of heaters.

(9) Power Supply - The power supply is a conventional full wave rectifier supply with condenser input. The unregulated output voltage is approximately 300 volts. R71 and V10, (OB2) supply 105 volts regulated to the 200 kc osc., react., tube, Xtal osc., keyer, and for external use with facsimile demodulator, Model XFD. A negative 105 volts regulated is obtained through a 6X4 half wave rectifier, and RC filter and an OB2 regulator tube. This voltage is used in the keying circuit and also to provide bias for the power amplifier.

SECTION III
INSTALLATION AND OPERATION

C-3-1 INSTALLATION

C-3-1-1 ELECTRICAL CONNECTIONS, INTERNAL

A. Connect P502 of CA-402 to J601 of RTP-2. (See Figure C-3-1)

B. Connect P503 of CA-408 to J602 of RTP-2.

C. Insert both 872A rectifier tubes into their sockets in the RTP-2 deck. Connect one high voltage lead to each plate cap.

D. Connect P512 of CA-417-2 to J603 of RTP-2.

E. Connect P511 of CA-417-2 to J503 of CAB-7.

F. Remove the long cover from the regulator section of the RTP-2 by loosening the twist lock fasteners. Insert the time delay relay K603 and its shield. Install tubes V608, V609 and V611. Replace the cover.

G. Install the remainder of the tubes in the RTP-2 deck.

H. Connect P506 of CA-417-1 to J303 of RTF-2.

J. Connect P504 of CA-408 to J405 of RTF-2.

K. Make the following intra-chassis connections to the RTF-2:

(1) J402 to P301
(2) J401 to P302
(3) J201 to P401

L. Connect P508 of CA-288-1 to J404 of RTX-2.

M. Connect P509 (blue) of CA-288-2 to J403 (blue) of RTF-2.

N. Install all tubes in the RTF-2 deck.

P. Connect P51 to J16 on the RTX-2 deck.

Q. Connect P501 of CA-288-1 to J1 of the RTX-2 deck.

R. Connect P510 of CA-288-2 to J15 of the RTX-2 deck.

S. Connect P505 of CA-417-1 to J504 of the CAB-7.

T. Check all cable connections for secure attachment.

U. See that all tubes have been installed.

V. Install all fuses. Proper values are engraved on the respective panels near the fuses.

C-3-1-2 ELECTRICAL CONNECTIONS, EXTERNAL

C-3-1-2-1 See Figure G-3-3 for connections to E501 and E502.

C-3-1-2-2 The input keying line may be a twisted pair of standard telephone type line. The line should be connected so that a positive voltage appears at the terminal 15 on MARK condition. The input impedance of the keying line is 100,000 ohms. (However, the line should be terminated in as low an impedance as the keying source may operate into. For this reason, a 2000 ohm, 10 watt resistor is supplied with each unit attached to the appropriate terminals of the XFK.) A twisted pair may be brought into the terminal 16. This line may be used to key the exciter merely by shorting it (MARK). Care must be taken, however, to see to it that this line is always absolutely open in order for the regular keying line to function properly.

C-3-2 OPERATION

C-3-2-1 Description of Controls and Indicators

RTP-2

CONTROL	FUNCTION
MAIN POWER ON/OFF	Applies AC voltage to the transmitter and provides automatic overload protection.
FILAMENT LINE (meter)	Indicates voltage at primary of filament transformer, T603.
FILAMENT LINE ADJUST	Selects taps on the filament transformer to maintain the desired 115 VAC.
UTILITY OUTLET	Convenience power outlet.
TRANSMITTER PLATES	Applies plate voltage to the low level stages and high voltage to the PA stage when the FINAL PLATE switch is ON.
FINAL OVERLOAD (SG/PLATE)	Resets overload relay system when tripped by excessive PA plate or screen grid currents.
MODE	Selects PHONE, TUNE, CW-FS or SSB operation.

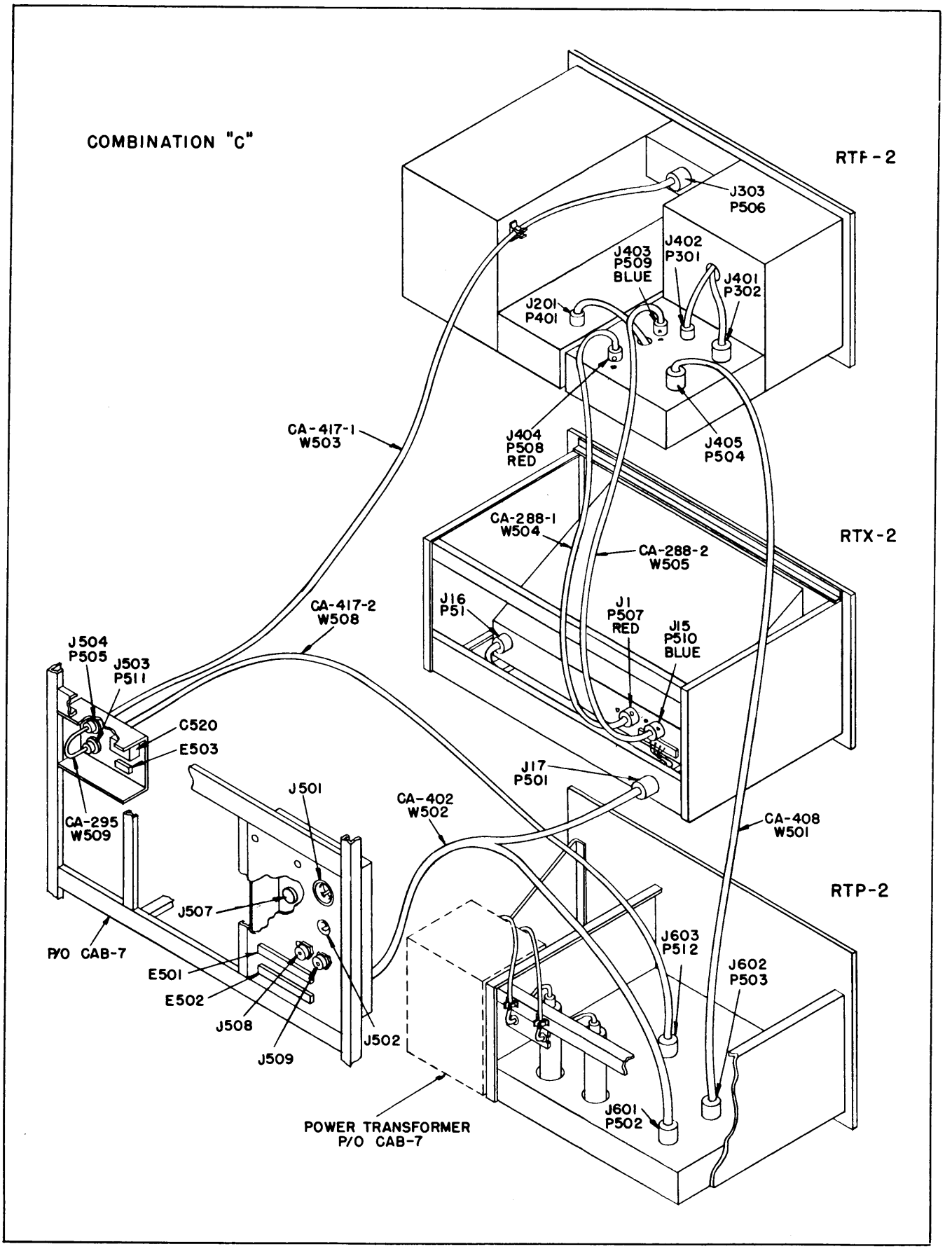


Figure C-3-1 Cabling Diagram Model GPT-750C2

FINAL PLATES	Applies high voltage to the PA stage when transmitter PLATES switch is ON.
MO BYPASS NORM/BYPASS	Allows Master Oscillator oven to continue operation when transmitter is not ON.

RTX-2 & XFK

PA PLATE CURRENT (meter)	Monitors plate current of final amplifier.
200 KC OVEN (Lamp)	ON when oven is warming. Indicates operation of 200 Kc oven.
POWER (Lamp)	ON when power is applied to the unit.
XTAL OVEN (Lamp)	ON when oven is warming. Indicates operation of crystal oven.
POWER ON/OFF (switch)	Controls power to all internal circuits.
OUTPUT TUNING MC	Sets output frequency to point shown on scale above control.
FREQUENCY SHIFT CPS	Varies frequency shift by amount shown on scale above control.
SHIFT LOCK	Locks FREQUENCY SHIFT CPS at desired setting.
BAND CHANGE	Used to select band which includes desired output frequency. Setting determined which scale of dial will apply.
FREQUENCY	Acts as trimmer for crystal selected by XTAL switch.
LOCK	Locks FREQUENCY control (above).
XTAL	Selects use of external oscillator or one of three internal crystals for frequency control.
POWER (INCR)	Controls power output of unit. Results are indicated by the PA PLATE CURRENT meter.
TEST	Provides simulated MARK or SPACE signals. Allows incoming signals to key unit when in LINE position.
FAX-KEY	Located at rear of unit. Used to select KEY or FACSIMILE inputs.

RTF-2

EXCITATION SW. (On top of Interconnect)	Selects and routes oscillator for SSB, FS and CW/PHONE.
SSB/NORMAL (On top of Multiplier)	Changes multiplier to straight-through frequency for SSB operation.
INNER OVEN (Lamp)	Lights when inner oven is warming.
OUTER OVEN (Lamp)	Lights when outer oven is warming.
ZERO BEAT (Lamp)	Indicates error in calibration of Master Oscillator during calibration procedure.
CALIBRATE	Used to bring the Master Oscillator to calibration during the calibration procedure.
MASTER OSCILLATOR FREQUENCY	Tunes Master Oscillator to frequency indicated on the dial.
KEY	Can be used for ON/OFF keying of transmitter during CW operation.
PA PLATE (meter)	Indicates PA Plate current.

RF OUTPUT	Indicates RF Output current.
DRIVER TUNING	Varies the multiplier and PA driver tuning capacitor.
DRIVE	Varies the amount of drive to the PA grids.
DRIVER BAND	Changes tuned frequency range of the driver and multiplier.
PA TUNING	Varies the main tuning vacuum capacitor which is an integral part of the PA Pi tank.
PA BAND	Sets the PA tank to the proper output frequency band by tapping of the output coil.
ANTENNA LOADING	Adjust the amount of coupling to the load.
AUX. LOADING	Switches in an additional loading capacitor for loads of lower impedance.
TEST KEY	Provides emergency and test keying.
PHONES	Audible monitoring of the error signal during MO calibration.
OSCILLATOR	Selects source of frequency control for transmitter or calibration of MO.
MULTIMETER	Measures points selected by associated switch.
MULTI-METER (switch)	Selects measurement of: PA Ebb DRIVER I_p PA Isg PA Ig PA Eg RF
PA PLATE (meter)	Indicates PA plate current.
RF OUTPUT	Indicates RF output current.

C-3-2-2 Preliminary Power Off Adjustments

C-3-2-2-1 Place the following controls in the positions indicated before applying power to the transmitter.

RTF-2

DRIVE	Fully counter-clockwise.
EXCITATION	LO OFF

(Note: If the XFK is to be driven by the MO or crystals within the transmitter:

(1) Throw the EXCITATION switch located on the top of the Interconnect chassis to the position marked FS L.O. ON.

(2) Throw the OSCILLATOR switch on the RTF front panel to MO if the MO is to be used or throw this same switch to the proper crystal position if crystal excitation is to be used.

(3) The Master Oscillator within the transmitter can be used to drive the Model XFK which as before, will then drive the transmitter multipliers.

SSB/NORMAL	NORMAL

RPT-2

FILAMENT LINE ADJUST	Position 2 from full counter-clockwise.
TRANSMITTER PLATES	STANDBY REMOTE
FINAL PLATE	OFF
MODE	TUNE
MAIN POWER	OFF
MO BYPASS (internal)	NORMAL

C-3-2-3 PRELIMINARY POWER - ON ADJUSTMENTS

A. See that all previous steps have been accomplished.

B. Connect a 1000 watt resistive 70 or 50 ohm load or antenna to J505, the RF output jack.

C. Connect power line from appropriate source to J501.

D. Turn MAIN POWER switch ON. The MAIN POWER indicator lamp should light.

E. Check the FILAMENT LINE meter for a reading of 115 volts. Use FILAMENT LINE ADJUST control for correction if necessary.

TABLE C-3-1 EXCITATION FREQUENCY CHART

MULT BAND	XTAL RANGE	XFK OUTPUT	XTAL FREQUENCY (Mcs.)
2 to 4 Mc.	1.8 to 3.8 Mc.	2.to 4 Mc.	f_o - .2
4 to 8	1.8 to 3.8	2 to 4	(f_o/2)- .2
8 to 16	1.8 to 3.8	2 to 4	(f_o/4)- .2
16 to 32	1.8 to 3.8	2 to 4	(f_o/8)- .2

TABLE C-3-2 VARIABLE MASTER OSCILLATOR FREQUENCY CHART

MULT BAND	MULT RANGE	VMO RANGE	XFK OUTPUT	VMO FREQUENCY
2 to 4	2 to 2.2 2.2 to 4	2.2 to 2.4 2 to 3.8	2 to 2.2 2.2 to 4	f_o+ .2 * f_o- .2
4 to 8	4 to 4.2 4.2 to 8	2.2 to 2.4 2 to 3.8	2 to 2.2 2.2 to 4	(f_o/2) + .2 * (f_o/2) - .2
8 to 16	8 to 8.2 8.2 to 16	2.2 to 2.4 2 to 3.8	2 to 2.2 2.2 to 4	(f_o/4) + .2 * (f_o/4) - .2
16 to 32	16 to 16.2 16.2 to 32	2.2 to 2.4 2 to 3.8	2 to 2.2 2.2 to 4	(f_o/8) + .2 * (f_o/8) - .2

f_o = assigned frequency

* When setting the VMO according to these formulas, the keying line polarity must be reversed in order to obtain the correct shift polarity.

F. Turn the POWER switch on front panel of the XFK to ON. The red light and the two oven cycling lamps on the front panel should light.

C-3-2-4 CHOOSING THE MASTER OSCILLATOR OR CRYSTAL FREQUENCY

C-3-2-4-1 Use Table C-3-2 to determine the correct MASTER OSCILLATOR or CRYSTAL frequency.

If the assigned carrier frequency is, for example, 13.900 Mc, the MO or crystal would be 3.275 Mc. From Table C-3-2, 13.900 Mc is divided by 4.

$$\frac{13.900 \text{ Mc}}{4} = 3.475 \text{ Mc}$$

Then, from 3.475 Mc subtract .200 Mc,

$$3.475 \text{ Mc} - .200 \text{ Mc} = 3.275 \text{ Mc}$$

C-3-2-4-2 When the MO frequency has been chosen be sure that the final frequency is approached from the same direction of knob rotation as was the check point. If by mistake, the dial should be turned too fast and the proper point is passed, go back at least 1 Kc and again approach the point from the original direction.

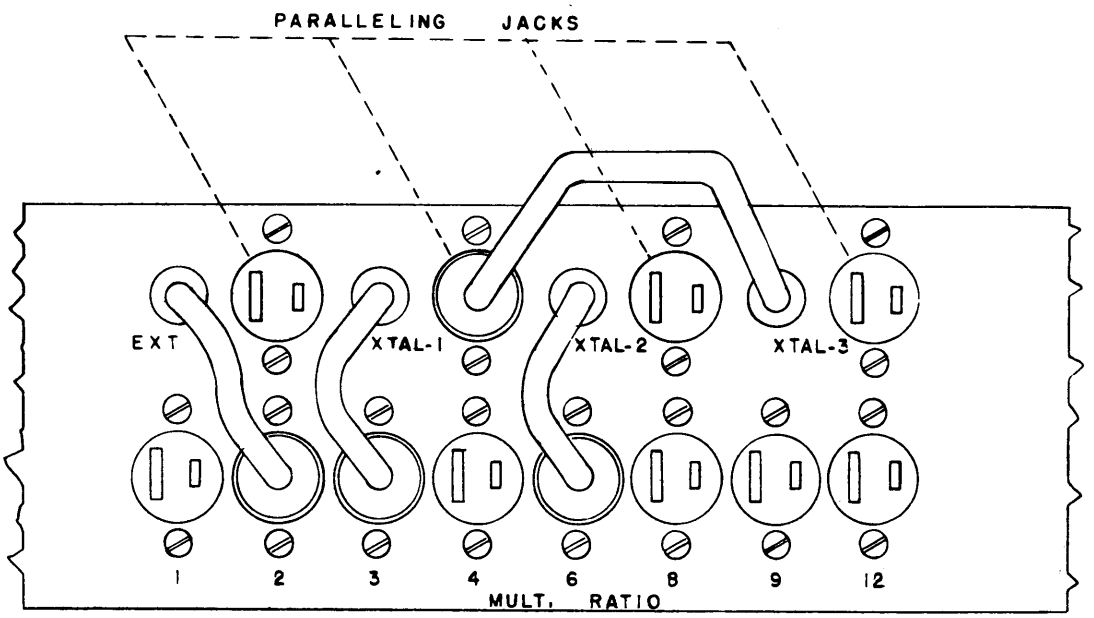
C-3-2-4-3 If crystal operation is desired, the crystal frequency must be chosen by the procedure in paragraph C-3-2-4. The crystals are plugged into either the Interconnect or the XFK. Three sockets are available on the top of the Interconnect chassis, and three sockets are available in the oven of the XFK. The greatest frequency stability is obtained by the use of crystals placed in the XFK oven.

C-3-2-5 TUNING THE XFK FOR OPERATION

C-3-2-5-1 INITIAL ADJUSTMENTS

C-3-2-5-1-1 Multiplication Preset: The proper transmitter multiplication ratio should be set at the rear of the chassis by means of the plug corresponding to the crystal position used on the front panel. Should the jack for any ratio be in use by another position, the plug may merely be inserted into the jack which is in parallel with the plug inserted into this particular ratio. This is illustrated in Figure C-3-2.

C-3-2-5-1-2 Key-Fax Switch: The switch on the rear apron of the XFK must be set in the



A TYPICAL PATCHING ARRANGEMENT

XTAL SELECTOR POSITION	XMTR. MULT. RATIO	XMTR. OUTPUT FREQ. SHIFT (DIAL SET.) CPS	XFK FREQ. SHIFT
EXT	2	850	425
XTAL - 1	3	850	283
XTAL - 2	6	850	142
XTAL - 3	3	850	283

Figure C-3-2 Multiplication Preset

KEY position to work on either voltage or contact keying. In FAX position a facsimile signal may be applied as explained under FACSIMILE OPERATION.

C-3-2-5-2 TUNE UP PROCEDURE

A. Turn XFK PLATE switch on and be sure to limit the plate current to 50 Ma with the POWER control.

B. Select the desired crystal using the crystal switch on the XFK or RTF depending on the location of the crystal desired.

C. Set the band change switch to the proper band for the XFK output frequency for the crystal selected.

D. Set the output dial to the correct output frequency. The plate current should be set at 50 Ma. Only a slight readjustment of this dial should be required to cause a dip in the plate current meter reading. At the higher frequencies on band 2, the incorrect sideband may cause a smaller dip at 400 Kc above or below the proper output frequency. Choose the correct dip by depending upon dial calibration.

E. Increase the POWER control until the desired output power is reached being sure not to increase the plate current over 50 Ma.

F. Set the SHIFT control at the desired shift of the transmitter. No allowance for frequency multiplication need be made if the patch panel, at the rear of the chassis has been properly connected.

G. Put the test switch on LINE and the unit is now ready to operate on keyed or contact signals.

H. Set FREQUENCY control to 0 and the unit will now be on frequency within ±50 cycles plus the grinding error of the crystal used. If the frequency is monitored more accurately, the frequency may be changed by as much as ±600 cycles with this control.

C-3-2-5-3 FACSIMILE OPERATION

C-3-2-5-3-1 To convert the Model XFK from keyed signals to facsimile it is only necessary to switch the KEY/FAX switch to FAX. The XFK should be tuned exactly as above. Keep in mind, however, that the SHIFT dial and the automatic multiplication ratio are now bypassed.

C-3-2-5-3-2 A signal at the FAX input of approximately ±4 volts will then shift the carrier ±500 cycles linear with applied voltage.

C-3-2-6 Tuning the GPT-750C2 for Operation

A. Do not alter control setting made in previous steps unless instructed to do so.

B. Rotate the DRIVE control fully clockwise.

C. Turn the DRIVER BAND switch to the range which includes the final carrier frequency.

D. Set the MULTIMETER switch to the PA Ig position.

E. Turn the DRIVER TUNING control to the frequency of the oscillator. A peak in PA grid current will indicate the correct point.

F. Turn the DRIVE control fully counter-clockwise.

CAUTION

BE SURE AN ANTENNA OR 1000 WATT 50 OR 70 OHM DUMMY LOAD IS CONNECTED TO J505.

G. Turn the PA BAND switch to the range which includes the final frequency.

H. Set the ANTENNA LOADING control to its fully counter-clockwise position or roughly pre-set it according to Figure C-3-3.

J. Set the AUX. LOADING control to the + (plus) position or as indicated in Figure C-3-3.

K. Turn the FINAL PLATE switch ON.

L. Advance the DRIVE control until the PA PLATE current meter indicates 120 Ma.

M. Turn the PA TUNING control until a definite plate current dip is obtained.

N. The RF OUTPUT meter may be used as an aid in tuning but it must be understood that it is an output indicator and does not necessarily give absolute values of RF power output.

CAUTION

A SHUNTING BAR HAS BEEN PROVIDED WITHIN THE PA COMPARTMENT FOR SHUNTING THE RF AMMETER THERMOCOUPLE. THIS WILL BE USEFUL WHEN A LOAD WITH LOW IMPEDANCE AND HIGH REACTANCE (HIGH STANDING WAVE RATIO) IS TO BE MATCHED. UNDER THESE CONDITIONS THE UNSHUNTED CIRCUIT WOULD CAUSE THE METER TO "PIN" DUE TO THE HIGH REACTIVE CURRENT IN THE LOAD.

P. Turn the MULTIMETER switch to the PA Isg position.

Q. Advance the DRIVE control until the screen current is about 10 Ma.

R. Turn the ANTENNA LOADING control clockwise until the screen current drops to almost zero and the plate current begins to rise.

S. Adjust the PA TUNING control until the plate current dips again and the screen current rises. Continue to advance the ANTENNA LOADING and DRIVE controls (each time redipping the plate current with the PA TUNING as before) until the screen current is 10 Ma while the plate current is 250 Ma.

CAUTION

THE PLATE CURRENT DIPS MUST BE OBTAINED AT THE LOWEST PA TUNING READING TO AVOID DOUBLING IN THE FINAL. IF FIGURE C-3-3 IS FOLLOWED, NO SUCH TROUBLE WILL OCCUR.

T. Turn the MODE switch to the CW-FS position.

U. Key the transmitter by either pressing the TEST KEY or by using an external key connected to the KEY jack. The plate current should rise to about 500 Ma while the PA Isg current becomes 90 Ma. The PA Isg will be between 15 and 30 Ma depending upon the operating frequency.

V. If the above results are not obtained the PA Isg can be increased by advancing the DRIVE control while the PA plate current can be increased by slight advancement of the ANTENNA LOADING control.

W. Make a final adjustment of the PA TUNING control for a peak in the PA Isg and a corresponding peak in RF OUTPUT. If the transmitter is fully loaded in this manner, it is much easier to adjust the PA TUNING for a screen current peak. The transmitter is now fully prepared to be placed in operation.

X. For simple ON/OFF control of the tuned transmitter leave the FINAL PLATE switch in the ON position and the TRANSMITTER PLATES switch in the STANDBY/REMOTE position. To operate under these conditions one need only throw the TRANSMITTER PLATES switch to the ON position and key the transmitter.

Y. If the overload protective system throws the transmitter OFF at any time it will probably be because excessive screen or plate currents have been drawn. The OVERLOAD RESET controls should then be used to restore operation so correction can be made.

C-3-2-7 ADDITIONAL INFORMATION

A. The absolute settings of the ANTENNA LOADING and AUX. LOADING controls is shown in Figure C-3-3 are approximate because these controls serve to balance out reactances in the antenna system. For this reason the antenna and frequency used will influence the final settings of these controls. The AUX. LOADING switch will seldom be used in the zero (0) position at

frequencies above the 2 to 4 megacycle band.

B. When tuning the upper end of the two highest bands (24 to 32 Mc), it will be necessary to advance the ANTENNA LOADING control to almost its fully clockwise position in order to obtain a plate current dip with the PA TUNING control.

C-3-2-8 SETTING THE TRANSMITTER TO THE FREQUENCY OF A RECEIVED SIGNAL

C-3-2-8-1 In some cases the operator may want to set the transmitter exactly on the same frequency as a signal being received. This is particularly useful in amateur communication. To set the transmitter to the frequency of a received signal, proceed as follows:

A. Tune up the transmitter with the exception of the final amplifier (leave the FINAL PLATE switch OFF). The master oscillator should be set so that the multiplier output frequency is close to frequency of the desired signal.

B. Tune the receiver to the desired signal.

C. Turn on the receiver BFO and vary the BFO frequency until a zero beat is obtained with the received signal carrier.

D. Pick up the transmitter on the receiver and readjust the master oscillator until a zero beat is heard. The master oscillator is now aligned with the received signal, and the remainder of the transmitter may now be properly tuned. If the master oscillator signal cannot be picked up on the receiver, insert about one foot of a four-foot length of insulated wire inside the top drawer and close the drawer. This will serve to radiate some of the master oscillator signal into the receiver. It will be possible in some cases, depending upon the strength of the received signal, to directly beat the transmitter with the received signal and leave the receiver BFO off.

C-3-2-9 REDUCED POWER OPERATION

C-3-2-9-1 The power output of the transmitter is readily adjustable from a minimum of a few watts to its maximum rated output of 1000 watts CW. To operate at reduced power, proceed as follows:

A. Tune the transmitter as prescribed for CW. Output power is now approximately 1000 watts.

B. Adjust the DRIVE control so that screen current drops to approximately 45 Ma.

C. Decrease the antenna loading until the screen current rises again to 90 Ma after the final amplifier has been reset for resonance. The power output is now approximately 500 watts. For an output power of less than 500 watts, screen current should be proportionately reduced.

SCREEN CURRENT VALUES FOR REDUCED POWER OPERATION

OUTPUT POWER (W)	SCREEN CURRENT (MA)
500 (and above)	90
400	70
300	55
200	35

D. Repeat step C until the desired power output is obtained.

FREQ MC	VMO FREQ	XFK			DRIVER		POWER AMPLIFIER						
		OUTPUT TUNING	FREQ SHIFT	MULT RATIO	BAND	TUNING	PA BAND	PA TUNING	PA LOADING	PA IG	PA IP	PA ISG	ANTENNA CURRENT
2.0	2200	2.0	425 CPS	1	2-4	2.0	2-2.5	063	38	12	460	73	4.45
2.5	2300	2.5	"	1	2-4	2.5	2-2.5	123	100	10	440	78	"
2.5	2300	2.5	"	1	2-4	2.5	2.5-3	070	10	10	470	50	"
3.0	2800	3.0	"	1	2-4	3.0	2.5-3	114	50	5	460	50	"
3.0	2800	3.0	"	1	2-4	3.0	3.0-4	065	2	10	450	70	"
4.0	3800	4.0	"	1	2-4	4.1	3.0-4	131	51	7	450	63	"
4.0	3800	4.0	"	1	4-8	1.9	4-6	055	100	12	460	80	"
6.0	2800	6.0	"	2	4-8	3.0	4-6	141	52	5	450	50	"
6.0	2800	6.0	"	2	4-8	3.0	6-8	110	35	5	450	57	"
8.0	3800	4.0	"	2	4-8	4.1	6-8	134	50	8	450	52	"
8.0	3800	4.0	"	2	8-16	2.0	6-8	153	68	5	440	60	"
8.0	3800	4.0	"	2	8-16	2.0	8-12	134	50	5	440	65	"
10.0	2300	5.0	"	4	8-16	2.5	8-12	159	71	5	440	50	"
12.0	3800	4.0	"	3	8-16	3.0	8-12	174	83	5	450	50	"
12.0	3800	4.0	"	3	8-16	3.0	12-16	166	50	5	440	57	"
14.0	3300	3.5	"	4	8-16	3.5	12-16	179	70	5	450	52	"
16.0	3800	4.0	"	4	8-16	4.0	12-16	196	80	6	450	65	"
16.0	3800	4.0	"	4	16-32	2.0	16-24	160	40	6	450	50	"
18.0	2250	6.0	"	6	16-32	2.25	16-24	169	53	6	470	62	"
20.0	2300	5.0	"	8	16-32	2.5	16-24	176	66	5	450	40	"
22.0	2550	5.1	"	8	16-32	2.7	16-24	184	72	4	450	42	"
24.0	3800	4.0	"	6	16-32	2.9	16-24	197	78	5	450	55	"
24.0	3800	4.0	"	6	16-32	2.9	24-32	173	57	6	450	60	"
26.0	3150	6.5	"	8	16-32	3.2	24-32	178	67	4	460	37	"
28.0	3300	3.5	"	8	16-32	3.4	24-32	184	70	3	460	35	"
30.0	2300	5.0	"	12	16-32	3.65	24-32	192	72	4	450	50	"
32.0	3800	4.0	425 CPS	8	16-32	3.9	24-32	206	77	3	450	42	"

TEST CONDITIONS:

a. 50 OHM NON-REACTIVE DUMMY LOAD.

b. POWER OUTPUT 1000 WATTS (4.5 AMPS AT 50 OHMS) MINIMUM.

Figure C-3-3 Tuning Chart Model GPT-750C2

SECTION IV
MAINTENANCE

C-4-1 Any maintenance to the equipment should be performed by a competent technician familiar with the transmitting techniques employed in this equipment.

C-4-2 Maintenance of the RTF-2 and RTP-2 are described in Part "GENERAL".

C-4-3 EXCITER ALIGNMENT

C-4-3-1 The least likely source of trouble should be the misalignment of the RF section of the XFK. Should this be suspected, due to either reduced power output or the output frequency dial showing a marked deviation from the indicated frequency calibration, the following procedure is recommended.

A. Alignment of Band 2

(1) Connect a 50 to 70 ohm load to the output jack. Meter either the current through the load with an R.F. thermocouple or connect an R.F. voltmeter across the load.

(2) Set bandswitch to band 2, rotate main tuning condenser to full mesh position (lowest frequency) note that the hairline on the dial matches the indicator line. If this is not so, leave the condenser in the same position and rotate the dial until they line up by loosening the set screws fastening the flexible coupling to the condenser.

(3) Set ceramic trimmers, C30, C43, C46 to minimum capacity.

(4) The following indicated frequencies should either be supplied by means of crystals or an external source. To simplify procedure it will be assumed that crystals will be used. If an external source is used. connect the signal source to the EXT. jack on the rear of the chassis and switch the crystal selector switch to EXT.

(5) Insert 2.6 Mc crystal in socket #1, 6.3 Mc crystal in socket #2.

(6) Switch crystal selector switch to xtal #1. Set tuning dial to 2.8 Mc. Place R.F. voltmeter on Pin 1 V4, tune T1 for maximum voltage. Place R.F. voltmeter at Pin 5 V5 and tune T3 for maximum voltage. Select first peak going in from minimum inductance. Tune T5 for maximum output indication in load. Remove R.F. voltmeter and retrim, T1, T3, T5 for maximum output in load.

(7) Switch to crystal position 2. Set tuning dial to 6.5 Mc. Tune C30, C43, C46 for maximum output indication in load.

(8) Remove V1, 200 Kc osc. tube. Tune main tuning condenser for maximum output indication in load. This will occur at the crystal frequency. Trim "Mixer Balance" potentiometer for minimum indication in load.

(9) Remove load. Remove crystal or external excitation. Set P.A. plate current to 50 Ma. Rotate tuning condenser over entire upper range of band and note spurious excitation, if any. Parasitics may be evidenced by dip in plate current of final amplifier when tuning main tuning condenser. If parasitics are evidenced, neutralize same by tuning C27.

(10) Replace V1, Repeat steps 6 and 7.

(11) Check tuning dial for proper sideband selection. If the above procedure has been done properly, there will be no indication above 6.5 Mc and the lower sideband will appear at 6.1 Mc.

B. Alignment of Band 1

(1) Set bandswitch to band 1. Insert 1.0 Mc crystal in socket #1 and 2.1 Mc. crystal in socket #2.

(2) Set ceramic trimmers C19, C24 and C28 to minimum capacity.

(3) Switch crystal selector to xtal #1. Set tuning dial to 1.2 Mc. Place R.F. voltmeter to pin 1 V4. Tune T2 for maximum voltage. Place R.F. voltmeter to pin 5 V5. Tune T4 for maximum voltage, select first peak going in from minimum inductance. Tune T6 for maximum output indication in load. Remove R.F. voltmeter and retrim T2, T4 and T6 for maximum output indication in load.

(4) Switch to crystal position 2. Set tuning dial to 2.3 Mc. Tune C19, C24, C28 for maximum output indication in load.

(5) Repeat (2) and (3).

(6) Check tuning dial for proper sideband selection. If the above procedure has been done properly, there will be no indication above 2.3 Mc and the lower side band will appear at 1.9 Mc.

C. Adjustment of Reactance Tube and 200 Kc Osc.

The proper alignment of this section of the Model XFK Exciter requires accurate frequency measurements. It is recommended that the equipment and method outlined in Figure C-4-1 and Figure C-4-2 be adopted for best accuracy and ease of measurement.

(1) Set up equipment as shown in Figure C-4-2.

(2) Observe that the pointer on the frequency knob reads minus 600 cycles when the capacitor C7 is approximately 7 deg. from being fully meshed. C7 should then move towards decreasing capacity as the knob is turned toward the plus 600 cycles position.

(3) Set "FAX-KEY" switch to "FAX". Return frequency knob to 0 cycles. By means of the coarse frequency adjust on the rear of the chassis, zero beat 200 Kc osc. with 100 Kc crystal in mixer.

(4) Connect a small variable voltage source (6v) to the "FAX" terminals on terminal board at rear of chassis. This source should be capable of alternately impressing equal positive and negative voltages at the "FAX" terminal.

(5) Set C2 at one-half its capacity. With zero voltage at "FAX" input terminal, zero beat 200 Kc osc. with mixer xtal. Apply sufficient positive voltage to cause a 500 cycle shift (app. 4 volts) Reverse polarity maintaining same amplitude. Note shift. If second shift is over 500 cycles slightly increase capacity of C2. RE-zero beat 200 Kc osc. with no input voltage, then repeat above procedure until both shifts are equal.

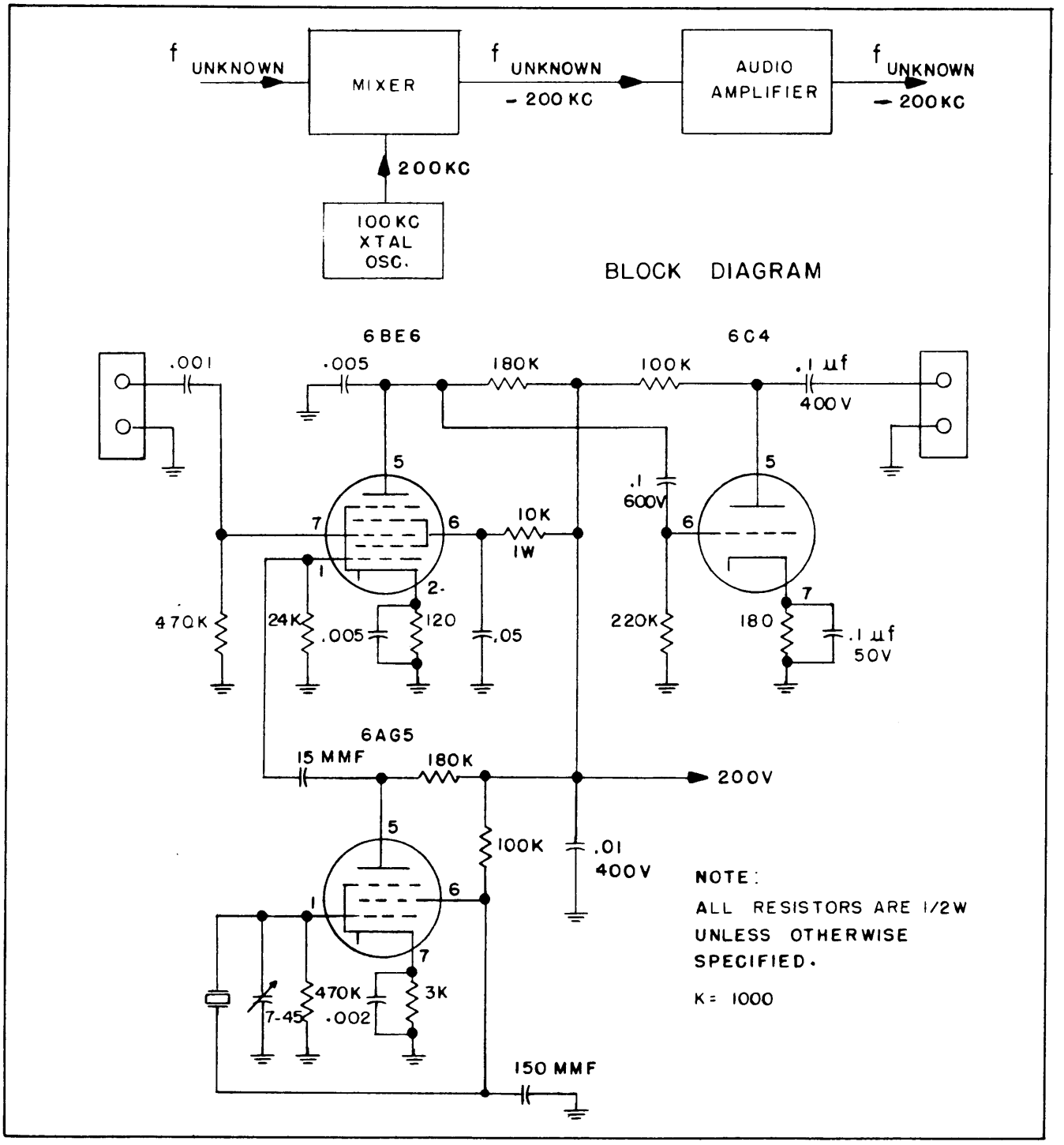


Figure C-4-1 Test Chassis

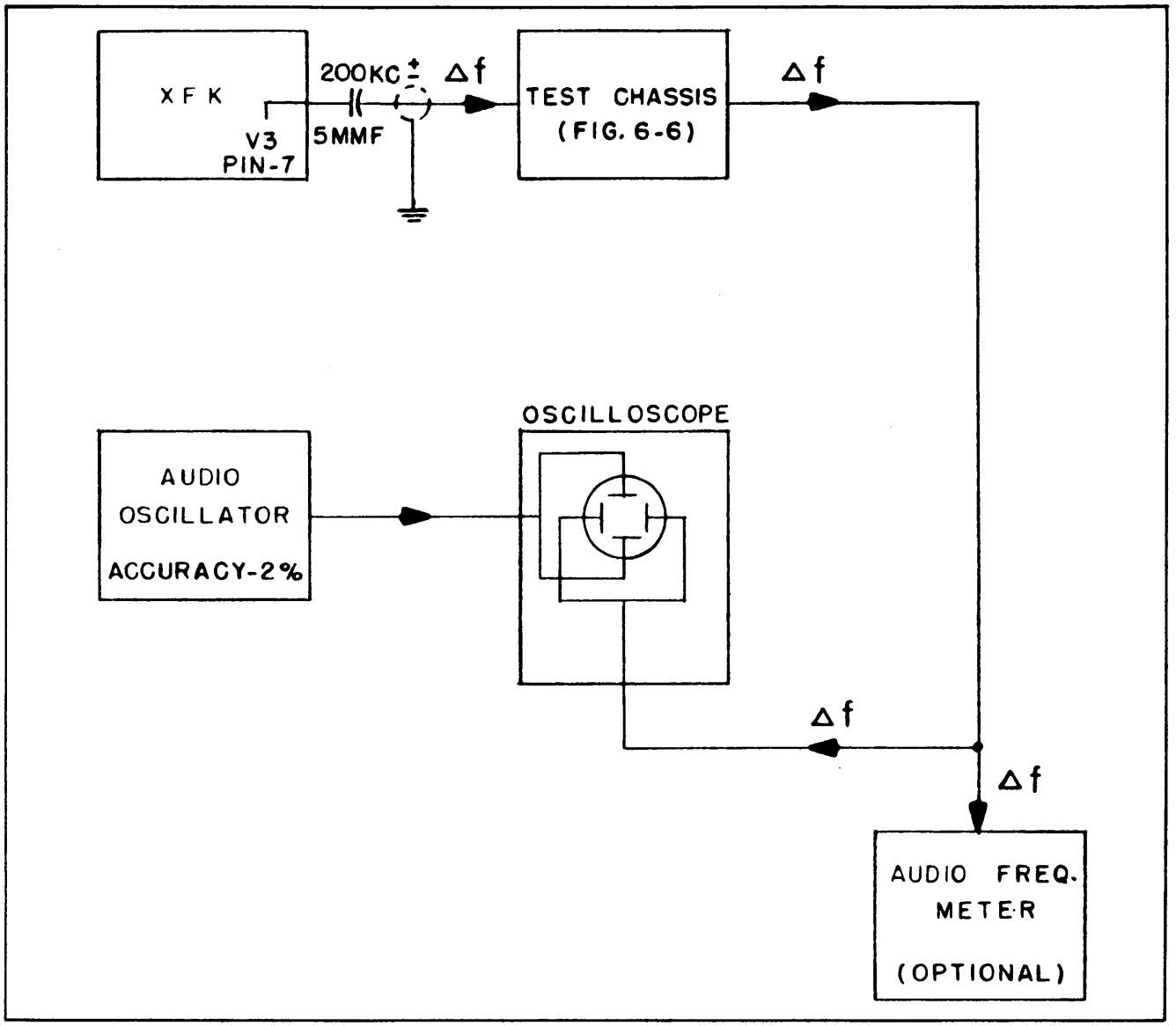


Figure C-4-2 Block Diagram

D. Adjustment of Keyer Circuit

(1) Set "FAX-KEY" switch to "KEY". With power "OFF" set ohmmeter to center arm of shift potentiometer. When dial reads 50 cycles resistance to ground should be 400 ohms.

(2) Set crystal selector switch to "xtal #1" and plug into multiplication ratio 1 on rear of chassis.

(3) Re-zero 200 Kc osc. Set shift dial to 500 cycles. Vary test switch from "Mark" to "Space" and note shift. Adjust "Shift Balance" potentiometer until shifts are equal. Adjust "Shift Amplitude" potentiometer until shift on either side is 250 cycles. Recheck "shift balance". The total shift is now 500 cycles, 250 cycles on either side of carrier.

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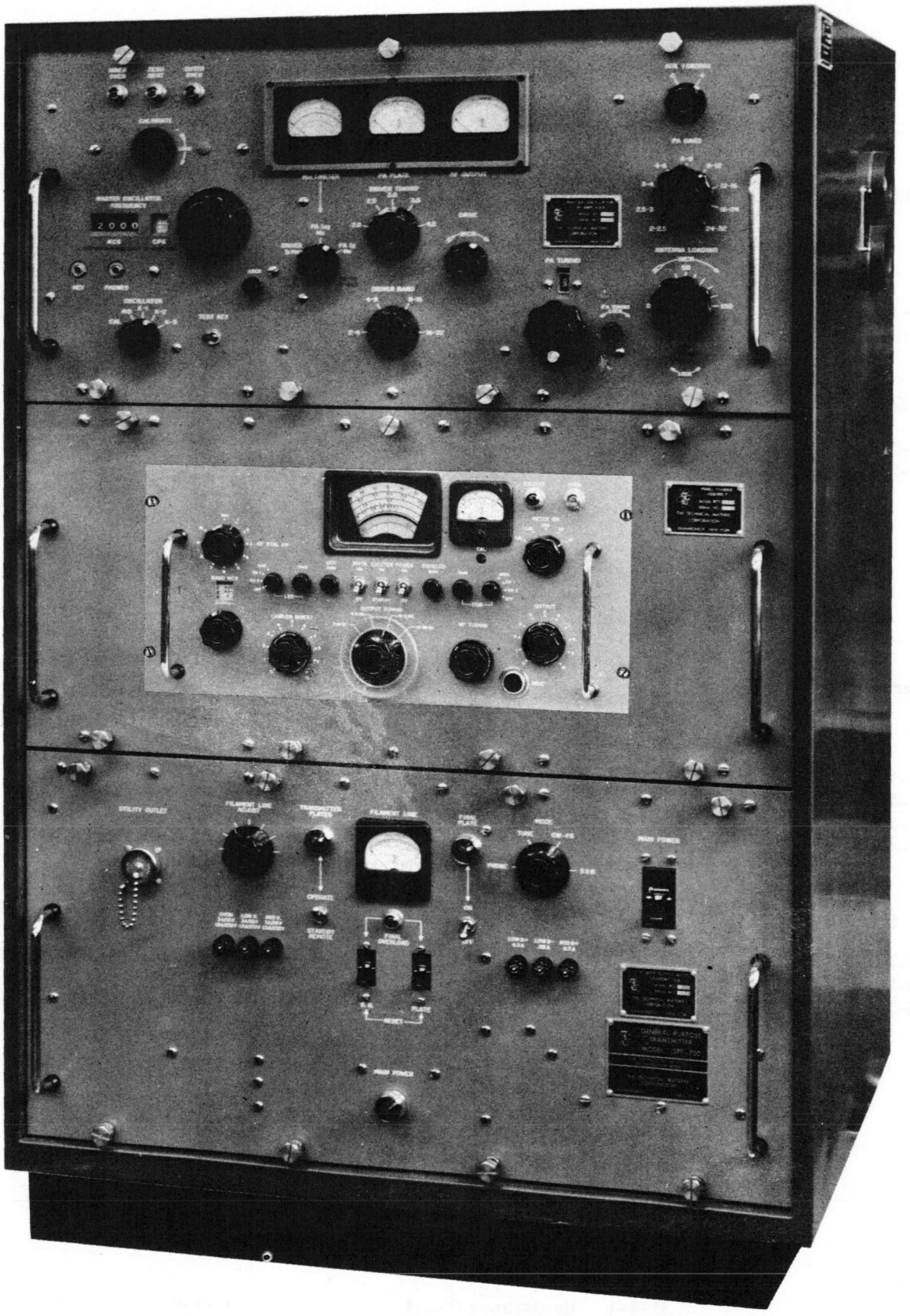

Figure D-1-1 Front View Model GPT-750D2

Figure D-1-2 Front View Model RTS-2

Figure D-1-3 Front View Model A-1516, Exciter Unit

SECTION I
GENERAL

D-1-1 DESCRIPTION

D-1-1-1 The "D" combination of the transmitter consists of the RF Deck (RTF-2), Sideband Exciter (RTS-2 & SBE) and Power Supply (RTP-2). Several modes of operation are possible with this unit. These modes and modes using accessory exciters are outlined in Part "GENERAL".

D-1-2 TECHNICAL SPECIFICATIONS

(See Part "GENERAL" for General Specifications)

CRYSTAL OSCILLATOR CHARACTERISTICS:
Frequency Range: 2 to 4 Mc.
Crystal Used: CR-18/U in HC-6/U Holder.
Number of Positions: 3, selectable from front panel.

AVERAGE PLATE EFFICIENCY:
Better than 50%.

WEIGHT:
895 pounds.

POWER OUTPUT:
700 watts PEP
500 watts PEP

SIGNAL TO DISTORTION RATIO:

35 db at 700 watts.

40 db at 500 watts.

RTS-2 & A-1516

STABILITY:
1 PPM for 24 hour period.

CRYSTAL POSITIONS:
Ten crystal, each with independent trimmer. Selection by front panel switch.

CRYSTAL SOCKETS:
For HC-6/U Holders. (CR-27/U Crystals) Contained in two temperature controlled, high mass aluminum ovens designed for high thermal inertia.

CRYSTAL OVEN TEMPERATURES:
75 deg. C for 17 Kc and 287 Kc oscillator, and 70 deg. C for MF and HF oscillator.

CARRIER SUPPRESSION:
At least 55 db down from PEP level.

CARRIER INSERTION:
Continuously adjustable.
MIKE INPUT: 3 pin MIKE jack.

SPURIOUS OUTPUT:
At least 60 db below PEP output.

DISTORTION PRODUCTS:
At full PEP output, distortion products are at least 45 db below either tone of a standard two tone test.

HARMONIC RADIATION:
Second harmonic at least 40 db below PEP output. All other harmonics at least 50 db below PEP output.

REJECTION OF UNUSED SIDEBAND:
500 cps tone 60 db below transmitted PEP.

AUDIO INPUT:
Two independent 600 ohm channels, balanced or unbalanced, -20 db level for full RF output. 500 K ohms for high impedance crystal or dynamic mike, -50 db for full RF output.

VOX OPERATION:
Voice control with anti-trip features, adjustable gain and squelch controls.

METERING:
Peak reading VTVM indicates:
(1) Audio level in USB or LSB channel.
(2) Mid frequency level for tuning purposes.
(3) Exciter RF output (percent of maximum power).

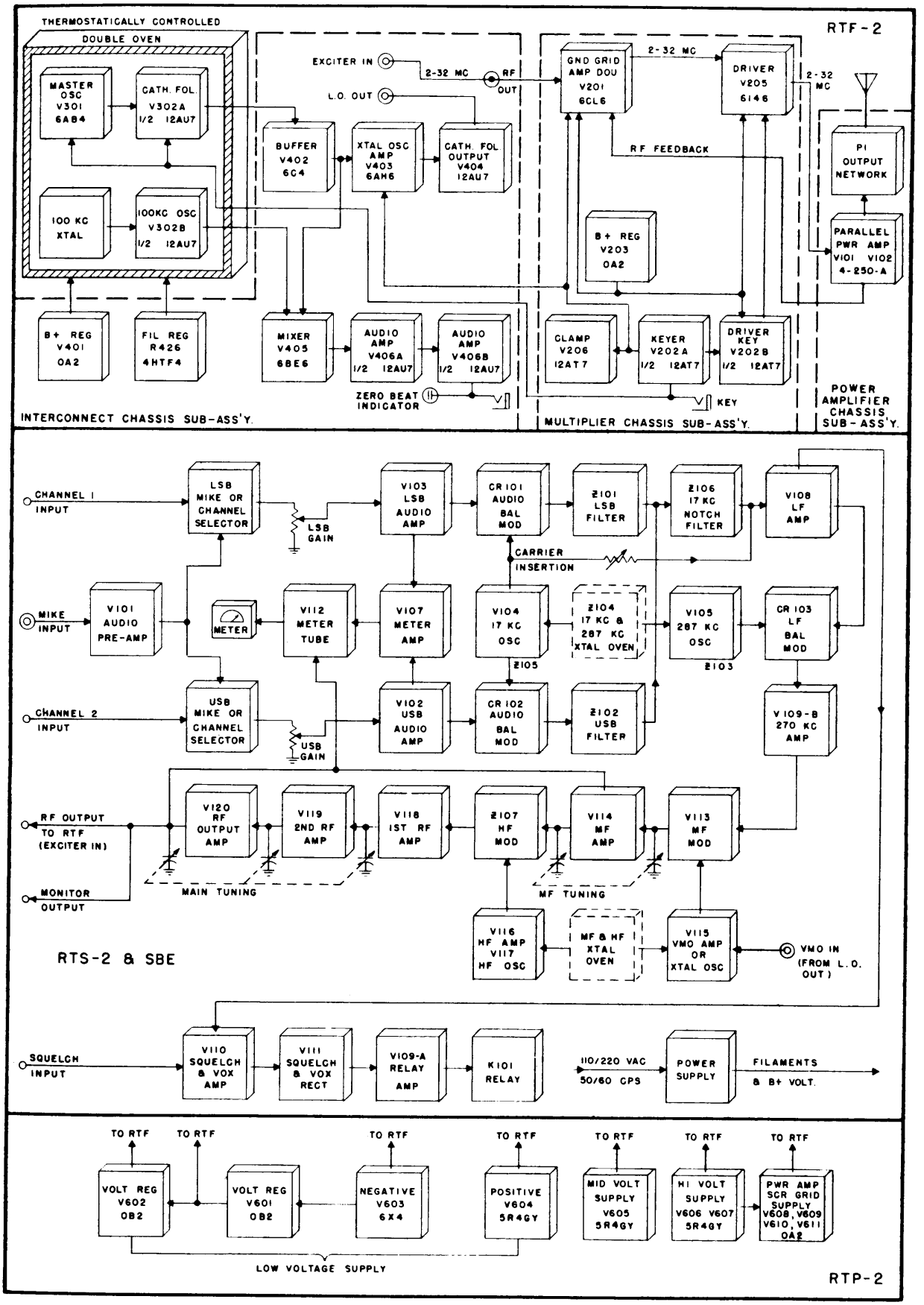

Figure D-1-4 Block Diagram Model GPT-750D2

SECTION II
THEORY OF OPERATION

MODEL SBE

D-2-1 INTRODUCTION

D-2-1-1 Functionally the SBE can be considered as four similar stages in which signals are amplified and raised in frequency. They are the (1) audio, (2) low, (3) medium and (4) high frequency modulation stages. These are followed by the final RF amplification and tuning section. Either channel in the first stage receives the microphone or other AF input, amplifies it and applies it to the audio balanced modulator where an exceptionally stable 17 Kc carrier from a crystal controlled oscillator is also applied. The two principle sidebands normally generated by modulation and the appreciably attenuated 17 Kc carrier appear in the audio modulator output. Both sidebands are then passed to a special sharp filter which removes one and passes the other on to the 17 Kc notch filter. The other audio input channel in the first stage is similar in operation with the exception that where the first channel passes the lower sideband from its modulator, the second channel passes only the upper sideband from its modulator. Both channels are used simultaneously in the A.M., double sideband, and independent sideband modes of operation.

D-2-1-2 The above is a general description of the first stage. Each of the three following stages is comparable to the first in operation. Briefly, the input to either or both channels, in this case, of the stage has been amplified and used to modulate a higher frequency in a special device (balanced modulator), for the generation of sidebands without carrier. One sideband was eliminated from each channel by a filter, one each passed on to serve as an input to the next stage where with some exceptions, the process begins again.

D-2-1-3 The 17 Kc notch filter which follows the audio frequency balanced modulators and filters is used to reduce any remaining 17 Kc carrier to a negligible level. The carrier to be transmitted for any of the reasons previously explained may then be inserted by a front panel control. All outputs from this section are then passed to the Low Frequency (LF) amplifier where the next stage begins.

D-2-1-4 The LF stage raises all frequencies previously centered about 17 Kc to the 270 Kc level. Once again a stable oscillator, this time 287 Kc, provides a carrier for the balanced modulator. Notice that there is no sideband filter as such employed in this stage. The bandpass characteristics of the following amplifier serves as a filter by passing only the lower sideband, centered on 270 Kc.

D-2-1-5 The mid-frequency (MF) stage, which follows the LF stage, is tuned according to the MF injection frequency (VMO) or XTAL). The stage raises and amplifies the signal frequency just as the previous ones do. The high frequency (HF) modulator (Z 107) raises the MF output to the final RF range by use of a selected crystal controlled HF oscillator. This completes the last of the four modulation stages in the Model SBE.

D-2-1-6 Final frequency adjustments, tuning and amplification are accomplished in the RF amplifier stages. The output of the exciter can range from 0 to 3 watts peak envelope power (PEP) by operation of the output control on the front panel.

D-2-2 GENERAL DESCRIPTION OF CIRCUITS

A. AUDIO CHANNELS

Connections for two audio input channels (600 ohm balanced or unbalanced) are provided on terminal strip E101. Channel 1, terminals 6, 7, 8: Channel 2, terminals 10, 11, 12. Terminals 7 and 11 may be grounded for systems balanced to ground. Terminals 8 and 12 may be grounded when used for systems unbalanced to ground. -20 db audio level is required at each channel input for full output of the Exciter. When a high impedance mike is plugged into the front panel MIKE jack, a preamp stage (V101) raises the signal to the -20 db level required for direct channel input. The outputs of V101, T101 and T102 are fed to S101 upper (USB) and S102 lower (LSB) sideband selector switches. The audio selected by these switches (Channel 1, 2 or MIKE) then goes to R168 (USB) and R169 (LSB) GAIN controls. R168 and R169 center arms are connected to S106D, for inverting upper and lower sideband input when the Exciter is operating in the 3.73 to 4.27 Mc range. Inversion takes place at this point to allow for a modulation inversion which occurs in a later circuit (Z107) above 4 Mc. The audio taken from S106D is amplified by V102 and V103, audio amplifiers. Audio is also taken from the center arms of R168 (USB GAIN) and R169 (LSB GAIN) to feed metering amplifiers V107A and V107B. Outputs of these amplifiers are connected to CR104 where in-

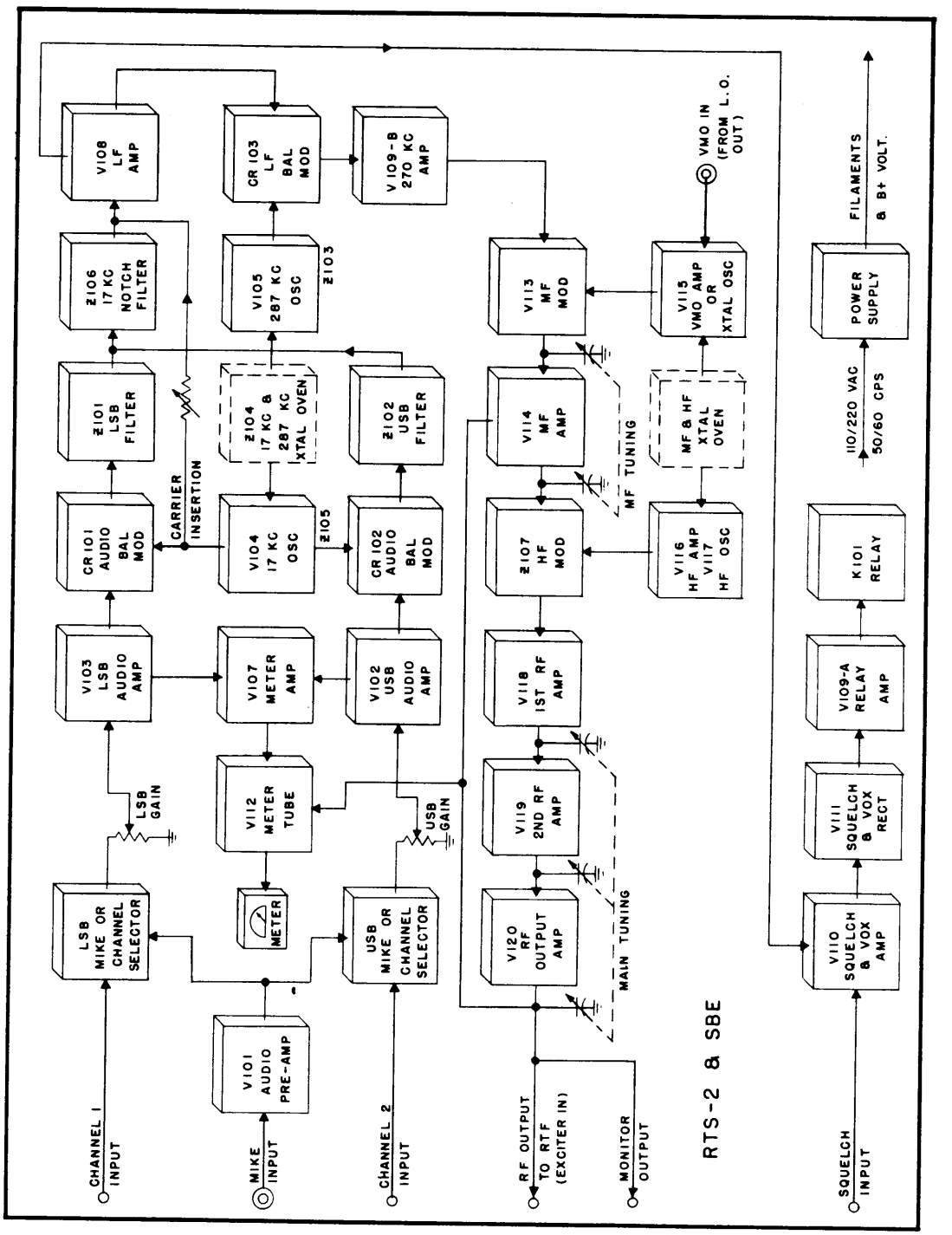

Figure D-2-1 Block Diagram, Model SBE.

coming signal peaks are rectified and coupled to V112/M101, a bridge type VTVM. This circuit is a peak reading device rather than an RMS indicating meter circuit.

Other inputs on terminal board E101 include the following:

Terminal 1 and Ground is intended for push-to-talk keying line when the VOX and squelch circuits are not in use.

Terminal 2 (gnd) and Terminal 3 are CW keying terminals.

Terminal 4 is grounded by K101 (exciter control relay) and can be used to energize an associated RF Amplifier/Transmitter.

Terminal 13 is the squelch input which is normally obtained from the 600 ohm output of a receiver at the operating position.

Terminals 5, 9, 14 are grounded.

B. AUDIO BALANCED MODULATOR AND SIDEBAND FILTERS

V102 and V103 operate as either upper or lower sideband amplifiers as explained in Part A above. However, T104 and CR101 will be referred to as the LSB audio balanced modulator, and T103 and CR102 as the USB audio balanced modulator. This sideband relationship is always true when using intermediate frequency; inversion of sidebands occurs in a later mixing circuit.

T104 couples incoming audio (from S106D amplified by V103) to CR101, a bridge type diode modulator. Pins 7-8 and 5-6 of CR101 form one set of bridge arms; and pins 2 and 3 form the other set. Z104 and Z105 are in a very stable amplitude regulated 17 Kc crystal oscillator circuit, the output of which is coupled to the center arm of R110 and R112 through T105.

R110 and R112 are used to equalize the injection voltage to pins 2 and 3 of CR101 and CR 102. When this is achieved, the inputs to Z101 and Z102 will consist of two low frequency signals of (17 Kc plus audio) and (17 Kc minus audio); e.g. if a single 1000 cps tone were applied to channel 1 transformer T101, and S101 (USB) switch is put in CH 1 position, the input to Z101 is (17 Kc plus 1 Kc and 17 Kc minus 1 Kc) or 18 and 16 Kc respectively. The 17 Kc carrier is almost completely balanced out by the proper adjustment of R110 and R112.

Z101 LSB filter is designed to pass only frequencies from 13.7 Kc to 16.650 Kc, thus only the sideband below the suppressed 17 Kc carrier is passed on to Z106. Z102 USB filter performs in the same manner as Z101, differing in that it passes frequencies between 17.350 Kc and 20.650 Kc, or the upper sideband, to Z106.

C. 17 Kc NOTCH FILTER

In operational modes where both sidebands are used simultaneously, upper and lower sidebands will not hetrodyne but will pass together through the 17 Kc notch filter (Z106) where any remaining carrier is reduced to an insignificant level.

D. LOW FREQUENCY AMPLIFIER

V108A and V108B are conventional RC coupled class A amplifiers which amplify USB and/or LSB frequencies centered about 17 Kc which are transformer coupled to the next stage by T106.

E. VOX CIRCUIT

The VOX circuit is operated by a portion of the 17 Kc USB and/or LSB energies taken from pin 2 of T106 and coupled to pin 2 (control grid) of V110 squelch and VOX amplifier. The gain of this amplifier is controlled by R140, VOX GAIN. The output is coupled to pin 2 (plate) of V111 squelch and VOX rectifier. DC output is developed across R145/C129 and amplified by V109A, relay amplifier, which operates K101, the exciter actuating relay. The threshold of the signal level required to operate this circuit is controlled by R140, VOX GAIN.

F. SQUELCH CIRCUIT

Some negative DC is also applied to the control grid of V109A by the squelch section of V111 rectifier, pins 1-7. The actuating signal for this part of the circuit is supplied by the squelch amplifier section V110, pins 1, 8 and 9, the input for which is terminal 13, E101, through SQUELCH GAIN control R129. The action of the squelch circuit is such that audio, originating from a receiver audio output terminal causes the opposite action of the VOX circuit on the control grid of V109A. The purpose of the squelch circuit is to prevent the audio from any nearby receiver from actuating the Exciter. When VOX and SQUELCH gains are properly set, only the operator talking directly into the mike will actuate the Exciter.

G. CARRIER INSERTION

Front panel control R106 (CARRIER INSERT) selects any degree of carrier insertion from -55 db to full output of the Exciter. It does so by taking a small amount of 17 Kc output from T105 and applying this in a controlled amount to pin 8 (cathode) of V108B, LF amplifier.

H. LOW FREQUENCY BALANCED MODULATOR

Either or both sideband signals amplified by V108 and coupled to the IF balanced modulator CR103 are generated about a center frequency of 17 Kc. Further mixing processes are now necessary to bring the output signal to the desired frequency. Sidebands centered on 17 Kc are applied to pins 5-6, 7-8 of CR103. 287 Kc injection voltage is taken from pin 8 of V105 (287 Kc oscillator) through C124. R113 provides a means of balancing the 287 Kc voltage on pins 2 and 3 of CR103 (modulator bridge). 270 Kc output (287 Kc - 17 Kc) sideband energy is taken from pins 2 and 3 of CR103 and passes through the 270 Kc LF transformer T108.

I. 270 Kc AMPLIFIER

Sideband energy centering around 270 Kc passes through T108 (270 Kc LF transformer) and is applied to pin 7 (grid) of V109B which is a conventional class A amplifier. The 270 Kc output of V109B is coupled to V113, the MF modulator, by T107.

J. MID FREQUENCY MODULATOR

Sideband energy centering around 270 Kc is coupled by T107 to pins 2 and 7 of push-pull amplifier V113. Mid-frequency injection is obtained from V115 which is controlled by the crystal oscillator section or VMO input from J104. This injection frequency is 270 Kc above the output of the MF modulator. The mid-frequency dial is calibrated to read directly in terms of the MF injection frequency although its circuit (C167 etc.) is actually tuned 270 Kc below it. The VMO or MF crystal frequency corresponds to this dial reading. The balancing out of the mid-frequency injection is accomplished by the MF balance control R130 which varies the gain of the A and B sections of V113 so that the mid-frequency injection cancels in the primary of T109. However, the mid-frequency (injection minus 270 Kc) is passed through T109. The MF modulator serves as the final modulation stage when output frequencies of less than 4.27 Mc are required from the Exciter. Under all other conditions its output is further raised in frequency by the HF modulator.

K. MID-FREQUENCY AMPLIFIER

V114 is a Class A RF Amplifier in which the input and output circuits are tuned to the MF output of V113. The output level of V114 is metered by M101 through CR106, S109 and V112. The output of V114 is applied to the HF balanced modulator through T110.

L. HIGH FREQUENCY MODULATOR

The function of the HF Modulator (Z107) is to provide final output frequencies from 4.27 Mc to 32.27 Mc by modulating the output of the MF Amplifier with an injection frequency from the HF Oscillator. Outputs below 4.27 Mcs, as previously explained, are exactly as produced in the MF Modulator (V113).

Injection frequencies from 8 Mc to 34 Mc in 2 Mc steps are supplied by the crystal controlled HF oscillator, V117. The proper injection is selected by use of the BAND MCS switch, a front panel control. The injection is always between 1.73 Mc and 3.73 Mc higher than the output of Z107. The BAND MCS switch is used in the 0 position when SBE outputs below 4.27 Mc are required. In this case an 18 Mc injection is applied to Z107 to prevent intermodulation distortion by keeping the diodes CR107 and CR108 properly biased. The 18 Mc injection and the sidebands produced in Z107 are not passed by the RF Amplifiers which are tuned to 4.27 Mc or less (approx. 13 Mc away) in this instance.

The output of Z107 is coupled to V118, the first RF Amplifier.

M. AMPLIFIERS, V118, V119 and V120

The RF output taken from R205 is now at the output frequency of the Exciter. The purpose of V118, V119 and V120 is to build up the generated signal to the rated 3 watt PEP output of the Exciter. These stages are gang tuned and band-switched by S106A, B, C, D to continuously cover the frequency range of 2 to 32 Mc. A small portion of the output is applied to R210 and R211 where through C176 and CR109 a small DC voltage is produced which is proportional to the output envelope peaks of the Exciter. This voltage is indicated by the V112/M101 metering circuit. An output indication of 100 equals 3 watts PEP when S109 meter switch is in the RF OUT position.

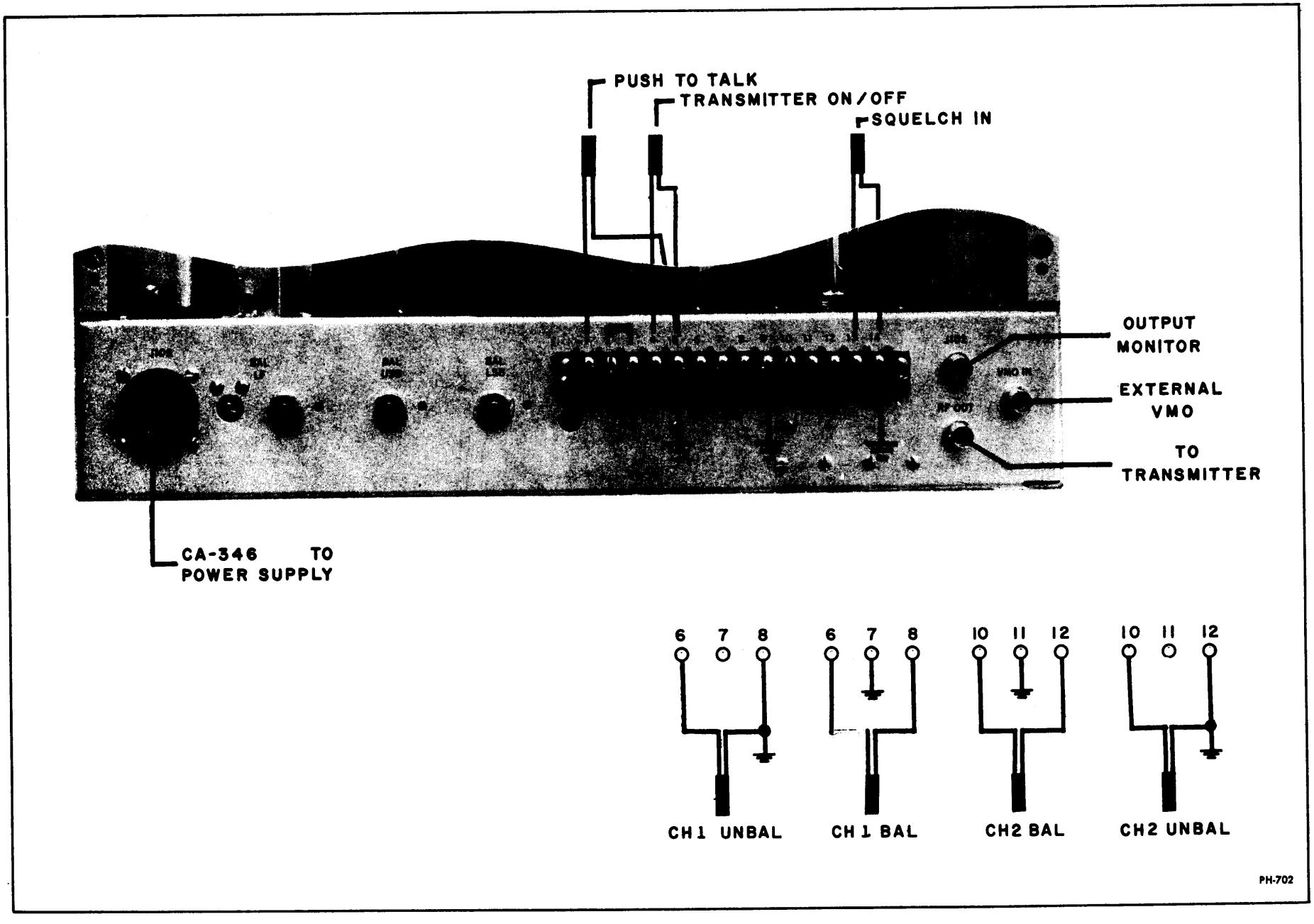

Figure D-2-2 Rear Panel Connections

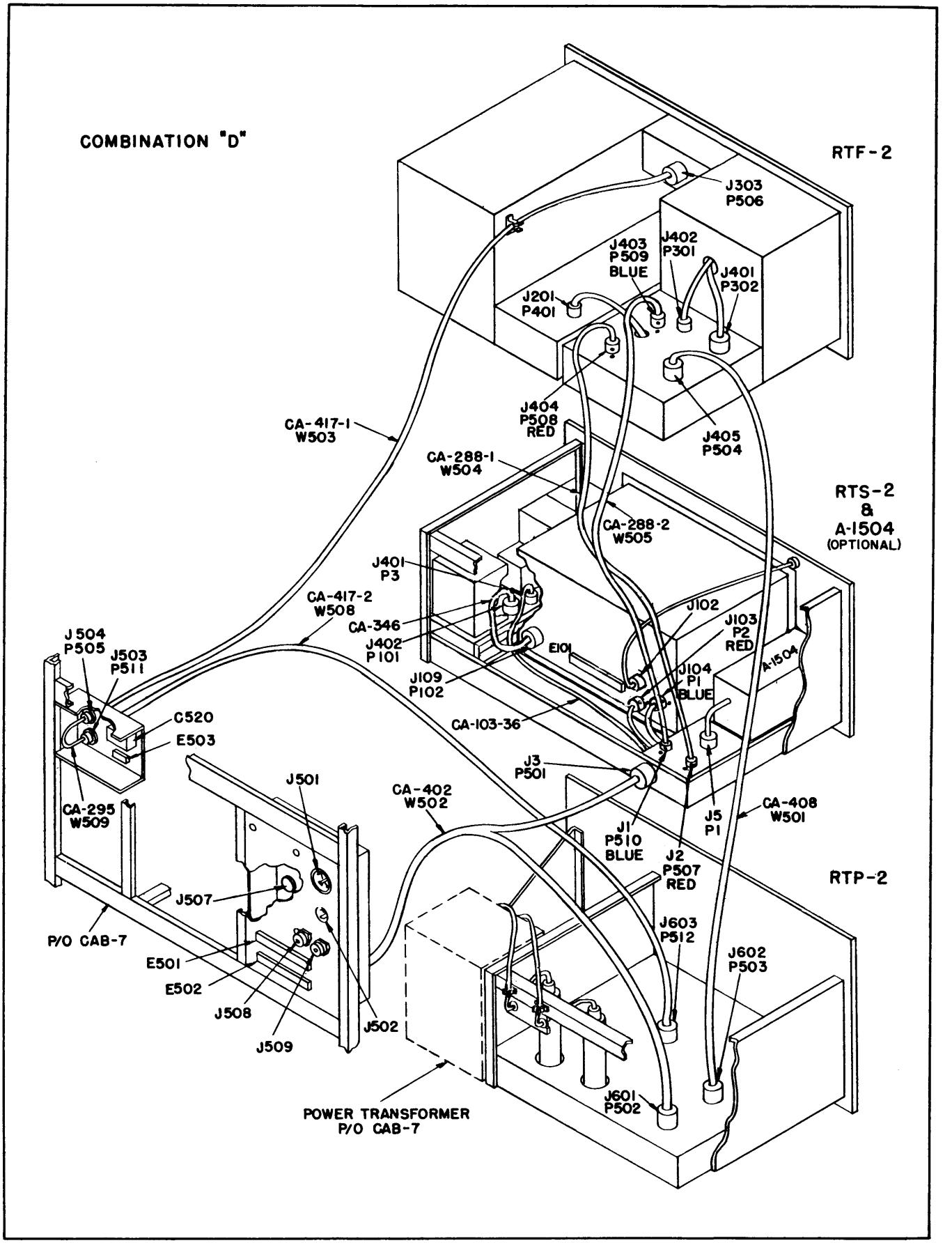

Figure D-2-3 Cabling Connections Model GPT-750D2

SECTION III
INSTALLATION AND OPERATION

D-3-1 INSTALLATION

D-3-1-1 ELECTRICAL CONNECTIONS, INTERNAL

D-3-1-1-1 The following connections should be made in the step by step sequence indicated. Reference should be made to the cabling diagram Figure D-2-1 included in this manual. Double check each connection by referring to plug (P) and jack (J) numbers stamped on the chassis, and to labels on each cable, not to color coding alone. This precaution will assure correct connection of cables and prevent possible damage to the equipment.

A. Pull out the RTP-2 (Transmitter Power Supply) drawer (lower) for access to connectors in rear.

B. Connect P502 of CA-402 (cabinet cable) to J601 of the RTP-2.

C. Connect P503 of CA-408 to J602 of the RTP-2.

D. Insert both 872A rectifier tubes into their respective sockets in the RTP-2 deck and connect one of the high voltage leads to each plate cap. These leads are interchangeable so there is no possibility of having them reversed.

E. Connect high voltage lead CA-417-2 of the RTP-2 to J503 of the cabinet.

F. Remove the long cover from the relay deck of the RTP-2 by loosening the twist lock fasteners and insert the time delay relay, K602, and its shield.

G. Install the remainder of the tubes in the RTP-2 deck.

H. Replace the cover over the Relay Deck.

J. Close the RTP-2 drawer.

L. Pull out the RTF-2 (upper) drawer until it locks in the extended position.

M. Connect P506 of CA-417-1 (cabinet assembly) to J303 of the RTF-2.

N. Connect P504 of CA-408 from the RTP-2 Deck to J405 of the RTF-2.

P. Make the following intra-chassis connections on the RTF-2 deck:

(1) J402 to P301
(2) J401 to P302
(3) J201 to P401

Q. Connect P508 (red) of CA-288-1 to J404 (red) of the RTF-2.

R. Connect P509 (blue) of CA-288-2 to J403 (blue) of the RTF-2.

S. Install all tubes in the RTF-2 drawer.

T. Close the RTF-2 drawer.

U. Open the RTS-2 drawer (center).

V. Connect P507 (red) of CA-288-1 from the RTF-2 to J2 (red) of the RTS-2.

W. Connect P510 (blue) of CA-288-2 from the RTF-2 to J1 (blue) of the RTS-2.

X. Connect P501 of CA-402 from the cabinet to J3 of the RTS-2.

Y. Check all cable connections on the RTS-2 to see that all plugs are twist locked in their respective jacks.

Z. Close the RTS-2 drawer.

D-3-1-2 ACCESSORIES

D-3-1-2-1 Optional 12 Volt Power Supply

D-3-1-2-1-1 A 12 volt DC power supply (A-1504) is available with the GPT-750D2 transmitter. When ordered, it is installed in the RTS-2 drawer. It is used as a source of power for the operation of standard remote RADIOPHONE UNITS.

D-3-1-2-1-2 The connections necessary to complete installation of the RADIOPHONE UNITS are made on terminal strips E501 and E502 located on the outside of the GPT-750 cabinet/frame assembly (CAB-7) at the rear. Wires used for this purpose must not be smaller than #22 and should be insulated for 500 volts or more. Technicians making the installation are advised to consider voltage drop over the entire length of wire being used when choosing its proper size.

D-3-1-2-1-3 Figure D-3-1 shows how one or two C-1207/UR units may be used. There are several ways in which operation may be conducted. For example, it is possible to have each RADIOPHONE UNIT operate independently at the same time over separate sidebands of the same GPT-750(D) transmitter. This and any other mode of operation is determined by the positions of the exciter controls.

D-3-2 OPERATION

D-3-2-1 Description of Controls and Indicators

RTP-2

CONTROL	FUNCTION
MAIN POWER ON/OFF	Applies AC voltage to the transmitter and provides automatic overload protection.

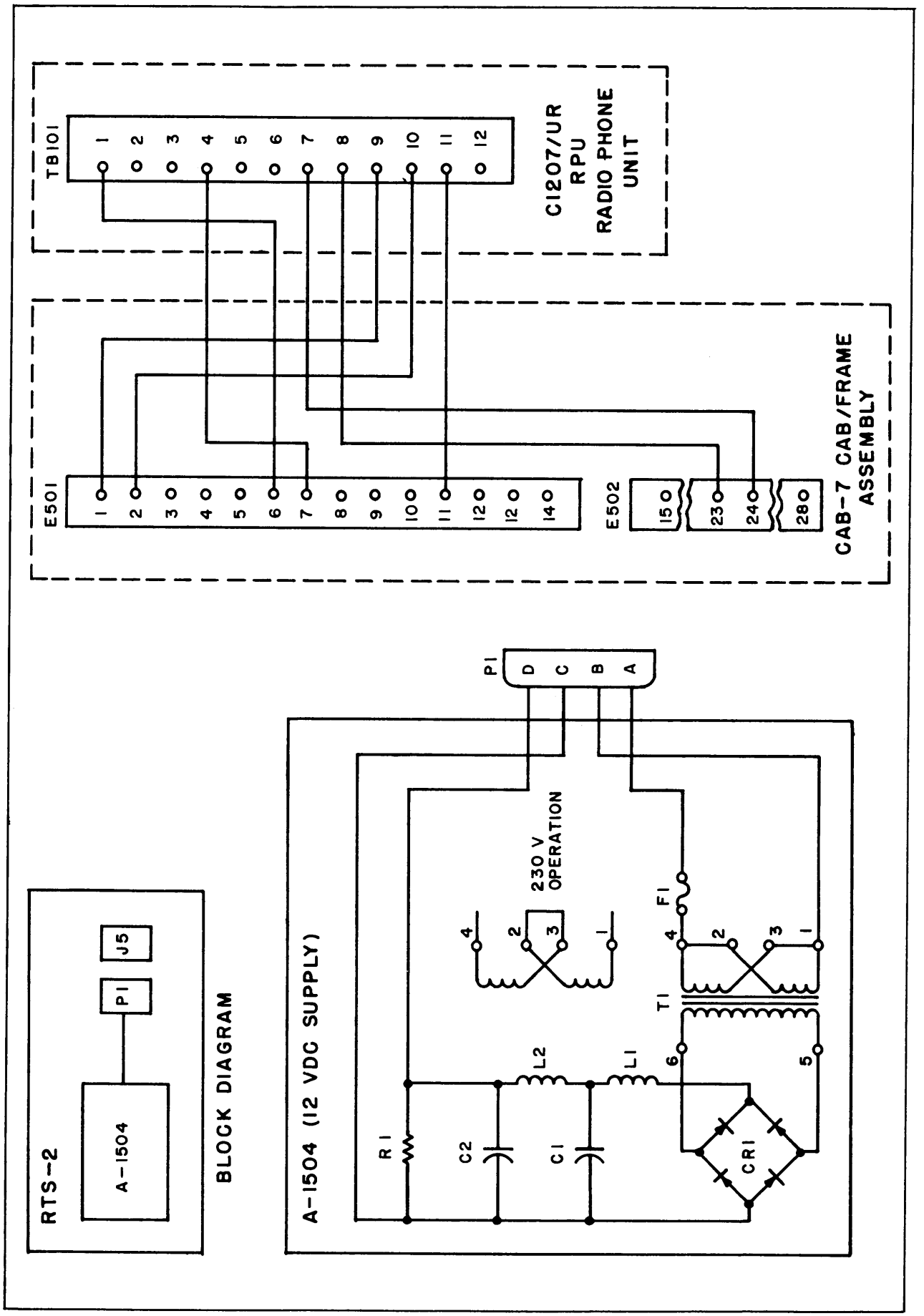

Figure D-3-1 Cabling Diagram 12 Volt Power Supply

FILAMENT LINE (meter)	Indicates voltage at primary of filament transformer, T603.
FILAMENT LINE ADJUST	Selects taps on the filament transformer to maintain the desired 115 VAC.
UTILITY OUTLET	Convenience power outlet.
TRANSMITTER PLATES	Applies plate voltage to the low level stages and high voltage to the PA stage when the FINAL PLATE switch is ON.
FINAL OVERLOAD (SG/PLATE)	Resets overload relay system when tripped by excessive PA plate or screen grid currents.
MODE	Selects PHONE, TUNE, CW-FS or SSB operation.
FINAL PLATES	Applies high voltage to the PA stage when transmitter PLATES switch is ON.
MO BYPASS NORM/BYPASS (In RTP-2)	Allows Master Oscillator oven to continue operation when transmitter main breaker is off.

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EXCITER UNIT

POWER ON/OFF (S103)	ON - Applies line voltage to SBE Power Supply. OFF - Disconnects line voltage from Power Supply.
EXCITER ON/ STANDBY (S105)	ON - Activates RF stages of the exciter without need for VOX or push-to-talk keying and without operating transmitter. STANDBY - Allows MIKE voice (VOX) or push-to-talk to activate the RF stages of the exciter and the associated transmitter when the XMTR ON/OFF switch is in the OFF position.
XMTR ON/OFF (S104)	ON - Applies high voltage to the transmitter when Transmitter Plates switch is in standby/remote position and Final Plates switch is on. By-passes and eliminates need for VOX or push-to-talk. OFF - Permits operation of the transmitter by VOX or push - to - talk circuit when EXCITER switch is in STANDBY position.
LSB	Switch selects audio input source (MIKE or external line) for lower sideband channel. GAIN - Adjusts level of LSB audio input.
USB	Switch selects audio input source (MIKE or external line) for Upper Sideband channel. GAIN - Adjusts level of USB Audio input.
VOX GAIN	Voice operated relay circuit gain control.
SQUELCH GAIN	Adjusts level at which squelch feature used in conjunction with VOX circuit becomes operative.
MF XTAL SW	Selects either external oscillator (VMO) or proper crystal for mid frequency oscillator.
BAND MCS	Indicates mixing frequency range of the HF modulator in 2 megacycles increments. It is controlled by the knob beneath the dial.

CARRIER INSERT	Controls level of carrier insertion from 0 to 100%.
OUTPUT TUNING	Selects output frequency band and adjusts setting of main tuning dial centrally located above knob.
MF TUNING	Tunes mid frequency circuit of the exciter the frequency of which is indicated by a dial below the lower section of main tuning dial.
OUTPUT	Adjust exciter output power level.
METER SW	CAL position is used to zero meter. Selects point in system to be measured by built - in VTVM circuit.
CAL	Adjustment located directly beneath meter. Use screwdriver to zero meter when METER SW is in CAL position.
EXCITER Lamp	Glows during operation when EXCITER switch is manually thrown to "ON" position or exciter is activated through VOX or push-to-talk circuit.
OVEN Lamp	Glows during operation when thermostats demand oven heating (automatic).
MIKE	Input jack to audio pre-amp for all high impedance (500K) microphones.

EXCITER POWER SUPPLY (RTS-2 DECK)

LAMP	Glows during operation. Indicates MAIN fuse intact and power is applied.
B+ FUSE MAIN FUSE OVEN FUSE	These fuses protect their respective circuits.

RTF-2

INNER OVEN (lamp)	Lights when inner oven is warming.
OUTER OVEN (lamp)	Lights when outer oven is warming.
ZERO BEAT (lamp)	Indicates when outer oven is warming. Indicates ZERO BEAT in calibration of Master Oscillator during calibration procedure.
CALIBRATE	Used to bring the Master Oscillator to calibration during the calibration procedure.
MASTER OSCILLATOR FREQUENCY	Tunes Master Oscillator to frequency indicated on the dial.
KEY	Can be used for ON/OFF keying of transmitter during CW operation.
PHONES	Audible monitoring of ZERO BEAT during MO calibration.
OSCILLATOR	Selects source of frequency control for transmitter or calibration of MO.
MULTIMETER	Measures points selected by associated switch.
MULTI-METER (switch)	Selects measurement of: PA ebb DRIVER Ip PA Isg PA Ig PA Eg RF
PA PLATE (meter)	Indicates PA plate current.
RF OUTPUT	Indicates RF Output current.

DRIVER TUNING	Varies the multiplier and PA driver tuning capacitor.
DRIVE	Varies the amount of drive to the PA grids.
DRIVER BAND	Changes frequency range of the driver and multiplier.
PA TUNING	Varies the main tuning vacuum capacitor which is an integral part of the PA Pi tank.
PA BAND	Sets the PA tank to the proper output frequency band by tapping of the output coil.
ANTENNA LOADING	Adjusts the amount of coupling to the load.
AUX. LOADING	Switches in an additional loading capacitor for loads of lower impedance.
TEST KEY	Provides emergency and test keying.
NORMAL-SSB switch (Internal)	Selects normal position for AM, FS, CW operation; or SSB operation.
EXCITATION switch (Internal)	Selects LO "ON" or "OFF" in SSB or FS positions or CW-PHONE operation.

D-3-2-2 VMO VS CRYSTAL FREQUENCY CONTROL

D-3-2-2-1 The mode of operation as well as the output frequency and power level of the transmitter is controlled by the exciter (SBE). The mid-frequency (MF) modulator section of the exciter is the actual frequency controlling stage. It can be supplied with an injection frequency controlled by the crystals in its own thermostatically governed oven, or with an injection frequency from an external VMO (Variable Master Oscillator)

D-3-2-2-2 Crystal control offers the highest degree of stability and the advantage of switching to any of ten preselected crystals, thereby reducing the number of adjustments necessary in changing frequency. Master oscillator control offers the advantage of a high degree of stability accompanied by an infinite number of output frequency possibilities immediately available within the transmitter range.

D-3-2-2-3 Although the crystals X-1, X-2, X-3 of the RTF-2 will also serve for MF injection, they are not normally used in this manner. These crystals normally serve as fixed frequency oscillators when the GPT-750D2 is used for other modes of operation without the use of the SSB exciter (SBE).

D-3-2-3 PRELIMINARY POWER - OFF ADJUSTMENTS

D-3-2-3-1 Place the following controls in the positions indicated before applying AC power to the transmitter:

RTF-2

DRIVE	-Fully counter-clock-wise.
NORMAL-SSB switch (*S204)	-SSB
EXCITATION switch (*S402)	-To be in L.O. ON position, if VMO is used with exciter, in L.O. OFF (SSB) position if not.

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XMTR ON/OFF	-OFF
EXCITER ON/STANDBY	-STANDBY
POWER ON/OFF	-OFF
OUTPUT	-Fully counter-clockwise.

RTP-2

FILAMENT LINE ADJUST	-Position two from fully counter-clock-wise.
TRANSMITTER PLATES	-STANDBY REMOTE
FINAL PLATE	-OFF
MODE	-TUNE
MAIN POWER	-OFF

*Located in RTF-2 deck. Open drawer for access. Controls are marked plainly.

D-3-2-4 PRELIMINARY POWER - ON ADJUSTMENTS

A. See that all previous steps have been accomplished.

B. Connect a 1000 watt resistive 70 or 50 ohm load or antenna to J505, the RF output jack.

C. Connect power line from appropriate source to J501.

D. Turn MAIN POWER switch ON.

E. The MAIN POWER indicator lamp should light.

F. Check the FILAMENT LINE meter for a reading of 115 volts.

G. Use FILAMENT LINE ADJUST control for correction if necessary.

D-3-2-5 CALIBRATION OF VMO
(See Part "GENERAL")

D-3-2-6 EXCITER OPERATION

D-3-2-6-1 General

D-3-2-6-1-1 The Model SBE tuning is done in a series of steps, depending upon the mode of operation required. The following is a general tuning procedure giving specific examples where needed for clarity. The built-in VTVM may be used for all measurements necessary for operation. Voltage checks called out in the following text may be obtained by use of the exciter METER SW.

D-3-2-6-2 Initial Adjustments

A. If the VMO in the GPT-750D2 is to be used, throw the TRANSMITTER PLATES switch to "OPERATE".

B. Be sure the transmitter FINAL PLATE switch is OFF and the SBE OUTPUT control is fully counter-clockwise.

C. Turn the Exciter POWER ON/OFF switch to ON. Allow a one hour warm-up period.

D. Turn the Exciter METER SW to the CAL position and zero the meter by use of the screwdriver adjustment (labeled "CAL") located directly below the meter on the front panel.

E. Place USB, LSB and XMTR switches in their OFF positions.

F. Turn the VOX GAIN and SQUELCH GAIN controls fully counter-clockwise.

G. Place the EXCITER ON/STANDBY switch in the STANDBY position. The equipment is now ready to be tuned.

H. Place XMTR switch on the SBE in "OFF" position.

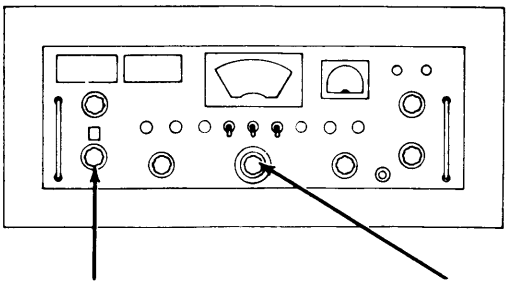
D-3-2-6-3 Selection of VMO or Crystal Frequency

D-3-2-6-3-1 The MF XTAL OVEN of the Exciter contains sockets for ten crystals any of which may be selected for use by the MF XTAL SW located on the front panel. The formula for selecting the proper crystal for MF injection according to the output frequency desired is as follows. This formula also applies to the VMO frequency if such is to be used instead of crystals.

A. Formulas for the General Case For crystal or VMO operation from 4.27 Mcs to 32 Mcs.

$$F_{xtal \text{ or } vmo} = 2.000(N) - F_{output} + .270$$

D-3-2-6-3-2 Where all frequencies are in Mcs and F_{output} is assumed to be the frequency of the (transmitted or suppressed) output carrier. The factor (N) is obtained from the table below. For RF output frequencies in the range of 2.0 to 4.27 Mc, $F_{xtal \text{ or } VMO} = F_{output} + .270$ Mc.



MODULATOR BAND	N	OUTPUT BAND
4.27 - 6.27	4	4 - 8
6.27 - 8.27	5	4 - 8 & 8 - 16
8.27 - 10.27	6	8 - 16
10.27 - 12.27	7	8 - 16
12.27 - 14.27	8	8 - 16
14.27 - 16.27	9	8 - 16 & 16 - 32
16.27 - 18.27	10	16 - 32
18.27 - 20.27	11	16 - 32
20.27 - 22.27	12	16 - 32
22.27 - 24.27	13	16 - 32
24.27 - 26.27	14	16 - 32
26.27 - 28.27	15	16 - 32
28.27 - 30.27	16	16 - 32
30.27 - 32.27	17	16 - 32

Example:

Suppose an output frequency of 10.5 Mcs is desired.

$$F_{xtal \text{ or } vmo} = 2.000\ (7) - 10.500 + .270$$

$$F_{xtal \text{ or } vmo} = 3.770 \text{ Mcs}$$

D-3-2-6-3-3 The single exception to the use of this formula is the case where the frequency range of the MF injection source (the VMO in the

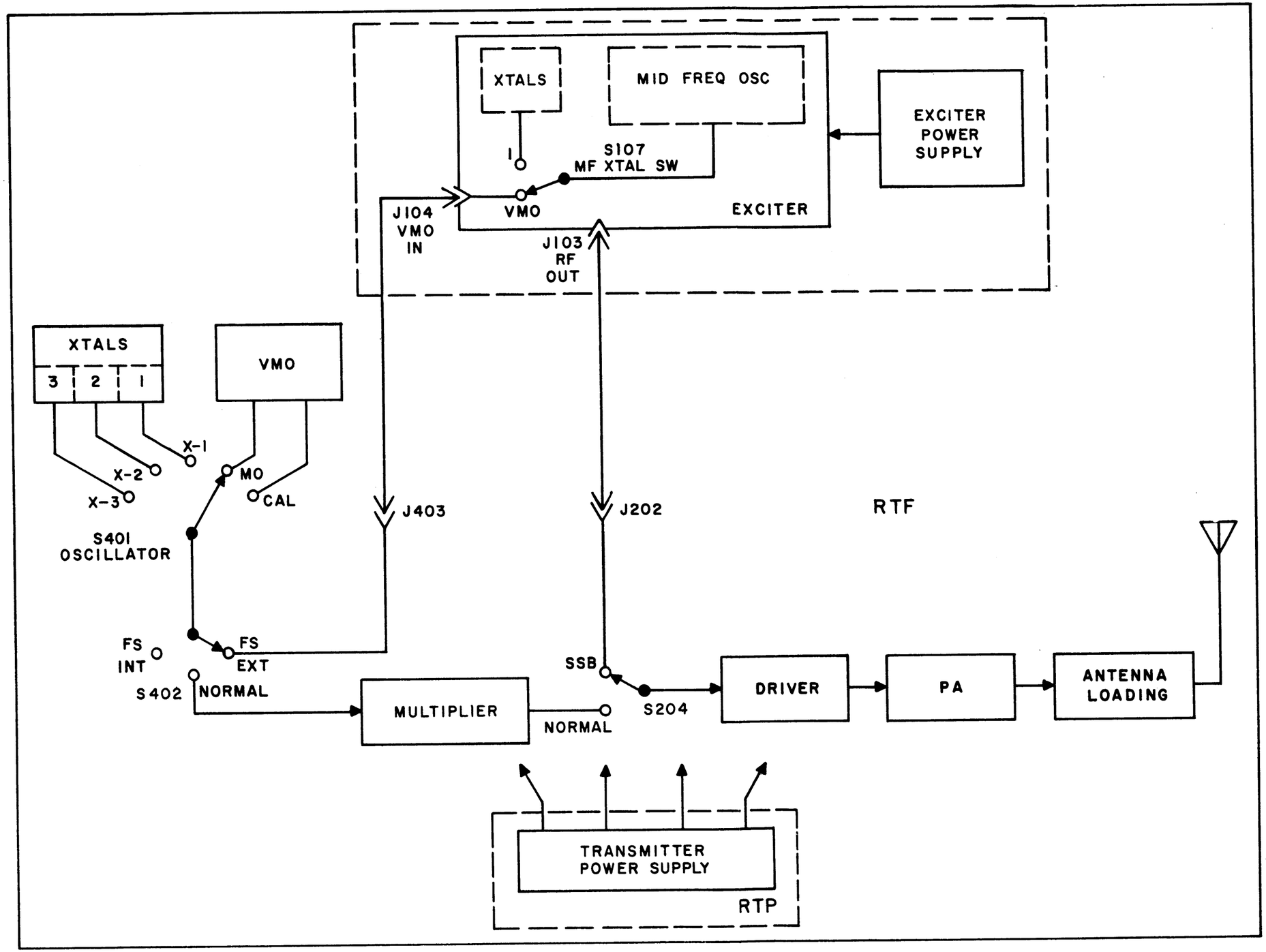


Figure D-3-2 Switching Diagram

GPT-750D2), for example) is not sufficient to permit generation of frequencies above 4.0 Mc (for output frequencies in the range of 3.73 to 4.27 Mc). Apply the following formula when such conditions exist:

OPERATING FREQUENCY (F_O):
3.27 to 4.27

BAND MCS SWITCH POSITION:
2 to 4.27

OUTPUT TUNING BANDSWITCH:
2 to 4

VMO:
F_O - .270

MF TUNING DIAL READING:
F_O + .270

OUTPUT TUNING DIAL:
F_O

NOTE: All above in megacycles. Upper and Lower Sideband Audio Channel inputs must be reversed.

D-3-2-6-4 MF Tuning, General

D-3-2-6-4-1 The Mid-frequency stages of the exciter must now be tuned to the injection frequency. Proceed as follows:

A. Place the Exciter METER SW in the MF position.

B. Be sure MF XTAL SW is turned to VMO or Crystal position of injection frequency desired.

C. Using MF TUNING control, set MF dial reading to correspond to VMO or crystal (injection) frequency selected. (Note exception in paragraph D-3-2-6-3-3 above).

D. Place the EXCITER ON/STANDBY switch in the STANDBY position.

E. Turn the CARRIER INSERT control fully clockwise.

F. Adjust the MF TUNING control for a peak reading on the meter. If the meter pins it may be necessary to reduce the setting of the CARRIER INSERT control. Very little control movement will be necessary if the dial reading has been carefully set as indicated above. Rely on the dial reading. Do not tune to an adjacent peak even though it may produce a higher reading on the meter.

D-3-2-6-5 MF Tuning, Special

D-3-2-6-5-1 This special tuning procedure applies only to the case outlined above where MF injection frequencies above 4.00 Mcs are not available for the provision of output frequencies in the range of 3.27 Mc to 4.27 Mc generated in the normal manner.

A. Turn meter switch to MF position.

B. Turn MF XTAL SW to VMO or XTAL position to be used.

C. Set the MF dial to read 270 Kc above the desired final output frequency. This properly tunes the MF amplifier whose tuning is always 270 Kc below the dial reading. This dial reading is also 540 Kc above the selected MF injection frequency (VMO or XTAL). The MF section provides all final output frequencies when the OUTPUT TUNING bandswitch is in the 2-4 Mc position.

NOTE

Under normal conditions the output of the MF Modulator-Amplifier section is centered on a frequency equal to the MF injection frequency less 270 Kc from the LF section. Outputs in the range of 3.73 to 4.27 Mc are not obtained in the usual manner when MF injection sources from 4.00 to 4.54 Mc are not available. It is for this reason that upper sideband products (centered on the MF injection frequency plus 270 Kc from the LF section) are to be used.

D. Place USB, LSB and XMTR switches in their OFF positions.

E. Turn the VOX GAIN control fully counterclockwise.

F. Place EXCITER ON/STANDBY switch in the STANDBY position.

G. Turn the CARRIER INSERT control fully clockwise.

NOTE: Adjust the MF TUNING control for a peak reading on the meter. If the meter pins it may be necessary to reduce the setting of the CARRIER INSERT control. Very little control movement should be necessary. Rely on the dial reading. Do not tune to an adjacent peak even though it may produce a higher reading on the meter.

H. When operating on sidebands under these conditions it is necessary that the sidebands inputs be reversed in order to obtain their proper relationship in the output. This means that a signal which is to be transmitted as an upper sideband, for example, must be introduced to the Exciter on the LSB input.

D-3-2-6-6 RF Tuning

A. Do not alter MF tuning.

B. Set BAND MCS SW to frequency range being used.

C. Set OUTPUT TUNING bandswitch to frequency being used.

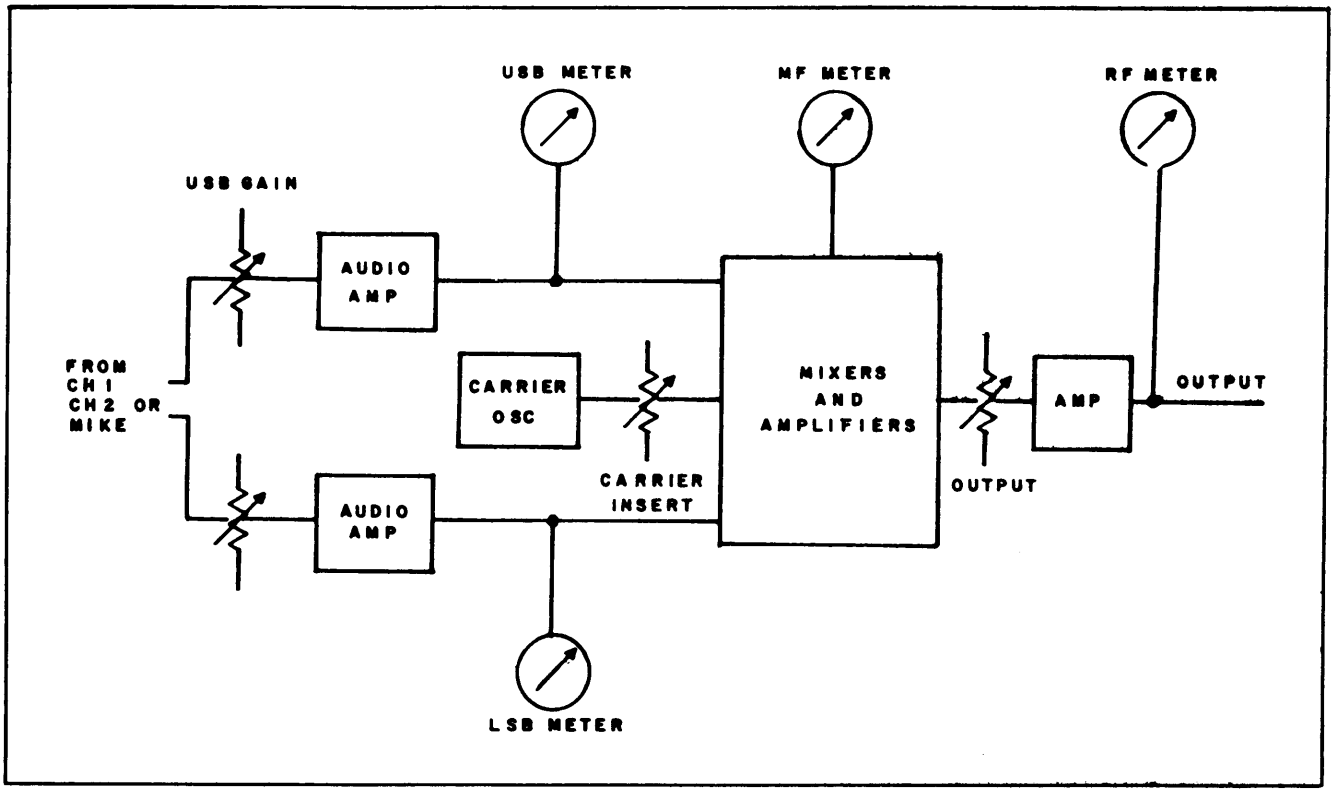


Figure D-3-3 Metering and Gain Controls Block Diagram

D. Place METER SW in RF position.

E. Using OUTPUT TUNING control, set output tuning dial to output frequency.

F. Place EXCITER ON/STANDBY switch in ON position.

G. Advance OUTPUT control for any reading on the meter.

H. Using OUTPUT TUNING control, tune for peak reading on meter. Very little control movement will be necessary. Relay upon the dial reading. Do NOT tune to a harmonic frequency.

J. Turn the OUTPUT control fully counter clockwise.

K. Throw the TRANSMITTER PLATES switch on the RTP-2 to "STANDBY/REMOTE".

L. Throw the Exciter ON/STANDBY switch to "STANDBY".

D-3-2-7 TRANSMITTER TUNING

D-3-2-7-1 Driver

A. Set the DRIVER BAND switch to the range of the desired output frequency.

B. Set the DRIVER TUNING control to the position nearest the final output frequency.

NOTE

The basic DRIVER TUNING range as indicated by the engravings on the front panel is 2 to 4 Mc. This holds only when the DRIVER BAND switch is in the 2 to 4 Mc position. When the DRIVER BAND switch is in the 4 to 8 Mc position the DRIVER TUNING markings are multiplied by 2. In the band of 8 to 16 Mc the markings are to be multiplied by 4 and in the band of 16 to 32 Mc they are to be multiplied by 8.

C. Set the MULTIMETER switch to the "PA Eg RF" position.

D. Throw the XMTR switch on the SBE to "ON".

E. Advance the OUTPUT control on the SBE to a setting of 3.

F. Turn the DRIVER TUNING control slightly clockwise or counter-clockwise until the PA Eg RF reading is at a maximum.

G. Return the OUTPUT control of the SBE to the fully counter-clockwise position.

H. Throw the XMTR switch on the SBE to the "OFF" position.

D-3-2-8 PA TUNING

A. Set the PA BAND switch to the range which includes the final output frequency.

B. Turn the MODE switch to the TUNE position.

CAUTION

BE SURE THAT AN ANTENNA OR 1000 WATT 50 OR 70 OHM DUMMY LOAD OR APPROPRIATE ANTENNA IS CONNECTED TO THE RF OUTPUT JACK (J505) OF THE TRANSMITTER.

C. Turn the FINAL PLATES switch ON.

D. Turn the ANTENNA LOADING control fully counter-clockwise.

E. Set the AUX. LOADING switch to position "0" or "+" as indicated in Figure D-3-4.

F. Set the PA TUNING control to the approximate setting according to Figure D-3-4.

G. Throw the XMTR switch on the SBE to "ON".

H. Advance the SBE OUTPUT control until the PA PLATE current increases to approximately 120 Ma.

CAUTION

A SHUNTING BAR IS PROVIDED (INSIDE THE RTF-2 ADJACENT TO THE THERMOCOUPLE) FOR THE PROTECTION OF THE RF AMMETER AND THERMOCOUPLE. IT SHOULD BE INSERTED IN THE CLIPS ON THE THERMOCOUPLE TO PREVENT OFF SCALE READING OF THE RF AMMETER UNDER CONDITIONS OF EXCESSIVE VSWR.

J. Rotate the PA TUNING control until a definite dip in the PA PLATE current is obtained.

K. Return the OUTPUT control of the SBE to the fully counter-clockwise position.

L. Turn the MODE switch to the SSB position.

M. Adjust the OUTPUT control on the SBE for a reading of approximately 20 (PA Eg RF) on the Multimeter.

N. Advance the ANTENNA LOADING control until the PA plate current rises to approximately 300 Ma.

P. Readjust the PA TUNING control until the PA PLATE current dips again.

Q. Continue to advance the ANTENNA LOADING control, each time readjusting the PA TUNING control for a dip in PA PLATE current, and to adjust the SBE OUTPUT control until a PA PLATE current of approximately 250 Ma is obtained WITH A MINIMUM OF OUTPUT, AS INDICATED BY THE PA Eg Rf METER, FROM THE SBE. The normal PA Eg Rf reading under these conditions will be between 20 and 30. In no case should the transmitter be so loaded or adjusted as to require a reading in excess of 30 on the PA Eg Rf meter. Doing so will result in excessive distortion.

R. Turn the OUTPUT control of the SBE to the fully counter-clockwise position.

S. Turn the CARRIER INSERT control of the SBE to the fully counter-clockwise position.

T. Throw the FINAL PLATES switch to the OFF position.

D-3-2-9 ADDITIONAL INFORMATION

A. The absolute settings of the ANTENNA LOADING and AUX. LOADING controls as shown in Figure D-3-4. are approximate because these controls serve to balance out reactance in the antenna system. The antenna and frequency used will therefore influence the final setting of these controls. The AUX. LOADING control will seldom be used in the zero (0) position at frequencies above the 2 to 4 megacycle range.

B. When tuning the upper end of the two highest bands (24 to 32 Mcs) it will be necessary to advance the ANTENNA LOADING control to almost the fully clockwise position in order to obtain a plate current dip with the PA TUNING control.

D-3-2-10 MODE SELECTION, PRELIMINARY INFORMATION

D-3-2-10-1 The SBE provides for the following modes of operation:

A. Single Sideband (SSB) with any degree of carrier insertion.

B. Double Sideband (DSB) with any degree of carrier insertion.

C. Double Sideband with full carrier insertion (Low Level AM).

D. Independent Sideband (ISB) with any degree of carrier insertion.

E. Continuous Wave Telegraphy (CW).

D-3-2-10-2 Gain Controls and Metering

A. Consult Figure D-3-3 for an illustration of where the carrier insertion, audio gain and metering circuits are located electrically and the function of each.

B. The USB and LSB GAIN controls vary the audio input levels to the upper and lower sideband respectively.

C. The CARRIER INSERT control varies the carrier insertion from 0 to 100%.

D. The meter circuits are selected by means of a front panel switch. They are used to indicate the USB and LSB audio levels, the MF radio frequency level, and the RF output level.

D-3-2-10-3 RF Output Components

D-3-2-10-3-1 The RF output normally consists of the following, the sum of which, as indicated by the RF output meter, must never exceed a reading of 100%:

A. Upper Sideband
B. Lower Sideband
C. Carrier

D-3-2-10-4 Formulas

D-3-2-10-4-1 The following formulas may be used to determine the proper output levels of the various RF components:

A. SSB with Carrier:
USB or LSB + carrier = 100% RF out
B. SSB without Carrier:
USB or LSB = 100% RF out
C. AM (Conventional Low Level AM):
*USB = 25%, LSB = 25%, carrier = 50%,
USB + LSB + carrier = 100% RF out
D. Double Sideband with Carrier:
*USB + *LSB + carrier = 100% RF out
E. Double Sideband without Carrier:
*USB (50%) + *LSB (50%) = 100% RF out
F. Independent Sideband (ISB) with Carrier:
USB + LSB + carrier = 100% RF out
G. Independent Sideband (ISB) without Carrier:
USB + LSB = 100% RF out
H. Continuous Wave Telegraphy (CW):
carrier = 100% RF out

*USB and LSB must be equal.

D-3-2-10-5 Preparatory

D-3-2-10-5-1 Setting of the SBE controls for apportionment of Sidebands:

A. Turn USB and LSB switches OFF.
B. Turn USB GAIN, LSB GAIN, VOX GAIN, SQUELCH GAIN, and OUTPUT controls to their fully counter-clockwise positions.
C. Set METER SW to the CAL position.
D. Adjust METER for zero indication by use of the screwdriver adjustment located directly beneath the meter itself.
E. Turn the CARRIER INSERT control to its fully clockwise position.
F. Tune the MF and RF sections of the SBE as outlined previously.
G. Turn the METER SW to the RF position.
H. Advance the OUTPUT control until the meter reads 100.
J. Turn the CARRIER INSERT control fully counter-clockwise.

NOTE: In making the adjustments indicated in step G above do not alter the setting of the SBE output control. If the control is inadvertently disturbed repeat steps E, G, H and J above before proceeding further. SEE D-3-2-6-6

D-3-2-10-6 Apportionment of RF Output Components

D-3-2-10-6-1 Choose one of the following instructions according to the mode of operation desired and with reference to the formulas in paragraph D-3-2-4 above.

A. Upper Sideband Component (USB)
(1) Set the USB switch to CH 1, CH 2, or MIKE, as appropriate.
(2) Apply audio modulation to input selected in (1) above.
(3) Advance USB GAIN control until meter indicates desired percentage on peaks.
B. Lower Sideband Component (LSB)
(1) Set LSB switch to CH 1, CH 2, or MIKE as appropriate.
(2) Apply audio modulation to input selected in (1) above.
(3) Advance LSB GAIN control until meter indicates desired percentage on peaks.
C. Both Sidebands
(1) Set USB switch to CH 1, CH 2 or MIKE as appropriate.
(2) Apply audio modulation to input selected in (1) above.
(3) Advance USB GAIN control until meter indicates desired percentage on peaks.
(4) Set the LSB switch to CH 1, CH 2, or MIKE as appropriate.
(5) Apply audio modulation to input selected in (4) above.
(6) Advance the LSB GAIN control until the meter indicates the desired percentage on peaks. The meter will indicate the arithmetical sum of the percentages of the components (USB, LSB, carrier) applied.

NOTE

The meter circuit within the SBE, as is the case with most VTVM's, has a small amount of waveform error. So, when the sidebands are set up independently of each other, the sum of 50 per cent and 50 per cent may appear as slightly less than 100 per cent on the meter. This is due to the presence of a modulated envelope which is generated when two or more frequencies are present in the output at the same time.

D. Carrier
(1) Turn USB and LSB switches to their OFF positions.
(2) Advance the CARRIER INSERT control until the meter indicates the desired percentage of carrier insertion.

NOTE

The sum of the USB, LSB and Carrier components of the RF output must never exceed 100% as indicated by the RF meter, although each individually may comprise 100% when used alone. Once the USB, LSB and Carrier percentages have been set, the OUTPUT control can be varied to provide the proper

drive level to the transmitter without altering the RF component proportions in any way.

D-3-2-11 VOX ADJUSTMENT

D-3-2-11-1 The VOX circuit will function only in the SSB and DSB operation of the unit and not with Conventional AM or SSB with full carrier.

A. Set EXCITER ON/STANDBY switch to STANDBY position.

B. Talking directly into the mike, adjust VOX GAIN until EXCITER lamp remains on with normal speech level but extinguishes with no speech input. Further adjustment may be necessary to prevent background noises from actuating the exciter.

D-3-2-12 SQUELCH GAIN ADJUSTMENT

A. Make connection from the 600 ohm audio output terminals of the station receiver to terminal board E501 as shown in Figure G-3-3.

B. Advance SQUELCH GAIN until audio from the station receiver will no longer trip the VOX circuit.

D-3-2-13 DRIVING THE TRANSMITTER IN SSB, DSB, ISB OR AM MODES OF OPERATION

D-3-2-13-1 Control Settings

D-3-2-13-2 The exciter and transmitter must be prepared, as instruced in previous sections, for operation in any of the above modes.

A. Turn the OUTPUT control of the SBE fully counter-clockwise.

B. Throw the FINAL PLATES switch of the transmitter to the ON position.

C. Set the MULTIMETER switch to the "PA Eg Rf" position.

D. Advance the OUTPUT control of the SBE while modulating the input until the PA PLATE current indicates approximately 250 Ma under steady state conditions or does not exceed approximately 250 Ma on modulation peaks.

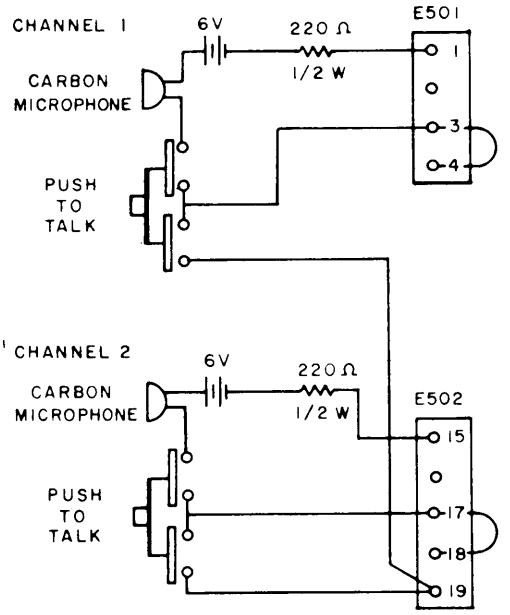
E. Throw the XMTR ON/OFF switch on the SBE to the OFF position.

D-3-2-13-3 Operation, SSB, DSB, ISB or AM

D-3-2-13-4 The transmitter is now ready to be used on the air. It may be activated by the VOX or push-to-talk controls. Push-to-talk operation must be used in any mode in which carrier is used since the VOX circuit will "lock up" upon the insertion of carrier.

D-3-2-13-5 Driving the Transmitter in the CW Mode of Operation

CARBON MICROPHONE CONNECTIONS



This circuit shows the use of 6 volts D.C. in conjunction with a 220 ohm resistor to maintain a D.C. microphone current of 20-30 ma. If a lower D.C. voltage is used, the resistance value must be lowered to maintain the 20-30 ma D.C. current rating which energizes the microphone. Since most carbon microphones have a built-in "push-to-talk switch, this switch is also shown in the circuit. The transmitter may now be operated on a push-to-talk basis from the microphone.

D-3-2-13-6 Control Settings

D-3-2-13-7 The exciter and transmitter must be prepared, as instruced in previous sections, for operation in the CW mode.

A. Attach a telegraph key (or keying line) to terminals 4 and 5 of terminal board E501 located on the rear of the transmitter cabinet (See Figure G-3-3). The transmitter may also be keyed with the test key or by connecting a telegraph key to the key jack on the front panel of the RTF-2.

B. Turn the OUTPUT control of the SBE fully counter-clockwise.

C. Throw the MODE switch to the CW-FS position.

D. Throw the XMTR ON/OFF switch on the SBE to the "ON" position.

E. Set the MULTIMETER switch to the PA Isg position.

F. Throw the FINAL PLATES switch to the ON position.

G. Key the transmitter by closing the telegraph test key.

H. Adjust the SBE output and transmitter PA

TUNING and ANTENNA LOADING controls in the manner prescribed for normal CW operation (see Part "GENERAL").

J. Open the telegraph or test key.

K. The transmitter is now ready for use in the CW mode of operation. If it is desired to turn the transmitter on and off (Transmitter Plates and Final Plates) remotely as well as remotely keying the transmitter this may be done by connecting a remote on-off switch to terminals 10 and 11 of terminal strip E501. The TRANSMITTER PLATE switch must be in the STANDBY/REMOTE position and the XMTR switch on the SBE must be in the OFF position.

FREQ MC	VMO FREQ	SBE			DRIVER		POWER AMPLIFIER								
		MF TUNING	MOD BAND	OUTPUT BAND	BAND	TUNING	PA BAND	PA TUNING	PA LOADING	PA EG-RF	PA IP	S/D RATIO DB USB	S/D RATIO DB LSB	CARRIER SUPPRESS	ANTENNA CURRENT
2.0	2270	2270	Q	2-4	2-4	1.9	2-2.5	059	0	20	200	40	40	55	2.25
2.5	2770	2770	0	2-4	2-4	2.5	2-2.5	115	45	35	210	45	45	"	"
2.5	2770	2770	0	2-4	2-4	2.5	2.5-3	067	88	25	210	45	45	"	"
3.0	3270	3270	0	2-4	2-4	3	2.5-3	112	20	30	220	40	40	"	"
3.0	3270	3270	0	2-4	2-4	3	3.0-4	069	75	30	210	40	40	"	"
4.0	3730	4270	0	2-4	2-4	4	3.0-4	130	38	30	220	45	45	"	"
4.0	3730	4270	0	4-8	4-8	2	4-6	053	72	30	220	40	40	"	"
6.0	2270	2270	4	4-8	4-8	3	4-6	140	45	30	220	42	42	"	"
6.0	2270	2270	4	4-8	4-8	3	6-8	108	25	30	225	42	42	"	"
8.0	2270	2270	5	4-8	4-8	4	6-8	151	60	30	220	42	42	"	"
8.0	2270	2270	5	8-16	8-16	2	6-8	151	60	30	210	41	41	"	"
8.0	2270	2270	5	8-16	8-16	2	8-12	132	30	30	210	42	42	"	"
10.0	2270	2270	6	8-16	8-16	2.5	8-12	157	63	30	210	41	41	"	"
12.0	2270	2270	7	8-16	8-16	3	8-12	173	78	30	210	45	45	"	"
12.0	2270	2270	7	8-16	8-16	3	12-16	164	47	30	240	40	40	"	"
14.0	2270	2270	8	8-16	8-16	3.5	12-16	176	60	30	220	43	43	"	"
16.0	2270	2270	9	8-16	8-16	4	12-16	199	75	30	225	45	45	"	"
16.0	2270	2270	9	16-32	16-32	2	16-24	155	25	30	230	40	40	"	"
18.0	2270	2270	10	16-32	16-32	2	16-24	165	25	30	210	40	40	"	"
20.0	2270	2270	11	16-32	16-32	2.5	16-24	173	60	30	225	45	45	"	"
22.0	2270	2270	12	16-32	16-32	2.6	16-24	182	65	30	225	40	40	"	"
24.0	2270	2270	13	16-32	16-32	2.9	16-24	195	72	30	225	40	40	"	"
24.0	2270	2270	13	16-32	16-32	2.8	24-32	168	50	45	210	40	40	"	"
26.0	2270	2270	14	16-32	16-32	3.1	24-32	174	55	45	210	41	41	"	"
28.0	2270	2270	15	16-32	16-32	3.4	24-32	177	80	30	290	40	40	"	"
30.0	2270	2270	16	16-32	16-32	3.6	24-32	188	72	25	240	40	40	"	"
32.0	2270	2270	17	16-32	16-32	4	24-32	207	70	25	210	35	35	55	2.25

TEST CONDITIONS:

a. 50 OHM NON-REACTIVE DUMMY LOAD.

b. POWER OUTPUT 500 WATTS PEP (2.25 AMPS AT 50 OHMS) MINIMUM.

Figure D-3-4 Tuning Chart Model GPT-750D2

SECTION IV
MAINTENANCE

D-4-1 GENERAL

D-4-1-1 The Model GPT-750D2 Transmitter is designed to provide long term trouble free operation. It is recommended that any necessary maintenance be accomplished by competent technicians familiar with sideband techniques.

D-4-1-2 Maintenance of the Basic Transmitter is covered in Part "GENERAL" the following maintenance procedures apply only to the RTS-2 (SBE).

D-4-2 OPERATOR'S MAINTENANCE

CAUTION

NEVER REPLACE A FUSE WITH ONE OF HIGHER RATING UNLESS CONTINUED OPERATION IS MORE IMPORTANT THAN PROBABLE DAMAGE TO THE EQUIPMENT. IF A FUSE BURNS OUT IMMEDIATELY AFTER REPLACEMENT, DO NOT REPLACE IT A SECOND TIME UNTIL THE TROUBLE HAS BEEN LOCATED AND CORRECTED.

D-4-2-1 All fuses and a power indicator lamp are located on the front panel of the Power Supply.

D-4-2-2 The Model SBE has triple fuse protection; oven heater, power supply primary and high voltage. (Since a partial short across the B+ line may not blow the line fuse, this separate high voltage fuse has been incorporated in the unit.)

D-4-2-3 If no meter readings can be obtained or the EXCITER lamp fails to light when the EXCITER switch is in the ON position, check F403 (B+ fuse). If dial lights and tube filaments fail to light when POWER ON/OFF switch is in the ON position, check F402 (MAIN fuse).

D-4-2-4 If after one hour warm up period the OVEN lamp fails to cycle every four or five minutes, check F401 (OVEN fuse).

D-4-3 VOLTAGE CHECKS

D-4-3-1 If, after checking tubes and fuses, and following trouble shooting chart, (at this point the trouble should be localized to a particular section or stage), check the tube socket voltages with a reliable 20,000 ohm per volt meter.

D-4-4 ALIGNMENT

D-4-4-1 Before any attempt is made to align the equipment, the following checks must be made in the order given.

A. 17 Kc Oscillator

(1) 1.0 to 1.5 volts should be found between the center arm of R110 or R112 and ground. This reading should be made with a reliable AC VTVM. If it is not correct check for faults in the 17 Kc Oscillator Section (Z105).

B. 287 Kc Oscillator

(1) Use a reliable VTVM with an RF probe to check for a reading of 1.0 to 1.5 volts from the center arm of R113 to ground. If the reading is not correct check for faults in the 287 Kc Oscillator Section (Z103).

C. Mid Frequency Oscillator

(1) Connect VMO or signal generator (2 to 4 Mc at up to 2.5 v, see below) to VMO input. Place 2 Mc and 4 Mc crystals in positions 1 and 2 respectively in the MF XTAL OVEN. Connect RF voltmeter to the junction of C163 and C164. Measure for the following voltages

MF XTAL SW	VOLTS (APPROX)
Position 1 (2 Mc)	2.5
Position 2 (4 Mc)	1.2
VMO (2 Mc)	2.0
VMO (4 Mc)	1.0

If these voltages are not obtained, check for faulty components in the mid frequency section.

D. HF Oscillator

(1) Connect RF voltmeter to top of R205 (output control), turn off MF oscillator by placing MF XTAL SW in a vacant position. Voltage should vary from 2 to 5 volts as BAND MCS switch is rotated from 0 to 14.

E. 270 Kc IF Alignment (Preliminary)

(1) Set R113 (LF BALANCE) to approximately mid position.

(2) Remote P103 from J106.

(3) Attach sensitive RF voltmeter to pin 2 of V113A.

(4) Remove CR103 and V105.

(5) Attach signal generator output to pins 2 and 3 of CR103 socket.

(6) Set signal generator frequency to 270 Kc.

(7) Keep output voltage at pin 2 V113A below 0.1 volts. Use output control of signal generator and slug adjustments at bottom of T107 and T108 to get peak reading on the RF voltmeter.

F. Signal Alignment of 270 Kc IF Amplifier

(1) Replace CR103 and V105.

(2) Remove signal generator from CR103 socket.

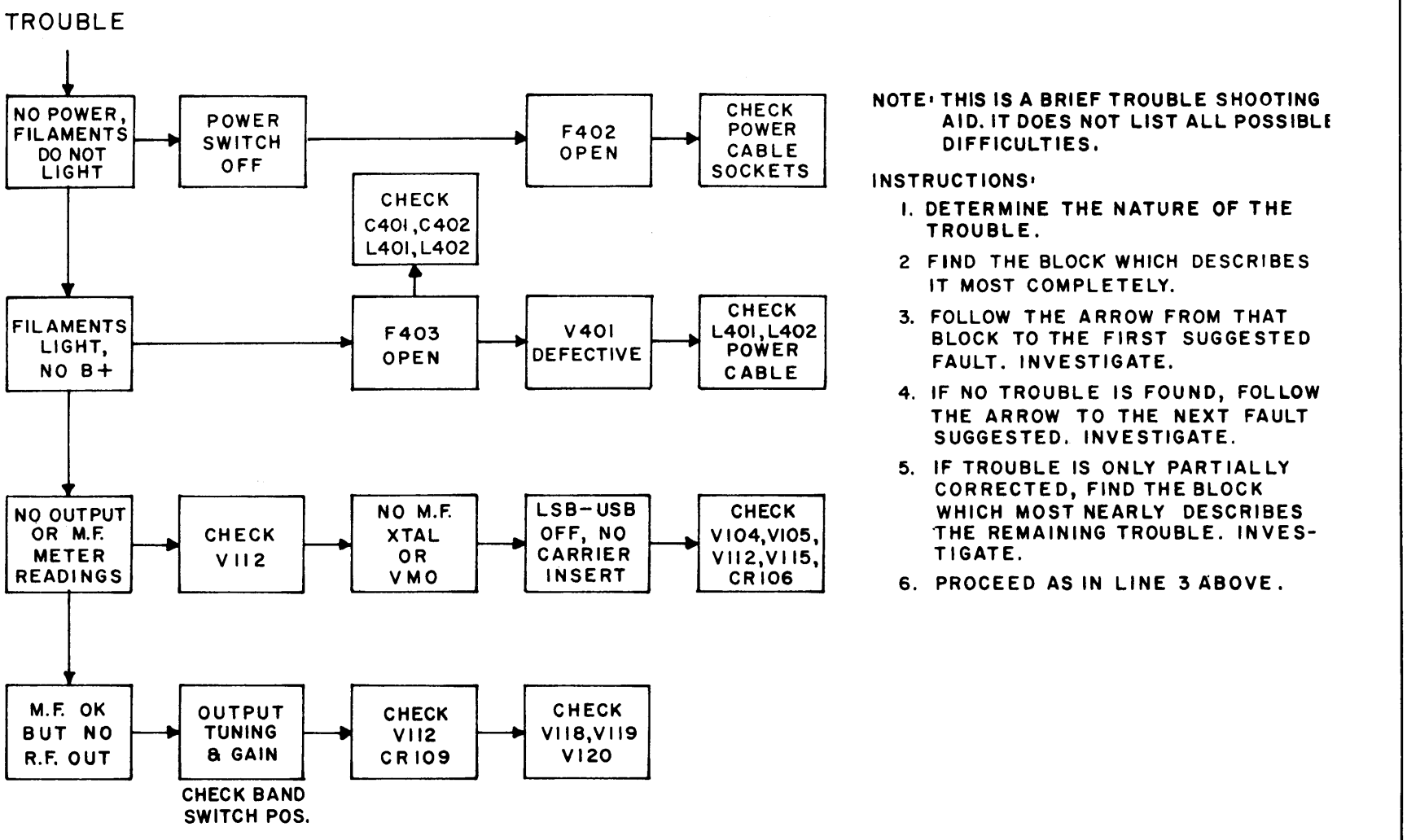


Figure D-4-1 Exciter Trouble Shooting Chart

(3) Advance CARRIER INSERT control to maximum clockwise position.

(4) Use slug adjustments of T107 and T108 to get new peak on RF voltmeter. (at pin 2 of V113A).

(5) Replace P103 in J106.

G. Mid Frequency Alignment

(1) Remove P107 from Z107 and connect sensitive RF voltmeter to the top of output potentiometer R205.

(2) Place 2.0 and 4.0 Mc crystals in sockets 1 and 2 respectively of mid frequency oven (or use external VMO connected to J104).

(3) Turn CARRIER INSERT control to zero.

(4) Turn R130 either fully clockwise or fully counter-clockwise to upset balance in the MF modulator.

(5) Set MF XTAL SW to position 1 (or VMO to 2 Mc).

(6) Set MF dial to 2.27 Mc.

(7) Tune T109 and T110 slugs only (on underside of chassis) to obtain peak reading on RF voltmeter.

(8) Set MF XTAL SW to position 2 (or VMO to 4 Mc).

(9) Set MF dial to 4.27 Mc.

(10) Tune trimmers C140 and C141 to obtain peak reading on RF voltmeter.

(11) Using R130, rebalance MF modulator.

(12) Remove RF voltmeter from R205.

(13) Set MF XTAL SW to position 1 (or VMO to 2 Mc).

(14) Set MF dial to exactly 2.0 Mc.

(15) Turn METER SW to MF position.

(16) Advance CARRIER INSERT control until a half scale meter reading is obtained on the front panel meter.

(17) Tune T109 and T110 slugs to obtain peak meter reading.

(18) Set MF XTAL SW to position 2 (or VMO to 4 Mc).

(19) Set MF dial to exactly 4.0 Mc.

(20) Advance CARRIER INSERT control until a half scale reading is obtained on the meter.

(21) Tune trimmers C140, C141 to obtain peak meter reading.

(22) Repeat steps 13 through 21 until ends of tuning range track.

(23) Put P107 back into J110 receptacle of Z107.

H. RF Alignment

(1) Disconnect P103 and P105.

(2) Turn OUTPUT control to maximum clockwise position.

(3) Connect output of signal generator to top of R205.

(4) Terminate RF output (J103) with non inductive 72 ohm resistor.

(5) Place RF voltmeter across the 72 ohm resistor.

(6) Using a signal generator output of approximately 0.1 volts with a frequency accuracy of 1.0% peak the output RF voltmeter as per the following table:

BAND SET	OUTPUT DIAL SET	SIGNAL GEN. FREQUENCY	TUNING ADJUSTMENT
*2 to 4 Mc	2.00 Mc	2.00 Mc 4.00 Mc	T116,T120, C191,C179
*4 to 8 Mc	4.00 Mc 8.00 Mc	4.00 Mc 8.00 Mc	T113,T117, T121,C203, C191,C180
*8 to 16 Mc	8.00 Mc 16.00 Mc	8.00 Mc 16.00 Mc	T115,T179, T122,C202, C190,C178
*16 to 32 Mc	16.00 Mc 32.00 Mc	16.00 Mc 32.00 Mc	T114,T118, T112,C201, C189,C177

*NOTE: Repeat process alternately from lower to higher frequency to assure tracking at band ends.

(7) Lock all slug adjustments immediately after the adjustment is made. Observe the RF meter reading while doing so to prevent possible detuning while tightening the lock nuts.

(8) Connect P103 to J106, and P105 to J108.

D-4-5 CARRIER SUPPRESSOR ADJUSTMENTS

D-4-5-1 PRELIMINARY

CAUTION

BE SURE THAT RF IS ALIGNED BEFORE PROCEEDING.

A. THE FOLLOWING TEST EQUIPMENT IS REQUIRED FOR THIS SECTION:

(1) A sensitive oscilloscope having an overall vertical sensitivity of at least .05 volts per inch.

(2) Test leads and a .05 mfd capacitor to be used with the above.

(3) Non-metallic aligning tool.

B. WARM-UP AND STABILIZATION PERIOD OF APPROXIMATELY THREE HOURS IS REQUIRED.

D-4-5-2 17 KC NOTCH FILTER ADJUSTMENT (Proceed in given order)

A. Turn CARRIER INSERT control (front panel) fully CCW.

B. Turn USB and LSB input switches (front panel) OFF.

C. Remove V105 (12AU7) from its position on the Z103 287 Kc oscillator enclosure.

D. Remove CR103 (CK-711) from the LF balanced modulator circuit.

E. Connect a .05 mfd capacitor in series with the test lead from the vertical amplifier input of the oscilloscope and attach to pins 7-8 of the CR103 socket.

F. Connect oscilloscope vertical amplifier input ground to chassis of SBE.

G. Unbalance the 17 Kc modulator by setting R110 (LSB BAL) and R112 (USB BAL) potentiometers fully clockwise. These controls are located on rear apron of chassis.

H. Set oscilloscope vertical amplifier range for the most sensitive (highest amplification) operating condition.

J. Advance the oscilloscope vertical gain control until the maximum amplitude of the trace is obtained or until it expands to fill the extreme graduations on the scope overlay pattern.

K. Adjust the oscilloscope sweep rate and synchronize controls until a steady 17 Kc sine wave is observed.

L. Remove K101 (VOX relay) for access to C119 located on side of Z106 (17 Kc notch filter).

M. Adjust C119 and R109 (Z106) until minimum 17 Kc amplitude is displayed on scope. Be sure to use nothing but a non-metallic alignment tool when adjusting C119. Adjust controls alternately until best reading is obtained. Watch scope carefully when tightening R109 shaft lock.

D-4-5-3 17 KC BALANCED MODULATOR ADJUSTMENT

A. Remove oscilloscope vertical amplifier input test lead from CR103 and connect .05 mfd capacitor in series as before to the junction of R171 and R172. Be sure that ground lead remains connected to chassis.

B. LSB and USB potentiometers R110 and R112 must now be returned from full clockwise to their proper positions. Adjust them alternately until the vertical oscilloscope pattern is minimum. Watch pattern to be sure that no amplitude increase occurs when R110 and R112 shafts are locked.

C. Replace K101, V105 and CR103.

D-4-5-4 270 KC MODULATOR ADJUSTMENT

A. Remove V104 (6U8, 17 Kc Osc.).

B. Remove P103 from J106 (MF OUT).

C. Connect test lead from oscilloscope vertical amplifier input through a .05 mfd capacitor to pin 2, (V113A, 12AT7, MF MOD).

D. Oscilloscope to be adjusted as before with the exception that SWEEP and SYNC controls must be changed for 287 Kc presentation.

E. Adjust R113 (LF BAL) until minimum amplitude is displayed on oscilloscope. Watch scope when locking R113 shaft to see that no change occurs.

F. Replace V104 and P103. Remove all test leads.

D-4-5-5 MF BALANCED MODULATOR ADJUSTMENT

A. Connect external VMO to J104 or locate the MF XTAL OVEN by following the MF XTAL SW shaft which enters directly into it. Release the fasteners holding the oven cover in place by turning each 1/4 turn CCW. Remove the oven cover and the celotex insulation found beneath it.

B. Plug a 4 Mc crystal into a socket in the oven. Note the number of the socket chosen or if VMO is used adjust it to 4.0 Mc.

C. Place the MF XTAL SW to the position bearing the same number unless VMO is used.

D. Replace the celotex insulation and the oven cover. Be sure that the cover is oriented so that its numbers correspond to the crystal positions below.

E. Proceed after a one hour warm-up period; adjust the MF TUNING dial to read 4.27 Mc.

F. Adjust the OUTPUT TUNING dial to 4.0 Mc.

G. Turn the EXCITER ON/STANDBY switch to ON.

H. Turn the METER SW to RF.

J. Adjust the output control clockwise until the meter registers a mid-scale reading.

K. Adjust R130, located in the mid-frequency compartment near the MF TUNING capacitor, until a minimum reading is indicated on the meter.

L. Advance the OUTPUT control CCW to maximum and again adjust R130 for a minimum reading.

D-4-5-6 HF BALANCED MODULATOR ADJUSTMENT

A. Turn BAND MCS switch to 4.27 - 6.27 Mc position.

B. With EXCITER ON/STANDBY switch ON turn OUTPUT TUNING largeknob until dial reads 8.0 Mc.

C. If meter pointer swings to a hardover maximum reading, return it to mid scale by detuning the circuit with the OUTPUT TUNING control.

D. Adjust R150, located in Z107 next to MF TUNING capacitor, for minimum reading.

D-4-6 OSCILLATOR FREQUENCY ADJUSTMENTS

D-4-6-1 PRELIMINARY

A. THE FOLLOWING TEST EQUIPMENT IS REQUIRED FOR THIS SECTION:

(1) An RF frequency meter accurate to one part per million.

(2) An RF generator accurate to one part per million.

(3) A sensitive RF VTVM.

(4) A sensitive communications receiver (AM).

D-4-6-2 287 KC OSCILLATOR

D-4-6-2-1 This oscillator is factory adjusted and should not require attention in the field. If adjustment is proven necessary the oscillator output may be taken from the arm of R113, LF BAL, and adjusted by C120 located under the chassis deck behind the crystal oven.

D-4-6-3 MF XTAL ADJUSTMENTS

A. Remove cover from MF XTAL OVEN.

B. Insert crystals to be used noting their values and locations.

C. Replace oven insulation and cover.

D. Allow a one hour warm-up period if set is cold.

E. Insert a short length of insulated wire through access slot in MF OVEN cover slot near crystal adjustments. Couple this wire to the antenna of a good communications receiver and to the accurate RF frequency generator.

F. Adjust the generator and the receiver tuning to frequency marked on the crystal selected.

G. Adjust the appropriate trimmer (C223-C232) with tool provided until a zero beat is heard from the receiver.

H. Repeat steps F and G for each crystal.

J. Remove wire from MF XTAL OVEN.

D-4-6-4 HF XTAL ADJUSTMENTS

A. Place insulated wire near trimmer capacitor in HF XTAL OVEN by passing it through access slots in cover. This oven is located on under side of chassis directly beneath the MF XTAL OVEN. Test equipment is connected in the same way as for MF XTAL ADJUSTMENTS.

B. The following chart provides information for testing each HF XTAL:

BAND MCS Switch Position	XTAL FREQ.	ADJUST
4.27 - 6.27	8.0 Mc	C233
6.27 - 8.27	10.0 Mc	C234
8.27 - 10.27	12.0 Mc	C235
10.27 - 12.27	14.0 Mc	C236
14.27 - 16.27	18.0 Mc	C237
18.27 - 20.27	11.0 Mc	C238
22.27 - 24.27	13.0 Mc	C239
30.27 - 32.27	17.0 Mc	C240

C. Use a sensitive RF VTVM to measure the voltage at the center conductor of J108 while adjusting the inductive trimmers L101-L114 (numbered 1-14) located on the deck between the MF XTAL OVEN and the front panel. The following chart provides instructions for each adjustment:

BAND MCS Switch Position	XTAL FREQ. (Mc)	HF INJECTION FREQ. (Mc)	ADJUST. TRIMMER
4.27 - 6.27	8	8	L101
6.27 - 8.27	10	10	L102
8.27 - 10.27	12	12	L103
10.27 - 12.27	14	14	L104
12.27 - 14.27	8	16	L105
14.27 - 16.27	18	18	L106
16.27 - 18.27	10	20	L107
18.27 - 20.27	11	22	L108
20.27 - 22.27	12	24	L109
22.27 - 24.27	13	26	L110
24.27 - 26.27	14	28	L111
26.27 - 28.27	15	30	L112
28.27 - 30.27	16	32	L113
30.27 - 32.27	17	34	L114

TABLE D-4-1 RESISTANCE CHART MODEL SBE-2 AND POWER SUPPLY

CONDITIONS:
1. All Power Off.
2. Power Plugs Disconnected.
3. All Measurements Taken With Respect To Ground Using a Hewlett-Packard Model 410B VTVM or Equivalent.
4. All Front Panel Switches & Controls in Max. CW Position.

TUBE	TYPE	SOCKET PIN NUMBERS								
		1	2	3	4	5	6	7	8	9
V101	6AB4	Inf.	NC	Fil	Fil	NC	470K	1.5K	-	-
V102	6AB4	Inf.	NC	Fil	Fil	NC	.1M	1.5K	-	-
V103	6AB4	Inf.	NC	Fil	Fil	NC	.1M	1.5K	-	-
V104	6U8	Inf.	2.2M	Inf.	Fil	Fil	Inf.	68	1K	68K
V105	12AU7	Inf.	470K	0	Fil	Fil	Inf.	470K	1K	Fil
V106	OA2	Inf.	0	NC	0	Inf.	NC	0	-	-
V107	12AT7	Inf.	.1M	1.2K	Fil.	Fil	Inf.	.1M	1.2K	Fil
V108	12AT7	Inf.	82K	1.5K	Fil	Fil	Inf.	100K	1.2K	Fil
V109	12AT7	83K	7M	820	Fil	Fil	Inf.	390K	330	Fil
V110	6U8	Inf.	470K	100K	Fil	Fil	150K	1K	470	5 K
V111	6AL5	100K	470K	Fil	Fil	7 M	NC	7 M	-	-
V112	12AU7	Inf.	1.5M	1.7K	Fil	Fil	Inf.	0	1.7K	Fil
V113	12AT7	Inf.	47K	500	Fil	Fil	Inf.	47K	500	Fil
V114	6AH6	39	0	Fil	Fil	Inf.	Inf.	100	-	-
V115	12AU7	Inf.	220K	0	Fil	Fil	Inf.	4.7K	1.5K	Fil
V116	6CL6	330	100K	Inf.	Fil	Fil	Inf.	330	Inf,	100K
V117	6U8	NC	100K	Inf.	Fil	Fil	Inf.	0	NC	NC
V118	6AH6	270	0	Fil	Fil	100K	133K	100	-	-
V119	6CL6	68	10	156K	Fil	Fil	100K	0	156K	10
V120	6146	500	Fil	100K	250	10	500	Fil	NC	Inf.
V401	5R4	Inf	16K	Inf	35	Inf	35	Inf	16K	-
V402	OA2	23K	Inf	Inf	Inf	23K	Inf	0	-	-

K = Thousand

M = Million

NC = No Connection

Inf. = Infinite Resistance

Fil = Filament

TABLE D-4-2 AVERAGE VOLTAGE CHART MODEL SBE AND POWER SUPPLY RTS-2

CONDITIONS: H.F. Oscillator Switch 4.27-6.27 Mcs, Output tuned to 8.0 Mcs, Band Switch 4-8 Mcs, Meter Switch in RF position. Output Control set to 100% on Meter, RF Output terminated with 70 ohm noninductive load, MF Xtal Switch in VMO position, LSB & USB Gain Controls min., Mike/Channel Selector "OFF", Main Power "ON", Exciter "ON", Xmtr "OFF" V104 and V105 Data taken at Octal Socket.

TUBE	TYPE	SOCKET PIN NUMBERS								
		1	2	3	4	5	6	7	8	9
V101	6AB4	57V	NC	0	6.3*	130V	0	1.0V	-	-
V102	6AB4	125V	NC	0	6.3*	130V	0	1.7V	-	-
V103	6AB4	125V	NC	0	6.3*	130V	0	1.8V	-	-
V104	6U8	.35V	0	.44V	0	6.3*	140V	0	150V	-
V105	12AU7	230V	8.5V	6.3*	.2V	150V	0	0	VAR.	-
V106	OA2	150V	NC	NC	NC	150V	NC	0	-	-
V107	12AT7	95V	0	1.4V	6.3*	6.3*	95V	0	1.4V	0
V108	12AT7	130V	0	2.4V	6.3*	6.3*	260V	0	4.2V	0
V109	12AT7	240V	.65V	.46V	6.3*	6.3*	255V	0	2.6V	0
V110	6U8	48V	0	0	6.3*	0	260V	2.9V	1.0V	0
V111	6AL5	.2V	0	0	6.3*	.8V	NC	0	-	-
V112	12AU7	230V	0	4.1V	0	0	230V	0	3.9V	6.3*
V113	12AT7	155V	0	3.0V	0	0	155V	0	3.2V	6.3*
V114	6AH6	0	0	0	6.3*	245V	110V	0.9V	-	-
V115	12AU7	85V	-14V	.16V	0	0	150V	0	7.0V	6.3*
V116	6CL6	6.0V	-16V	150V	0	6.3*	210V	6.0V	NC	-16V
V117	6U8	NC	-10V	115V	0	6.3*	220V	.1V	NC	NC
V118	6AH6	0	0	6.3*	0	190V	105V	1.4V	-	-
V119	6CL6	3.7V	NC	150V	6.3*	0	190V	0	-	0
V120	6146	28V	0	190V	-	0	28V	6.3*	0	260V
V401	5R4	0	315V	0	400*	0	400*	0	315V	-
V402	OA2	150V	0	0	0	150V	0	0	-	-

NC = No Connection

* = AC Voltages

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

CABINET, ELECTRICAL EQUIPMENT, MODEL CAB-7

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
B501	FAN, intake: includes motor, blade and frame; 115 v, 50/60 cps, single phase; 2 ufd running capacitor, 1650 rpm, 38 watts full load.	Air Intake	AX-142
C501	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc.	RF Filter	CM35B103M
C502	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C503	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C504	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C505	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C506	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C507	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C508	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C509	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C510	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C511	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C512	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C513	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C514	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C515	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C516	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C517	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C518	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C519	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
C520	CAPACITOR, fixed: paper dielectric; 2 ufd, ±10%, 600 wvdc, oil filled and impregnated; hermetically sealed bathtub case.	Phase Shift	CP53B1FF205K
C521	CAPACITOR, fixed: ceramic; high voltage; 3 uufd, ±10%, 5000 wvdc.	Voltage Divider	CC-109-1
C522	CAPACITOR, fixed: mica; button type; 1000 uufd, ±5%, char. D, 300 wvdc.	Voltage Divider	CB21PD102J
C523	CAPACITOR, fixed: mica; .01 ufd, ±20%, char. B, 300 wvdc. (Same as C501)	RF Filter	CM35B103M
E501	TERMINAL STRIP, barrier type: fourteen 6-32 nickel plated brass binding head screws; black phenolic body.	Accessory Terminals	TM-100-14
E502	TERMINAL STRIP, barrier type: fourteen 6-32 nickel plated brass binding head screws; black phenolic body. (Same as E501)	Accessory Terminals	TM-100-14
E503	TERMINAL STRIP, barrier type: three 6-32 nickel plated brass binding head screws; black phenolic body.	Blower Term. Board	TM-100-3
E504	CLIP, electrical: white ceramic body, phosphor bronze spring clip to fit 9/16 inch dia. tube cap.	Plate Cap.	HB-102-1
E505	CLIP, electrical: white ceramic body, phosphor bronze spring clip to fit 9/16 inch dia. tube cap. (Same as E504)	Plate Cap.	HB-102-1
E506	BOLT, hex head: steel, nickel plated; 5/8-11 threads x 1 inch long.	Ground Connection	SCHH6211SN16
J501	CONNECTOR, receptacle: male; recessed, locking type; 3 contacts, 20 amps.	Power Input	PL-133-NG
J502	CONNECTOR, receptacle: male; recessed, locking type; 2 contacts, 10 amps at 250 v, 15 amps at 125 v.	Power Input for Accessory Line	JJ-100
J503	Used on W509.		
J504	Used on W509.		
J505	CONNECTOR, receptacle: R.F. female.	RF Out	UG-560/U
J506	CONNECTOR, receptacle: R.F. female.	RF Monitor	SO-239
J507	CONNECTOR, receptacle: male, 22 contacts.	Interconnect	MS3102A28-11P

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
J508	ADAPTER, bulkhead: UHF type; one female contact on each end.	Interconnect	PL-274
J509	ADAPTER, bulkhead: UHF type; one female contact on each end. (Same as J508)	Interconnect	PL-274
L501	INDUCTOR, choke: 2 uhy, ±.1 uhy, Q less than 200 at 7.9 mc.	Line Filter	CL-120-1
L502	INDUCTOR, choke: 2 uhy, ±.1 uhy, Q less than 200 at 7.9 mc. (Same as L501)	Line Filter	CL-120-1
MP501	PIN, guide: 303 stainless steel; 2-7/8 inch lg o/a, 1/2 in. dia. pin; mtd. by 5/8 in. long 3/8-16 thds.	Support for Rear of Drawers	PM-506
MP502	FILTER, air: 10-1/8 x 11-3/8 x 1/2 in. o/a.	Air Filter	AD-102-6
MP503	FILTER, air: 7-5/8 x 16-7/8 x 1/2 inch o/a.	Air Filter	AD-102-7
MP504	STRAP, ground: .032 thk copper, silver plated; 1'' wide x 20'' lg, 11/16'' dia. hole 1/2'' from one end.	Ground Strap	MS-1389-20
MP505	WIPER, ground: .025 thk phosphor bronze, silver plated: 4-1/4 x 1 x 3/4 inch overall.	Ground Wiper RF Deck	MS-888
MP506	WIPER, R.F.: .025 thk phosphor bronze, silver plated: 4-1/4 x 13/16 x 3/4 in. overall.	RF Contact, RF Deck	MS-891
MP507	WIPER, ground: .025 thk phosphor bronze, silver plated; 9-1/2 x 1/2 x 3/4 in. overall.	Ground Wiper RF Deck	MS-781
MP508	SPRING, compression: beryllium copper; 1 inch lg. x 3/4 inch o.d.	Support for MP507A, B	SP-125-S-16
MP509	TRACK & SLIDE: hard drawn steel, cadmium plate & 4 coats of lubricating paint.	Drawer Slides Cabinet Mounted	TK-100-2
**MP510 thru 515	SHOCK MOUNT: 900 lb. load; 5-1/4 x 5-1/4 x 2-1/2 inch o/a; four 1/2 in. mounting holes on 4-1/4 x 4-1/4 in. mtg. centers.	Shock Mounts	SH-100
	**These are optional items which replace base when unit is shock mounted, (standard equipment on the AN/URT-17A).		

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
MP516 thru 537	NUT, floating anchor: two lug basket; steel, cad. plate; 5/16 x 24 NF 3 thds; 1-9/32 x 13/16 x 13/32 in. o/a; two 9/64 in mounting holes on 1 in. mtg. center.	Panel Holding	NT-117-3124A
P501	Used on W502.		
P502	Used on W502.		
P503	Used on W501.		
P504	Used on W501.		
P505	Used on W503.		
P506	Used on W503.		
P507	Used on W504.		
P508	Used on W504.		
P509	Used on W505.		
P510	Used on W505.		
P511	Used on W508.		
P512	Used on W508.		
P513	CONNECTOR, plug: female; locking type; polarized; 3 contacts, 20 amps (loose item, for J501).	J501 Mating	PL-134NG
P514	Used on W510.		
P515	Used on W510.		
P516	CONNECTOR, plug: coaxial; UHF type; one contact, 500 vdc peak, mica insulation (loose item, for J506).	J506 Mating	PL-259A mica
P517	CONNECTOR, plug: coaxial; HN type; 50 ohms, 5000 volts peak (loose item, for J505).	J505 Mating	UG-59B/U
P518	CONNECTOR, plug: coaxial; UHF type ; one contact , 500 vdc peak, mica insulation (loose item, for J508). (Same as P516)	J508 Mating	PL-259A mica
P519	CONNECTOR, plug: coaxial; UHF type; one contact, 500 vdc peak, mica insulation (loose item, for J509) (Same as P516)	J509 Mating	PL-259A mica
S501	SWITCH, interlock: push pull; SPDT, normally open, 15 amps; at 120/250 VAC; .2 amps (resistive) at 250 VDC.	Safety Switch	SW-230

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
S502	SWITCH, interlock: push pull; SPDT, normally open, 15 amps; at 120/250 VAC; .2 amps (resistive) at 250 VDC. (Same as S501)	Safety Switch	SW-230
S503	SWITCH, interlock: push pull; SPDT, normally open, 15 amps; at 120/250 VAC; .2 amps (resistive) at 250 VDC. (Same as S501)	Safety Switch	SW-230
S504	SWITCH, interlock: push pull; SPDT, normally open, 15 amps; at 120/250 VAC; .2 amps (resistive) at 250 VDC. (Same as S501)	Safety Switch	SW-230
T501	TRANSFORMER, power: step up; primary - 115/230 vac, 50/60 cps, single phase: secondary - to deliver 2800 v at 680 ma into load of 4120 ohms. Hermetically sealed rectangular steel case. Four 1/4-20 thd. mtg. inserts on 6 inch x 6 inch mtg. centers.	Power	TF-193
W501	CABLE ASSEMBLY, power: 98 inch long o/a. Consists of 22 conductors, insulated sleeving; P503 (MS3106B-28-11P) on one end; P504 (MS3106B-28-11S) on other end; 2 each cable clamps.	Power Supply to RTF	CA-408
W503	CABLE ASSEMBLY, high voltage: 11 feet long o/a. Consists of single conductor, P505 (MS3108B-18-16P) on one end, P506 (MS3106B-18-16S) on other end. 2 each MS-3057-10 cable clamp.	High Voltage Cable	CA-417-1
W504	CABLE ASSEMBLY, R.F.: 90 inches long o/a. Consists of RG-59/U conductor; P507 (PL-259A-mica) on one end, P508 (UG-260/U) on other end; both plugs color coded red.	RF Cable	CA-288-1
W505	CABLE ASSEMBLY, R.F.: 90 inches long o/a. Consists of RG-59/U conductor; P509 (PL-259A-mica) on one end, P510 (UG-260/U) on other end; both plugs color coded blue.	RF Cable	CA-288-2
W508	CABLE ASSEMBLY, high voltage; 4 ft. 6 in. long o/a. Consists of single conductor, P511 (MS3108B-18-16S) on one end, P512 (MS3106B-18-16P) on other end. 2 each MS-3057-10 cable clamp.	High Voltage Cable	CA-417-2

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
W509	CABLE ASSEMBLY, high voltage; 7 inches long o/a. Consists of single conductor, J503 (MS3102A-18-16P) on one end, J504 (MS3102A-18-16S) on other end.	High Voltage Bypass Cable	CA-295
W510	CABLE ASSEMBLY, power: 6 ft. long o/a. Consists of double conductor, P514 female plug on one end, P515 two prong male plug other end.	Power Cable	CA-103-72

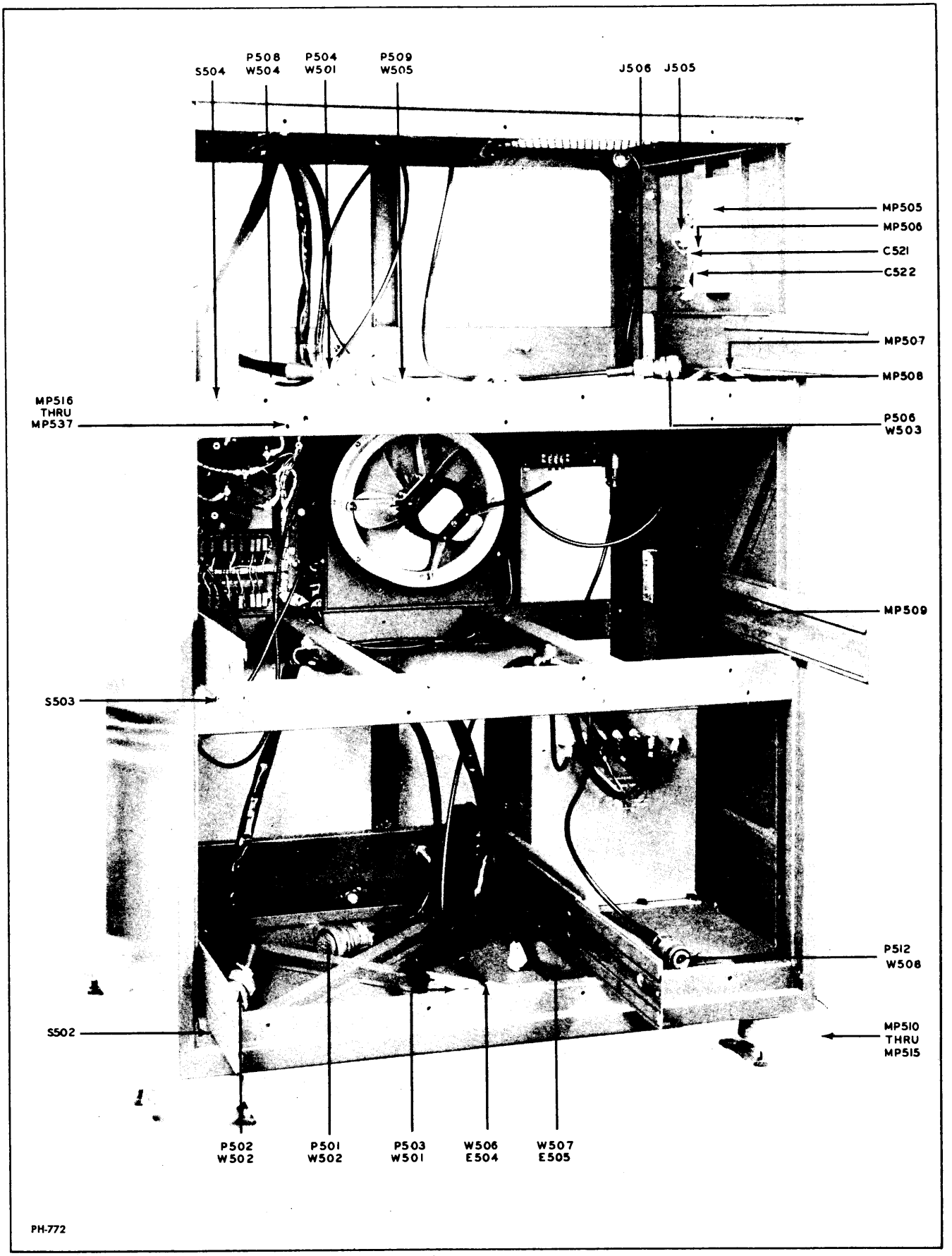


Figure E-1 Front View Model CAB-7

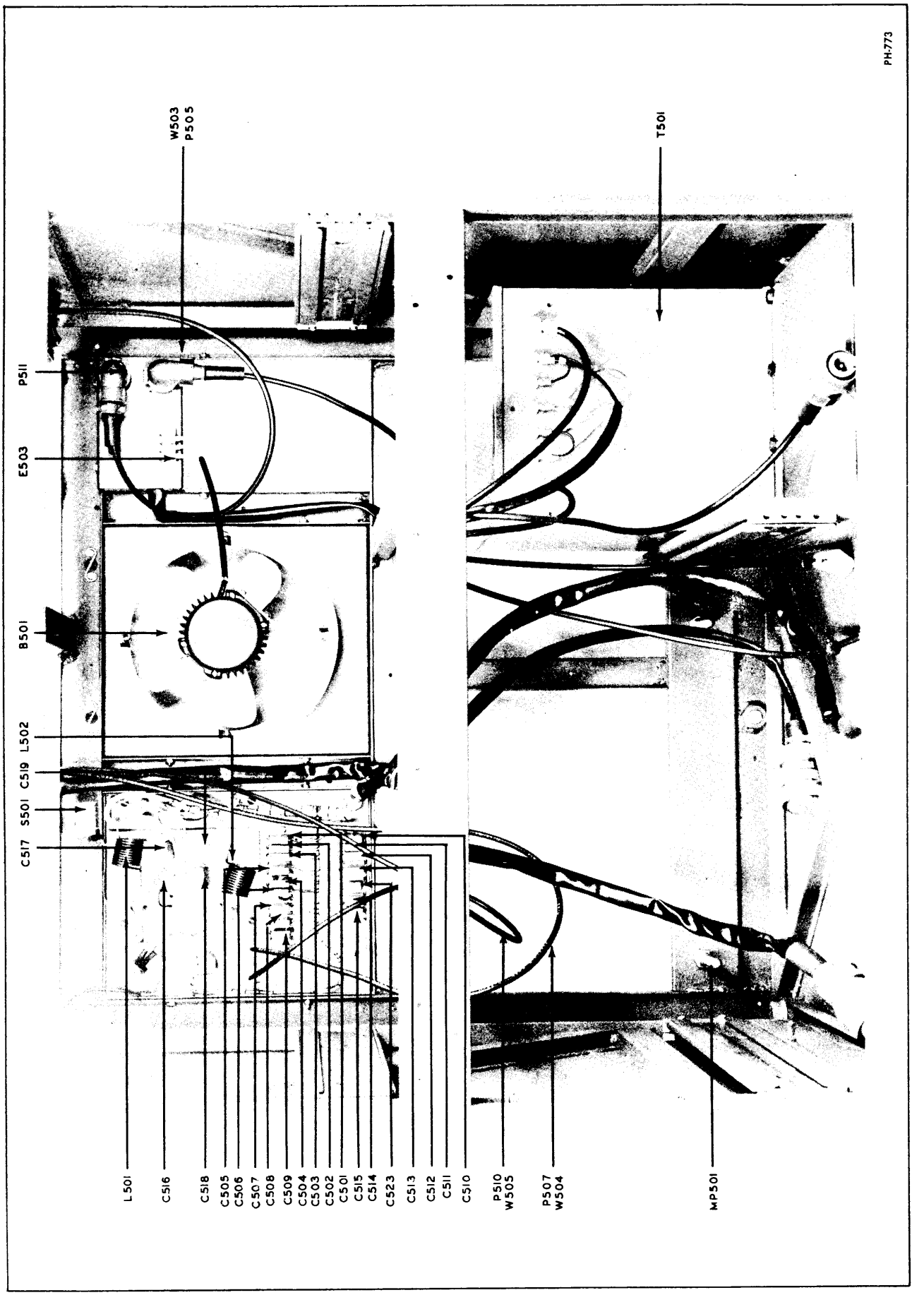


Figure E-2 Front View, Bottom Section Model CAB-7

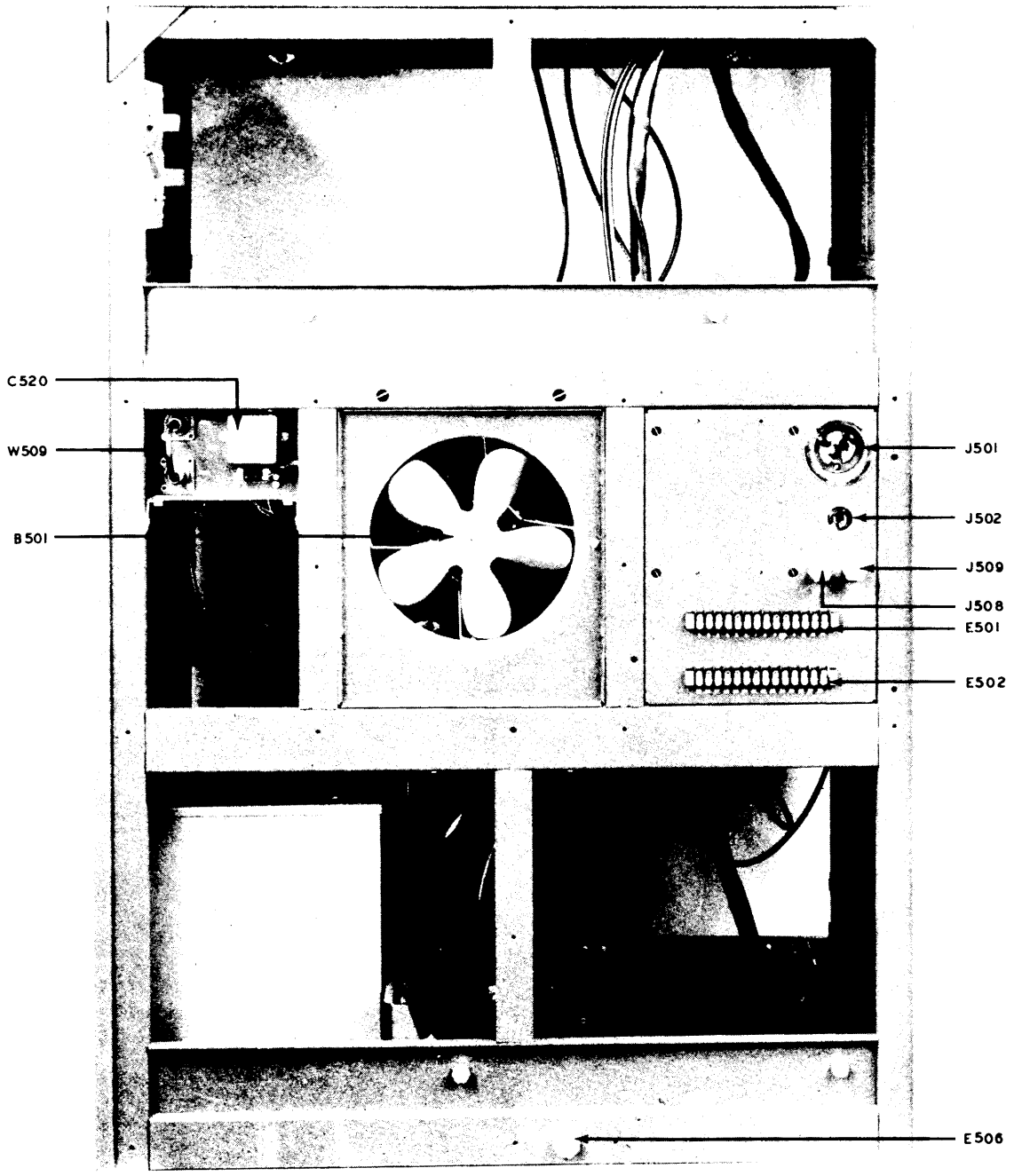


Figure E-3 Rear View Model CAB-7

PARTS LIST
PARTS ILLUSTRATION
SECTION "A" MODEL RTF-2

POWER AMPLIFIER, MODEL RTF-2

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
A101	ASSEMBLY, switch-coils, consists of S102, L112, L113; 7-1/2 in. lg. x 6 in. wide x 5-1/2 in. high o/a.	Band Switching	AX-106
A102	COUPLER ASSEMBLY, indicator: consists of C115, C116, L110, L111, and TC101, terminal board and two leads w/solder lug terminals. Terminal board has four 6-32 threaded inserts on 1-3/4 x 5-3/8 in. mounting centers.	Low Pass Filter	AX-143
B101	BLOWER ASSEMBLY: 115 v, 50/60 cps, .34 watts, single phase; 3400 rpm, counter-clockwise rotation. Consists of motor, blades and mounting plate.	Ventilation	AX-146
C101	CAPACITOR, fixed: mica; 1000 uufd, ±10%, 2500 wvdc, char. B.	Screen Decoupling V101	CM45B102K
C102	CAPACITOR, fixed: mica; 1000 uufd, ±10%, 2500 wvdc, char. B. (Same as C101)	Screen Decoup. V101	CM45B102K
C103	CAPACITOR, fixed: mica; 150 uufd, ±10%, 2500 wvdc, char. B.	Cathode Bypass V101	CM45B151K
C104	CAPACITOR, variable: teflon dielectric: 2-4.2 mmfd, consisting of: Plate, neutralizer: aluminum Rotor Disc, neutralizer: aluminum Mounting Plate, neutralizer: teflon Plate, dielectric: teflon	Neutralizing Cap. V101-V102	 MS-780 MS-779 PX-324 PX-325
C105	CAPACITOR, fixed: mica; 10,000 uufd, ±5%, 300 wvdc, char. C.	p/o LP Filter V101	CM35C103J
C106	CAPACITOR, fixed: ceramic; 0.75 uufd, 10 kvdc, NPO temperature coef.; complete with brackets.	RF Feedback	AM-105
C107	CAPACITOR, fixed: mica; 10,000 uufd, ±5%, 300 wvdc, char. C. (Same as C105)	p/o LP Filter V102	CM35C103J
C108	CAPACITOR, fixed: mica; 150 uufd, ±10%, 2500 wvdc, char. B. (Same as C103)	Cathode Bypass V102	CM45B151K
C109	CAPACITOR, fixed: mica; 1000 uufd, ±10%, 2500 wvdc, char. B. (Same as C101)	Screen Bypass V102	CM45B102K
C110	CAPACITOR, fixed: "trylar"; 1000 uufd, ±10%, 8000 wvdc.	RF Bypass, S101	CK-102K-102P

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C111	CAPACITOR, fixed: "trylar"; 1000 uufd, ±10%, 8000 wvdc. (Same as C110)	RF Decoupling S101	CK-102K-102P
C112	CAPACITOR, fixed: "trylar"; 500 uufd, ±10%, 8000 wvdc.	PL Plate Decoup. S101	CX-102K-501P
C113	CAPACITOR ASSEMBLY, variable: vacuum; 10-400 uufd, 7.5 kv; 42 amp; CW rotation decr. capacitance. Complete w/gear.	PA Tuning S101	AM-108
C114	CAPACITOR, fixed: "trylar"; 500 uufd, ±10%, 8000 wvdc. (Same as C112)	RF Bypass S101	CX-102K-501P
C115	CAPACITOR, fixed: mica; 500 uufd, ±5%, 500 wvdc, char. B. (Suggested replacement assembly - A102)	p/o LP Filter M303	CM20B501J
C116	CAPACITOR, fixed: mica; 500 uufd, ±5%, 500 wvdc, char. B. (Same as C115) (Suggested replacement assembly - A102)	p/o LP Filter M303	CM20B501J
C117 A & B	CAPACITOR, variable: air; 2 sections, 70-1000 mmfd each.	Antenna Loading S103	CB-140
C118	CAPACITOR, fixed: "trylar"; 2000 uufd, ±5%, 4000 wvdc.	Antenna Loading S103	CX-102J-202M
C119	NOT USED.		
C120	NOT USED.		
C121	CAPACITOR, fixed: ceramic; 3 uufd, ±.25 uufd, 500 wvdc, char. SL.	p/o Divider Network	CC21SL030C
C122	CAPACITOR, fixed: mica; 27 uufd, ±10%, 500 wvdc, char. B.	p/o Divider Network	CM20B270K
C123	CAPACITOR, fixed: mica; .001 ufd, ±10%, 500 wvdc, char. B.	RF Filter	CM20B102K
C124	CAPACITOR, fixed: mica; 2000 uufd, ±10%, 500 wvdc, char. B.	RF Filter	CM30B202K
C125	CAPACITOR, fixed: "mylar"; .1 ufd, ±5%, 200 wvdc, char. B.	RF Filter	CN108B1003K
C126	NOT USED.		
C127	CAPACITOR, fixed: paper; bathtub case; 1 ufd, ±10%, 600 wvdc, char. F.	Phase Shift B101	CP53B1FF105K
C128	CAPACITOR, fixed: button type; 360 uufd, ±2%, 300 wvdc, char. D.	p/o PA Neutralization	CB21PD361G
CR101	DIODE, silicon.	Half Wave Rectifier	1N-303

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
E101	CONTACT BUTTON ASSEMBLY: brass, silver plated; 1 inch long 6-32 stud.	Chassis Contact	A-1094-2
E102	CONTACT BUTTON ASSEMBLY: brass, silver plated; 9/16 inch long 6-32 stud.	Chassis Contact	A-1094-1
E103	INSULATOR, pillar: round; white glazed steatite; 3/4 in. lg. x 1/2 in. dia.; grade 3; both ends tapped 8-32.		NS3W0206
E104	INSULATOR, pillar: round; white glazed steatite; 3/4 in. lg. x 1/2 in. dia.; grade 3; both ends tapped 8-32. (Same as E103)		NS3W0206
E105	INSULATOR, pillar: round; white glazed steatite; 3/4 in. lg. x 1/2 in. dia.; grade 3; both ends tapped 8-32. (Same as E103)		NS3W0206
E106	INSULATOR, pillar: round; white glazed steatite; 3/4 in. lg. x 1/2 in. dia.; grade 3; both ends tapped 8-32. (Same as E103)		NS3W0206
E107	INSULATOR, pillar: round; white glazed steatite; 3/4 in. lg. x 1/2 in. dia.; grade 3; both ends tapped 8-32. (Same as E103)		NS3W0206
E108	INSULATOR, pillar: round; white glazed steatite; 3/4 in. lg. x 1/2 in. dia.; grade 3; both ends tapped 8-32. (Same as E103)		NS3W0206
E109	INSULATOR, pillar: round; white glazed steatite; 3/4 in. lg. x 1/2 in. dia.; grade 3; both ends tapped 8-32. (Same as E103)		NS3W0206
E110	INSULATOR, pillar: round; white glazed steatite; 1-3/4 in. lg. x 1/2 in. dia.; grade 3; both ends tapped 8-32.		NS3W0214
E111	INSULATOR, pillar: round; white glazed steatite; 1-3/4 in. lg. x 1/2 in. dia.; grade 3; both ends tapped 8-32. (Same as E110)		NS3W0214
E112	INSULATOR, pillar: round; white glazed steatite; 3/4 in. lg. x 3/4 in. dia.; grade 3; both ends tapped 10-32.		NS3W0306
E113	INSULATOR, pillar: round; white glazed steatite; 3/4 in. lg. x 3/4 in. dia.; grade 3; both ends tapped 10-32. (Same as E112)		NS3W0306

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
E114	INSULATOR, pillar: round; white glazed steatite; 3/4 in. lg. x 3/4 in. dia.; grade 3; both ends tapped 10-32. (Same as E112)		NS3W0306
E115	INSULATOR, pillar: round; white glazed steatite; 3/4 in. lg. x 3/4 in. dia.; grade 3; both ends tapped 10-32. (Same as E112)		NS3W0306
E116	INSULATOR, pillar: round; white glazed steatite; 1 in. lg. x 3/4 in. dia.; grade 3; both ends tapped 10-32.		NS3W0308
E117	INSULATOR, pillar: round; white glazed steatite; 1-3/4 in. lg. x 3/4 in. dia.; grade 3; both ends tapped 10-32.		NS3W0314
E118	INSULATOR, pillar: round; white glazed steatite; 1-3/4 in. lg. x 3/4 in. dia.; grade 3; both ends tapped 10-32. (Same as E117)		NS3W0314
E119	INSULATOR, pillar: round; white glazed steatite; 1-3/4 in. lg. x 3/4 in. dia.; grade 3; both ends tapped 10-32. (Same as E117)		NS3W0314
E120	INSULATOR, pillar: round; white glazed steatite; 2-1/2 in. lg. x 3/4 in. dia. grade 3; both ends tapped 10-32.		NS3W0320
E121	INSULATOR, pillar: round; white glazed steatite; 5 in. lg. x 1 in. dia.; grade 3; both ends tapped 1/4-20.		NS3W0440
E122	INSULATOR, feed thru: male; white glazed steatite; 7/8 in. lg. o/a x 7/8 in. dia, tapered flange; 1/2 in. dia. x 3/8 in. lg. insert; 3/16 in. dia. hole.		NS-112-1
E123	INSULATOR, feed thru: female; white glazed steatite; 1/2 in. lg. o/a x 7/8 in. dia. tapered flange; 1/2 in. dia. x 3/8 in. deep well; 3/16 in. dia. hole.		NS-112-2
E124	INSULATOR, feed thru: male; white glazed steatite; 7/8 in. lg. o/a x 7/8 in. dia. tapered flange; 1/2 in. dia. x 3/8 in. lg. insert; 3/16 in. dia. hole. (Same as E122)		NS-112-1
E125	INSULATOR, feed thru: female; white glazed steatite; 1/2 in. lg. o/a x 7/8 in. dia. tapered flange; 1/2 in. dia. x 3/8 in. deep well; 3/16 in. dia. hole. (Same as E123)		NS-112-2

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
J101	CONNECTOR, receptacle: female; BNC type.	RF Out, Test	UG-560/U
L101	COIL, R.F.: fixed; 180 microhenries, ±10 microhenries, Q = 50.	Screen Decoupling Coil	A-1126
L102	COIL, R.F.: fixed: 2 microhenries, ±.1 microhenries, Q = 200.	p/o LP Filter V101	CL-120-2
L103	COIL, R.F.: 1.1 uhy, Q = greater than 70; at 7.9 mc test frequency.	Filter	CL-139
L104	CHOKE, R.F.: 750 microhenries, ±20%, 100 ma, 17 ohms DC resistance.	p/o Divider Network	CL-100-5
L105	COIL, R.F.: fixed; 2 microhenries, ±.1 microhenries, Q = 200. (Same as L102)	p/o LP Filter V102	CL-120-2
L106	COIL, R.F.: fixed; 180 microhenries, ±10 microhenries, Q = 50. (Same as L101)	Screen Decoupling V102	A-1126
L107	COIL, R.F.: fixed; 38 microhenries, ±5%, Q = 160.	Plateload, Choke HF Band	A-1163
L108	CHOKE, R.F.: fixed; 87 uh, ±5 uh, Q greater than 170; at 2.5 mc test frequency.	Plate Load, Choke, LF Band	A-1529
L109	COIL, R.F.: fixed; 38 microhenries, ±5%, Q = 160. (Same as L107)	RF Decoupling S101	A-1163
L110	COIL, R.F.: fixed; 180 microhenries, ±10 microhenries, Q = 50. (Same as L101) (Suggested replacement assembly - A102)	p/o LP Filter M303	A-1126
L111	COIL, R.F.: fixed: 180 microhenries, ±10 microhenries, Q = 50. (Same as L101) (Suggested replacement assembly - A102)	p/o LP Filter M303	A-1126
L112	COIL, R.F.: 1.22 microhenries; tapped at .8 microhenries; p/o A101, not a replaceable item.		
L113	COIL, R.F.: 31 microhenries; tapped at 1.2, 2.4, 4.2, 9.2, 11, 15.5 and 27 microhenries; p/o A101, not a replaceable item.		
L114	COIL, R.F.: fixed; 180 microhenries, ±10 microhenries, Q = 50. (Same as L101)	Safety Choke S102A	A-1126
L115	COIL, R.F.: fixed; 128 uh, ±12 uh., Q greater than 100; at 790 Kc test frequency.	Filter	A-1045

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
L116	COIL, R.F.: fixed; 26.4 uh, ±2.6 uh, Q greater than 100; at 2.5 mc test frequency.	Filter	A-1076
MP101	GEAR, helical: nylon; 24 teeth; 1.5 in. pitch dia.; for 1/4 in. shaft, two 6-32 x 3/8 in. Allen head screws. Part of C113.		
MP102	GEAR, helical: steel; 24 teeth; 1.5 in. pitch dia.; for 1/4 in. shaft, two 6-32 x 1/8 in. Allen head screws.		GR-138
MP103	COUPLING, flexible: non-insulated type; 1-1/4 in. dia. x 23/32 in. long, for 1/4 in. shaft; four 6-32 Allen head screws.		MC-104-2
MP104	FILTER, air: single pad; 6-5/8 in. long x 3-5/8 in. wide x 1/2 in thick.	Air Filter	AD-102
MP105	CAP, plate: heat dissipating; 7/8 in. lg. x 3/4 in. dia.; dural.		HB-106-6
MP106	CAP, plate: heat dissipating; 7/8 in. lg. x 3/4 in. dia.; dural. (Same as MP105)		HB-106-6
MP107	CONNECTOR, vacuum cap: phosphor bronze; silver plated; accomodates 3/4 dia.		FH-102
MP108	COUPLING, 7/16 in. dia. x 3/4 in. lg. for 1/4 in. shaft, four 6-32 Allen head set screws.		MC-102
MP109	INSULATOR, R.F. plate: teflon; 2-3/4 in. x 2-3/4 in. x 1/4 in. thick.		PX-299
MP110	WRENCH, hexagonal: for #10-12 set screw; 2 in. long.		WR-100-5
MP111	WRENCH, hexagonal: for #8 set screw. 6 in. long.		WR-100-18
MP112	WRENCH, hexagonal: for #5-6 set screw; 6 in. long.		WR-100-19
MP113 A&B	SLIDE, chassis: 12-1/8 in. long x 1-3/4 in. high x 1/4 in. thk. o/a closed: steel; lubricating paint finish.		TK-100-1
MP114 A&B	SOCKET, pin: stainless steel; 2 in. dia. x 1/2 in. thk.; four 10-32 tapped mtg. holes equally spaced on 3/4 in. radius circle.	Rear Support	PM-507
MP115 A thru G	SCREW, thumb: 5/16 x 24 thds; slotted 3/4'' hexagonal head; 2 in. long; stainless steel.	Panel Locking	SC-139

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
PS101	SUPPRESSOR, parasitic; 124 Mc, ±3 Mc.	To Plate V101	AX-144
PS102	SUPPRESSOR, parasitic: 124 Mc, ±3 Mc. (Same as PS101)	To Plate V102	AX-144
PS103	SUPPRESSOR, parasitic: 105 Mc, ±3 Mc.	To Control Grid V101	AX-155
PS104	SUPPRESSOR, parasitic: 105 Mc, ±3 Mc. (Same as PS103)	To Control Grid V102	AX-155
R101	RESISTOR, fixed: composition; 2200 ohms, ±5%, 1/2 watt.	p/o Divider Network	RC20GF222K
S101 A & B	SWITCH, rotary: 9 position; single section, 36 deg. detent; ceramic wafer and insulation; silver plated contacts and wiper.	p/o PA Bandswitch	SW-165
S102	SWITCH, rotary: 9 position; single section; ceramic wafer and insulation; silver plated contacts and wiper; 30 amps max. current: p/o A101, not a replaceable item.		
S103	SWITCH, rotary: 2 position; single section; 60 deg. detent, non-shorting.	Aux. Loading	SW-134
S104	SWITCH, push-button: momentary contact; normally closed; SPST, 15 a. at 125, 250 or 460 VAC; 1/2 a. at 125 VDC; 1/4 a. at 250 VDC.	p/o PA Bandswitch	SW-169
T101	TRANSFORMER, power: filament; pri. - 115/230 VAC, 50/60 cps, single phase; insulation 1500 V peak; hermetically sealed metal case.	PA Filament	TF-155
TC101	THERMOCOUPLE, meter: external; range 0-8. (Suggested replacement assembly - A102)	Sensing Device M303	TH-100-8
V101	TUBE, electron: radial beam power pentode; 5 pin metal shell base and plate cap.	p/o PA Final Stage	4-250A
V102	TUBE, electron: radial beam power pentode; 5 pin metal shell base and plate cap. (Same as V101)	p/o PA Final Stage	4-250A
XV101	SOCKET, tube: giant 5 pin base.	Socket for V101	TS-125-2
XV102	SOCKET, tube: giant 5 pin base. (Same as XV101)	Socket for V102	TS-125-2

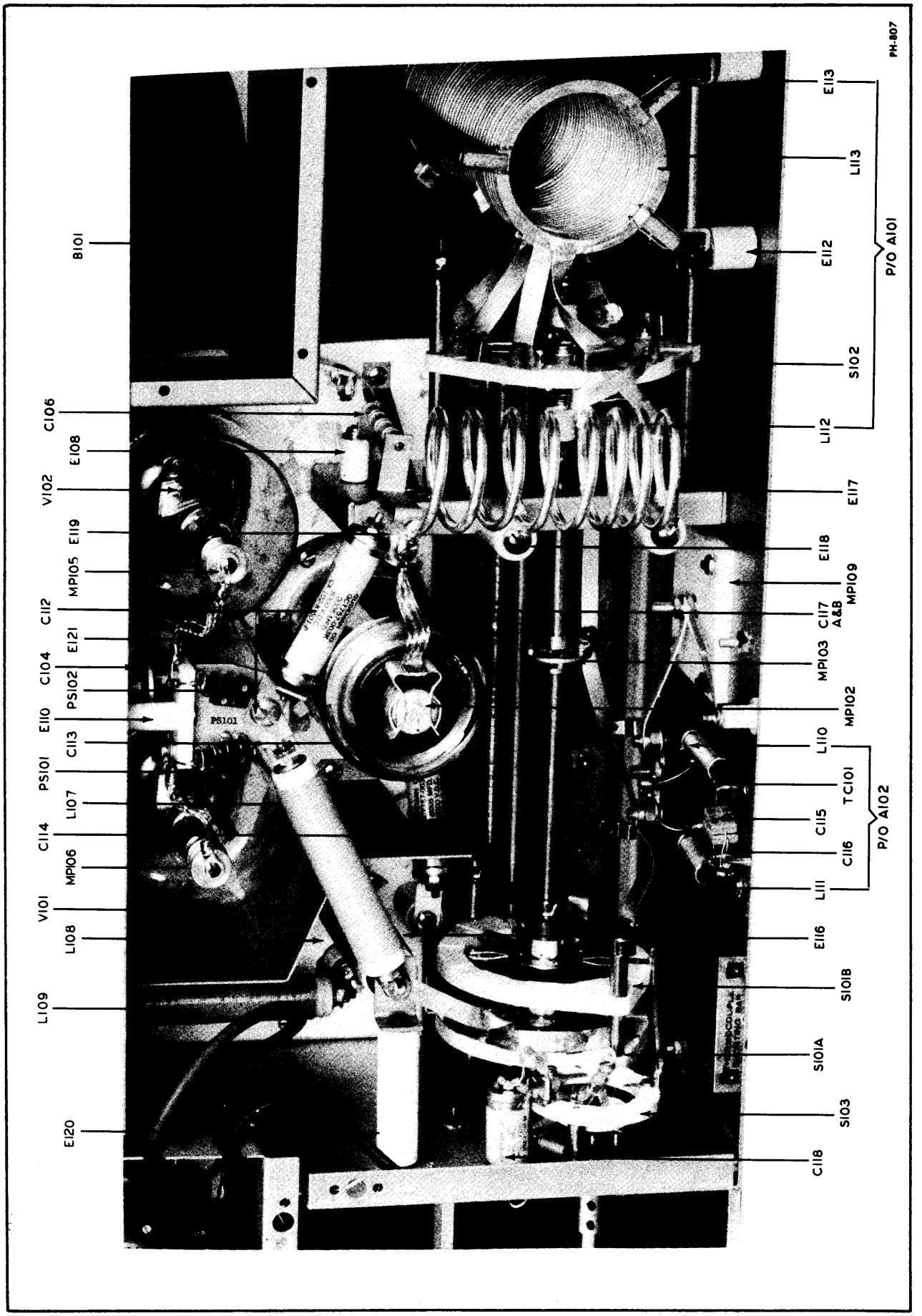


Figure E-9 Top View Section "A"

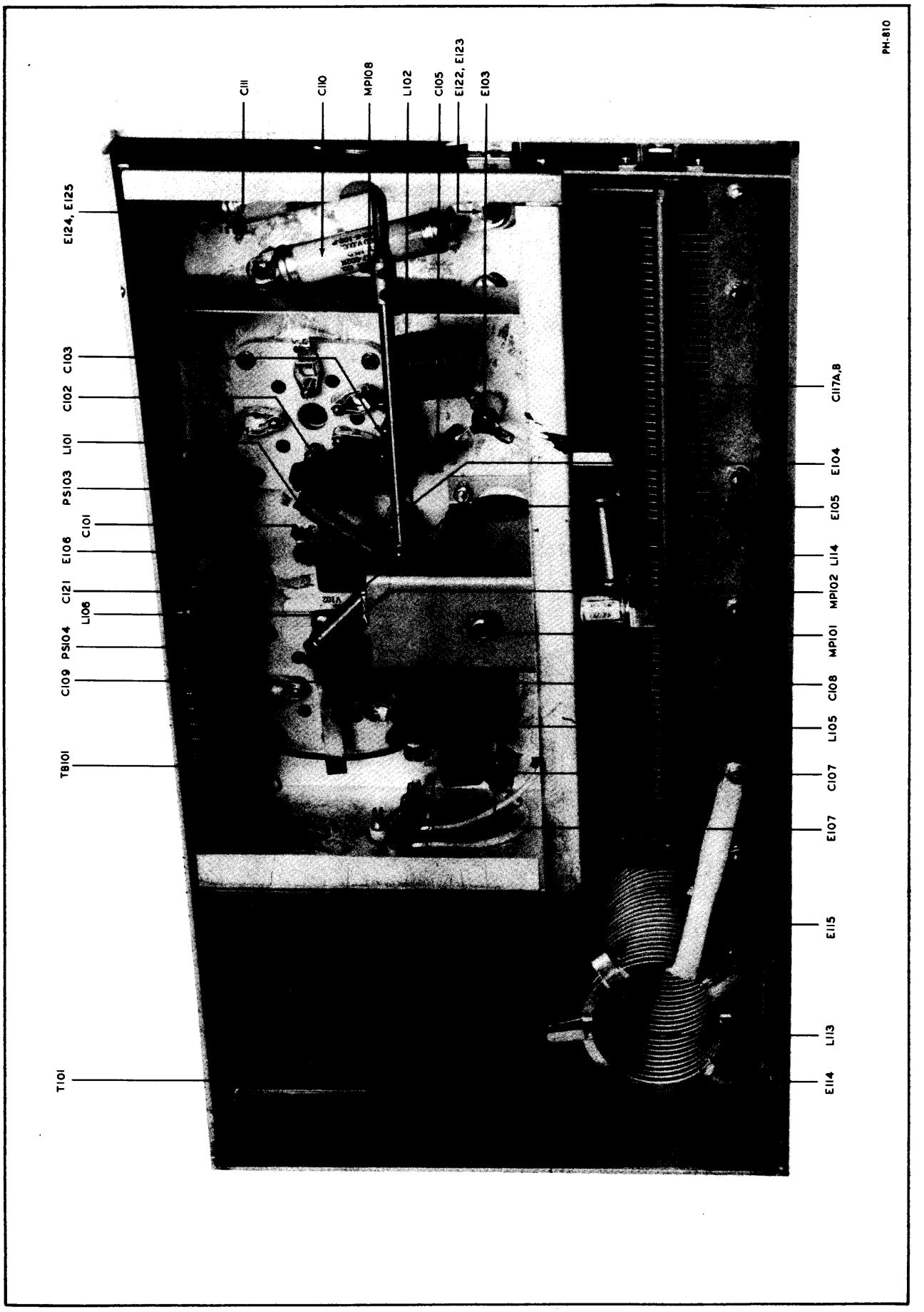


Figure E-10 Bottom View Section "A"

PARTS LIST
PARTS ILLUSTRATIONS
SECTION "B" MODEL RTF-2

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C201 A&B	CAPACITOR, variable: air dielectric; two sections, 12.5-282.5 uufd ea. section; ceramic insulation.	Driver Tuning	CB-127
C201C	CAPACITOR, variable: air dielectric; 12.5-282.5 ufd; ceramic insulation.	Driver Tuning	CB-128
C202	CAPACITOR, fixed: mica; .01 ufd, ±5%, char. C, 300 wvdc.	Input Coupling	CM35C103J
C203	CAPACITOR, fixed: terminal type; 1000 uufd, ±10%, char. W; terminal type Q.	RF Bypass	CB21QW102K
C204	CAPACITOR, fixed: terminal type; 1000 uufd, ±10%, char. W; terminal type Q. (Same as C203)	RF Bypass	CB21QW102K
C205	CAPACITOR, fixed: terminal type; 1000 uufd, ±10%, char. W; terminal type Q. (Same as C203)	Screen Bypass	CB21QW102K
C206	CAPACITOR, fixed: mica; .01 ufd, ±5%, char. C, 300 wvdc. (Same as C202)	p/o Key Click Filter	CM35C103J
C207	CAPACITOR, fixed: mica; 1000 uufd, ±5%, char. B, 500 wvdc.	RF Coupling, V201	CM20B102J
C208	CAPACITOR, fixed: terminal type; 1000 uufd, ±10%, char. W; terminal type Q. (Same as C203)	RF Bypass V201	CB21QW102K
C209	CAPACITOR, fixed: mica; 1000 uufd, ±5%, char. B, 500 wvdc. (Same as C207)	Plate Decoup. V201	CM20B102J
C210	CAPACITOR, variable: ceramic; 3-12 uufd, 500 wvdc, char. A.	Tank Trimmer V201	CV11A120
C211	CAPACITOR, fixed: mica; 1000 uufd, ±5%, char. B, 500 wvdc. (Same as C207)	RF Coupling V204	CM20B102J
C212	CAPACITOR, variable: ceramic; 4-30 uufd, 500 wvdc, char. C.	p/o V201 Tank Capacity	CV11C300
C213	CAPACITOR, fixed: mica; .01 ufd, ±5%, char. C, 300 wvdc. (Same as C202)	Cathode Bypass V204	CM35C103J
C214	CAPACITOR, fixed: terminal type; 1000 uufd, ±10%, char. W; terminal type Q. (Same as C203)	Screen Bypass V204	CB21QW102K
C215	CAPACITOR, fixed: mica; 500 uufd, ±5%, 500 wvdc, char. B.	RF Coupling V204	CM20B501J

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C216	CAPACITOR, fixed: mica; 1000 uufd, ±5%, char. B, 500 wvdc. (Same as C207)	Plate Decoupling V204	CM20B102J
C217	CAPACITOR, fixed: mica; 1000 uufd, ±5%, char. B, 500 wvdc. (Same as C207)	Plate Decoupling V204	CM20B102J
C218	CAPACITOR, variable: ceramic; 3-12 uufd, 500 wvdc, char. A. (Same as C210)	Trimmer Band 2	CV11A120
C219	CAPACITOR, fixed: mica; 500 uufd, ±5%, 500 wvdc, char. B. (Same as C215)	RF Coupling V205	CM20B501J
C220	CAPACITOR, fixed: terminal type; 470 uufd, ±10%, char. W; terminal type Q.	p/o LP Filter V202B	CB21QW471K
C221	CAPACITOR, fixed: mica; 12000 uufd, ±5%, 600 wvdc, char. B.	Plate Decoupling	CM50B123J
C222	CAPACITOR, fixed: mica; 330 uufd, ±10%; 2500 wvdc, char. B.	RF Coupling V205	CM45B331K
C223	CAPACITOR, fixed: terminal type; 1000 uufd, ±10%, char. W; terminal type Q. (Same as C203)	Screen Bypass V205	CB21QW102K
C224	CAPACITOR, fixed: mica; 100 uufd, ±5%, 500 wvdc, char. D.	DC Blocking to C104	CM20D101J
C225	CAPACITOR, fixed: mica; 2200 uufd, ±10%, 1200 wvdc, char. B.	p/o LP Filter V205	CM45B222K
C226	CAPACITOR, fixed: mica; 130 uufd, ±10%, 500 wvdc, char. D.	RF Coupling	CM20D131G
C227	CAPACITOR, fixed: mica; 500 uufd, ±5%, 500 wvdc, char. B. (Same as C215)	RF Bypass V206 Fil.	CM20B501J
C228	CAPACITOR, fixed: mica; 1000 uufd, ±5%, char. B. 500 wvdc. (Same as C207)	Screen Decoupling V204	CM20B102J
C229	CAPACITOR, fixed: mica; 1000 uufd, ±5%, char. B, 500 wvdc. (Same as C207)	Screen Decoupling V201	CM20B102J
C230	CAPACITOR, fixed: mica; 1000 uufd, ±5%, char. B, 500 wvdc. (Same as C207)	RF Bypass, M301	CM20B102J
C231	CAPACITOR, variable: ceramic; 3-12 uufd, 500 wvdc, char. A. (Same as C210)	Trimmer Band 3	CV11A120
C232	CAPACITOR, variable: ceramic; 7-45 uufd, 500 wvdc, char. C.	Trimmer Band 4	CV11C450

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C233	CAPACITOR, fixed: mica; 1000 uufd, ±5%, char. B, 500 wvdc. (Same as C207)	DC Blocking	CM20B102J
C234	CAPACITOR, fixed: terminal type; 1000 uufd, ±10%, char. W; terminal type Q. (Same as C203)	RF Bypass S204B	CB21QW102K
C235	CAPACITOR, fixed: mica; 1000 uufd, ±5%, char. B, 500 wvdc. (Same as C207)	RF Bypass	CM20B102J
C236	NOT USED.		
C237	CAPACITOR, variable: ceramic; 3-12 uufd, 500 wvdc, char. A. (Same as C210)	Trimmer Band 1	CV11A120
C238	CAPACITOR, variable: ceramic; 3-12 uufd, 500 wvdc, char. A. (Same as C210)	Trimmer Band 2	CV11A120
C239	CAPACITOR, variable: ceramic; 3-12 uufd, 500 wvdc, char. A. (Same as C210)	Trimmer Band 3	CV11A120
C240	CAPACITOR, fixed: mica; 3 uufd, ±5%, 500 wvdc, char. C.	Resonating Cap., L208	CM20C300J
C241	CAPACITOR, fixed: mica; .01 ufd, ±5%, char. C, 300 wvdc. (Same as C202)	Bypass	CM35C103J
C242	CAPACITOR, fixed: mica; .01 ufd, ±5%, char. C, 300 wvdc. (Same as C202)	Bypass	CM35C103J
C243	CAPACITOR, fixed: mica; .01 ufd, ±5%, char. C, 300 wvdc. (Same as C202)	Bypass	CM35C103J
E201	TERMINAL STRIP, barrier type: twelve 6-32 screws and solder lug terminals.		TM-100-12
E202	TERMINAL STRIP, barrier type: twelve 6-32 screws and solder lug terminals. (Same as E201)		TM-100-12
E203	INSULATOR, pillar type.		NS3W0104
J201	CONNECTOR, coaxial: female; BNC type, single hole mtg.	RF Input V201	UG-625/U
L201	CHOKE, R.F.: 128 microhenries; ±12 microhenries, Q=100.	Plate Load Choke, V201	A-1045
L202	CHOKE, R.F.: 128 microhenries, ±12 microhenries, Q=100. (Same as L201)	Screen Decoupling V204	A-1045

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
L203	COIL ASSEMBLY, 2-4 Mc; 17.2 - 28 microhenries, ±5%, Q=50.	Trimmer Band 1 V201	A-1103
L204	COIL ASSEMBLY, 4-8 Mc; 3.5-6.2 microhenries, ±5%, Q=90.	Trimmer Band 2 V201	A-1104
L205	COIL ASSEMBLY, 4-8 Mc; 6-9.5 uhy, Q less than 60; at 7.9 Mc test frequency.	Equalizer V209	A-1626
L206	CHOKE, R.F.: 128 microhenries; ±12 microhenries, Q=100. (Same as L201)	Screen Decoupling V201	A-1045
L207	COIL ASSEMBLY, 8-16 Mc; 1.3-1.56 microhenries, ±5%, Q=90.	Trimmer Band 3	A-1105
L208	COIL ASSEMBLY, 16-32 Mc; .185 - .200 uhy; Q less than 100; at 25 Mc test frequency.	Trimmer Band 4	A-1601
L209	CHOKE, plate: 180 microhenries, ±10 microhenries, Q=120.	Plate Load Choke V205	A-1096
L210	CHOKE, R.F.: fixed; 750 microhenries, ±20%.	p/o LP Filter V205	CL-100-5
L211	SWITCH COIL ASSEMBLY: 2-4 Mc; 15-23 microhenries, ±5%, Q=80.	Trimmer Band 1	A-1108
L212	SWITCH COIL ASSEMBLY:	Output Tuning, V205	A-1628
L213	SWITCH COIL ASSEMBLY:	Output Tuning, V205	A-1627
L214	SWITCH COIL ASSEMBLY: 16-32 Mc; .30-.34 microhenries, Q=250.	Trimmer Band 4	A-1192
L215	COIL, R.F.: 10 millihenries; 100 ma max. current; resistance approx. 30 ohms, bakelite body.	p/o LP Filter V205	CL-101-4
L216	INDUCTOR, choke: fixed; 180 micro-henries, ±10 microhenries, Q=50.	p/o LP Filter M301 CKT	A-1126
L217	CHOKE, R.F.: fixed; 750 microhenries, ±20%. (Same as L210)	RF Choke	CL-100-5
L218	CHOKE, R.F.: 128 microhenries; ±12 microhenries, Q=100. (Same as L201)	RF Choke	A-1045
MP201	CAP, plate: heat dissipating; 7/8 in. lg. x 3/4 in. dia., dural.		HB-106-6
MP202	COUPLING, flexible: insulated, steatite; 1-1/4" dia. x 13/16" lg; for 1/4" shaft; four 6-32 x 3/16" lg. Allen head screws.		MC-104-1

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
MP203	COUPLING, flexible: insulated, steatite; 1-1/4" dia. x 13/16" lg.; for 1/4" shaft; four 6-32 x 3/16" lg. Allen head screws. (Same as MP202)		MC-104-1
MP204	COUPLING, flexible: non-insulated; 1-1/4" dia. x 13/16" lg; for 1/4" shaft; four 6-32 x 3/16" lg. Allen head screws.		MC-104-2
MP205	COUPLING, flexible: non-insulated; 1-1/4" dia. x 13/16" lg.; for 1/4" shaft; four 6-32 x 3/16" lg. Allen head screws. (Same as MP204)		MC-104-2
MP206	INDEX, switch: 4 position, 60 deg. clover leaf index.		SW-179
MP207	GEAR, right angle drive, 1-1/16" wide x 7/8" dp x 2-19/32 in. lg. o/a; 1/4" shaft.		GR-125
MP208	CORE, ferramic: .350 ±.025 dia. x 2" lg; material Q.		CI112Q2R0F
PS201	SUPPRESSOR, parasitic: 6 close wound turns #30 DSC wire on a 100 ohm ±10%, 1/2 watt resistor.	PS, Plate Ckt. V204	A-1119
PS202	SUPPRESSOR, parasitic: 6 close wound turns #30 DSC wire on a 100 ohm ±10%, 1/2 watt resistor. (Same as PS201)	PS, Control Grid V204	A-1119
R201	RESISTOR, fixed: composition; 10,000 ohms, ±10%, 1/2 watt.	Grid Leak V201	RC20GF103K
R202	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1 watt.	p/o Keyer Load V202A	RC30GF104K
R203	RESISTOR, fixed: wire wound; 50,000 ohms, ±5%, 10 watts.	Keyer Plate Load V202A	RW-109-43
R204	RESISTOR, fixed: composition; 47,000 ohms, ±10%, 1/2 watt.	Grid Current Limiting	RC20GF473K
R205	RESISTOR, fixed: wire wound; 25,000 ohms, ±5%, 10 watts.	p/o Cathode Bias V202A	RW-109-38
R206	RESISTOR, fixed: composition; 1000 ohms, ±10%, 1/2 watt.	p/o Cathode Bias V202A	RC20GF102K
R207	RESISTOR, fixed: composition; 100 ohms, ±10%, 1/2 watt.	Cathode Bias V201	RC30GF101K
R208	RESISTOR, fixed: wire wound; 15,000 ohms, ±5%, 10 watts.	Volt. Dropping V203	RW-109-36
R209	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1/2 watt.	p/o Keyer Click Filter, V202B	RC20GF104K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R210	RESISTOR, fixed: composition; 10 ohms, ±5%, 1/2 watt.	Meter Shunt M301	RC20GF100J
R211	RESISTOR, adjustable: wire wound; 25,000 ohms linear, ±10%; 4 watts.	Drive Control V205	RA-106-ASRD-253A
R212	RESISTOR, fixed: composition; 1 megohm, ±10%, 1/2 watt.	p/o Voltage Divider	RC20GF105K
R213	RESISTOR, fixed: wire wound; 2250 ohms, 47 ma; 5 watts.	DC Dropping V204	RW-107-41
R214	RESISTOR, fixed: composition; 10,000 ohms, ±10%, 1/2 watt. (Same as R201)	Grid Leak Bias V204	RC20GF103K
R215	RESISTOR, fixed: composition; 470 ohms, ±10%, 1 watt.	Cathode Bias V204	RC30GF471K
R216	RESISTOR, fixed: composition; 18,000 ohms, ±5%, 1/2 watt.	Meter Multiplier M301	RC20GF183J
R217	RESISTOR, fixed: composition; 12,000 ohms, ±10%, 2 watts.	p/o Voltage Divider V205	RC42GF123K
R218	RESISTOR, fixed: composition; 82,000 ohms, ±10%, 1 watt.	p/o Keyer Load V202B	RC30GF823K
R219	RESISTOR, fixed: composition; 47,000 ohms, ±10%, 2 watts.	p/o Voltage Divider V202B	RC42GF473K
R220	RESISTOR, fixed: composition; 12,000 ohms, ±10%, 2 watts. (Same as R217)	Grid Leak Bias V205	RC42GF123K
R221	RESISTOR, fixed: composition; 10 ohms, ±5%, 1/2 watt. (Same as R210)	Meter Shunt M301	RC20GF100J
R222	RESISTOR, fixed: composition; 430,000 ohms, ±5%, 1/2 watt.	Meter Multiplier M301	RC20GF434J
R223	RESISTOR, fixed: composition; 18,000 ohms, ±5%, 1/2 watt. (Same as R216)	Meter Multiplier M301	RC20GF183J
R224	RESISTOR, fixed: composition; 180,000 ohms, ±10%, 2 watts.	p/o Voltage Divider V202A	RC42GF184K
R225	RESISTOR, fixed: composition; 22,000 ohms, ±10%, 1/2 watt.	p/o Voltage Divider V202A	RC20GF223K
R226	RESISTOR, fixed: composition; 470,000 ohms, ±10%, 2 watts.	PA Screen Protective	RC42GF474K
R227	RESISTOR, fixed: composition; 1500 ohms, ±10%, 1/2 watt.	SSB Input S204B	RC20GF152K
R228	RESISTOR, fixed: wire wound; 2250 ohms, 47 ma; 5 watts. (Same as R213)	Plate Load, V201	RW-107-41
R229	NOT USED.		

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R230	RESISTOR, fixed: wire wound; 10 ohms, ±5%, 5 watts.	Driver Load Band 1	RR-114-10-W
R231	RESISTOR, fixed: composition; 1500 ohms, ±10%, 1/2 watt. (Same as R227)	Voltage Dropping	RC20GF152K
R232	RESISTOR, fixed: composition; 10 ohms, ±5%, 1/2 watt. (Same as R210)	Meter Shunt M301	RC20GF100J
R233	RESISTOR, fixed: composition; 18,000 ohms, ±5%, 1/2 watt. (Same as R216)	Multiplier M301	RC20GF183J
R234	RESISTOR, fixed: composition; 3,900 ohms, ±10%, 2 watts.	RF Filter	RC42GF392K
S201	BANDSWITCH, multiplier, rotary: 3 sections; no detent, non-shorting, ceramic wafers; silver plated; brass contacts.	p/o Driver Band Switch	SW-247
S202	SWITCH ASSY., rotary: 2 sections, 4 positions, ceramic, silver plated contacts and wipers.	p/o Driver Band Switch	AS-105
S203	SWITCH ASSY., rotary: 2 sections, 5 positions, 60 deg. angle of throw; non-shorting type; ceramic wafer and insulation, silver plated contacts and wipers.	Multi-Meter Switch	AS-107
S204	SWITCH ASSY., 2 sections, 2 positions, 30 deg. angle of throw; non-shorting type; ceramic wafer and insulation, silver plated contacts and wipers.	SSB Normal Switch	AS-103
V201	TUBE, electron: power pentode, 9 pin miniature.	Grounded Grid Amp. Doubler	6CL6
V202	TUBE, electron: duo diode, 9 pin miniature.	Keyer/ Driver Keyer	12AT7
V203	TUBE, electron: voltage regulator; 7 pin miniature.	Voltage Reg.	OA2
V204	TUBE, electron: beam power amplifier; 7 pin miniature.	Doubler	6BF5
V205	TUBE, electron: beam power; large wafer octal base with sleeve.	Driver	6146
V206	TUBE, electron: duo diode, 9 pin miniature. (Same as V202)	Keyer Clamp	12AT7
XV201	SOCKET, electron tube: miniature 9 pin.		TS103P01
XV202	SOCKET, electron tube: miniature 9 pin. (Same as XV201)		TS103P01

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
XV203	SOCKET, electron tube: miniature 7 pin.		TS102P01
XV204	SOCKET, electron tube: miniature 7 pin. (Same as XV203)		TS102P01
XV205	SOCKET, electron tube: octal base.		TS101P01
XV206	SOCKET, electron tube: miniature 9 pin. (Same as XV201)		TS103P01

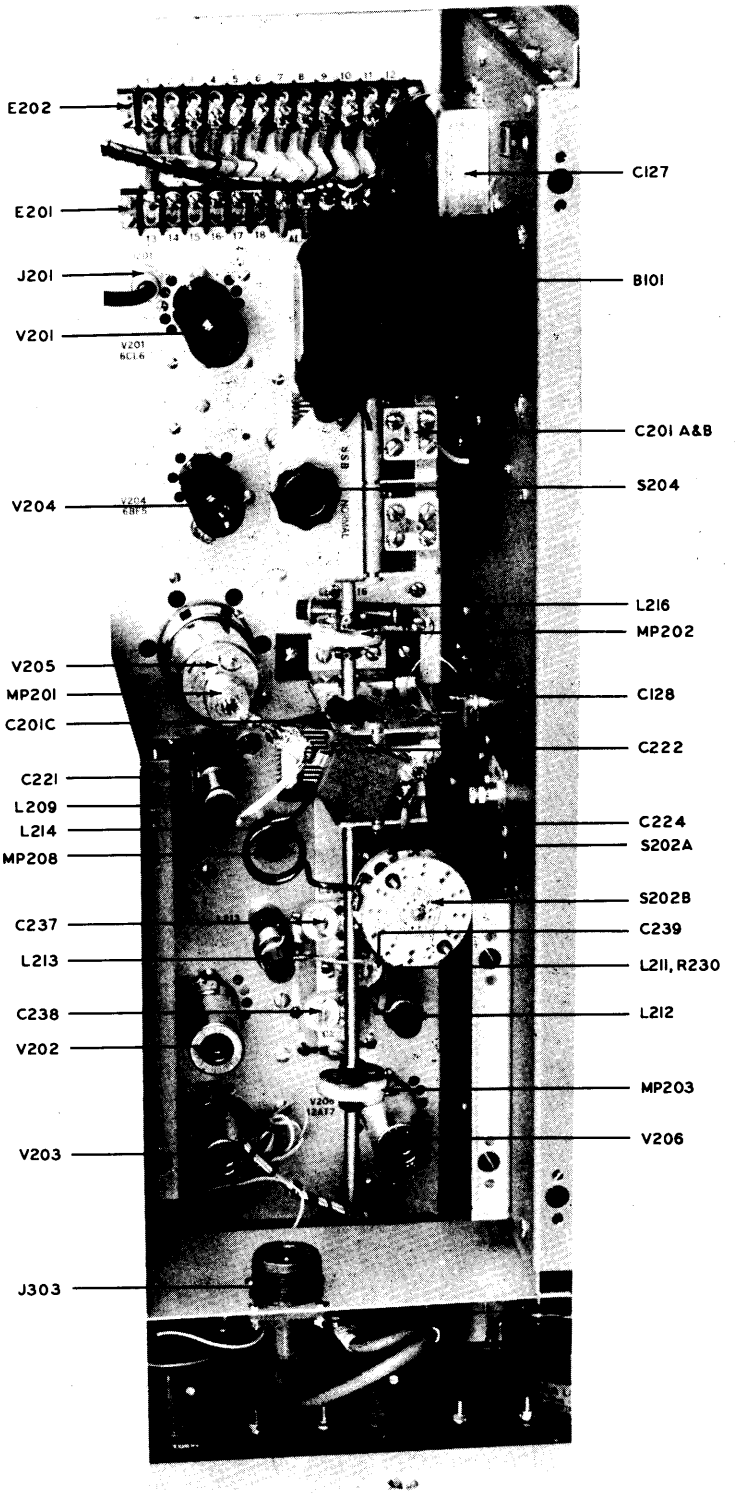


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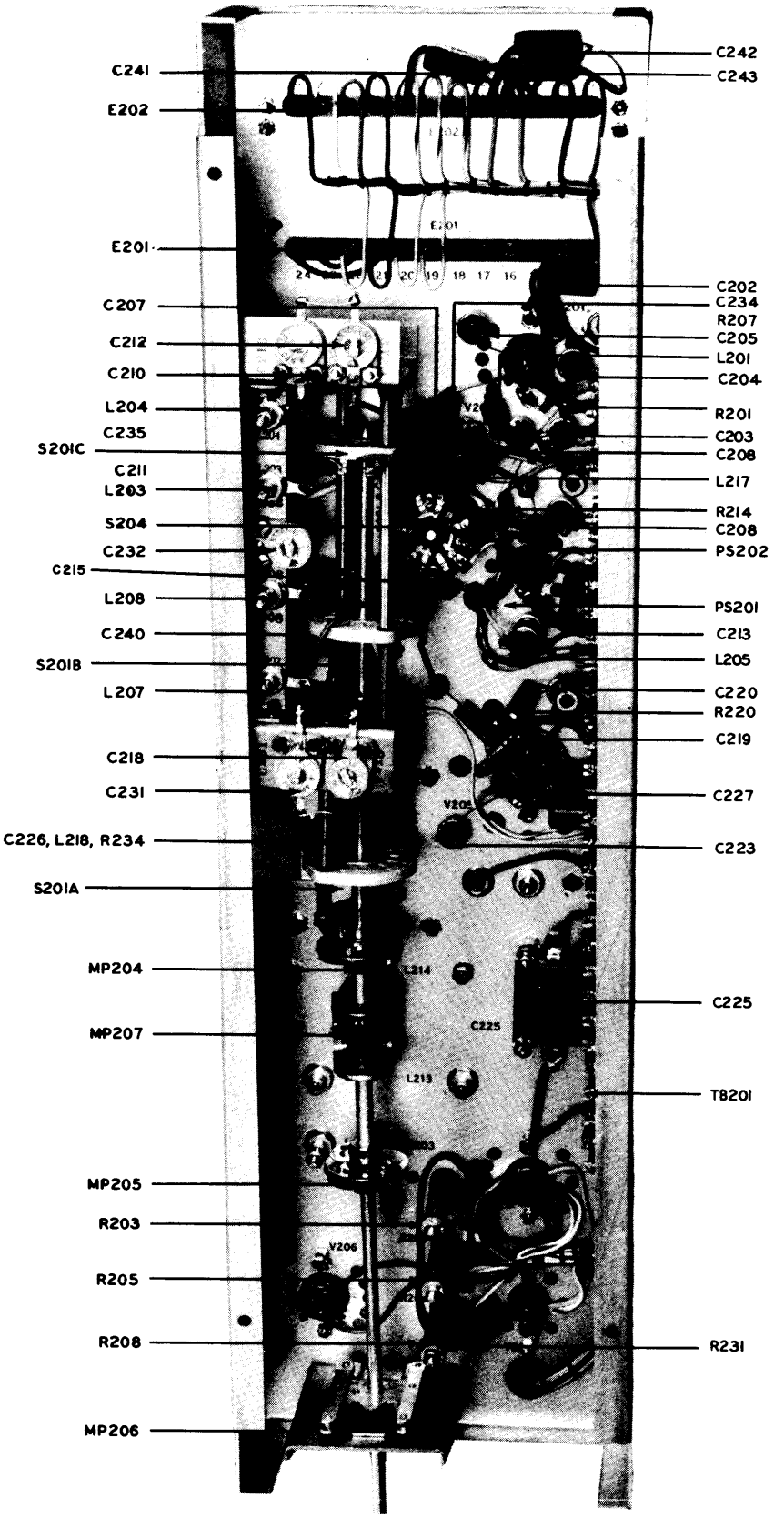
Figure E-11 Top View Section "B"



Figur E-12 Bottom View Section "B"

PARTS LIST
PARTS ILLUSTRATIONS
MODEL RTF-2

Sections "C" and "D"

FRONT PANEL, MODEL RTF-2

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C310	CAPACITOR, fixed: mica; .01 mfd., ±10%, char. B; 300 wvdc.	Bypass	CM35B103K
C318	CAPACITOR, fixed: mica; .01 mfd., ±10%, char. B; 300 wvdc. (Same as C310)	Bypass	CM35B103K
I301	LAMP, neon: miniature; 110 volts, 1/25 watt; T-3-1/4 clear bulb; bayonet base.	Inner Oven Indicator	BI-100-51
I302	LAMP, neon: miniature; 110 volts, 1/25 watt; T-3-1/4 clear bulb; bayonet base. (Same as I301)	Outer Oven Indicator	BI-100-51
I303	LAMP, neon: miniature; 110 volts, 1/25 watt; T-3-1/4 clear bulb; bayonet base. (Same as I301)	Zero Beat Indicator	BI-100-51
J301	JACK, telephone tip and sleeve.	Phones Jack	JJ-034
J302	JACK, telephone tip and sleeve. (Same as J301)	Key Jack	JJ-034
M301	MILLIAMETER, D.C.: 0-100, black; 0-5K, red; 0-150, green scales; 3 in. x 3-1/8 in. case; four 4-36 mtg. studs on 2-1/4 in. x 2-1/4 in. mtg. centers with an 2-3/4 in. dia. cutout.	Multimeter	MR-115
M302	METER, D.C.: 0-750 milliamps; 3 x 3-1/8 in. sq. case; four 4-40 mtg. studs on 2-1/4'' x 2-1/4'' mtg. centers with an 2-13/16'' dia. cutout.	P. A. Plate	MR-110-750-5
M303	METER, R.F.: 0-8 amps; 3 x 3-1/8'' sq. case; four 4-40 mtg. studs on 2-1/4 x 2-1/4'' mtg. centers with an 2-13/16 in. dia. cutout.	R.F. Output	MR-109
MP301	COUNTER, revolution non-reset: 4 digit; 5-25/32 in. lg. x 1-15/16 in. wide x 1-19/64 in. high o/a; 1/4 in. shaft.	M.O. Frequency	CY-104
MP302	GEAR, miter.		A-939
MP303	GEAR, miter. (Same as MP302)		A-939
MP304	SUBASSEMBLY, calibrate knob shaft: 1/4 x 3-11/32 o/a; w/gear.		A-830
MP305	GEAR, split: aluminum, 48 pitch; 55 teeth; 14-1/2° pressure angle; anti backlash type.		GR-127
MP306	KNOB, instrument: fluted body; 1-1/8 '' dia. x 5/8'' high o/a; black.	Calibrate	MP-100-1

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
MP307	KNOB, instrument: fluted body; skirt type; 2-1/16" dia. x 7/8" high o/a; black.	Driver Tuning	MP-106-1
MP308	KNOB, instrument: fluted body; skirt type; white line; 2-1/16" dia. x 7/8" high o/a; black.	Driver Band	MP-106-2
MP309	KNOB, instrument: fluted body; skirt type; 3" dia. x 1-5/16" high o/a; black.	M.O. Frequency	MP-107-1
MP310	KNOB, skirt type: fluted body; white line on skirt; 1-1/2" dia. x 7/8" high o/a; black.	Osc. Selector	MP-108-2
MP311	KNOB, skirt type: fluted body; white line on skirt; 1-1/2" dia. x 7/8" high o/a; black. (Same as MP310)	Multimeter	MP-108-2
MP312	KNOB, skirt type: fluted body; white line on skirt; 1-1/2" dia. x 7/8" high o/a; black. (Same as MP310)	Drive	MP-108-2
MP313	KNOB, skirt type: fluted body; white line on skirt; 1-1/2" dia. x 7/8" high o/a; black. (Same as MP310)	Aux. Loading	MP-108-2
MP314	KNOB, instrument type: fluted body; 2-3/8" dia. x 7/8" high o/a; black.	Antenna Loading	MP-110
MP315	KNOB, instrument type: fluted body; white dot; 2-3/8" dia. x 7/8" high o/a; black.	PA Band	MP-110-WD
MP316	KNOB, instrument type: fluted body; 2-3/8" dia. x 7/8" high o/a; black; w/crank.	PA Tuning	MP-113
MP317	KNOB, lock: round body; 1-5/8" dia. x 3/8" high; black.	Calibrate Lock	MP-111-3
MP318	KNOB, instrument: round body; 5/8" dia. x 13/32 in. high o/a.	M.O. Freq. Lock	MP-102-2
MP319	KNOB, instrument: round body; 5/8" dia. x 13/32 in. high o/a. (Same as MP318)	PA Tuning Lock	MP-102-2
MP320	KNOB, instrument: round body; 5/8" dia. x 13/32 in. high o/a. (Same as MP318)	Antenna Loading Lock	MP-102-2
MP321	COUNTER, direct drive: 3 digit; clockwise ascending; 1-1/4 in. x 1 in. x 1 in. o/a; 1/8 in. dia. x 1 in. long round shaft.	PA Tuning	CY-107
S304	SWITCH, lever: two position; non-locking, silver contacts; 3 amp at 120 VAC.	Test Key	SW-186

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
XI301	LIGHT, indicator: w/clear white lens; for miniature bayonet base; T-3-1/4 bulb.	Inner Oven	TS-106-2
XI302	LIGHT, indicator: w/clear white lens; for miniature bayonet base; T-3-1/4 bulb. (Same as XI301)	Outer Oven	TS-106-2
XI303	LIGHT, inidicator: w/clear white lens; for miniature bayonet base; T-3-1/4 bulb. (Same as XI301)	Zero Beat	TS-106-2

MASTER OSCILLATOR, MODEL RTF-2

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
A301	OSCILLATOR ASSEMBLY, variable: consists of: C301, 302, 303, 304, 305, 306, 307, 308, 309, 311, 312, 319, 320, L301, 302, 303, R301, 302, 304, 305, 306, 320, Y301, XV301, 302. *See page E-24.	VMO Oscillator	AO-100
C301	CAPACITOR ASSEMBLY: variable: air dielectric; 21.0 to 220 mmfd. Not a replaceable item, see A301.	VMO Tuning V301	A-1000
C302	CAPACITOR, variable: air dielectric; one section, 7 plates; 5 to 25 mmfd, ±5 mmfd. Not a replaceable item, see A301.	VMO Correction	CB-105
C303	CAPACITOR, variable: air dielectric; one section, 3 plates; 2.8-11 mmfd; 1-17/32 in. lg. x 1-3/8 in. high o/a. Not a replaceable item, see A301.	VMO Trimmer Cap. V301	CB-121
C304	CAPACITOR, fixed: ceramic; 10 mmfd, ±.25 mmfd, 500 wvdc. Not a replaceable item, see A301.	VMO Padder Cap. V301	CC107RG100C
C305	CAPACITOR, fixed: ceramic; 270 mmfd, ±5%, 500 wvdc. Not a replaceable item, see A301.	VMO Grid Coupling Cap. V301	CC47LG271J
C306	CAPACITOR, fixed: ceramic; 270 mmfd, ±5%; 500 wvdc. (Same as C305) Not a replaceable item, see A301.	VMO Cathode Coupling Cap. V301	CC47LG271J
C307	CAPACITOR, fixed: mica; .01 mfd, ±10%; char. B; 300 wvdc. Not a replaceable item, see A301.	MO Plate Bypass V301	CM35B103K
C308	CAPACITOR, fixed: mica; .01 mfd, ±10%; char. B; 300 wvdc. Not a replaceable item, see A301. (Same as C307)	Cath. Fol. Plate Bypass Cap. V302A	CM35B103K
C309	CAPACITOR, fixed: mica; 1000 mmfd, ±5%; 500 wvdc, char. B. Not a replaceable item, see A301.	Plate Coup. Cap. 100 Kc Osc. V302B	CM20B102J
C310	(See Front Panel)		
C311	CAPACITOR, fixed: mica; 240 mmfd, ±5%; char. C, 500 wvdc. Not a replaceable item, see A301.	100 Kc Adjust V302B	CT-103-1
C312	CAPACITOR, fixed: mica; 240 mmfd; ±5%; char. C, 500 wvdc. Not a replaceable item, see A301.	Plate Coup. Cap. 100 Kc, V302B	CM20C241J
C313	CAPACITOR, fixed: mica; .01 mfd, ±10%; char. B, 300 wvdc. (Same as C307).	Inner Oven Ther. Arc Supp. E301	CM35B103K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C314	CAPACITOR, fixed: mica; .01 mfd, ±10%; char. B; 300 wvdc. (Same as C307)	Relay Arc Supp. E301	CM35B103K
C315	CAPACITOR, fixed: paper; .1 mfd, +40 -10%; 400 wvdc; plastic tubular case.	Outer Oven Ther. Arc. Supp. E302	CN-100-4
C316	CAPACITOR, fixed: mica; 500 mmfd, ±5%; 500 wvdc, char. B.	RF Meter Decoup. Cap. M303	CM20B501J
C317	CAPACITOR, fixed: mica; 500 mmfd; ±5%; 500 wvdc, char. B. (Same as C316)	RF Meter Decoup. Cap. M303	CM20B501J
C318	(See Front Panel)		
C319	CAPACITOR, fixed: ceramic; 8.2 mmfd., ±5%, 500 wvdc. Not a replaceable item, see A301	VMO Temperature Compensation	CC-102-5
C320	CAPACITOR, fixed: mica; .01 mfd, ±10%; char. B; 300 wvdc. (Same as C307) Not a replaceable item, see A301.	RF Bypass Cap. V301	CM35B103K
E301	BOARD, terminal: barrier type; eight 6-32 x 1/4'' binding head machine screws.	Inner Oven Terminal	TM-102-8
E302	BOARD, terminal: barrier type; eight 6-32 x 1/4'' binding head machine screw. (Same as E301)	Outer Oven Terminal	TM-102-8
E303	BOARD, terminal: barrier type; fourteen 6-32 x 1/4'' binding head machine screws.	Oven-PS Interconnect	TM-102-14
E304	INSULATOR, pillar: round; white glazed steatite, 1/2'' lg. x 3/8'' dia. both ends tapped 6-32.	Standoff for L301	NS3W0104
E305	INSULATOR, pillar: round; white glazed steatite, 1/2'' lg. x 3/8'' dia. both ends tapped 6-32. (Same as E304)	Standoff for L301	NS3W0104
L301	COIL ASSEMBLY, R.F.: slug tuned; 27.5-28.0 microhenries, Q=200. Not a replaceable item, see A301.	VMO Tank Coil V301	A-243
L302	CHOKE, R.F.: 1 millihenry; 100 ma. Not a replaceable item, see A301.	VMO Cathode Choke, V301	CL-101-2
L303	CHOKE, R.F.: 750 microhenries; ±20%. Not a replaceable item, see A301.	Plate Decoup. Choke, V302A	CL-100-5
MP322	LAMP INSTALLER.		TP-104

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
MP323	DRIVER, vernier; 3/8 in. lg. shaft with 3/64 in. x 3/64 in. slot.		PM-207
MP324	COUPLING, shaft: flexible; non-insulator spring action type; fit 1/4" dia. shaft w/four 6-32 set screws.		PM-220
MP325	COUPLING, shaft: flexible; non-insulator spring action type; fit 1/4" dia. shaft w/four 6-32 set screws. (Same as MP324)		PM-220
MP326	COUPLING, shaft: flexible; non-insulator spring action type; fit 1/4" dia. shaft w/four 6-32 set screws. (Same as MP324)		PM-220
R301	RESISTOR, fixed: composition; 3900 ohms, ±10%; 1/2 watt. Not a replaceable item, see A301.	Plate Decoup. Res., V301	RC30GF392K
R302	RESISTOR, fixed: composition; 1000 ohms, ±10%; 1 watt. Not a replaceable item, see A301.	Cathode Output Res., V302A	RC30GF102K
R303	NOT USED.		
R304	RESISTOR, fixed: composition; 47,000 ohms, ±10%; 1/2 watt. Not a replaceable item, see A301.	Plate Load Res., V302B	RC20GF473K
R305	RESISTOR, fixed: composition; 4700 ohms, ±10%; 1/2 watt. Not a replaceable item, see A301.	Cathode Output Res., V302B	RC20GF472K
R306	RESISTOR, fixed: composition; 470,000 ohms, ±10%; 1/2 watt. Not a replaceable item, see A301.	Grid Leak Res., V302B	RC20GF474K
R307 A & B	RESISTOR, fixed: wire wound; heater element, two sections, 1300 ohms each section, insulated.	Inner Oven Heaters	RR-105
R308 A & B	RESISTOR, fixed: wire wound; heater element, two sections, 160 ohms each section, insulated.	Outer Oven Heaters	RR-106
R309	RESISTOR, fixed: composition; 9100 ohms, ±5%; 2 watts.	Relay Drop Res., 220 V oper. E301	RC42GF912J
R310	RESISTOR, fixed: composition; 9100 ohms, ±5%; 2 watts. (Same as R309)	Relay Drop Res., 220 V. oper. E301	RC42GF912J
R311	RESISTOR, fixed: composition; 100 ohms, ±10%; 1/2 watt.	Inner Thermo. Arc Suppressor	RC20GF101K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R312	RESISTOR, fixed: composition; 220,000 ohms, ±10%; 1/2 watt.	Inner Oven Ind. Protector E301	RC20GF224K
R313	RESISTOR, fixed: composition; 220,000 ohms, ±10%; 1/2 watt. (Same as R213)	Outer Oven Ind. Protector E302	RC20GF224K
R314	RESISTOR, fixed: composition; 100 ohms, ±10%; 1/2 watt. (Same as R311)	Outer Oven Therm Arc Supp. E302	RC20GF101K
R315	RESISTOR, fixed: composition; 100 ohms, ±10%; 1/2 watt. (Same as R311)	Relay Arc Supp. E303	RC20GF101K
R316	NOT USED.		
R317	NOT USED.		
R318	NOT USED.		
R319	NOT USED.		
R320	RESISTOR, fixed: composition; 22,000 ohms, ±10%; 1/2 watt. Not a replaceable item, see A301	VMO Grid Leak	RC20GF223K
S301	SWITCH ASSEMBLY, thermostatic: bi-metallic; operate at 70°C, ±0.5°C.	Inner Oven Thermostat	A-1236
S302	SWITCH, thermostatic: bi-metallic; operate at 80°C, ±2°C.	Inner Oven Safety Thermostat	SS-100-3
S303	SWITCH, thermostatic: bi-metallic; operate at 60°C, ±2°C.	Outer Oven Thermostat	SS-100-1
V301	TUBE, electron: HF power triode; 7 pin miniature.	VMO	6AB4
V302	TUBE, electron: medium-mu duo-triode; 9 pin miniature.	Cathode Follower 100 Kc Osc.	12AU7
XV301	SOCKET, electron tube: 7 pin miniature. Not a replaceable item, see A301.	Socket for V301	TS102P01
XV302	SOCKET, electron:tube: 9 pin miniature. Not a replaceable item, see A301.	Socket for V302	TS103P01
XY301	SOCKET, crystal: .487 in. spacing for .095 in. pins.	Socket for Y301	TS-105-1
Y301	CRYSTAL UNIT, quartz; 100 Kcs. Not a replaceable item, see A301.	100 Kc Crystal	CR-100
	*NOTE: TMC Part AO-100 Oscillator Assembly, is replaced in this equipment as a unit. It requires precise alignment at the factory before use. The assembly will be repaired and aligned free of charge if returned to plant, transportation charges paid.		

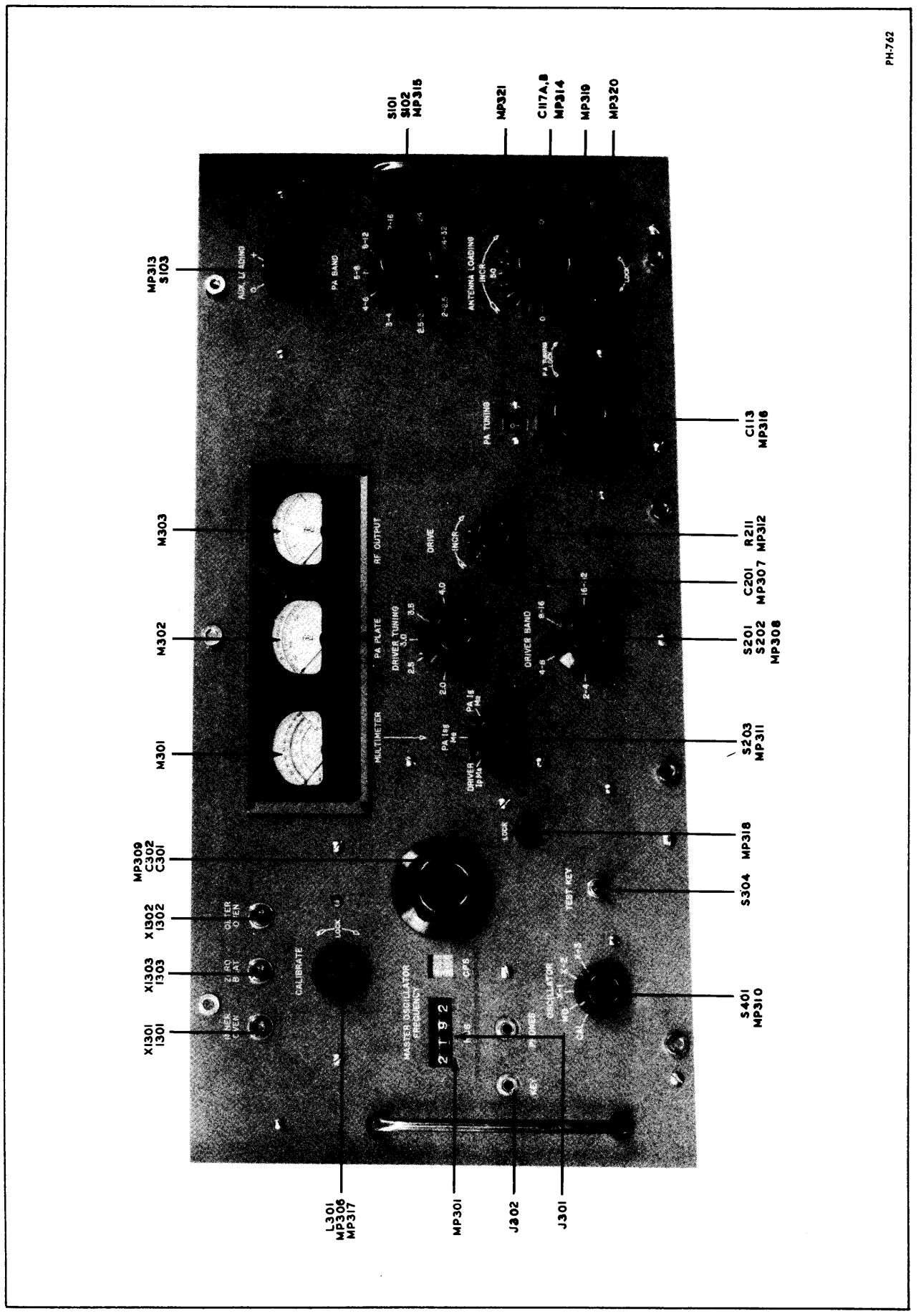


Figure E-4 Front View Model RTF-2

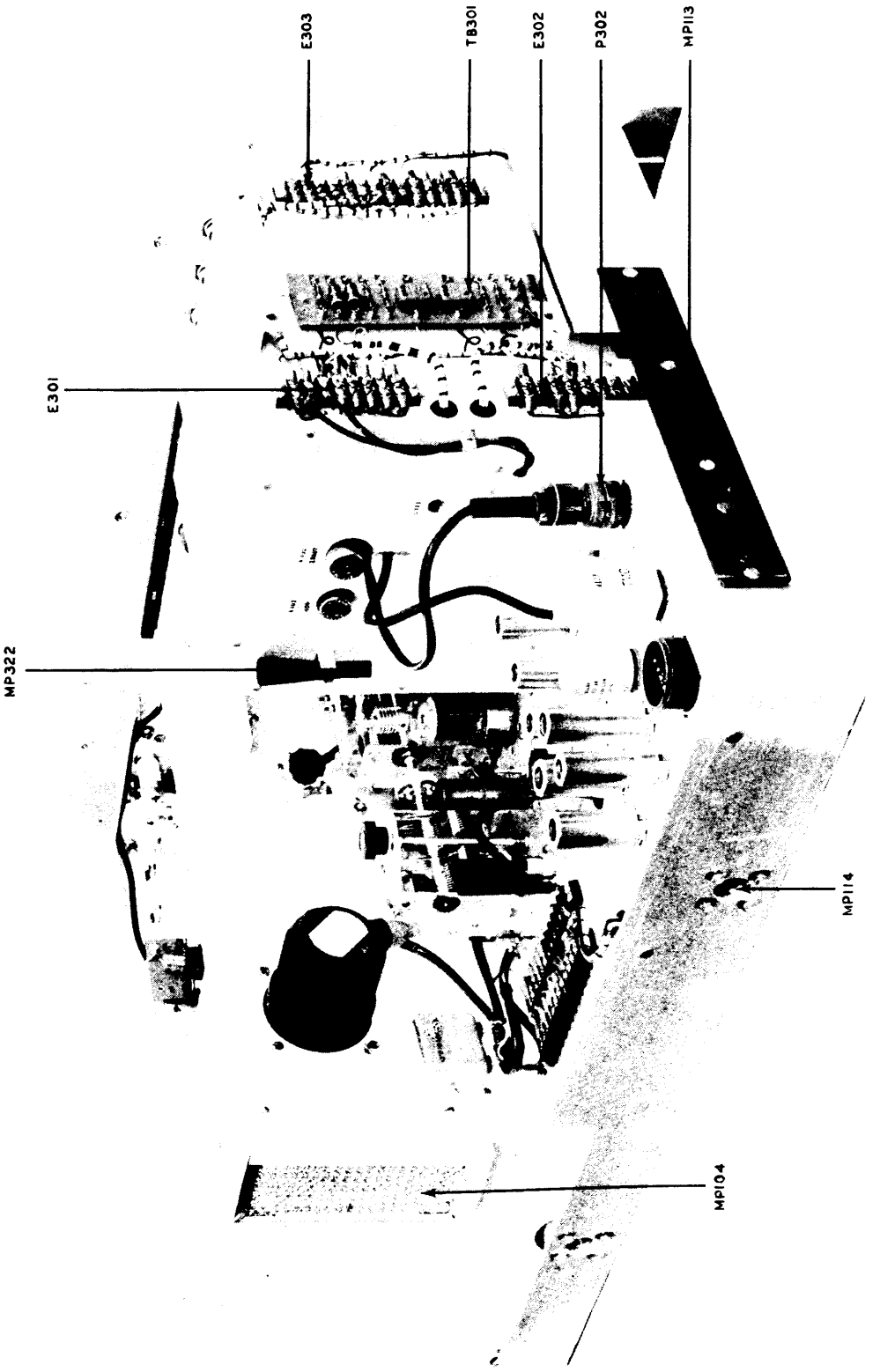


Figure E-5 Rear View Model RTF-2

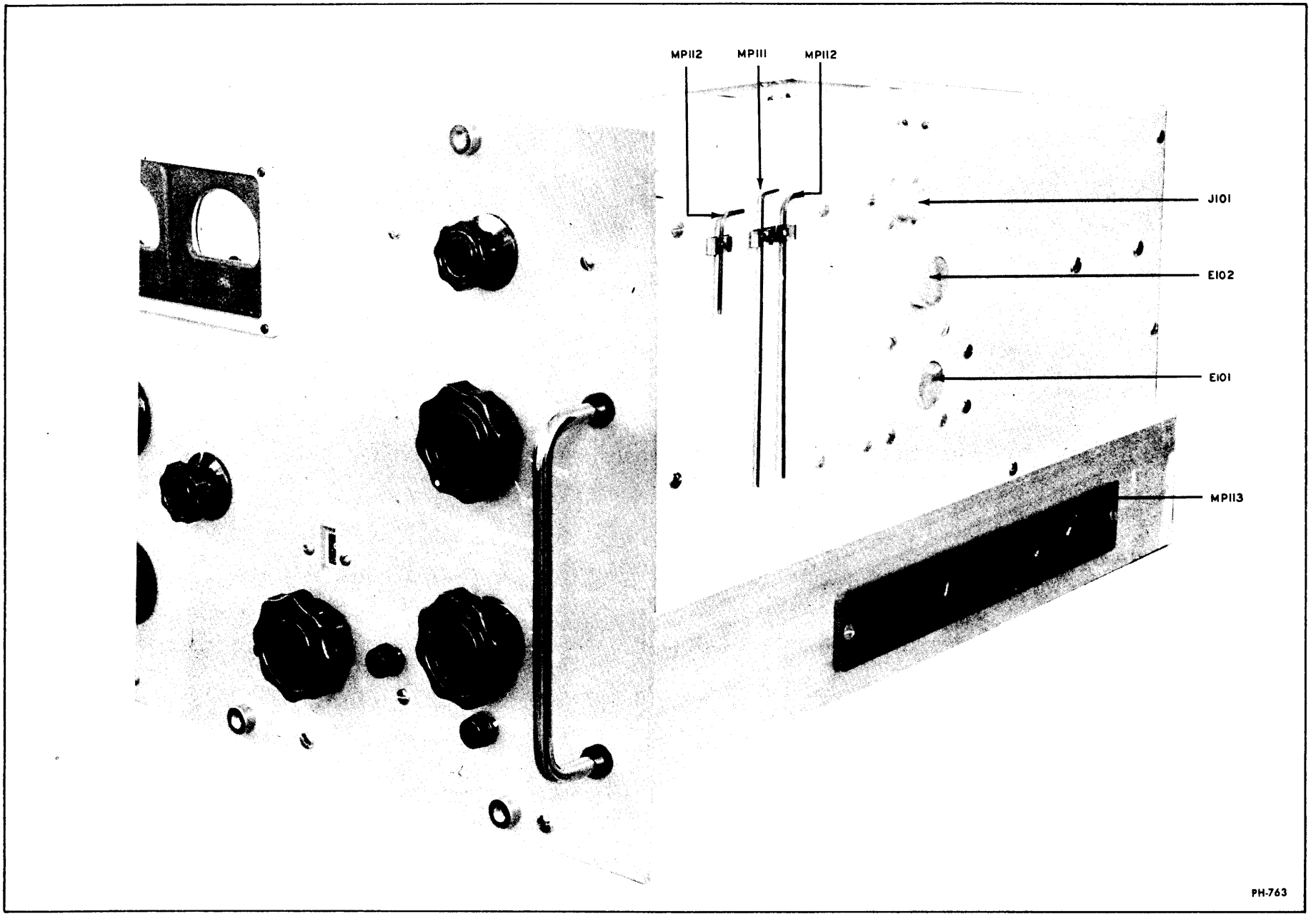


Figure E-6 Side View Model RTF-2

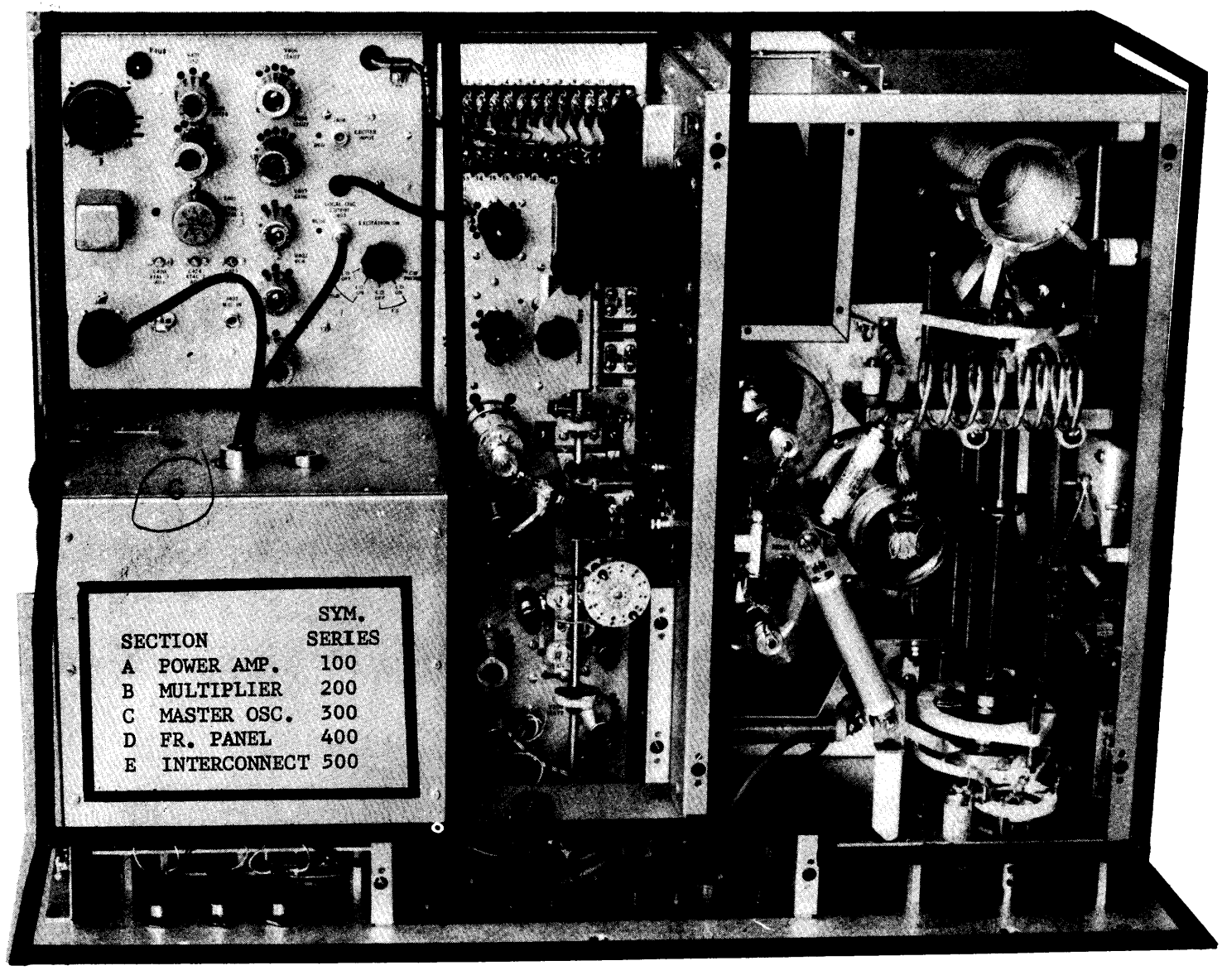


Figure E-7 Section Callouts Model RTF-2

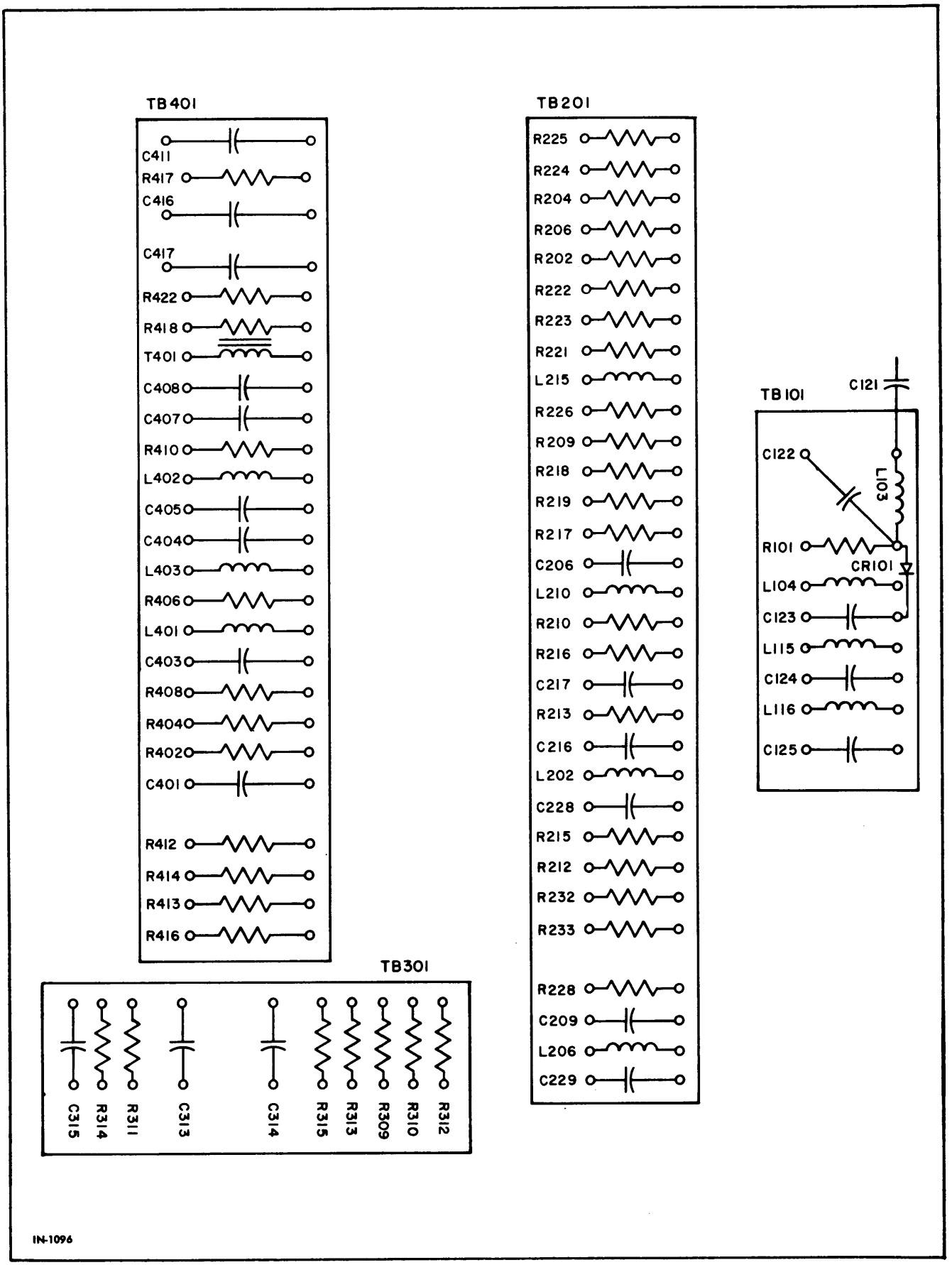


Figure E-8 Terminal Board Layout Model RTF-2

INTERCONNECT CHASSIS, MODEL RTF-2

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C401	CAPACITOR, fixed: mica; .01 mfd., ±5%; 300 wvdc; char. C.	Plate Bypass V402	CM35C103J
C402	CAPACITOR, fixed: mica; 1000 mmfd, ±5%; 500 wvdc, char. B.	RF Input V402	CM20B102J
C403	CAPACITOR, fixed: mica; .01 mfd, ±5%; 300 wvdc; char. C. (Same as C401)	p/o LP Filter V403	CM35C103J
C404	CAPACITOR, fixed: mica; 1000 mmfd, ±5%, 500 wvdc, char. B. (Same as C402)	RF Coupling V404	CM20B102J
C405	CAPACITOR, fixed: mica; .01 mfd., ±5%, 300 wvdc; char. C. (Same as C401)	Plate Bypass V404	CM35C103J
C406	CAPACITOR, fixed: mica; .01 mfd., ±5%; 300 wvdc; char. C. (Same as C401)	Cathode Bypass V403	CM35C103J
C407	CAPACITOR, fixed: mica; .01 mfd., ±5%; 300 wvdc; char. C. (Same as C401)	RF Bypass V404	CM35C103J
C408	CAPACITOR, fixed: mica; .01 mfd., ±5%; 300 wvdc; char. C. (Same as C401)	Output V404	CM35C103J
C409	CAPACITOR, fixed: mica; 1000 mmfd, ±5%; 500 wvdc, char. B. (Same as C402)	Input Coupling V405	CM20B102J
C410	CAPACITOR, fixed: mica; 1000 mmfd, ±5%; 500 wvdc, char. B. (Same as C402)	LP Filter V406	CM20B102J
C411	CAPACITOR, fixed: paper; .1 mfd., +40 -10%; 400 wvdc; plastic tubular case.	Input Coupling V406	CN-100-4
C412	CAPACITOR, fixed: mica; 5 mmfd, ±20%; char. B, 500 wvdc.	DC Blocking V405	CM20B050M
C413	CAPACITOR, fixed: mica; 1000 mmfd, ±5%; 500 wvdc, char. B. (Same as C402)	Screen Bypass V405	CM20B102J
C414	CAPACITOR, fixed: mica; 1000 mmfd, ±5%; 500 wvdc, char. B. (Same as C402)	p/o LP Filter V405	CM20B102J
C415	CAPACITOR, fixed: mica; 1000 mmfd, ±5%; 500 wvdc, char. B. (Same as C402)	p/o LP Filter V405	CM20B102J

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C416	CAPACITOR, fixed: paper; .1 mfd., +40 -10%; 400 wvdc; plastic tubular case. (Same as C411)	Audio Coupling V406	CN-100-4
C417	CAPACITOR, fixed: paper; .1 mfd, +40 -10%; 400 wvdc; plastic tubular case. (Same as C411)	Audio Coupling V406	CN-100-4
C418	CAPACITOR, fixed: mica; 1000 mmfd, ±5%; 500 wvdc, char. B. (Same as C402)	RF Coupling V402	CM20B102J
C419	CAPACITOR, fixed: mica; 1000 mmfd, ±5%; 500 wvdc, char. B. (Same as C402)	Screen Bypass V403	CM20B102J
C420	CAPACITOR, variable: air dielectric; one section, nineteen plates; 3.2 to 50 mmfd, 500 wvdc.	Xtal 3 Trimmer	CT-104-3
C421	CAPACITOR, fixed: mica; .01 mfd., ±5%; 300 wvdc; char. C. (Same as C401)	RF Bypass	CM35C103J
C422	CAPACITOR, fixed: mica; .01 mfd., ±5%; 300 wvdc; char. C. (Same as C401)	RF Bypass V403	CM35C103J
C423	CAPACITOR, variable: air dielectric; one section; nineteen plates; 3.2 to 50 mmfd, 500 wvdc. (Same as C420)	Xtal 1 Trimmer	CT-104-3
C424	CAPACITOR, variable: air dielectric; one section; nineteen plates; 3.2 to 50 mmfd, 500 wvdc. (Same as C420)	Xtal 2 Trimmer	CT-104-3
C425	CAPACITOR, fixed: mica; .01 mfd., ±5%; 300 wvdc; char. C. (Same as C401)	Arc Suppressor Z401	CM35C103J
C426	CAPACITOR, fixed: mica; 150 mmfd; ±2%; char. D., 500 wvdc.	Screen Bypass V403	CM20D151G
C427	CAPACITOR, fixed: mica; .01 mmfd., ±5%; 300 wvdc; char. C. (Same as C401)	B+ Bypass	CM35C103J
C428	CAPACITOR, fixed: paper; .1 mfd., +40 -10%; 400 wvdc; plastic tubular case. (Same as C411)	B+ Bypass	CN-100-4
F401	FUSE, cartridge: 5 amps, 250 v, instantaneous.	Heater Fuse	FU-100-5
J401	CONNECTOR, receptacle: 7 contacts rated at 20 amps, 200 VDC, 150 VAC (RMS); mtg. dim. 1-1/32 in. mtg. centers.	Interconnect MO Power	MS3102A-16S-1S

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
J402	CONNECTOR, receptacle: electrical; 1 female contact; 52 ohms; BNC type.	MO Input	UG-625/U
J403	CONNECTOR, receptacle: electrical; 1 female contact; 52 ohms; BNC type. (Same as J402)	LO Out	UG-625/U
J404	CONNECTOR, receptacle: electrical; 1 female contact; 52 ohms; BNC type. (Same as J402)	Exciter In	UG-625/U
J405	CONNECTOR, receptacle: pin type; 4 contacts rated at 35 amps, 18 contacts rated at 20 amps; 200 VDC, 150 VDC (RMS): mtg. dim. 1.782 in. dia. cutout w/four 9/64 in. dia. holes on 1-9/16 in. mtg. centers.	Interconnect RTF	MS3102A-28-11P
K401	RELAY ASSEMBLY, 4500 ohms DC; hermetically sealed.	Inner Oven Control Relay	A-123
L401	COIL, radio frequency: 750 micro-henries, ±20%; 100 ma. max. current, DC resistance approx. 17 ohms; bakelite body.	p/o LP Filter V403	CL-100-5
L402	COIL, radio frequency: 750 micro-henries, ±20%; 100 ma. max. current, DC resistance approx. 17 ohms; bakelite body. (Same as L401)	Plate Decoupling V404	CL-100-5
L403	COIL, radio frequency: 100 micro-henries, ±10%; 100 ma. max. current, DC resistance approx. 5.5 ohms: bakelite body.	Plate Decoupling V403	CL-100-4
L404	COIL, radio frequency: 750 micro-henries, ±20%; 100 ma. max, current, DC resistance approx. 17 ohms; bakelite body. (Same as L401)	B+ Filter	CL-100-5
L405	COIL, radio frequency: 750 micro-henries, ±20%; 100 ma max. current, DC resistance approx. 17 ohms; bakelite body. (Same as L401)	B+ Filter	CL-100-5
MP401	COUPLING, solid; 7/16 in. dia. x 3/4 in. lg; for 1/4 in. shaft; four 6-32 Allen head set screws.	Shaft, S401	MC-102
R401	RESISTOR, fixed: wire wound; 6000 ohms, ±5%; 10 watts.	Voltage Dropping V401	RW-109-45
R402	RESISTOR, fixed: composition; 33,000 ohms, ±10%; 1 watt.	Plate Load, V402	RC30GF333K
R403	RESISTOR, fixed: composition; 4700 ohms, ±10%; 1/2 watt.	Grid Leak, V402	RC20GF472K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R404	RESISTOR, fixed: composition; 1000 ohms, ±10%; 1/2 watt.	Cathode Load, V402	RC20GF102K
R405	NOT USED.		
R406	RESISTOR, fixed: composition; 82,000 ohms, ±10%; 1/2 watt.	Screen Dropping, V403	RC20GF823K
R407	RESISTOR, fixed: composition; 100,000 ohms, ±10%; 1/2 watt.	Grid Leak, V404	RC20GF104K
R408	RESISTOR, fixed: composition; 160 ohms, ±5%; 1/2 watt.	Cathode Bias V403	RC20GF181K
R409	RESISTOR, fixed: composition; 100,000 ohms, ±10%; 1/2 watt. (Same as R407)	Grid Leak, V403	RC20GF104K
R410	RESISTOR, fixed: composition; 1 megohm, ±10%; 1/2 watt.	Cathode Bias V404	RC20GF105K
R411	RESISTOR, fixed: composition; 100,000 ohms, ±10%; 1/2 watt. (Same as R407)	Grid Leak, V405	RC20GF104K
R412	RESISTOR, fixed: composition; 56,000 ohms, ±10%; 1/2 watt.	Voltage Dropping	RC20GF563K
R413	RESISTOR, fixed: composition; 1 megohm, ±10%; 1/2 watt. (Same as R410)	Plate Load, V405	RC20GF105K
R414	RESISTOR, fixed: composition; 100,000 ohms, ±10%; 1/2 watt. (Same as R407)	Screen Dropping V405	RC20GF104K
R415	NOT USED.		
R416	RESISTOR, fixed: composition; 1000 ohms, ±10%; 1/2 watt. (Same as R404)	p/o LP Filter V405	RC20GF102K
R417	RESISTOR, fixed: composition; 220,000 ohms, ±10%; 1/2 watt.	Plate Load, V406	RC20GF224K
R418	RESISTOR, fixed: composition; 82,000 ohms, ±10%; 2 watts.	Plate Load, V406	RC42GF823K
R419	RESISTOR, fixed: composition; 100,000 ohms, ±10%; 1/2 watt. (Same as R407)	Grid Leak Bias, V405	RC20GF104K
R420	RESISTOR, fixed: composition; 4.7 megohms; ±10%; 1/2 watt.	Grid Leak Bias, V406	RC20GF475K
R421	RESISTOR, fixed: composition; 220,000 ohms, ±10%; 1/2 watt. (Same as R417)	Grid Leak Bias, V406	RC20GF224K
R422	RESISTOR, fixed: composition; 10,000 ohms, ±10%; 1/2 watt.	Output Load V406	RC20GF103K
R423	RESISTOR, fixed: wire wound; 30 ohms, ±5%; 5 watts.	p/o RF Output Attenuator	RR-116-30-W

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R424	RESISTOR, fixed: composition; 56,000 ohms, ±10%; 1/2 watt. (Same as R412)	Relay Divider, K401	RC20GF563K
R425	RESISTOR, fixed: wire wound; 50 ohms, ±5%; 5 watts.	p/o RF Output Attenuator	RR-116-50-W
R426	RESISTOR, current regulating: ballast vacuum tube type.	Ballast	RR-109
S401	SWITCH ASSY., rotary: 3 section; 5 position; wafer "A & B" bakelite, wafer "C" ceramic; contacts and wipers silver plated, 1/4 in. dia. drive shaft 10-1/2 in. lg.	Oscillator Switch	AS-106
S402	SWITCH ASSY., CW-FS: 2 section; 5 position; 30 deg. angle of throw; non-shorting; ceramic wafers; silver plated brass contacts; 1/4 in. shaft.	Excitation Switch	AS-108
T401	TRANSFORMER, H.F.: VMO output	CF Load	TF-183
V401	TUBE, electron: regulator; 7 pin miniature, operating at 150 VDC; 5 amps min.; 30 amps max. current.	Voltage Regulator	OA2
V402	TUBE, electron: HF power triode; 7 pin miniature.	Cathode Follower	6C4
V403	TUBE, electron: sharp cutoff R.F. pentode; 7 pin miniature.	Xtal Osc. Amp.	6AH6
V404	TUBE, electron: medium-mu duo-triode; 9 pin miniature.	Cathode Follower Osc. Output	12AU7
V405	TUBE, electron: heptode converter; 7 pin miniature.	Mixer	6BE6
V406	TUBE, electron: medium-mu duo-triode; 9 pin miniature. (Same as V404)	Audio Amplifier	12AU7
XF401	FUSE, extractor post type; 250 v, 15 amp.	Holder for F401	FH-100-2
XK401	SOCKET, electron tube: octal	Socket for K401	TS101P01
XR426	SOCKET, electron tube: 9 pin miniature.	Socket for R426	TS103P01
XV401	SOCKET, electron tube: 7 pin miniature.	Socket for V401	TS102P01
XV402	SOCKET, electron tube: 7 pin miniature. (Same as XV401)	Socket for V402	TS102P01
XV403	SOCKET, electron tube: 7 pin miniature. (Same as XV401)	Socket for V403	TS102P01
XV404	SOCKET, electron tube: 9 pin miniature. (Same as XR426)	Socket for V404	TS103P01

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
XV405	SOCKET, electron tube: 7 pin miniature. (Same as XV401)	Socket for V405	TS102P01
XV406	SOCKET, electron tube: 9 pin miniature. (Same as XR426)	Socket for V406	TS103P01
XY401	SOCKET, crystal: .486 in. spacing for .050 in. pin dia.	Socket for Y401	TS-104-1
XZ401	SOCKET, electron tube: octal. (Same as XK401)	Socket for Z401	TS101P01
Z401	OVEN, crystal: 6.3 v, 7.5 watt heater; 75° C ±2°C; 1-1/4 in. dia. x 2-5/32 lg; octal base.	Crystal Holder	PO-158-1

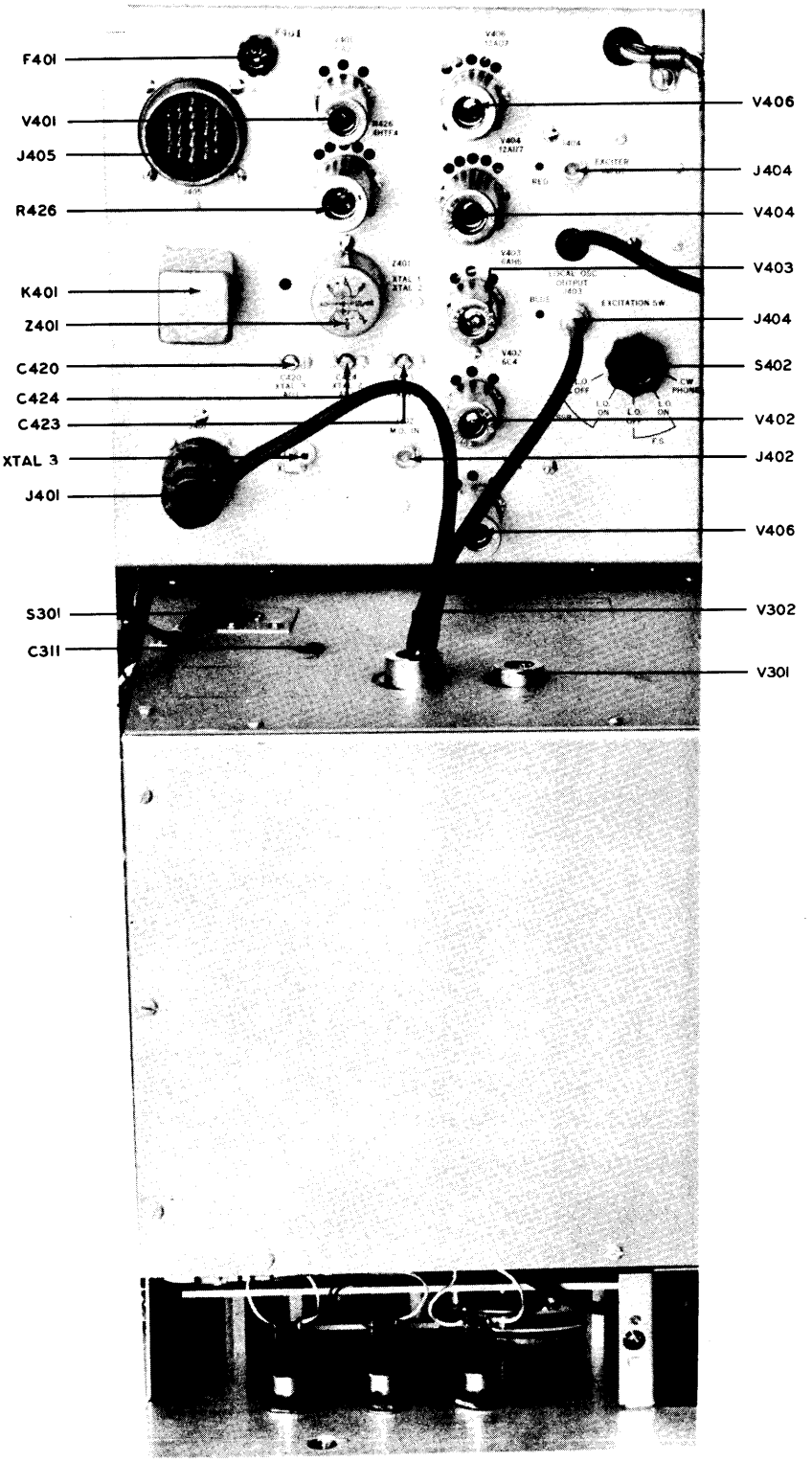


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Figure E-13 Top View Section "E"

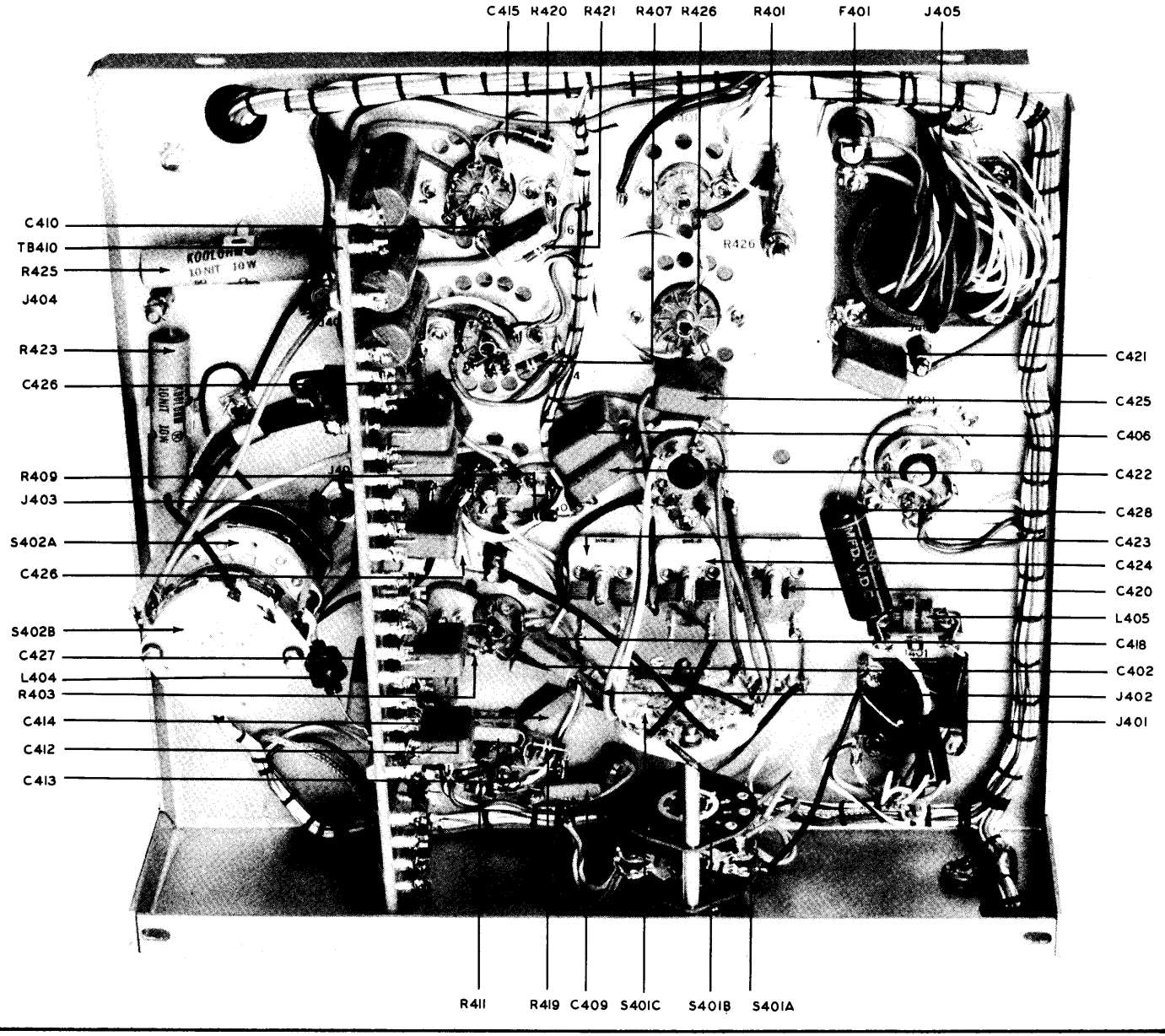


Figure E-14 Bottom View Section "E"

PARTS LIST
PARTS ILLUSTRATIONS
MODEL RTP-2

POWER SUPPLY, MODEL RTP-2

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C601	CAPACITOR, fixed: paper dielectric; 4 ufd, ±10%, 4000 wvdc; furnished with mounting clamps.	H.V. B+ Filter Cap., T603	CN-109
C602	CAPACITOR, fixed: paper dielectric; 4 ufd, ±10%, 4000 wvdc; furnished with mounting clamps. (Same as C601)	H.V. B+ Filter Cap., T603	CN-109
C603	CAPACITOR, fixed: 0.10 ufd, +40 -10%, 600 wvdc.	Arc Suppressor Cap., E602	CN-100-22
C604	CAPACITOR, fixed: paper dielectric; 4 ufd, ±10%, 600 wvdc.	B- Filter Cap., V601	CP40C2FF405K
C605	CAPACITOR, fixed: paper dielectric; 4 ufd, ±10%, 600 wvdc. (Same as C604)	B- Filter Cap., V602	CP40C2FF405K
C606	CAPACITOR, fixed: dry electrolytic; polarized, 80 ufd, 450 wvdc.	B+ Filter Cap., V604	CE51F800R
C607	CAPACITOR, fixed: paper dielectric; 4 ufd, ±10%, 600 wvdc. (Same as C604)	B+ Filter Cap., V604	CP40C2FF405K
C608	CAPACITOR, fixed: paper dielectric; 4 ufd, ±10%, 600 wvdc. (Same as C604)	B+ Filter Cap., V605	CP40C2FF405K
C609	CAPACITOR, fixed: paper dielectric; 4 ufd, ±10%, 600 wvdc. (Same as C604)	B+ Filter Cap., V605	CP40C2FF405K
C610	CAPACITOR, fixed: paper dielectric; 4 ufd, ±10%, 4000 wvdc, furnished with mounting clamps. (Same as C601)	H.V. B+ Filter Cap., T603	CN-109
C611	CAPACITOR, fixed: paper dielectric; 10,000 uufd, +30 -10%, 1000 wvdc.	Spark Suppressor Cap., K601	CN-110-103-G
C612	CAPACITOR, fixed: 0.10 ufd, +40 -10%, 600 wvdc. (Same as C603)	Pulse Forming Cap., K602	CN-100-22
CB601	CIRCUIT BREAKER, main power: toggle lever type; DPST; connection A to B 250 VAC, 16A; A to C 250 VAC, 32A; manual reset, armature trip release.	Line Voltage Breaker	SW-164
CB602	CIRCUIT BREAKER, final S.G. overload reset: toggle lever type; 250 VAC, 15A; 1% ripple; .01 ADC, manual reset, armature trip release.	Final Screen Grid Overload Reset	SW-229
CB603	CIRCUIT BREAKER, final plate overload reset: toggle lever type; 250 VAC, 15A; 1% ripple; .1 ADC, manual reset, armature trip release.	Final Plates Overload Reset	SW-215
CR601	DIODE, silicon.	S.G. Protect	1N1084
CR602	DIODE, silicon. (Same as CR601)	S.G. Protect	1N1084

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
E601	TERMINAL STRIP, barrier lug type: 8 brass, nickel plated 6-32 binding head machine screws; moulded phenolic body.	Final Screen Grid Overload Reset Terminal	TM-100-8
E602	TERMINAL STRIP, barrier lug type; 24 brass, nickel plated 6-32 binding head machine screws; moulded phenolic body.	Transmitter Plates Relay Terminal	TM-102-12
E603	TERMINAL STRIP, barrier lug type; 24 brass, nickel plated 6-32 binding head machine screws; moulded phenolic body. (Same as E602)	P.A. Plate Overload Relay Term.	TM-102-12
E604	SHIELD, tube.	Shield for V601	TS-102-U03
E605	SHIELD, tube. (Same as E604)	Shield for V602	TS-102-U03
E606	SHIELD, tube. (Same as E604)	Shield for V603	TS-102-U03
E607	SHIELD, tube. (Same as E604)	Shield for V608	TS-102-U03
E608	SHIELD, tube. (Same as E604)	Shield for V609	TS-102-U03
E609	SHIELD, tube. (Same as E604)	Shield for V610	TS-102-U03
E610	SHIELD, tube. (Same as E604)	Shield for V611	TS-102-U03
E611	SHIELD, heat dissipating.	Shield for K602	TS-128-3
E612 thru E617	FUSE CLIP.	Clips for Spare Fuses	FC-102-1-XX-C
F601	FUSE, time lag: cartridge type; 3 amps, 115 V.	M.O. Oven Fuse	FU-102-003
F602	FUSE, time lag: cartridge type; 3 amps, 115V. (Same as F601)	Low Voltage Supply Fuse	FU-102-003
F603	FUSE, time lag: cartridge type; 3 amps, 115V. (Same as F601)	Mid Voltage Supply Fuse	FU-102-003
F604	FUSE, time lag: cartridge type; .125 amp, 115V.	Low B- Fuse	FU-102-.125
F605	FUSE, time lag: cartridge type; 0.3 amp; 115V.	Low B+ Fuse	FU-102-.300
F606	FUSE, time lag: cartridge type; 0.3 amp; 115V. (Same as F605)	Mid B+ Fuse	FU-102-.300
I601	LAMP, neon: miniature bayonet base; 110/125 V, type T-3-1/4.	Final Overload Indicator	BI-100-51H
I602	LAMP, incandescent: double contact bayonet base; 120 V, 3 watts, type 5-6.	Final Plate Indicator	BI-102-3

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
I603	LAMP, incandescent: double contact bayonet base; 120 V, 3 watts, type 5-6. (Same as I602)	Xmtr. Plates Indicator	BI-102-3
I604	LAMP, incandescent: double contact bayonet base; 120 V, 3 watts, type 5-6. (Same as I602)	Main Power Indicator	BI-102-3
J601	CONNECTOR, receptacle: male.	Power Input	MS3102A-28-11P
J602	CONNECTOR, receptacle: female.	Power Output	MS3102A-28-16S
J603	CONNECTOR, receptacle: female.	High Voltage Output	MS3102A-18-16S
J604	CONNECTOR, receptacle: female; A.C.; two contacts.	Utility Outlet	JJ-169
K601	RELAY ASSY., transmitter plates: 115 VDC, 5000 ohm coil resistor; min. oper. amps. .015; furnished with cable.	Transmitter Plates Relay	A-1270
K602	RELAY, thermostatic delay: 6 volts, normally open, 60 ±12 sec. delay; miniature 9 pin base, SPST; 2.5 watts.	Time Delay Relay	RL-111-6N060T
K603	RELAY, time delay: break-make type; 6.3 volts DC.	Time Delay Lock-In	RL-116-AC-3C-006.3
L601	REACTOR, filter: 50 hy; DC resistance approx. 800 ohms; 30 ma dc; insulated for 1500 V; in accordance with MIL-T-27, GR. 1 - CL. A - FAM. 03.	Filter Choke V603	TF-166
L602	REACTOR, filter: 10 hy; DC resistance approx. 85 ohms; 200 ma dc; insulated for 1500 V; in accordance with MIL-T-27, GR. 1 - CL. A - FAM 04.	Filter Choke V604	TF-144
L603	REACTOR, filter: 10 hy; DC resistance approx. 85 ohms; 200 ma dc; insulated for 1500 V; in accordance with MIL-T-27, GR. 1 - CL. A - FAM 04. (Same as L602)	Filter Choke V604	TF-144
L604	REACTOR, filter: 10 hy; DC resistance approx. 85 ohms; 200 ma dc; insulated for 1500 V; in accordance with MIL-T-27, GR. 1 - CL. A - FAM 04. (Same as L602)	Filter Choke V605	TF-144
L605	REACTOR, filter: 10 hy; DC resistance approx. 85 ohms; 200 ma dc; insulated for 1500 V; in accordance with MIL-T-27, GR. CL. A - FAM 04. (Same as L602)	Filter Choke V605	TF-144

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
L606	REACTOR, filter: 10 hy at 600 ma; 25 hy at 100 ma; DC resistance less than 60 ohms; insulated for 4000 V; in accordance with MIL-T-27, GR. 1 - CL. A - FAM. 04.	High Voltage	TF-5012
M601	METER, A.C. volt: 0 to 150 range.	Filament Line	MR-108-150
MP601	CLAMP, tube: corrosion resistant steel.	Clamp for V604	CU-118-1S
MP602	CLAMP, tube: corrosion resistant steel. (Same as MP601)	Clamp for V605	CU-118-1S
MP603	CLAMP, tube: corrosion resistant steel. (Same as MP601)	Clamp for V606	CU-118-1S
MP604	CAP, dust: 1-3/8 x 18 thds. fits MS22 connector; 1-1/2" dia. x 7/16" high; complete with chain; alum. cad. plated.	Aux. Outlet Cover	HB-109-8-C
MP605	SLIDE, chassis: 12-1/8" lg x 1-3/4" h x 1/4" thk o/a closed. steel; lubri - cating paint finish.	Chassis Slide	TK-100-1
MP606	SCREW, thumb: 5/16 x 24 thds; slotted 3/4" hexagonal head 2" lg; stainless steel.	Panel Mtg. Screw	SC-139
MP607	SOCKET, pin: stainless steel; 2 in. dia. x 1/2" thk; four 10-32 tapped mtg. holes equally spaced on 3/4" radius circle.	Rear Support	PM-507
R601	RESISTOR, fixed: wire wound; 15,000 ohms, 10 watts, 25.5 ma.	p/o PA SG Divider	RW-109-36
R602	RESISTOR, fixed: wire wound; 15,000 ohms, 10 watts, 25.5 ma. (Same as R601)	p/o PA SG Divider	RW-109-36
R603	RESISTOR, variable: wire wound; 500 ohms, ±10%, 12.5 watts; linear taper.	PA SG Over-load Adjust.	RP-100-X-H-501K
R604	RESISTOR, fixed: wire wound; 400 ohms ohms, 10 watts, 158 ma.	p/o PA SG Over-load Circuit	RW-109-17
R605	RESISTOR, variable: wire wound; 2000 ohms, ±10%, 12.5 watts; linear taper.	Final Bias Adj.	RP-100-X-H-202K
R606	RESISTOR, fixed: wire wound; 5,000 ohms, 10 watts, 45 ma.	Bias Divider	RW-109-32
R607	RESISTOR, fixed: wire wound; 25,000 ohms, 20 watts, 16 ma.	Bleeder Res., K602	RW-110-36
R608	RESISTOR, fixed: wire wound; 7.5 ohms, 10 watts, 1.15 ma.	p/o PA Over-load Circuit	RW-109-48
R609	RESISTOR, variable: wire wound; 15 ohms, ±10%, 12.5 watts, linear taper.	Final Plate Overload Adjust	RP-100-X-H-150K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R610	RESISTOR, fixed: wire wound; 6,000 ohms, 10 watts, 41 ma.	Bleeder V601	RW-109-45
R611	RESISTOR, fixed: wire wound; 500 ohms, 10 watts, 142 ma.	Peak Current Limiter	RW-109-19
R612	RESISTOR, fixed: wire wound; 50,000 ohms, 10 watts, 14 ma.	Bleeder V602	RW-109-43
R613	DELETED.		
R614	RESISTOR, fixed: composition; 68,000 ohms, ±10%, 2 watts.	p/o PA Plates Overload Divider	RC42GF683K
R615	RESISTOR, fixed: wire wound; 50,000 ohms, ±5%, 160 watts, 57 ma.	Bleeder HV	RW-117-35
R616	RESISTOR, fixed: wire wound; 50,000 ohms, ±5%, 160 watts, 57 ma. (Same as R615)	Bleeder HV	RW-117-35
R617	RESISTOR, fixed: wire wound; 12,500 ohms, ±5%, 160 watts, 113 ma.	Bleeder HV	RW-117-28
R618	RESISTOR, fixed: composition; 220,000 ohms, ±10%, 2 watts.	p/o HV Divider	RC42GF224K
R619	RESISTOR, fixed: composition; 20 M ohms, ±5%, 2 watts.	p/o HV Divider	RC42GF206J
R620	RESISTOR, fixed: composition; 20 M ohms, ±5%, 2 watts. (Same as R619)	p/o HV Divider	RC42GF206J
R621	RESISTOR, fixed: composition; 20 M ohms, ±5%, 2 watts. (Same as R619)	p/o HV Divider	RC42GF206J
R622	RESISTOR, fixed: composition; 20 M ohms, ±5%, 2 watts. (Same as R619)	p/o HV Divider	RC42GF206J
R623	RESISTOR, fixed: composition; 20 M ohms, ±5%, 2 watts. (Same as R619)	p/o HV Divider	RC42GF206J
R624	RESISTOR, fixed: wire wound; 90,000 ohms, ±5%, 160 watts, 42 ma.	PA SG Dropping	RW-117-39
S601	SWITCH, rotary: 3 sections, 4 positions, 60° angle of throw; non-shorting type; silver plated brass contacts; bakelite insulation.	Mode Switch	SW-228
S602	SWITCH, toggle: DPDT; 2 amps at 125 V; bat type toggle.	MO Bypass Switch	ST-22N
S603	SWITCH, toggle: DPST; 250 V at 20 amps; 1-1/2 horsepower 250 V.	Xmtr Plates	ST-104
S604	SWITCH, toggle: DPST; 250 V at 20 amps; 1-1/2 horsepower 250 V. (Same as S603)	Final Plate	ST-104

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
S605	SWITCH, rotary: 7 taps; 180° total rotation, 150 V, 10 amps AC; non-shorting type. NOTE: Main Power Transformer T501 is part of Model CAB-7	Filament Line	SW-167-7
T601	TRANSFORMER, power: pri. - 115/230 VAC at 50/60 cps; sec 1 - 500 VDC at 200 ma: sec 2-5.0 VAC at 2.0 A: sec 3 - 6.3 VAC at 1.3 A: sec 4 - 6.3 VAC at 3A, CT; hermetically sealed metal case.	LV Rect. Input	TF-161
T602	TRANSFORMER, power: pri. - 115/230 VAC at 50/60 cps; sec 1 - 500 VDC at 200 ma: sec 2 - 5.0 VAC at 2.0A: sec 3 - 6.3 VAC at 1.3 A: sec 4 - 6.3 VAC at 3 A, CT; hermetically sealed metal case. (Same as T601)	MV Rect. Input	TF-161
T603	TRANSFORMER, filament power: pri. - 115/230 VAC at 50/60 cps; sec. 5 VAC at 15 A, C.T.; hermetically sealed metal case.	HV Rect. Input	TF-147
T604	TRANSFORMER, auto: input - 115/230 V, 50/60 cps: Output seven positions tapped in 5 V steps from 100 V to 13 V; Any tap - 3 A to load; hermetically sealed metal case.	Line Voltage Adjust	TF-164
V601	TUBE, electron: voltage regulator; 7 pin miniature.	Bias Reg.	OB2
V602	TUBE, electron: voltage regulator; 7 pin miniature. (Same as V601)	Bias Reg.	OB2
V603	TUBE, electron: full wave rectifier; 7 pin miniature.	LV Rect.	6X4
V604	TUBE, electron: full wave rectifier; octal base.	LV Rect.	5R4GY
V605	TUBE, electron: full wave rectifier; octal base. (Same as V604)	MV Rect.	5R4GY
V606	TUBE, electron: mercury vapor half wave rectifier; A4-29 base.	HV Rect.	872A
V607	TUBE, electron: mercury vapor half wave rectifier; A4-29 base. (Same as V606)	HV Rect.	872A
V608	TUBE, electron: Voltage Regulator, 7 pin miniature.	SG Reg.	OA2

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
V609	TUBE, electron: Voltage Regulator, 7 pin miniature. (Same as V608)	SG Reg.	OA2
V610	TUBE, electron: Voltage Regulator, 7 pin miniature. (Same as V608)	SG Reg.	OA2
V611	TUBE, electron: Voltage Regulator, 7 pin miniature. (Same as V608)	SG Reg.	OA2
XC606	SOCKET, octal.	Cap. Socket for C606	TS101P01
XCR601	BLOCK, mounting: polarized; albaloy plated bronze clips.	Socket for CR601	CU-128
XCR602	BLOCK, mounting: polarized; albaloy plated bronze clips. (Same as XCR601)	Socket for CR602	CU-128
XF601	HOLDER, fuse: solder lug terminals, phenolic body and cap.	Socket for F601	FH-103
XF602	HOLDER, fuse: solder lug terminals, phenolic body and cap. (Same as XF601)	Socket for F602	FH-103
XF603	HOLDER, fuse: solder lug terminals, phenolic body and cap. (Same as XF601)	Socket for F603	FH-103
XF604	HOLDER, fuse: solder lug terminals, phenolic body and cap. (Same as XF601)	Socket for F604	FH-103
XF605	HOLDER, fuse: solder lug terminals, phenolic body and cap. (Same as XF601)	Socket for F605	FH-103
XF606	HOLDER, fuse: solder lug terminals, phenolic body and cap. (Same as XF601)	Socket for F606	FH-103
XI601	SOCKET, miniature: bayonet base; w/red lens.	Socket for I601	TS-106-1
XI602	SOCKET, lamp: bayonet base; w/red lens.	Socket for I602	TS-124-1
XI603	SOCKET, lamp: bayonet base; w/red lens. (Same as XI602)	Socket for I603	TS-124-1
XI604	SOCKET, lamp: bayonet base; w/green lens.	Socket for I604	TS-124-2
XK602	SOCKET, 9 pin miniature.	Socket for K602	TS-103-P01
XV601	SOCKET, 7 pin miniature.	Socket for V601	TS-102-PO1

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
XV602	SOCKET, 7 pin miniature. (Same as XV601)	Socket for V602	TS-102-P01
XV603	SOCKET, 7 pin miniature. (Same as XV601)	Socket for V603	TS-102-P01
XV604	SOCKET, octal. (Same as XC606)	Socket for V604	TS-101-P01
XV605	SOCKET, octal. (Same as XC606)	Socket for V605	TS-101-P01
XV606	SOCKET, tube: bayonet base; jumbo twist lock, 4 pin base.	Socket for V606	TS-123-211-1
XV607	SOCKET, tube: bayonet base; jumbo twist lock, 4 pin base. (Same as XV606)	Socket for V607	TS-123-211-1
XV608	SOCKET, 7 pin miniature. (Same as XV601)	Socket for V608	TS-102-P01
XV609	SOCKET, 7 pin miniature. (Same as XV601)	Socket for V609	TS-102-P01
XV610	SOCKET, 7 pin miniature. (Same as XV601)	Socket for V610	TS-102-P01
XV611	SOCKET, 7 pin miniature. (Same as XV601)	Socket for V611	TS-102-P01

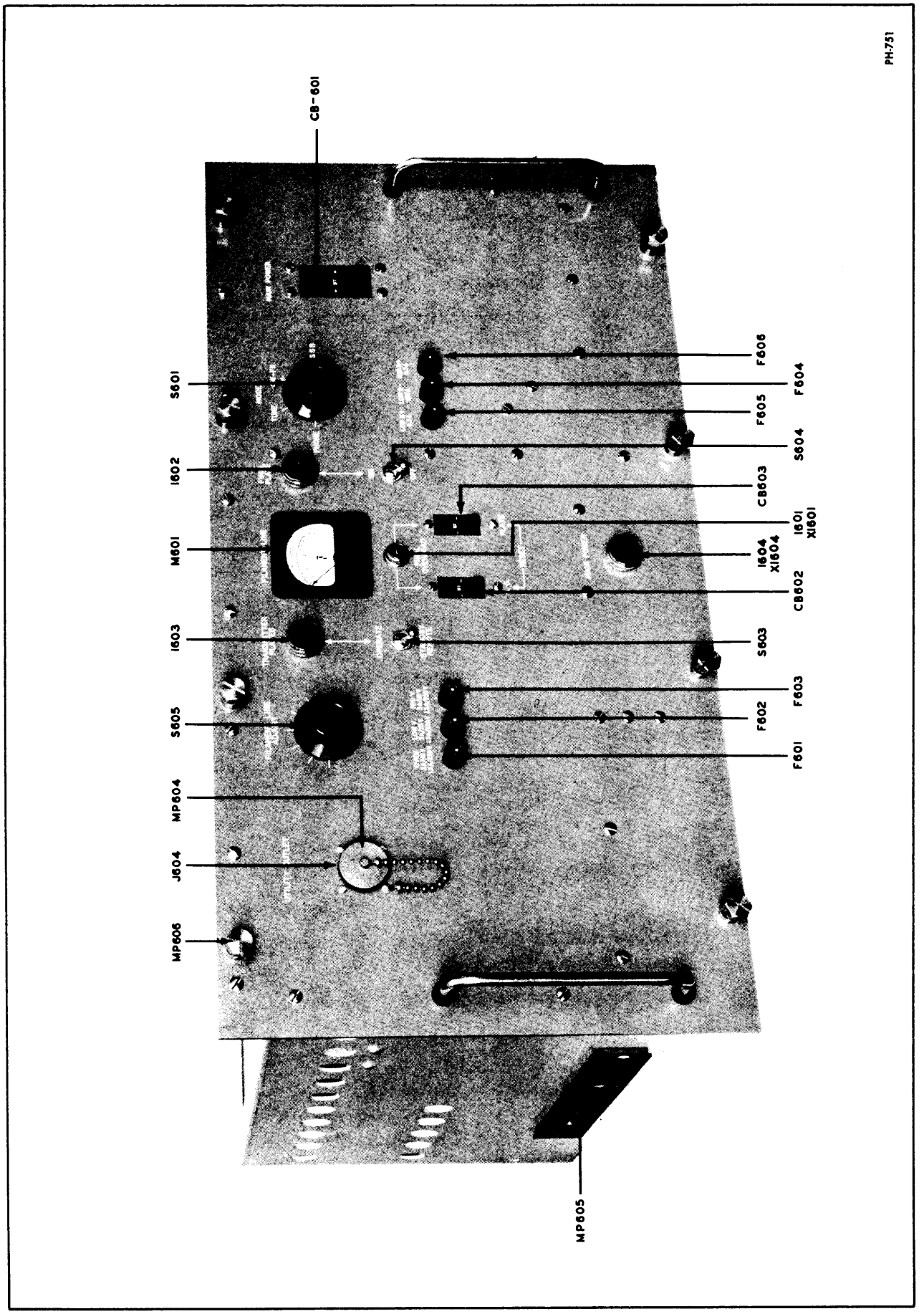


Figure E-15 Front View Model RTP-2

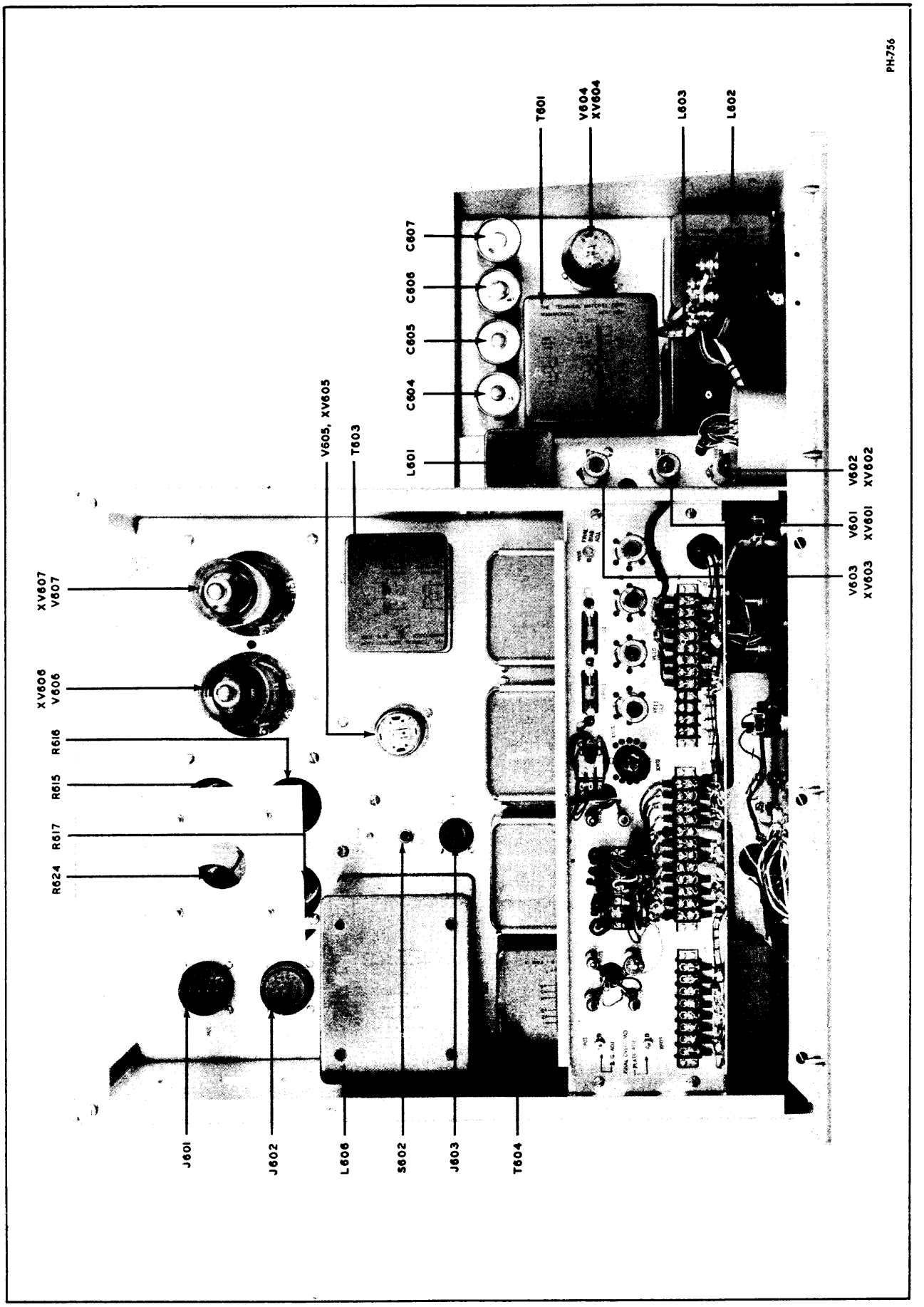


Figure E-16 Top View Model RTP-2

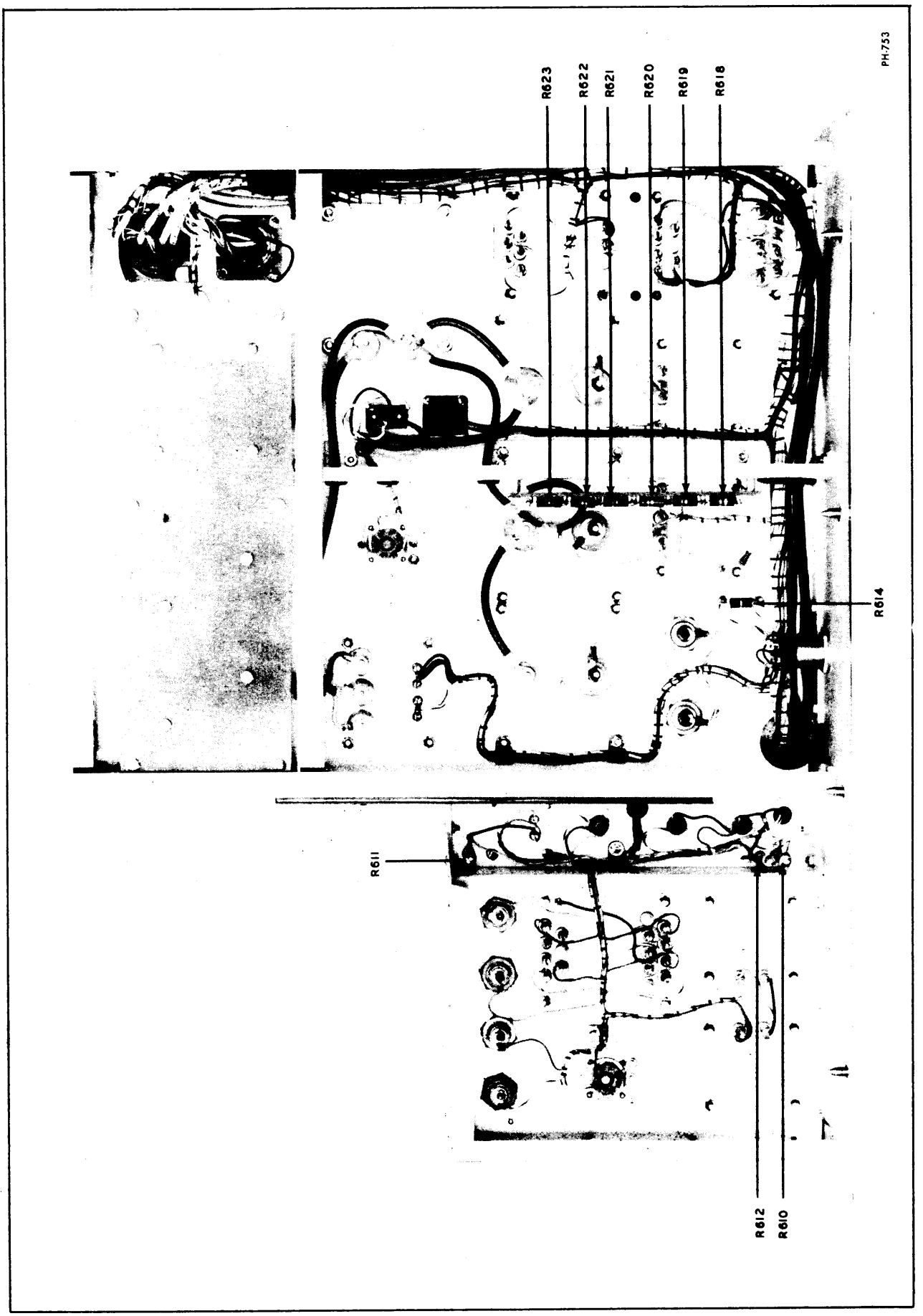


Figure E-17 Bottom View Model RTP-2

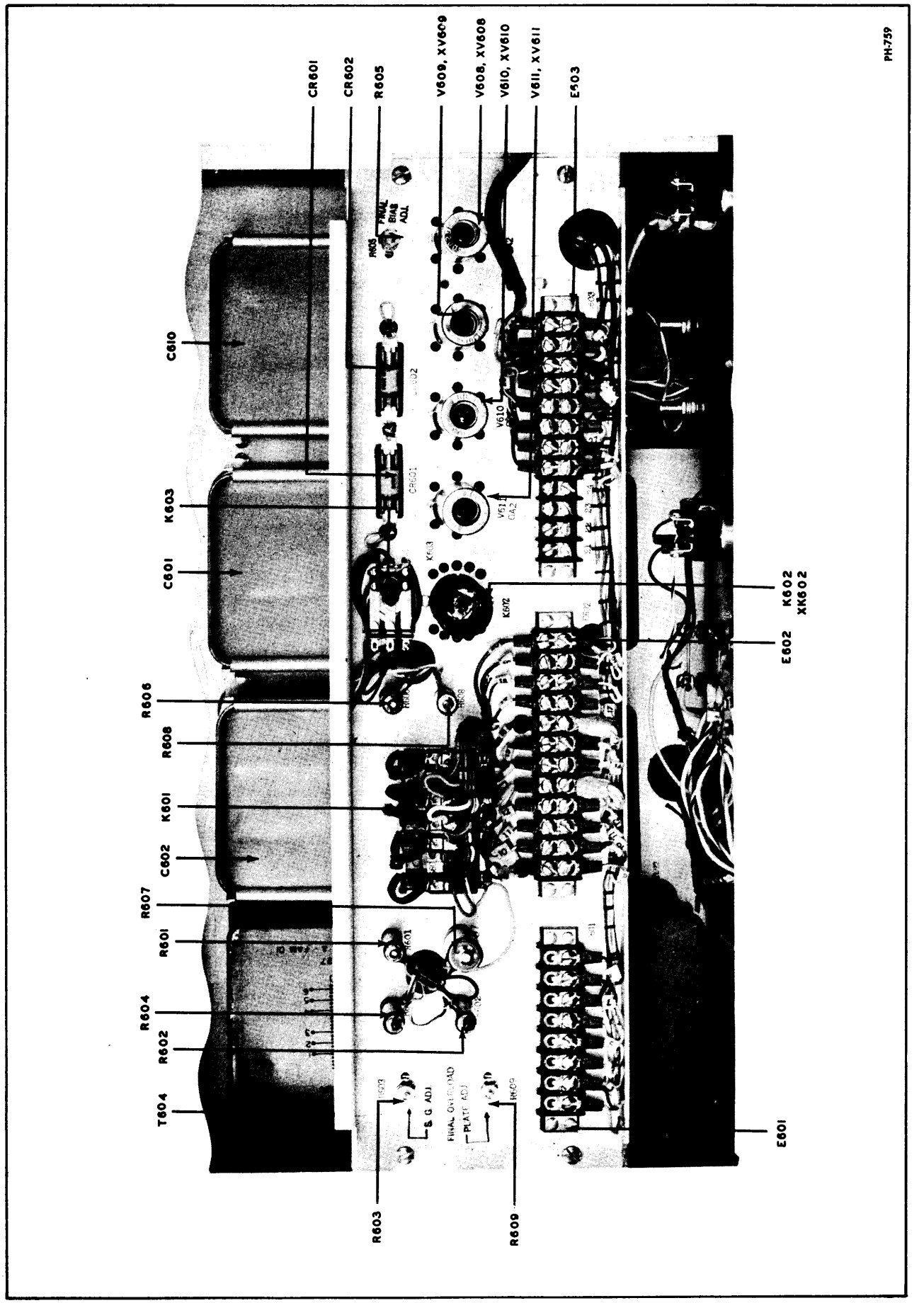


Figure E-18 Top View, Relay Deck Model RTP-2

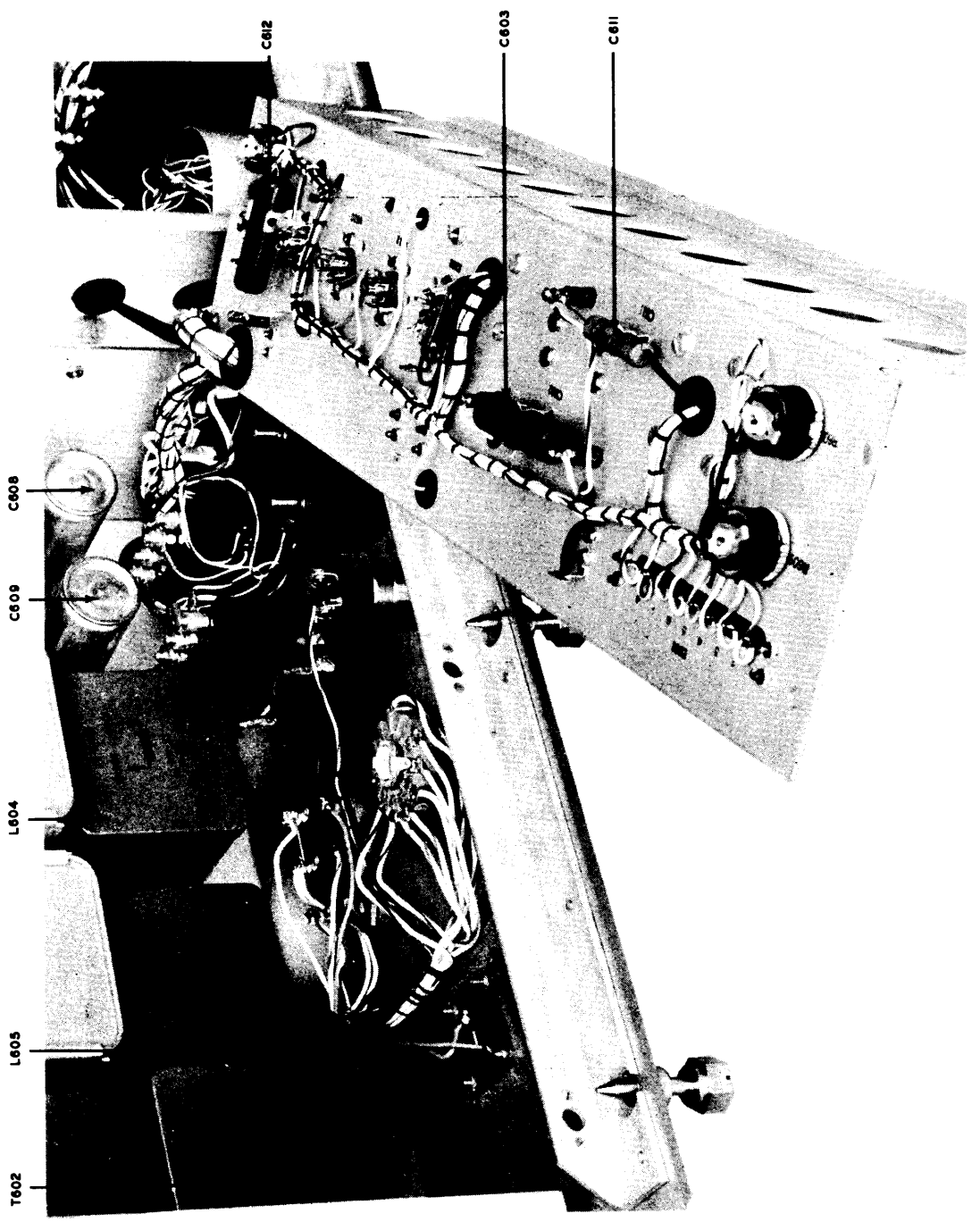


Figure E-19 Bottom, Relay Deck Model RTP-2

PARTS LIST
PARTS ILLUSTRATIONS
MODEL RTM-2

MODULATOR DECK, MODEL RTM-2 - Part f MODEL GPT-750(B)-2

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C701	CAPACITOR, fixed: moulded plastic; .02 mmfd, +40 -20%; 600 wvdc.	Coupling Cap., V702	CN-100-17
C702	CAPACITOR, fixed: moulded plastic; .02 mmfd, +40 -20%; 600 wvdc. (Same as C701)	Coupling Cap., V703	CN-100-17
C703	CAPACITOR, fixed: paper dielectric; 4 mfd, ±10%; 600 wvdc.	DC Filter Cap., V707	CP40C2FF405K
C704	CAPACITOR, fixed: paper dielectric; 4 mfd, ±10%; 600 wvdc. (Same as C703)	DC Filter Cap., V707	CP40C2FF405K
E701	CLIP, electrical: white ceramic; phosphor bronze spring clip to fit 9/16 in. dia. tube cap.	V704 Grid Clip	HB-102-1
E702	CLIP, electrical: white ceramic; phosphor bronze spring clip to fit 9/16 in. dia. tube cap. (Same as E701)	V705 Grid Clip	HB-102-1
E703	CLIP, electrical: white ceramic; phosphor bronze spring clip to fit 9/16 in. dia. tube cap. (Same as E701)	V704 Plate Clip	HB-102-1
E704	CLIP, electrical: white ceramic; phosphor bronze spring clip to fit 9/16 in. dia. tube cap. (Same as E701)	V705 Plate Clip	HB-102-1
E705	INSULATOR, pillar: round; white glazed steatite; 3/4 in. long x 1/2 in. dia., tapped 8-32 x 1/4 in. dp each end.	Spark Gap Standoff	NS5W0206
E706	INSULATOR, pillar: round; white glazed steatite; 3/4 in. long x 1/2 in. dia., tapped 8-32 x 1/4 in. dp each end. (Same as E705)	Spark Gap Standoff	NS5W0206
F701	FUSE, cartridge: time lag; 3 amp.	AC Supply Fuse	FU-102-003
I701	LAMP, incandescent: 6-8 V; 0.250 amp; bulb T-3-1/4 clear.	Power Indicator	BI-101-44
J701	CONNECTOR, receptacle: MS pin type; 22 contacts; 20 amps, 200 VDC, 150 VAC (rms); mtg. dim. 1-5/8 in. dia. cut out, w/four 9/64 in. holes on 1-9/16 in. mtg. centers.	Modulator Input	MS3102A-28-11P
J702	CONNECTOR, receptacle: MS socket type; one contact; 35 amps, 3000 VDC, 2100 VAC (rms); mtg. dim. 1.156 in. dia. cut out w/four 1/8 in. holes in 1-1/16 in. mtg. centers.	Modulator Output	MS3102A-18-16S

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
J703	CONNECTOR, receptacle: MS pin type; one contact; 35 amps, 3000 vdc, 2100 VAC (rms); mtg. dim. 1.156 in. dia. cut out w/four 1/8 in. holes on 1-1/16 in. mtg. centers.	H.V. Input	MS3102A-18-16P
K701	RELAY, switch: DPDT; 10 amp, non-inductive, coil 150 VDC, Coil res., approx. 10,000 ohms.	Phone-CW Switch	RL-115
L701	REACTOR, filter: 10 hy; DC resistance approx. 85 ohms; 200 Ma DC insulated for 1500 V; in a/w MIL-T-27 GR.-1-CL. A - FAM. 04.	DC Filter Choke, J701	TF-144
L702	REACTOR, filter: 10 hy; DC resistance approx. 85 ohms; 200 Ma DC insulated for 1500 V; in a/w MIL-T-27 GR.-1-CL. A - FAM. 04. (Same as L701)	Filter Choke V707	TF-144
L703	REACTOR, filter: 10 hy. DC resistance appox. 85 ohms; 200 Ma DC insulated for 1500 V; in a/w MIL-T-27 GR. -1-CL. A - FAM. 04. (Same as L701)	Filter Choke, V707	TF-144
M701	METER, milliamp: 0-500 milliamps DC; mtg. dim. one 2-13/16 in. dia. hole w/four 9/64 in. dia. hole on 2-1/4 in. mtg. centers.	Modulator Plate	MR-110-500S
MP701 A,B	SLIDE, chassis: 12-1/8 in. lg. x 1-3/4 h. x 1/4 in. thk. o/a closed: steel; lubricating paint finish.	Drawer Slide	TK-100-1
MP702	SCREW, thumb: 5/16 x 24 thds; slotted 3/4 in. hexagonal head; 2 in. lg; stainless steel.	Panel Mtg. Screw	SC-139
MP703	SOCKET, pin: stainless steel; 2 in. dia. x 1/2 in. thk; four 10-32 tapped mtg. holes equally spaced on 3/4 in. radius circle.	Rear Support	PM-507
R701	RESISTOR, variable: dual; composition; 50,000 ohms linear, ±10%, 2 watts.	GAIN Control Res., V701	RV104ATRD503A
R702	RESISTOR, fixed: composition; 560 ohms, ±10%, 1/2 watt.	Cathode Bias Res., V701	RC20GF561K
R703	RESISTOR, fixed: composition; 22,000 ohms, ±10%, 1/2 watt.	p/o Grid Input Imped, T702	RC20GF223K
R704	RESISTOR, fixed: composition; 22,000 ohms, ±10%, 1/2 watt. (Same as R703)	p/o Grid Input Impedance, T702	RC20GF223K
R705	RESISTOR, fixed: wire wound; 100 ohms, ±5%, 10 watts.	Cathode Bias Resistor, V703	RW-109-9
R706	RESISTOR, fixed: composition; 82,000 ohms, ±10%, 1/2 watt.	Feedback Res., T703	RC20GF823K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R707	RESISTOR, fixed: composition; 82,000 ohms, ±10%, 1/2 watt. (Same as R707)	Feedback Res., T702	RC20GF823K
R708	RESISTOR, adjustable: wire wound; 7500 ohms, 10 watts.	Relay Dropping Res., V706	RA108-752-10
R709	RESISTOR, fixed: wire wound; 30,000 ohms, ±5%, 10 watts.	Voltage Reg. Dropping Res., V706	RW-109-39
R710	RESISTOR, fixed: composition; 180 ohms, ±10%, 2 watts.	Meter Shunt Res., M701	RC42GF181K
R711	RESISTOR, fixed: wire wound; 5000 ohms, ±5%; 10 watts.	Suppressor Res., L701	RW-109-32
R712	RESISTOR, fixed: wire wound; 25,000 ohms, ±10%; 20 watts.	Bleeder Res., L701	RW-110-36
T701	TRANSFORMER, audio: pri 600 ohms center tapped, secondary 50,000 ohms center tapped; response 50 cps to 15,000 cps ±2 db; insulated for 1500 V. in a/w MIL-T-27 GR. 1- CL.A - FAM. 11.	Input Transformer	TF-142
T702	TRANSFORMER, audio: interstage; pri 30,000 ohms center tapped. Secondary -two windings 120,000 ohms total; response - 50 to 15,000 cps. ±1db; insulated for 1500 V. in a/w MIL-T-27 GR.1-CL.A-FAM. 15.	Interstage Transformer	TF-141
T703	TRANSFORMER, audio: driver; pri 5000 ohms center tapped, 150 ma DC balanced; secondary 5000 ohms center tapped, 50 ma DC balanced; response 50 to 1500 cps ±2 db; non-power level 10 watts output; eff 95% or better; insulated for 1500 V. in a/w MIL-T-27 GR. 1-CL.A-FAM.12.	Interstage Transformer	TF-140
T704	TRANSFORMER, audio: modulation; pri - 22,000 ohms center tapped: working volts approx. 1400 V (rms) (each side of CT) superimposed on 2500 VDC, 250 ma DC bal; sec. 10,000 ohms, approx. 1900 V (rms) superimposed on 2500 VDC, 250 ma DC unbal; overall power level 350 watts eff 95% or better; response 100 cps to 10 Kcs ±2 db; insulated for 8 KV. in a/w MIL-T-27 GR. 1- CL.A - FAM. 14.	Modulation Transformer	TF-139
T705	TRANSFORMER, power: 115/230 VAC, 50/60 cycle single phase; secondary 270 VDC at 200 ma/500 VDC at 200 ma 5.0 VDC at 2.0 amps, 6.3 VDC at 1.3 amps, 6.3 VDC at 3.0 amps C.T. insulation test 3000 volts. In a/w MIL-T-27 GR. 1. CL. A - FAM. 01.	Power Supply	TF-161

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
T706	TRANSFORMER, filament: 115/230 VAC, 50/60 cycle; secondary 10 V at 10 amps C.T. insulated for 1500 V; in a/w MIL-T-27 GR. 1 - CL.A-FAM. 01.	Filament Transformer	TF-145
V701	TUBE, electron: duo triode; 9 pin miniature.	Audio Amplifier	12AT7
V702	TUBE, electron: beam power amplifier.	Modulator Driver	6L6
V703	TUBE, electron; beam power amplifier; (Same as V702)	Modulator Driver	6L6
V704	TUBE, electron: triode; jumbo 4 large pin base w/anode and grid caps.	Modulator	810
V705	TUBE, electron: triode; jumbo 4 large pin base w/anode and grid caps. (Same as V704)	Modulator	810
V706	TUBE, electron: voltage regulator; 7 pin miniature.	Voltage Regulator	OA3
V707	TUBE, electron: full wave rectifier; octal base.	Rectifier	5R4GY
XF701	HOLDER, fuse.	Socket for F701	FH-103
XI701	SOCKET, indicator: w/red frosted lens; for miniature bayonet base T-3-1/4 lamp.	Socket for I701	TS-106-1
XV701	SOCKET, tube: miniature 9 pin.	Socket for V701	TS-103-P01
XV702	SOCKET, tube: octal; one piece saddle mtg w/4 tinned ground lugs.	Socket for V702	TS-101-P01
XV703	SOCKET, tube: octal; one piece saddle mtg. w/4 tinned ground lugs. (Same as XV702)	Socket for V703	TS-101-P01
XV704	SOCKET, tube: jumbo twist lock; 4 pin base.	Socket for V704	TS-123-211-1
XV705	SOCKET, tube: jumbo twist lock; 4 pin base. (Same as XV704)	Socket for V705	TS-123-211-1
XV706	SOCKET, tube: octal; one piece saddle mtg w/4 tinned ground lugs. (Same as XV702)	Socket for V706	TS-101-P01
XV707	SOCKET, tube: octal; one piece saddle mtg w/4 tinned ground lugs. (Same as XV702)	Socket for V707	TS-101-P01

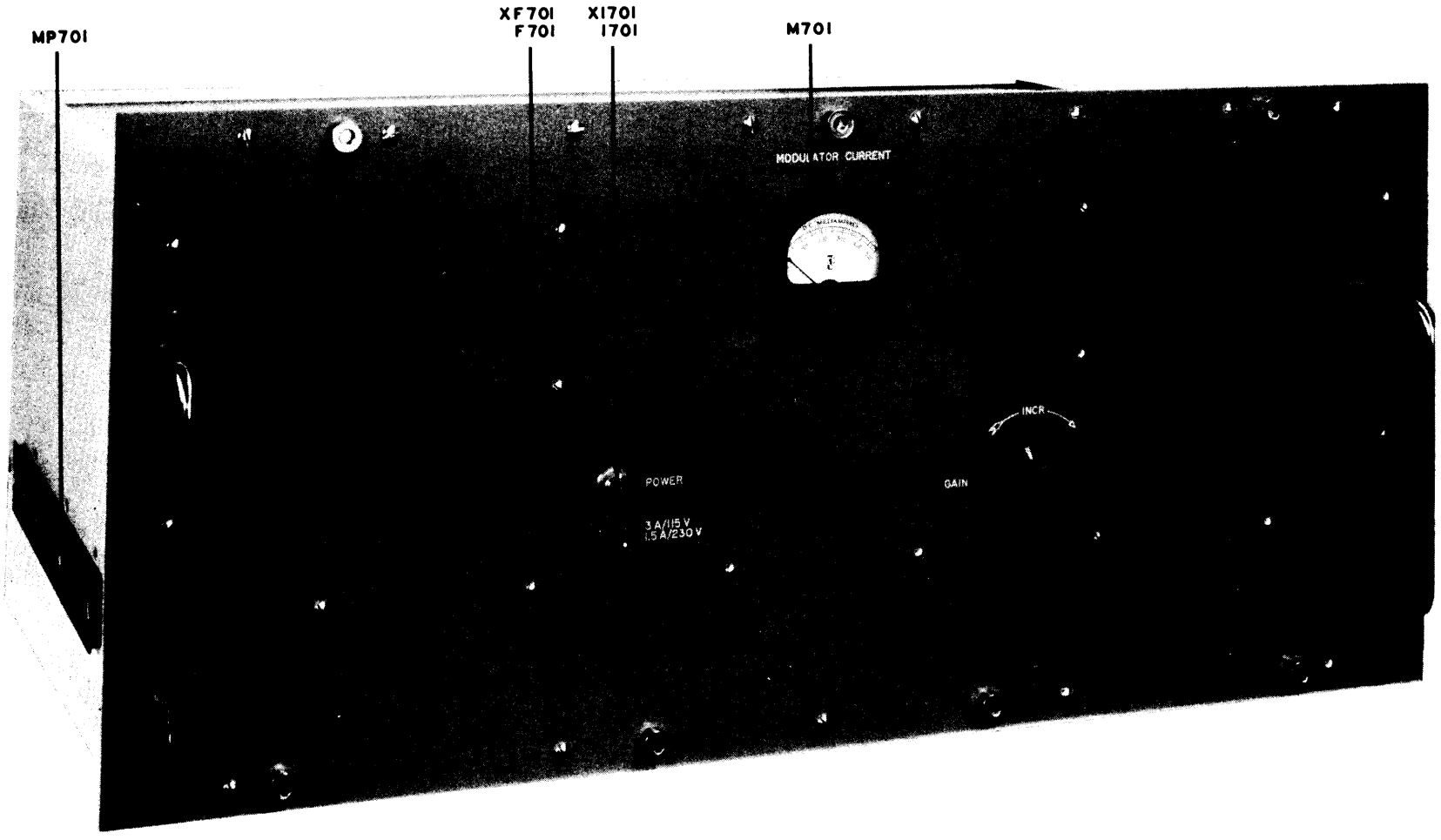


Figure E-20 Front View Model RTM-2

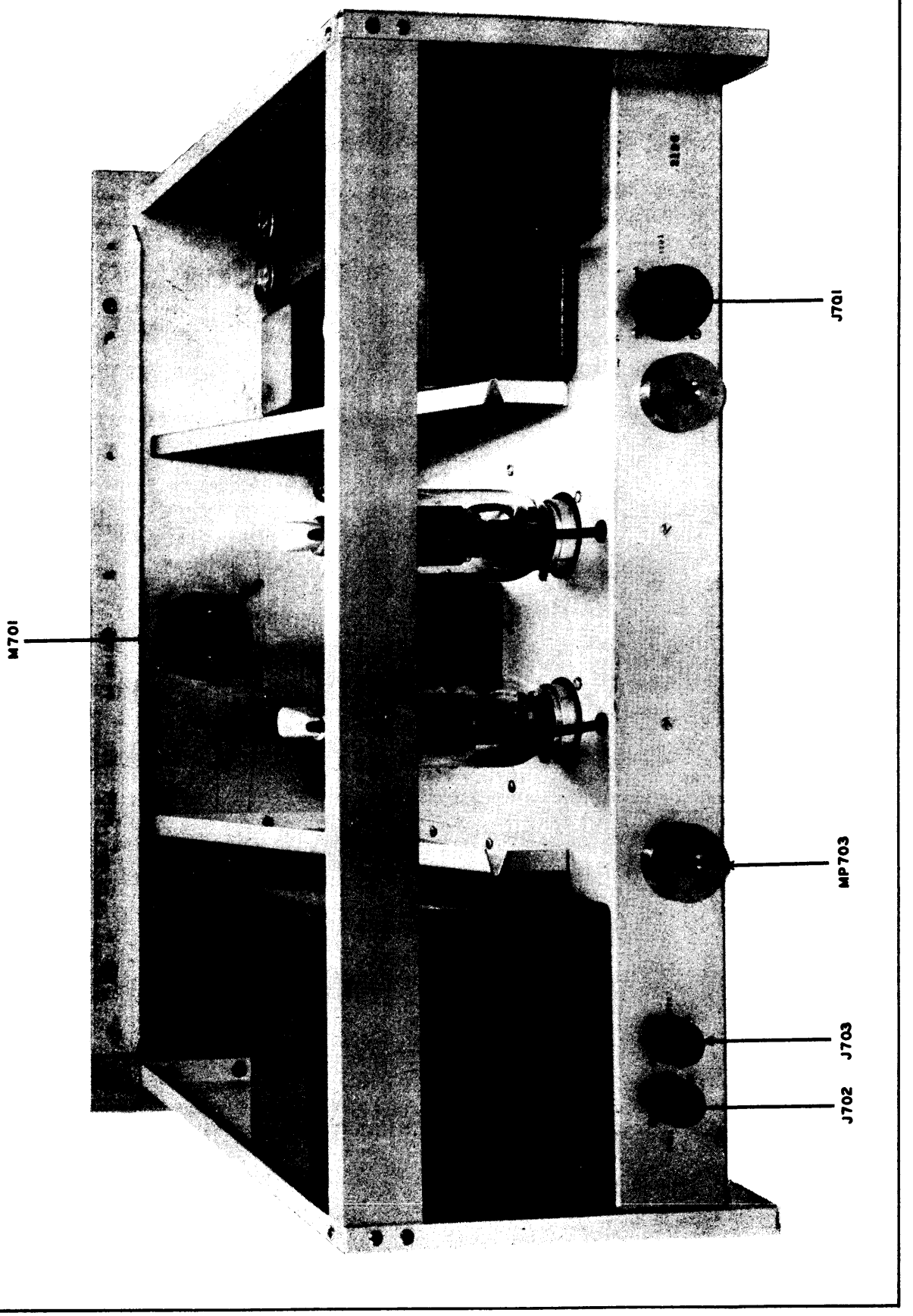


Figure E-21 Rear View Model RTM-2

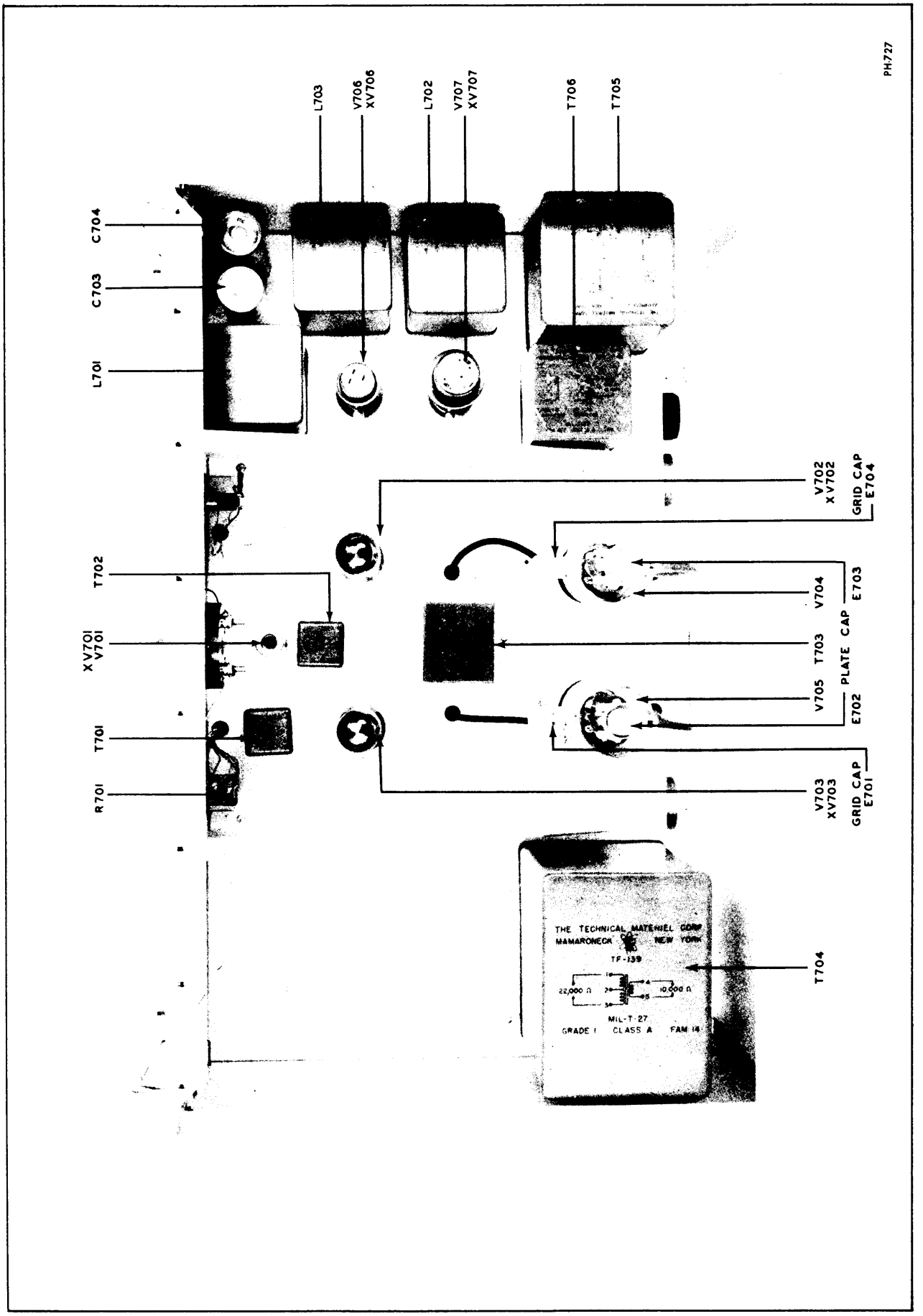


Figure E-22 Top View Model RTM-2

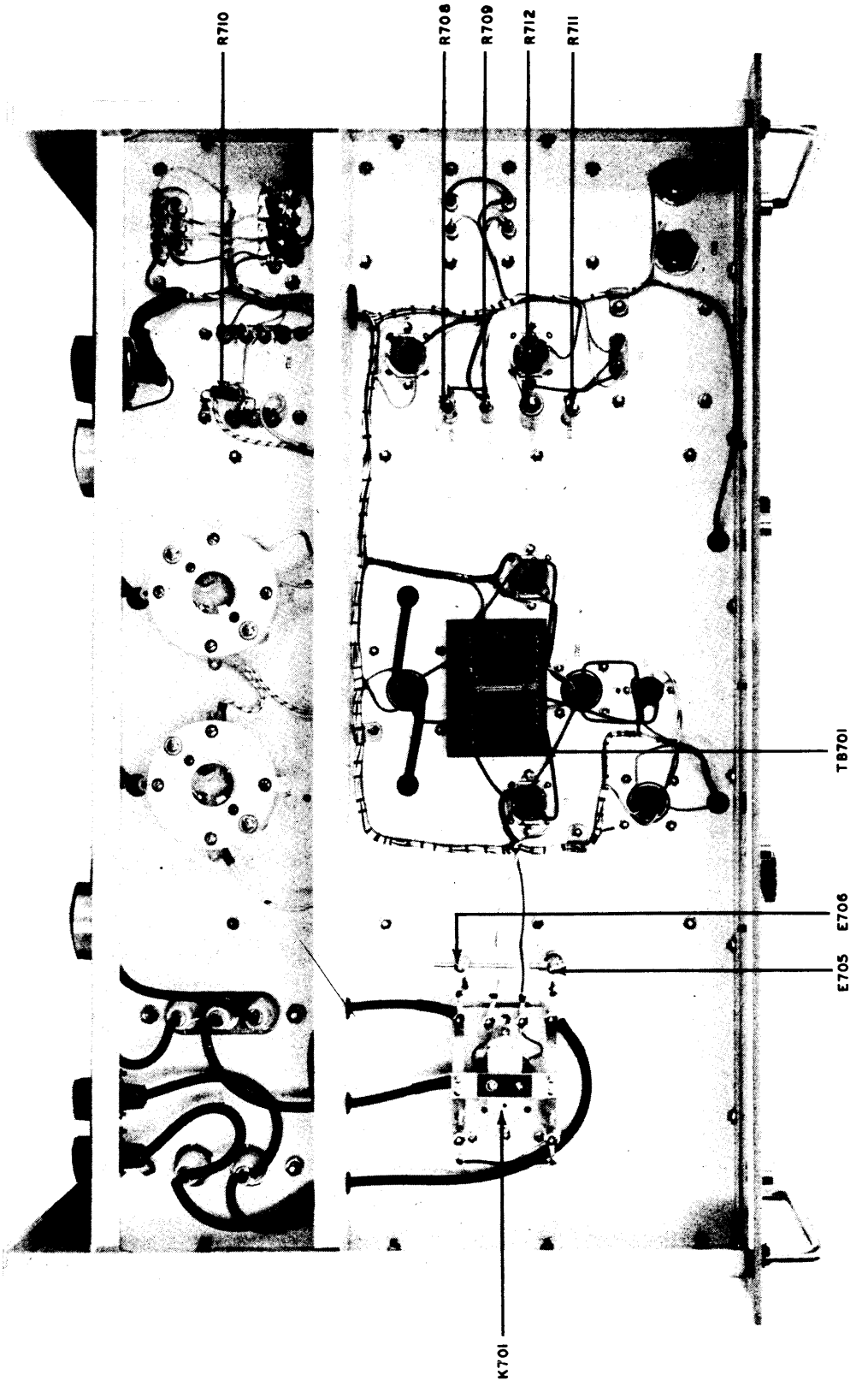


Figure E-23 Bottom View Model RTM-2

PARTS LIST
PARTS ILLUSTRATIONS
MODEL RTS-2

PANEL CHASSIS ASSEMBLY, MODEL RTS-2 - Part f MODEL GPT-750(D)-2

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C401	CAPACITOR, fixed: dry electrolytic; polarized, 80 mf, 450 wvdc.	Filter Cap., V401	CE51F800R
C402	CAPACITOR, fixed: dry electrolytic; polarized, 80 mf, 450 wvdc. (Same as C401)	Filter Cap., V401	CE51F800R
C403 A & B	CAPACITOR, fixed: dry electrolytic; polarized, 20 mf, 450 wvdc.	Filter Cap., V401	CE52E200R
C404 A & B	CAPACITOR, fixed: ceramic; disc type; two section; .01 mf, 500 wvdc each section.	Line Bypass Cap.	CC-100-23
E401	TERMINAL BOARD, phenolic: 12 terminals, right angle spade lug type.	Fanning Strip	TM-105-14AR
F401	FUSE, cartridge: 3 amps.	Oven Fuse	FU-102-3
F402	FUSE, cartridge: 1/4 amp.	B+ Fuse	FU-102-.250
F403	FUSE, cartridge: 2 amps.	Main Pwr. Fuse	FU-102-2
I401	LAMP, incandescent: 6-8v; 150 ma; T-3-1/4 clear bulb; bayonet base.	Main Power Ind.	BI-101-47
J1	CONNECTOR, jack series UHF, mica dielectric. Part of W403 and W404.	RF Input	SO-239
J2	CONNECTOR, jack series UHF, mica dielectric. Part of W403 and W404. (Same as J1.)	RF Output	SO-239
J3	CONNECTOR, receptacle: AN pin type: 4 contacts rated at 35 amps, 18 contacts rated at 20 amps, 200 VDC, 150 VAC (RMS); mtg. dim. 1.782'' dia. cutout with four 9/64'' dia. holes on 1-9/16'' mtg. centers.	Power Input	MS3102A-28-11P
J5	CONNECTOR, receptacle: AN socket type; 7 contacts rated at 20 amps, 200 VDC, 150 VAC (rms); mtg. dim. 1-1/32'' mtg. centers.	For 12 Volt Power Supply if used.	MS3102A-16S-1S
J6	CONNECTOR, plug.	RF Monitor	UG-492/U
J401	CONNECTOR, receptacle: male; two contacts; 10 amps at 250 v., 15 amps at 125 v., twist lock type.	AC Input	JJ-100
J402	CONNECTOR, receptacle: female; AN pin type.	Power Interconnect	MS3102A-20-27S
L401	REACTOR, filter: 10 henries; DC resistance approx. 85 ohms, 200 ma DC, insulated for 1500 v., in a/w MIL-T-27 GR., 1 CL A. FAM. 04.	Filter Choke V401	TF-144

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
L402	REACTOR,filter: 10 henries; DC resistance approx. 85 ohms, 200 ma DC, insulated for 1500 v., in a/w MIL-T-27 GR., 1 CL A. FAM. 04. (Same as L401)	Filter Choke V401	TF-144
MP401	SLIDE, chassis: 12-1/8" lg. x 1-3/4" h. x 1/4" thk o/a closed; steel; lubricating paint finish.	Chassis Track	TK-100-1
MP402	SLIDE, chassis: 12-1/8" lg. x 1-3/4" h. x 1/4" thk o/a closed; steel lubricating paint finish. (Same as MP401)	Chassis Track	TK-100-1
MP403	SCREW, thumb: 5/16'x 24 thds; slotted 3/4" hexagonal head; 2" o/a lg.; stainless steel.	Panel Locking	SC-139
MP404	SCREW, thumb: 5/16 x 24 thds; slotted 3/4" hexagonal head; 2 " o/a lg.; stainless steel. (Same as MP403)	Panel Locking	SC-139
MP405	SCREW, thumb: 5/16 x 24 thds; slotted 3/4" hexagonal head; 2" o/a lg.; stainless steel. (Same as MP403)	Panel Locking	SC-139
MP406	SCREW, thumb: 5/16 x 24 thds; slotted 3/4" hexagonal head; 2" o/a lg.; stainless steel. (Same as MP403)	Panel Locking	SC-139
MP407	SCREW, thumb: 5/16 x 24 thds; slotted 3/4" hexagonal head; 2" o/a lg.; stainless steel. (Same as MP403)	Panel Locking	SC-139
MP408	SCREW, thumb: 5/16 x 24 thds; slotted 3/4" hexagonal head; 2" o/a lg.; stainless steel. (Same as MP403)	Panel Locking	SC-139
MP409	SCREW, thumb: 5/16 x 24 thds; slotted 3/4" hexagonal head; 2" o/a lg.; stainless steel. (Same as MP403)	Panel Locking	SC-139
P401	Part of W403.		
P402	Part of W403.		
R401	RESISTOR, fixed: composition; 15,000 ohms, ±10%; 2 watts.	Voltage Dropping V402	RC42GF153K
R402	RESISTOR, fixed: wire wound; 7500 ohms, ±5%; 10 watts.	Voltage Dropping V402	RW-109-33
R403	RESISTOR, fixed: wire wound; 1,000 ohms, ±5%; 10 watts.	Voltage Dropping	RW-109-24
R404	RESISTOR, fixed: wire wound; 15,000 ohms, ±5%; 10 watts.	Bleeder Res.	RW-109-36
R405	RESISTOR, fixed: composition; 100,000 ohms, ±10%; 1 watt.	Bleeder Res.	RC30GF104K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
T401	TRANSFORMER, power: 115/230 VAC, 50/60 cycles; term 12 & 16 500 VDC, 13 & 15 270 VDC term 14 CT; at 200 ma; term. 10 & 11 5.0 VAC at 2 amps; 8 & 9 6.3 VAC at 1.2 amps; 5 & 7 6.3 VAC at 3 amps; CT insulated for 3000 volts in accordance with MIL-T-27 GR. 1 CL. A FAM. 03.	Power Xfmr.	TF-161
T402	TRANSFORMER, power: step-down; primary 110 or 220 v, 50 to 60 cps; secondary 6.3 v at 4.125A center tapped.	Fil. Xmfr.	TF-104
V401	TUBE, electron: duo diode; rectifier.	Rectifier	5R4
V402	TUBE, electron: voltage regulator, 7 pin miniature; operating at 150 VDC.	Voltage Regulator	OA2
XF401	FUSEHOLDER: extractor post type; 250 V, 15 amp.	Fuse Holder F401	FH-100-1
XF402	FUSEHOLDER: extractor post type; 250 V, 15 amp. (Same as XF401)	Fuse Holder F402	FH-100-1
XF403	FUSEHOLDER: extractor post type; 250 V, 15 amp. (Same as XF401)	Fuse Holder F403	FH-100-1
XC401	SOCKET, electron tube: octal.	Socket, C401	TS-101-P01
XC402	SOCKET, electron tube: octal. (Same as XC401)	Socket, C402	TS-101-P01
XC403	SOCKET, electron tube: octal. (Same as XC401)	Socket, C403	TS-101-P01
XV401	SOCKET, electron tube: octal. (Same as XC401)	Socket, V401	TS-101-P01
XV402	SOCKET, electron tube: 7 pin miniature.	Socket, V402	TS-102-P01
W401	CABLE ASSY, power: consists of 13 conductors, MS3106B-20-27P on one end, MS3108B-20-27S on other end, 3 feet long cable clamp to cable clamp.	Power Cable	CA-471
W402	CABLE,ASSY: consists of coaxial cable RG-59/U and two UG-260/U plugs 24 inches long end to end.	RF Cable	CA-107-24
W403	CABLE ASSY: RF interconnect, consists of coaxial cable RG-59/U, SO-239 receptacle connector on one end, UG-260/U plug connector on other end.	SBE to RTM Interconnect	CA-341-12R
W404	CABLE ASSY: RF interconnect consists of coaxial cable RG-59/U, SO-239 receptacle connector on one end, UG-260/U plug connector on other end.	SBE to RTM Interconnect	CA-341-12B

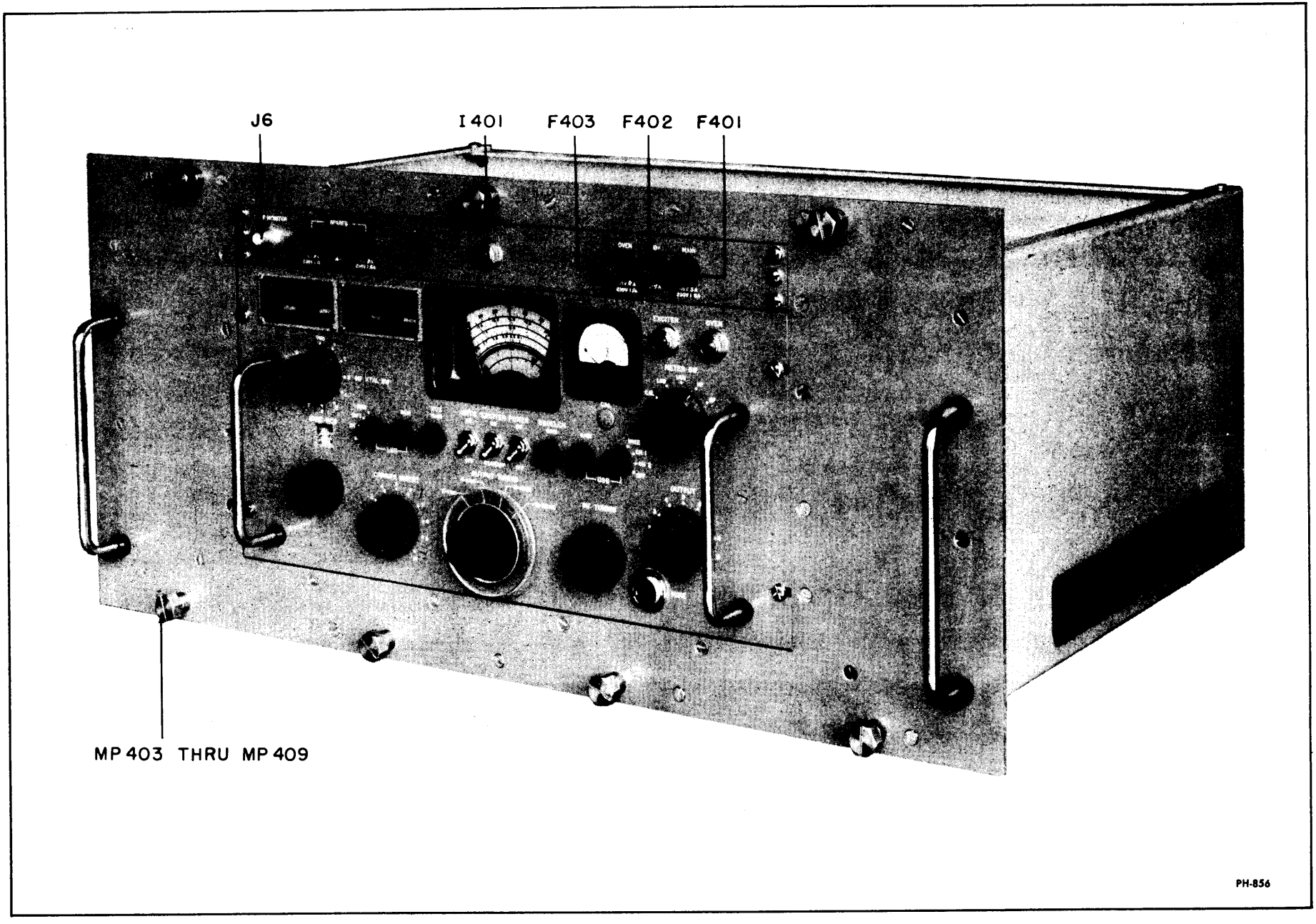


Figure E-24 Front View Model RTS-2

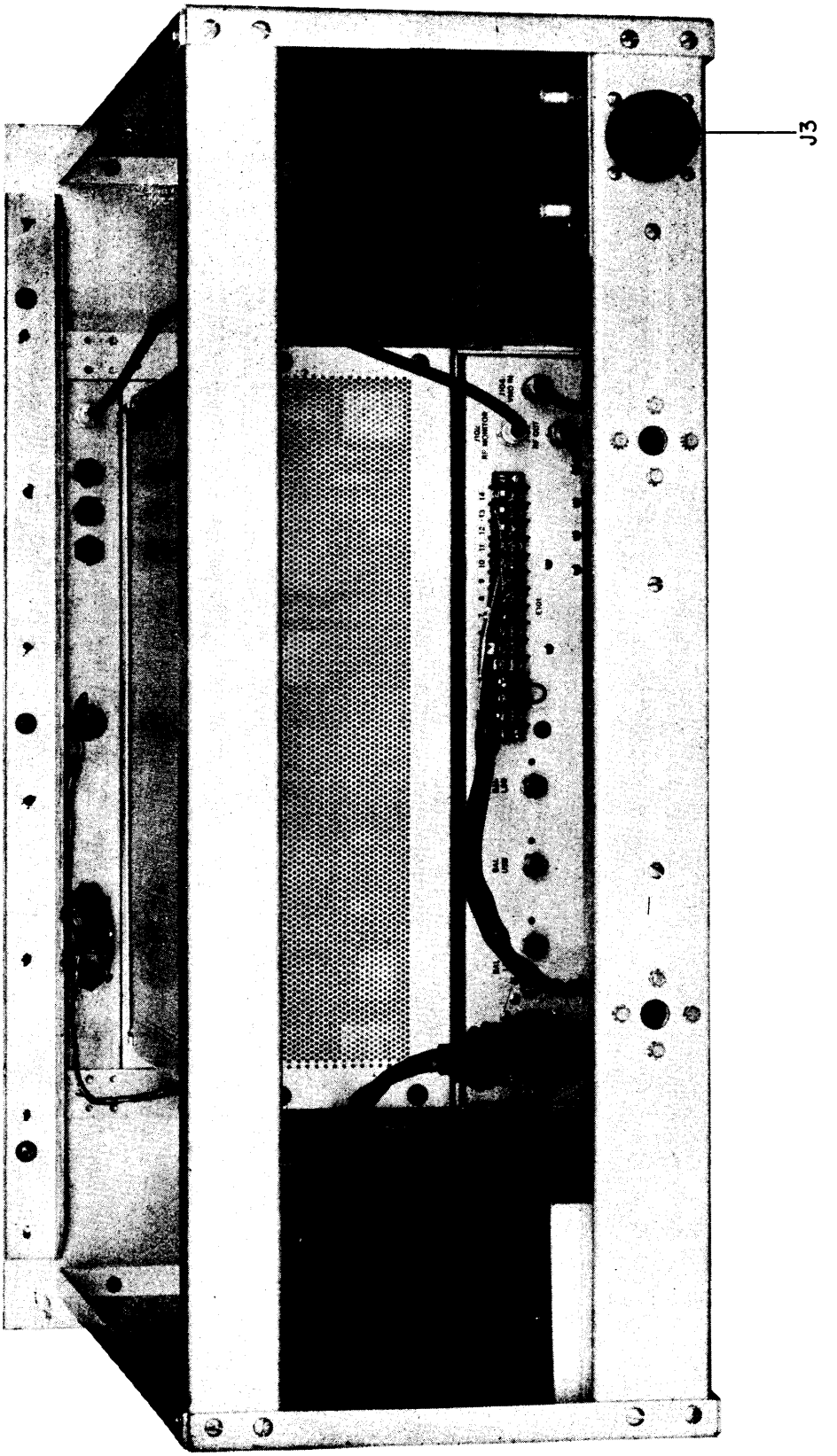


Figure E-25 Rear View Model RTS-2

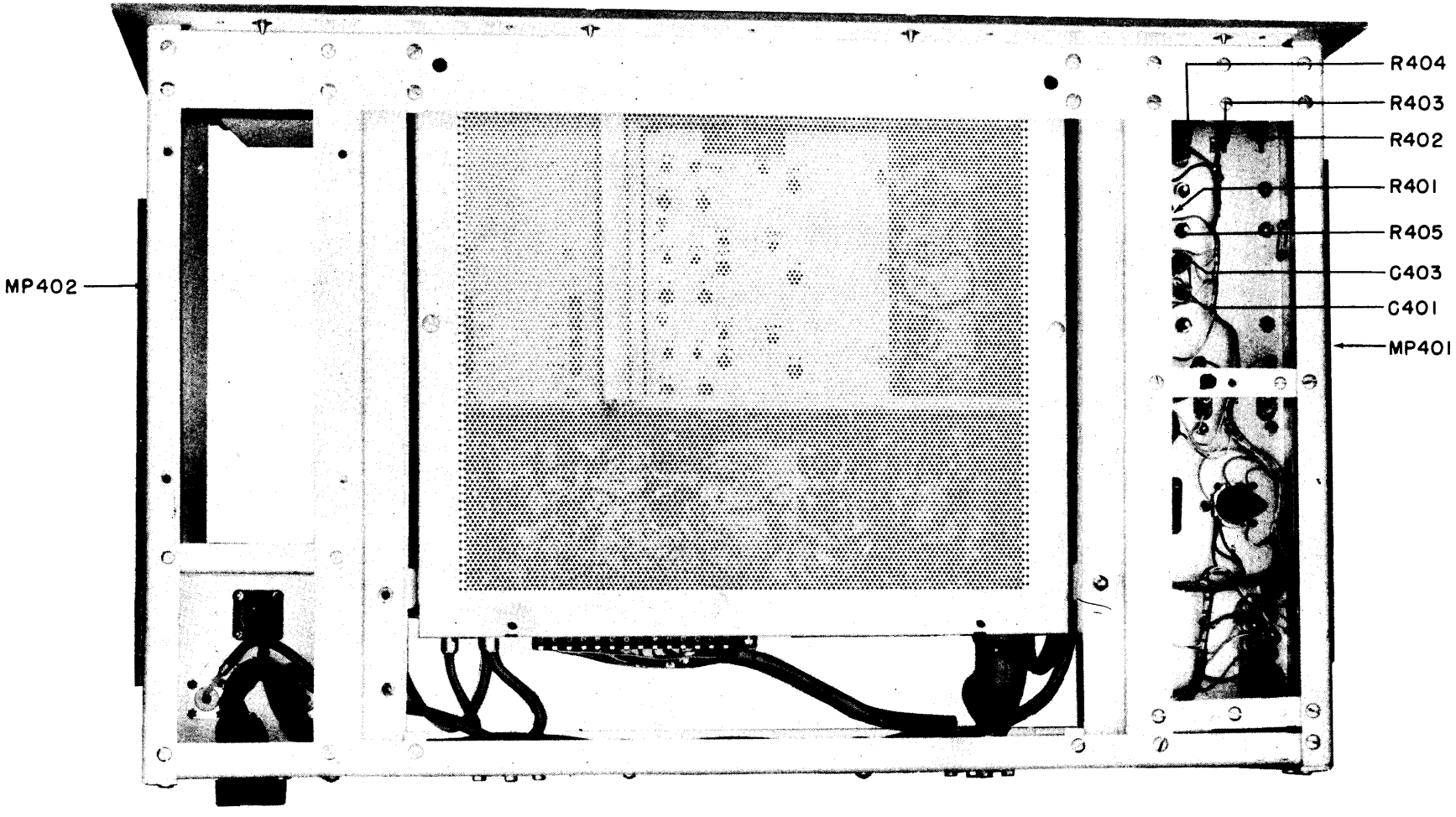


Figure E-26 Top View Model RTS-2

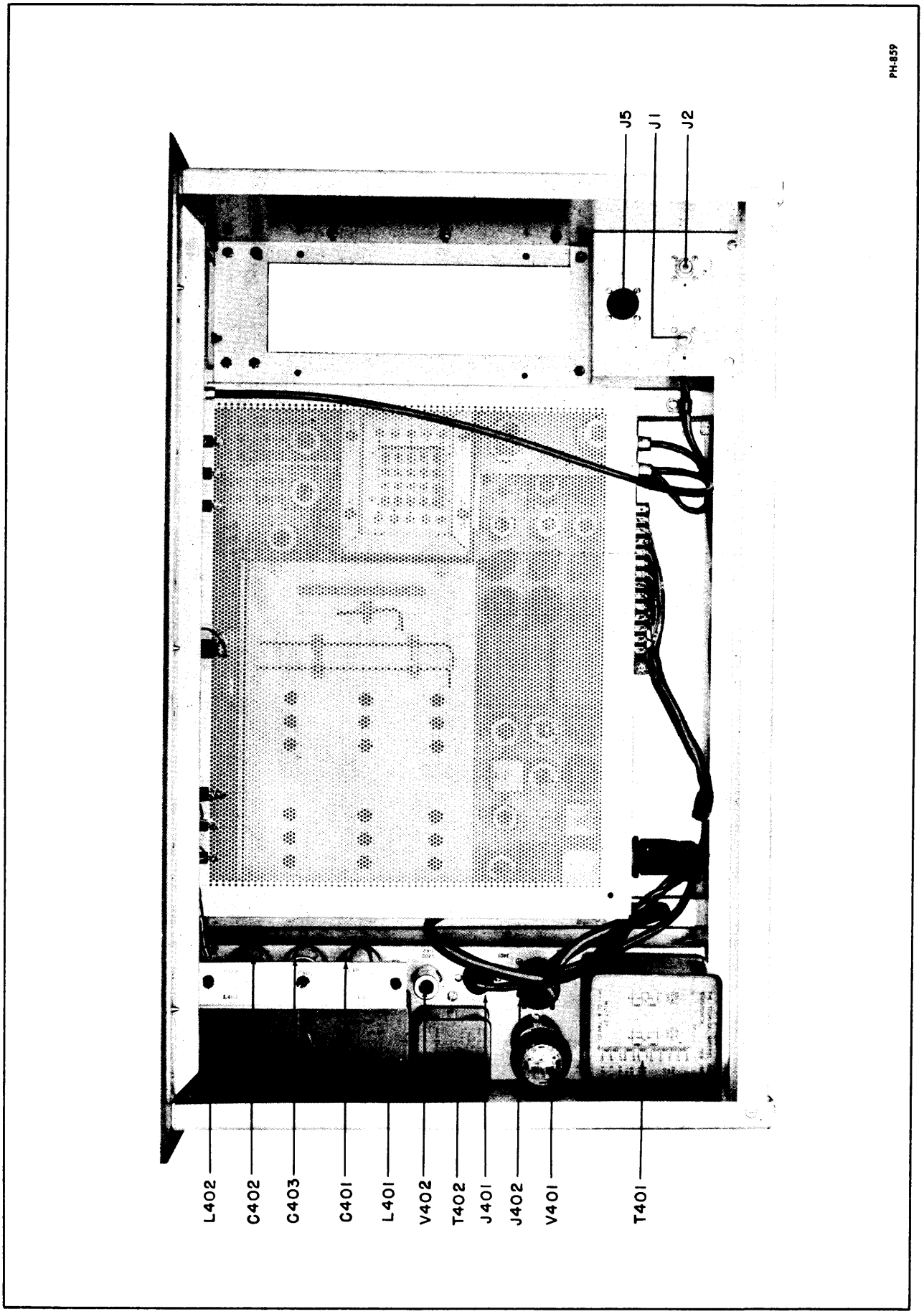


Figure E-27 Bottom View Model RTS-2

PARTS LIST
PARTS ILLUSTRATIONS
EXCITER UNIT

OSCILLATOR, RADIO FREQUENCY, MODEL A-1516

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C101	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%.	RF Bypass & Coupling E101	CC-100-16
C102	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	RF Bypass & Coupling E101	CC-100-16
C103	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	RF Bypass & Coupling E101	CC-100-16
C104	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%.	RF Bypass & Coupling E101	CC-100-29
C105	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass & Coupling E101	CC-100-29
C106	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass & Coupling E101	CC-100-29
C107	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass & Coupling E101	CC-100-29
C108	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass & Coupling E101	CC-100-29
C109	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass & Coupling E101	CC-100-29
C110	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass & Coupling E101	CC-100-29
C111	CAPACITOR, fixed: paper dielectric; .5 ufd, ±10%, 600 wvdc.	17 Kc Decoupling Z105	CP53B1EF504K
C112	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Coupling Z105	CC-100-16
C113	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Bypass Z105	CC-100-16
C114	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Coupling Z105	CC-100-16
C115	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	RF Bypass Z105	CC-100-16
C116	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	RF Bypass V106	CC-100-16
C117	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	287 Kc Decoupling V106	CC-100-16
C118	CAPACITOR, fixed: mica dielectric; 1000 uufd, ±10%, 500 wvdc, char. D.	Coupling	CM20D102K
C119	CAPACITOR, variable: ceramic; 7-45 uufd, 500 wvdc, char. C.	17 Kc Notch Adj. Z106	CV11C450

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C120	CAPACITOR, variable: ceramic; 1.5 - 7 uufd, 500 wvdc, char. A.	287 Kc Adj. Z103	CV11A070
C121	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	RF Bypass Z103	CC-100-16
C122	CAPACITOR, fixed: mica dielectric; 220 uufd, ±10%, 500 wvdc, char. D.	RF Bypass Z103	CM20D221K
C123	CAPACITOR, fixed: ceramic; 10 uufd, ±.5 uufd, 500 wvdc, char. SL.	Coupling Z103	CC21SL100D
C124	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Coupling Z103	CC-100-16
C125	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	RF Bypass V110	CC-100-16
C126	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	Coupling V110	CC-100-29
C127	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Coupling V110	CC-100-16
C128	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	Coupling V110	CC-100-29
C129	CAPACITOR, fixed: mylar dielectric; .1 ufd, ±10%, 200 wvdc.	Time Constant V111	CN106C104K
C130	CAPACITOR, fixed: mylar dielectric; .1 ufd, ±10%, 200 wvdc. (Same as C129)	Time Constant V111	CN106C104K
C131	CAPACITOR, fixed: composition; 510 uufd, ±5%, 500 wvdc, char. C.	Coupling V114	CM15C511J
C132	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass V112	CC-100-29
C133	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	Coupling V115	CC-100-29
C134	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	Bypass V115	CC-100-29
C135	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Decoupling V113	CC-100-16
C136	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	Coupling V115	CC-100-29
C137	CAPACITOR, fixed: ceramic dielectric; 8 uufd, ±10%, 500 wvdc, char. SL.	Coupling V115	CC21SL080K
C138	CAPACITOR, fixed: ceramic dielectric; 8 uufd, ±10%, 500 wvdc, char. SL. (Same as C137)	Coupling V115	CC21SL080K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C139	CAPACITOR, fixed: ceramic dielectric; 47 uufd, ±2%, 500 wvdc, char. SL.	RF Bypass V115	CC21SL470G
C140	CAPACITOR, variable: ceramic; 3-12 uufd, 500 wvdc, char. A.	MF Trimmer V114	CV11A120
C141	CAPACITOR, variable: ceramic; 3-12 uufd, 500 wvdc, char. A. (Same as C140)	MF Trimmer V114	CV11A120
C142	CAPACITOR, fixed: metallized paper; .04 ufd, 200 wvdc.	Audio Bypass V103	CN-111-5
C143	CAPACITOR, fixed: metallized paper; .04 ufd, 200 wvdc. (Same as C142)	Audio Bypass V103	CN-111-5
C144	CAPACITOR, fixed: metallized paper; .04 ufd, 200 wvdc. (Same as C142)	Audio Bypass V102	CN-111-5
C145	CAPACITOR, fixed: metallized paper; .04 ufd, 200 wvdc. (Same as C142)	Audio Bypass V102	CN-111-5
C146	CAPACITOR, fixed: mica dielectric; 11,000 uufd, ±1%.	Freq. Det. Cap., Z106	CM108F1102F
C147	CAPACITOR, fixed: mica dielectric; 11,000 uufd, ±1%. (Same as C146)	Freq. Det. Cap., Z106	CM108F1102F
C148	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	Coupling V108	CC-100-29
C149	CAPACITOR, fixed: mica dielectric; 330 uufd, ±2%, 500 wvdc, char. D.	17 Kc Bypass T105	CM20D331G
C150	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	LF Bypass T106	CC-100-16
C151	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Coupling V107	CC-100-16
C152	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Coupling Cap.	CC-100-16
C153	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Bypass V107	CC-100-16
C154	CAPACITOR, fixed: mica dielectric; 1600 uufd, ±2%, 500 wvdc, char. D.	p/o T108	CM20D162G
C155	CAPACITOR, fixed: mica dielectric; 1600 uufd, ±2%, 500 wvdc, char. D. (Same as C154)	p/o T108	CM20D162G
C156	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Coupling V107	CC-100-16
C157	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Coupling V107	CC-100-16

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C158	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Bypass V107	CC-100-16
C159	CAPACITOR, fixed: mica dielectric; 1600 uufd, ±2%, 500 wvdc, char. D. (Same as C154)	p/o T107	CM20D162G
C160	CAPACITOR, fixed: mica dielectric; 1600 uufd, ±2%, 500 wvdc, char. D. (Same as C154)	p/o T107	CM20D162G
C161	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Decoupling T107	CC-100-16
C162	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	RF Bypass J101	CC-100-16
C163	CAPACITOR, fixed: ceramic dielectric; 47 uufd, ±2%, 500 wvdc, char. SL. (Same as C139)	MF Coupling V113	CC21SL470G
C164	CAPACITOR, fixed: ceramic dielectric; 47 uufd, ±2%, 500 wvdc, char. SL. (Same as C139)	MF Coupling V113	CC21SL470G
C165	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	LF Bypass V108	CC-100-16
C166	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Decoupling V113	CC-100-16
C167 A&B	CAPACITOR, variable: air dielectric; 2 sections, 12.5 to 282 uufd, each section.	MF Tuning, V114	CB-127-1
C168	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	RF Bypass V114	CC-100-16
C169	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	RF Bypass V114	CC-100-16
C170	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	DC Blocking V114	CC-100-16
C171	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Decoupling V114	CC-100-16
C172	NOT USED.		
C173	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	RF Bypass	CC-100-16
C174	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass	CC-100-29
C175	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass, RF Output	CC-100-29
C176	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Coupling, RF Output	CC-100-16

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C177	CAPACITOR, variable: ceramic; 4-30 uufd, 500 wvdc, char. C.	Tunes T112, V120	CV11C300
C178	CAPACITOR, variable: ceramic; 4-30 uufd, 500 wvdc, char. C. (Same as C177)	Tunes T122, V120	CV11C300
C179	CAPACITOR, variable: ceramic; 4-30 uufd, 500 wvdc, char. C. (Same as 177)	Tunes T120, V120	CV11C300
C180	CAPACITOR, variable: ceramic 4-30 uufd, 500 wvdc, char. C. (Same as C177)	Tunes T121, V120	CV11C300
C181A	CAPACITOR, variable: air dielectric; 12.5 to 282 uufd, each section.	RF Tuning, V120	CB-137-1
C181B	CAPACITOR, variable: air dielectric; 12.5 to 282 uufd, each section.	RF Tuning V119	CB-137-2
C181C	CAPACITOR, variable: air dielectric; 12.5 to 282 uufd, each section.	RF Tuning, V118	CB-137-3
C182	CAPACITOR, fixed: mica dielectric; 1000 uufd, ±10%, 500 wvdc. char. D. (Same as C118)	Coupling, V120	CM20D102K
C183	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	Decoupling, V120	CC-100-29
C184	CAPACITOR, fixed: ceramic dielectric; 1000 uufd, ±20%, 500 wvdc, char. A.	RF Feed Thru Cap., V120	CK70A102M
C185	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass V120	CC-100-29
C186	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	Cathode Bypass V120	CC-100-29
C187	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	Cathode Bypass V120	CC-100-29
C188	CAPACITOR, fixed: dry electrolytic; 50 ufd, 50 wvdc, char. C.	Cathode Bypass V120	CE63C500G
C189	CAPACITOR, variable: ceramic; 1.5 - 7 uufd, 500 wvdc, char. A. (Same as C120)	Tunes T118, V119	CV11A070
C190	CAPACITOR, variable: ceramic; 4-30 uufd, 500 wvdc, char. C. (Same as C177)	Tunes T119, V119	CV11C300
C191	CAPACITOR, variable: ceramic; 4-30 uufd, 500 wvdc, char. C. (Same as C177)	Tunes T116, V119	CV11C300

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C192	CAPACITOR, variable: ceramic; 4-30 uufd, 500 wvdc, char. C. (Same as C177)	Tunes T117, V119	CV11C300
C193	CAPACITOR, fixed: mica dielectric; 1000 uufd, ±10%, 500 wvdc, char. D. (Same as C118)	Coupling V119	CM20D102K
C194	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%, (Same as C104)	RF Bypass V119	CC-100-29
C195	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	Decoupling V119	CC-100-29
C196	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	Cathode Bypass V119	CC-100-29
C197	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Cathode Bypass V119	CC-100-16
C198	CAPACITOR, fixed: ceramic dielectric; 1000 uufd, ±20%, 500 wvdc, char. A. (Same as C184)	RF Feed Thru Cap., V120	CK70A102M
C199	CAPACITOR, fixed: ceramic dielectric; 1000 uufd, ±20%, 500 wvdc, char. A. (Same as C184)	RF Feed Thru Cap., V118	CK70A102M
C200	CAPACITOR, fixed: ceramic dielectric; 1000 uufd, ±20%, 500 wvdc, char. A. (Same as C184)	RF Feed Thru Cap., V119	CK70A102M
C201	CAPACITOR, variable: ceramic; 4 - 30 uufd, 500 wvdc, char. C. (Same as C177)	Tunes T114, V118	CV11C300
C202	CAPACITOR, variable: ceramic; 4 - 30 uufd, 500 wvdc, char. C. (Same as C177)	Tunes T115, V118	CV11C300
C203	CAPACITOR, variable: ceramic; 4 - 30 uufd, 500 wvdc, char. C. (Same as C177)	Tunes T113, V118	CV11C300
C204	CAPACITOR, fixed: ceramic; 1000 uufd, ±20%, 500 wvdc, char. A. (Same as C184)	RF Feed Thru Cap V118	CK70A102M
C205	CAPACITOR, fixed: mica dielectric; 1000 uufd, ±10%, 500 wvdc, char. D. (Same as C118)	Coupling, V118	CM20D102K
C206	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass, V118	CC-100-29
C207	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	Cathode Bypass V118	CC-100-29

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C208	CAPACITOR, fixed: ceramic; 1000 uufd, ±20%, 500 wvdc, char. A. (Same as C184)	RF Feed Thru Cap., V118	CK70A102M
C209	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass, V116	CC-100-29
C210	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	Coupling, V116	CC-100-29
C211	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	Cathode Bypass, V116	CC-100-29
C212	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass, V116	CC-100-29
C213	CAPACITOR, fixed: ceramic dielectric; 1000 uufd, ±20%, 500 wvdc, char. A. (Same as C184)	RF Feed Thru Cap., V116	CK70A102M
C214	CAPACITOR, fixed: ceramic dielectric; 15 uufd, ±5%, 500 wvdc, char. SL.	RF Bypass, V116	CC21SL150J
C215	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	AC Blocking, V116	CC-100-29
C216	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass, V117	CC-100-29
C217	CAPACITOR, fixed: ceramic dielectric; 47 uufd, ±2%, 500 wvdc, char. SL. (Same as C139)	Coupling, V117	CC21SL470G
C218	CAPACITOR, fixed: ceramic dielectric; .001 ufd, +80 -20%. (Same as C104)	RF Bypass, V117	CC-100-29
C219	CAPACITOR, fixed: ceramic dielectric; 8 uufd, ±10%, 500 wvdc, char. SL. (Same as C137)	Coupling, V117	CC21SL080K
C220	CAPACITOR, fixed: ceramic dielectric; 47 uufd, ±2%, 500 wvdc, char. SL. (Same as C139)	Bypass, V117	CC21SL470G
C221	CAPACITOR, fixed: ceramic dielectric; 1000 uufd, ±20%, 500 wvdc, char. A. (Same as C184)	RF Feed Thru Cap.	CK70A102M
C222	CAPACITOR, fixed: paper dielectric; .05 ufd, +40 -10%, 400 wvdc.	Transient Sup. Oven Term. Board	CN-100-3
C223	CAPACITOR, variable: 1 - 8 uuf.	Freq. Adj.	CV-101-1
C224	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C225	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C226	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C227	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C228	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C229	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C230	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C231	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C232	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C233	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C234	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C235	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C236	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C237	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C238	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C239	CAPACITOR, variable: 1- 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C240	CAPACITOR, variable: 1 - 8 uuf. (Same as C223)	Freq. Adj.	CV-101-1
C241	CAPACITOR, fixed: mica dielectric; 220 uufd, ±5%, 500 wvdc, char. D.	Tunes L101, S108	CM15D221J
C242	CAPACITOR, fixed: mica dielectric; 130 uufd, ±5%, 500 wvdc, char. C.	Tunes L101, S108	CM15C131J
C243	CAPACITOR, fixed: mica dielectric; 82 uufd; ±5%, 500 wvdc, char. C.	Tunes L103, S108	CM15C820J
C244	CAPACITOR, fixed: mica dielectric; 47 uufd, ±5%, 500 wvdc, char. C.	Tunes L105, S108	CM15C470J
C245	CAPACITOR, fixed: mica dielectric; 24 uufd, ±5%, 500 wvdc, char. C.	Tunes L108, S108	CM15C240J

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C246	CAPACITOR, fixed: ceramic dielectric; 1000 uufd, ±20%, 500 wvdc, char. A. (Same as C184)	RF Feed Thru Cap. Fil., V116	CK70A102M
C247	CAPACITOR, fixed: ceramic dielectric; 1000 uufd, ±20%, 500 wvdc, char. A. (Same as C184)	RF Feed Thru Cap. Fil., V120	CK70A102M
C248	CAPACITOR, fixed: ceramic dielectric; 1000 uufd, ±20%, 500 wvdc, char. A. (Same as C184)	RF Feed Thru Cap Fil., V119	CK70A102M
C249	CAPACITOR, fixed: ceramic dielectric; 1000 uufd, ±20%, 500 wvdc, char. A. (Same as C184)	RF Feed Thru Cap. Fil., V118	CK70A102M
C250	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Meter Bypass, V112	CC-100-16
C251	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Coupling, V101	CC-100-16
C252	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	RF Bypass, V113	CC-100-16
C253	CAPACITOR, fixed: ceramic dielectric; 1000 uufd, ±20%, 500 wvdc, char. A. (Same as C184)	RF Feed Thru Cap., V119	CE70A102M
C254	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Cathode Bypass, V113	CC-100-16
C255	CAPACITOR, fixed: mica dielectric; 27 uuf, ±5%, 500 wvdc, char. C.	RF Bypass, T108	CM20C270J
C256	CAPACITOR, fixed: mica dielectric; 51 uufd, ±5%, 500 wvdc, char. C.	Tunes L104, S108	CM15C510J
C257	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Bypass	CC-100-16
C258	CAPACITOR, variable: ceramic; 7-45 uufd, 500 wvdc, char. C. (Same as C119)	LF Gain	CV11C450
C259	CAPACITOR. variable: ceramic; 7-45 uufd, 500 wvdc, char. C. (Same as C119)	LF Balance	CV11C450
C260	CAPACITOR, fixed: ceramic dielectric; .01 ufd, +80 -20%. (Same as C101)	Bypass Cap., V109	CC-100-16
C261	CAPACITOR, fixed: mylar dielectric; 0.1 ufd, ±10%, 100 wvdc.	AVC Suppressor Stabilizing Cap., Z104	CN-108-B-1003K
CR101	DIODE ASSEMBLY, germanium: four diodes; hermetically sealed.	Bal. Mod.	CK-711

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
CR102	DIODE ASSEMBLY, germanium: four diodes; hermetically sealed. (Same as CR101)	Bal. Mod.	CK-711
CR103	DIODE ASSEMBLY, germanium: four diodes; hermetically sealed. (Same as CR101)	Bal. Mod.	CK-711
CR104	DIODE, silicon.	Meter Rect.	1N-300
CR105	DIODE, silicon. (Same as CR104)	Meter Rect.	1N-300
CR106	DIODE, silicon. (Same as CR104)	Meter Rect.	1N-300
CR107	DIODE, germanium.	Part of HF Mod.	1N-67
CR108	DIODE, germanium. (Same as CR107)	Part of HF Mod.	1N-67
CR109	DIODE, silicon. (Same as CR104)	Meter Rect.	1N-300
CR110	DIODE, germanium. (Same as CR107)	Part of 17 kc Osc.	1N-67
E101	BOARD, terminal: general purpose barrier type; 14 brass nickel plated 6-32 binding head machine screws; moulded phenolic body.	Terminal Board Rear Apron	TM-100-14
E102	CLIP, electrical: ceramic body.	Plate Cap, V120	HB-102-2
I101	LAMP, neon: min. bayonet base; 110/125 v, 1/25 watt; T-3-1/4 bulb.	Excite on Ind.	BI-100-51
I102	LAMP, neon: min. bayonet base; 110/125 v, 1/25 watt; T-3-1/4 bulb. (Same as I101)	Oven Ind.	BI-100-51
I103	LAMP, incandescent: min. bayonet base; 6/8 volts, .15 amp; T-3-1/4.	Main Power Ind.	BI-101-47
J101	CONNECTOR, receptacle: female, 3 contact, chassis type.	Mike Jack	JJ-133-3
J102	CONNECTOR, receptacle: female, 1 contact, chassis type.	RF Out	UG-625/U
J103	CONNECTOR, receptacle: female, 1 contact, chassis type. (Same as J102)	RF Out	UG-625/U
J104	CONNECTOR, receptacle: female, 1 contact, chassis type. (Same as J102)	VMO In	UG-625/U
J105	CONNECTOR, receptacle: male; one contact, 50 ohm.	RF Connector	JJ-154
J106	CONNECTOR, receptacle: male, one contact, 50 ohm. (Same as J105)	RF Connector	JJ-154
J107	CONNECTOR, receptacle: male; one contact, 50 ohm. (Same as J105)	RF Connector	JJ-154

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
J108	CONNECTOR, receptacle: male, one contact, 50 ohm. (Same as J105)	RF Connector	JJ-154
J109	CONNECTOR, receptacle.	Power Jack	MS3102A-20-27P
J110	CONNECTOR, receptacle: male, one contact, 50 ohm. (Same as J105)	RF Connector	JJ-154
K101	RELAY ASSY., solenoid, plug in type, octal base.	VOX Relay	A-1460
L101	COIL, R.F.: 8 mc: .95 - 1.01 uhy; Q greater than 115.	8 mc Tank Har. Gen., S108	A-1445-4
L102	COIL, R.F.: 10 mc; .95 - 1.01 uhy; Q greater than 115.	10 mc Tank Har. Gen., S108	A-1445-5
L103	COIL, R.F.: 12 mc: .95 - 1.01 uhy; Q greater than 115.	12 mc Tank Har. Gen., S108	A-1445-6
L104	COIL, R.F.: 14 mc: .95 - 1.01 uhy; Q greater than 115.	14 mc Tank Har. Gen., S108	A-1445-7
L105	COIL, R.F.: 16 mc: .95 - 1.01 uhy; Q greater than 115.	16 mc Tank Har. Gen., S108	A-1445-8
L106	COIL, R.F.: 18 mc: .95 - 1.01 uhy; Q greater than 115.	18 mc Tank Har. Gen., S108	A-1445-9
L107	COIL, R.F.: 20 mc: .95 - 1.01 uhy; Q greater than 115.	20 mc Tank Har. Gen., S108	A-1445-10
L108	COIL, R.F.: 22 mc: .77 - .83 uhy; Q greater than 115.	22 mc Har. Gen., S108	A-1445-11
L109	COIL, R.F.: 24 mc: .67 - .73 uhy; Q greater than 115.	24 mc Har. Gen., S108	A-1445-12
L110	COIL, R.F.: 26 mc: .58 - .64 uhy; Q greater than 115.	26 mc Har. Gen., S108	A-1445-13
L111	COIL, R.F.: 28 mc: .46 - .50 uhy; Q greater than 115.	28 mc Har. Gen., S108	A-1445-3
L112	COIL, R.F.: 30 mc: .40 - .45 uhy; Q greater than 115.	30 mc Har. Gen., S108	A-1445-1
L113	COIL, R.F.: 32 - 34 mc: .29 - .34 uhy; Q greater than 115.	32 mc Har. Gen., S108	A-1445-2
L114	COIL, R.F.: 32 - 34 mc: .29 - .34 uhy; Q greater than 115. (Same as L113)	34 mc Har. Gen., S108	A-1445-2
L115	COIL, R.F.: 10 uhy; 75 ma, 3 pi.	Choke, RF, V115	CL-101-4
L116	COIL, R.F.: 2.8 uhy.	Choke, RF, V118	CL-105-3
L117	COIL, R.F.: 128 uhy.	Choke, RF, V120	A-1451-3
L118	COIL, R.F.: 750 uhy, 75 ma, 2 pi.	Choke, RF, V119	CL-100-5

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
L119	COIL, R.F.: 128 uhy.	Choke, RF, V119	A-1045
L120	COIL, R.F.: 128 uhy. (Same as L119)	Choke, RF, V120	A-1045
L121	COIL, R.F.: 750 uhy, 75 ma, 2 pi. (Same as L118)	Choke, RF, V118	CL-100-5
L122	COIL, R.F.: 128 uhy, (Same as L119)	Choke, RF, V118	A-1045
L123	COIL, R.F.: 750 uhy, 75 ma, 2 pi. (Same as L118)	Choke, RF, V118	CL-100-5
L124	COIL, R.F.: 750 uhy, 75 ma, 2 pi. (Same as L118)	Choke, RF, V120	CL-100-5
L125	COIL, plate peaking.	Choke, RF, V116	A-1466
L126	COIL, R.F.: 128 uhy. (Same as L119)	Plate Load, V117	A-1045
L127	COIL, R.F.: 750 uhy, 75 ma, 2 pi. (Same as L118)	Choke, RF, V116	CL-100-5
L128	COIL, R.F.: 15.8 uhy.	Choke, RF, V117	p/o A-1461
L129	COIL, R.F.: 4 uhy.	Choke, RF, Fil. of V119	CL-105-2
L130	COIL, R.F.: 4 uhy. (Same as L129)	Choke, RF, Fil. of V118	CL-105-2
L131	COIL, R.F.: 4 uhy. (Same as L129)	Coupling, T110	CL-105-2
L132	COIL, R.F.: 128 uhy. (Same as L119)	Choke, RF Plate	A-1045
M101	METER, D.C.: micro amp., 0-200.	VTVM	MR-100-8
P101	CONNECTOR, plug: male; AN pin type.	Power Intercon. Cable Plug	MS3106B-20-27P
P102	CONNECTOR, plug: female; AN pin type.	Power Intercon. Cable Plug	MS3106B-20-27S
P103	CONNECTOR, plug: min. coaxial type.	M.F. Osc. Output	PL-154
P104	CONNECTOR, plug: min. coaxial type. (Same as P103)	VMO Injection	PL-154
P105	CONNECTOR, plug: min. coaxial type. (Same as P103)	H.F. Osc. Inj.	PL-154
P106	CONNECTOR, plug: min. coaxial type. (Same as P103)	VMO Injection	PL-154
P107	CONNECTOR, plug: min. coaxial type.	H.F. Osc. Inj.	PL-155
PS101	SUPPRESSOR, parasitic.	Parasitic Supp.	A-1453
R101	RESISTOR, fixed: composition; 560 ohm, ±10%, 1/2 watt.	Terminating Res., T101	RC20GF561K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R102	RESISTOR, fixed: composition; 560 ohm, ±10%, 1/2 watt. (Same as R101)	Terminating Res., T102	RC20GF561K
R103	RESISTOR, fixed: composition; 470,000 ohms, ±10%, 1/2 watt.	Grid Return, V101	RC20GF474K
R104	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1/2 watt.	Plate Load, V101	RC20GF104K
R105	RESISTOR, fixed: composition; 1500 ohms, ±10%, 1/2 watt.	Cathode, V101	RC20GF152K
R106	RESISTOR, variable: composition; 50,000 ohms, ±20%, 2 watts.	Carrier Insert, T105	RV4ATRD503B
R107	RESISTOR, fixed: composition; 6800 ohms, ±10%, 1/2 watt.	Dropping, T105	RC20GF682K
R108	RESISTOR, fixed: composition; 1800 ohms, ±10%, 1/2 watt.	Decoupling, V106	RC20GF182K
R109	RESISTOR, variable: composition; 50,000 ohms, ±10%, 2 watts.	Notch Control, Z106	RV4ATSD503A
R110	RESISTOR, variable: composition; 100 ohms, ±10%, 2 watts.	LSB Balance, Z101	RV4ATXA101A
R111	RESISTOR, fixed: composition; 22,000 ohms, ±10%, 1/2 watt.	Plate Load, Z105	RC20GF223K
R112	RESISTOR, variable: composition; 100 ohms, ±10%, 2 watts. (Same as R110)	USB Balance, Z102	RV4ATXA101A
R113	RESISTOR, variable: composition; 100 ohms, ±10%, 2 watts. (Same as R110)	LF Balance, Z101	RV4ATXA101A
R114	RESISTOR, fixed: composition; 1000 ohms, ±10%, 1/2 watt.	Cathode, Z105	RC20GF102K
R115	RESISTOR, fixed: composition; 68,000 ohms, ±10%, 1/2 watt.	Grid Return, Z105	RC20GF683K
R116	RESISTOR, fixed: composition; 2.2 M, ±10%, 1/2 watt.	Grid Return, Z105	RC20GF225K
R117	RESISTOR, fixed: composition; 22,000 ohms, ±10%, 1/2 watt. (Same as R111)	Grid Return, Z105	RC20GF223K
R118	RESISTOR, fixed: composition; 68 ohms, ±10%, 1/2 watt.	Cathode, Z105	RC20GF680K
R119	RESISTOR, fixed: composition; 180,000 ohms, ±10%, 1/2 watt.	Dropping, Z105	RC20GF184K
R120	RESISTOR, fixed: wire wound; 5000 ohms, ±5%, 10 watts.	Dropping, V106	RW-109-32
R121	RESISTOR, fixed: composition; 10 M, ±10%, 1/2 watt.	Limiting, Z105	RC20GF106K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R122	RESISTOR, fixed: composition; 15,000 ohms, ±10%, 1/2 watt.	Screen Dropping, Z105	RC20GF153K
R123	RESISTOR, fixed: composition; 1000 ohms, ±10%, 1/2 watt. (Same as R113)	Decoupling, V106	RC20GF102K
R124	RESISTOR, fixed: composition; 4700 ohms, ±10%, 1 watt.	Decoupling, V106	RC30GF472K
R125	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1/2 watt. (Same as R104)	Plate Load, Z103	RC20GF104K
R126	RESISTOR, fixed: composition; 470,000 ohms, ±10%, 1/2 watt. (Same as R103)	Grid Return, Z103	RC20GF474K
R127	RESISTOR, fixed: composition; 470,000 ohms, ±10%, 1/2 watt. (Same as R103)	Grid Return, Z103	RC20GF474K
R128	RESISTOR, fixed: composition; 1000 ohms, ±10%, 1/2 watt. (Same as R113)	Cathode, Z103	RC20GF102K
R129	RESISTOR, variable: composition; 5000 ohms, ±20%, 2 watts.	Squelch Gain, V110	RV4ATSA502B
R130	RESISTOR, variable: composition; 1000 ohms, ±10%, 2 watts.	MF Balance, V113	RV4ATXA102A
R131	RESISTOR, fixed: composition; 820 ohms, ±10%, 1/2 watt.	Cathode, V107	RC20GF821K
R132	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1/2 watt. (Same as R104)	Plate Load, V107	RC20GF104K
R133	RESISTOR, fixed: composition; 10 M, ±10%, 1/2 watt. (Same as R121)	Dropping, V107	RC20GF106K
R134	RESISTOR, fixed: composition; 220,000 ohms, ±10%, 1/2 watt.	Dropping, V107	RC20GF224K
R135	RESISTOR, variable: composition; 1000 ohms, ±10%, 2 watts.	Meter Balance, V112	RV4ATSA102A
R136	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1/2 watt. (Same as R104)	Plate Load, V110	RC20GF104K
R137	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1/2 watt. (Same as R104)	Plate Load, V110	RC20GF104K
R138	RESISTOR, fixed: composition; 82,000 ohms, ±10%, 2 watts.	Cathode Bias, V110	RC42GF823K
R139	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 2 watts.	Screen Dropping, V110	RC42GF104K
R140	RESISTOR, variable: composition; 100,000 ohms, ±20%, 2 watts.	VOX GAIN, V110	RV4ATSA104B
R141	RESISTOR, fixed: composition; 470 ohms, ±10%, 1/2 watt.	Cathode, V110	RC20GF471K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R142	RESISTOR, fixed: composition; 1000 ohms, ±10%, 1/2 watt. (Same as R114)	Cathode, V110	RC20GF102K
R143	RESISTOR, fixed: composition; 470,000 ohms, ±10%, 1/2 watt. (Same as R103)	Grid Return, V110	RC20GF474K
R144	RESISTOR, fixed: composition; 470,000 ohms, ±10%, 1/2 watt. (Same as R103)	Plate Load, V111	RC20GF474K
R145	RESISTOR, fixed: composition; 10 M, ±10%, 1/2 watt. (Same as R121)	Time Constant, V111	RC20GF106K
R146	RESISTOR, fixed: composition; 2.2M, ±10%, 1/2 watt. (Same as R116)	Dropping, V111	RC20GF225K
R147	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1/2 watt. (Same as R104)	Cathode, V111	RC20GF104K
R148	RESISTOR, fixed: composition; 10 M, ±10%, 1/2 watt. (Same as R121)	Dropping, V111	RC20GF106K
R149	RESISTOR, fixed: composition; 10 M, ±10%, 1/2 watt. (Same as R121)	Time Constant, V111	RC20GF106K
R150	RESISTOR, variable: composition; 500 ohms, ±10%, 2 watts.	HF Balance, Z107	RV4ATXA501A
R151	RESISTOR, fixed: composition; 820 ohms, ±10%, 1/2 watt. (Same as R131)	Cathode, V109	RC20GF821K
R152	RESISTOR, fixed: composition; 82,000 ohms, ±10%, 2 watts. (Same as R138)	Cathode Bias, V109	RC42GF823K
R153	RESISTOR, fixed: composition; 220,000 ohms, ±10%, 1/2 watt. (Same as R134)	Dropping, I101	RC20GF224K
R154	RESISTOR, fixed: composition; 1.5 M, ±5%, 1/2 watt.	Grid Return, V112	RC20GF155J
R155	RESISTOR, fixed: composition; 22,000 ohms, ±10%, 1 watt.	Plate Load, V112	RC30GF223K
R156	RESISTOR, fixed: composition; 22,000 ohms, ±10%, 1 watt. (Same as R155)	Plate Load, V112	RC30GF223K
R157	RESISTOR, fixed: composition; 1200 ohms, ±10%, 1/2 watt.	Cathode, V112	RC20GF122K
R158	RESISTOR, fixed: composition; 1200 ohms, ±10%, 1/2 watt. (Same as R157)	Cathode, V112	RC20GF122K
R159	RESISTOR, fixed: composition; 22,000 ohms, ±10%, 1/2 watt. (Same as R111)	Plate Load, V115	RC20GF223K
R160	RESISTOR, fixed: composition; 22,000 ohms, ±10%, 1/2 watt. (Same as R111)	Plate Load, V115	RC20GF223K
R161	RESISTOR, fixed: composition; 1500 ohms, ±10%, 1/2 watt. (Same as R105)	Cathode, V115	RC20GF152K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R162	RESISTOR, fixed: composition; 4700 ohms, ±10%, 1/2 watt.	Grid Return, V115	RC20GF472K
R163	RESISTOR, fixed: composition; 220,000 ohms, ±10%, 1/2 watt. (Same as R134)	Grid Return, V115	RC20GF224K
R164	RESISTOR, fixed: composition; 47,000 ohms, ±10%, 1/2 watt.	Dropping, V114	RC20GF473K
R165	RESISTOR, fixed: composition; 47,000 ohms, ±10%, 1/2 watt. (Same as R164)	Dropping, V114	RC20GF473K
R166	RESISTOR, fixed: composition; 1000 ohms, ±10%, 1/2 watt. (Same as R114)	Dropping, USB Gain	RC20GF102K
R167	RESISTOR, fixed: composition; 1000 ohms, ±10%, 1/2 watt. (Same as R114)	Dropping, LSB Gain	RC20GF102K
R168	RESISTOR, variable: composition; 100,000 ohms, ±20%, 2 watts. (Same as R140)	USB Gain, V102	RV4ATSA104B
R169	RESISTOR, variable: composition; 100,000 ohms, ±20%, 2 watts. (Same as R140)	LSB Gain, V103	RV4ATSA104B
R170	RESISTOR, fixed: composition; 1500 ohms, ±10%, 1/2 watt. (Same as R105)	Dropping, T117	RC20GF152K
R171	RESISTOR, fixed: composition; 240,000 ohms, ±10%, 1/2 watt.	Dropping, Z101	RC20GF244K
R172	RESISTOR, fixed: composition; 240,000 ohms, ±10%, 1/2 watt. (Same as R171)	Dropping, Z102	RC20GF244K
R173	RESISTOR, fixed: composition; 33,000 ohms, ±10%, 1/2 watt.	Dropping, Z106	RC20GF333K
R174	RESISTOR, fixed: composition; 240,000 ohms, ±10%, 1/2 watt. (Same as R171)	Grid Return, V108	RC20GF244K
R175	RESISTOR, fixed: composition; 1500 ohms, ±10%, 1/2 watt. (Same as R105)	Cathode, V108	RC20GF152K
R176	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1/2 watt. (Same as R104)	Plate Load, V108	RC20GF104K
R177	RESISTOR, fixed: composition; 47,000 ohms, ±10%, 1/2 watt. (Same as R164)	Grid Return, V108	RC20GF473K
R178	RESISTOR, fixed: composition; 1500 ohms, ±10%, 1/2 watt. (Same as R105)	Cathode, V108	RC20GF152K
R179	RESISTOR, fixed: composition; 1000 ohms, ±10%, 1/2 watt. (Same as R114)	T103 Terminating	RC20GF102K
R180	RESISTOR, fixed: composition; 1000 ohms, ±10%, 1/2 watt. (Same as R114)	T104 Terminating	RC20GF102K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R181	RESISTOR, fixed: composition; 820 ohms, ±10%, 1/2 watt. (Same as R131)	Cathode, V107	RC20GF821K
R182	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1/2 watt. (Same as R104)	Plate Load, V107	RC20GF104K
R183	RESISTOR, fixed: composition; 10 M, ±10%, 1/2 watt. (Same as R121)	Dropping, V107	RC20GF106K
R184	RESISTOR, fixed: composition; 220,000 ohms, ±10%, 1/2 watt. (Same as R134)	Dropping, V107	RC20GF224K
R185	RESISTOR, fixed: composition; 220 ohms, ±10%, 1/2 watt.	Dropping, CR103	RC20GF221K
R186	RESISTOR, fixed: composition; 220 ohms, ±10%, 1/2 watt. (Same as R185)	Dropping, CR103	RC20GF221K
R187	RESISTOR, fixed: composition; 22,000 ohms, ±10%, 1/2 watt. (Same as R111)	T108 Terminating	RC20GF223K
R188	RESISTOR, fixed: composition; 22,000 ohms, ±10%, 1/2 watt. (Same as R111)	T108 Terminating	RC20GF223K
R189	RESISTOR, fixed: composition; 330 ohms, ±10%, 1/2 watt.	Cathode, V109	RC20GF331K
R190	RESISTOR, fixed: composition; 22,000 ohms, ±10%, 1/2 watt. (Same as R111)	T107, Terminating	RC20GF223K
R191	RESISTOR, fixed: composition; 1000 ohms, ±10%, 1 watt.	Decoupling, T107	RC30GF102K
R192	RESISTOR, fixed: composition; 47,000 ohms, ±10%, 1/2 watt. (Same as R164)	Grid Return, V113	RC20GF473K
R193	RESISTOR, fixed: composition, 47,000 ohms, ±10%, 1/2 watt. (Same as R164)	Grid Return, V113	RC20GF473K
R194	RESISTOR, fixed: composition; 560 ohms, ±10%, 1/2 watt. (Same as R101)	Cathode Bias, V103	RC20GF561K
R195	RESISTOR, fixed: composition; 560 ohms, ±10%, 1/2 watt. (Same as R101)	Cathode Bias, V104	RC20GF561K
R196	RESISTOR, fixed: composition; 10,000 ohms, ±10%, 2 watts.	Decoupling, V113	RC42GF103K
R197	RESISTOR, fixed: composition; 68 ohms, ±10%, 1/2 watt. (Same as R118)	Parasitic Suppressor, V113	RC20GF680K
R198	RESISTOR, fixed: composition; 68 ohms, ±10%, 1/2 watt. (Same as R118)	Parasitic Suppressor, V113	RC20GF680K
R199	RESISTOR, fixed: composition; 39 ohms, ±10%, 1/2 watt.	Parasitic Suppressor, V114	RC20GF390K
R200	RESISTOR, fixed: composition; 100 ohms, ±10%, 1/2 watt.	Cathode, V114	RC20GF101K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R201	RESISTOR, fixed: composition; 68 ohms, ±10%, 1/2 watt. (Same as R118)	VMO Load, J107	RC20GF680K
R202	RESISTOR, fixed: composition; 82,000 ohms, ±10%, 1/2 watt.	Screen Dropping, V114	RC20GF823K
R203	RESISTOR, fixed: composition; 1200 ohms, ±10%, 1 watt.	Decoupling, V114	RC30GF122K
R204	RESISTOR, fixed: composition; 220,000 ohms, ±10%, 1/2 watt. (Same as R134)	Dropping, V114	RC20GF224K
R205	RESISTOR, variable: composition; 5000 ohms, ±20%, 2 watts.	Output Control, Z107	RV4ATRD502B
R206	RESISTOR, fixed: composition; 100 ohms, ±10%, 1/2 watt. (Same as R200)	Transient Suppressor, Heater T.B.	RC20GF101K
R207	RESISTOR, fixed: wire wound; 20 watts.	Oven Heater	RR-102-1
R208	RESISTOR, fixed: wire wound; 20 watts. (Same as R207)	Oven Heater	RR-102-1
R209	RESISTOR, fixed: composition; 3.3 M, ±5%, 1/2 watt.	Dropping, RF Meter Circuit	RC20GF335J
R210	RESISTOR, fixed: composition; 1000 ohms, ±5%, 1/2 watt.	Dropping, RF Meter Circuit	RC20GF102J
R211	RESISTOR, fixed: composition; 560 ohms, ±5%, 1/2 watt.	Dropping, RF Meter Circuit	RC20GF561J
R212	RESISTOR, fixed: composition; 10,000 ohms, ±10%, 1/2 watt.	Dropping, RF Output	RC20GF103K
R213	RESISTOR, fixed: composition; 470,000 ohms, ±10%, 1/2 watt. (Same as R103)	Screen Dropping, V120	RC20GF474K
R214	RESISTOR, fixed: composition; 10 ohms, ±10%, 1/2 watt.	Suppressor, V120	RC20GF100K
R215	RESISTOR, fixed: composition; 68,000 ohms, ±10%, 1/2 watt. (Same as R115)	Dropping, V119	RC20GF683K
R216	RESISTOR, fixed: wire wound; 550 ohms, ±5%, 10 watts.	Cathode Bias, V120	RW-109-19
R217	RESISTOR, fixed: composition; 5,600 ohms, ±10%, 1 watt.	Screen Dropping, V119	RC30GF562K
R218	RESISTOR, fixed: composition; 39 ohms, ±10%, 1/2 watt. (Same as R199)	Suppressor, V119	RC20GF390K
R219	RESISTOR, fixed: composition; 68 ohms, ±10%, 1/2 watt. (Same as R118)	Cathode Bias, V119	RC20GF680K
R220	RESISTOR, fixed: composition; 10 ohms, ±10%, 1/2 watt. (Same as R214)	Suppressor, V119	RC20GF100K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R221	RESISTOR, fixed: composition; 390,000 ohms, ±10%, 1/2 watt.	Dropping, V109B	RC20GF394K
R222	RESISTOR, fixed: composition; 1000 ohms, ±10%, 1/2 watt. (Same as R114)	Dropping, V119	RC20GF102K
R223	RESISTOR, fixed: composition; 33,000 ohms, ±10%, 1/2 watt. (Same as R173)	Screen Dropping, V118	RC20GF333K
R224	RESISTOR, fixed: composition; 10 ohms, ±10%, 1/2 watt. (Same as R214)	Suppressor, V118	RC20GF100K
R225	RESISTOR, fixed: composition; 100 ohms, ±10%, 1/2 watt. (Same as R200)	Cathode Bias, V118	RC20GF101K
R226	RESISTOR, fixed: composition; 10 ohms, ±10%, 1/2 watt. (Same as R214)	Suppressor, V118	RC20GF100K
R227	RESISTOR, fixed: composition; 2700 ohms, ±10%, 1/2 watt.	Grid Return, V118	RC20GF272K
R228	RESISTOR, fixed: composition; 330 ohms, ±10%, 1/2 watt. (Same as R198)	Cathode Bias, V116	RC20GF331K
R229	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1/2 watt. (Same as R104)	Grid Return, V116	RC20GF104K
R230	RESISTOR, fixed: composition; 2700 ohms, ±10%, 1 watt.	Decoupling, V116	RC30GF272K
R231	RESISTOR, fixed: composition; 6800 ohms, ±10%, 1 watt.	Decoupling, V116	RC30GF682K
R232	RESISTOR, fixed: composition; 22,000 ohms, ±10%, 1/2 watt. (Same as R111)	Screen Dropping, V116	RC20GF223K
R233	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1/2 watt. (Same as R104)	Grid Return, V116	RC20GF104K
R234	RESISTOR, fixed: composition; 22,000 ohms, ±10%, 1/2 watt. (Same as R111)	p/o T107	RC20GF223K
R235	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1/2 watt. (Same as R104)	Dropping, I102	RC20GF104K
R236	RESISTOR, fixed: composition; 100 ohms, ±10%, 1/2 watt. (Same as R200)	Plate Dropping, V109B	RC20GF101K
R237	RESISTOR, fixed: composition; 270 ohms, ±10%, 1/2 watt.	Isolating, T110	RC20GF271K
R238	RESISTOR, fixed: composition; 5.1 M, ±5%, 1/2 watt.	Voltage Divider, Meter	RC20GF515J
R239	RESISTOR, fixed: composition; 1500 ohms, ±10%, 1/2 watt. (Same as R105)	Loading, T119	RC20GF152K
R240	RESISTOR, fixed: composition; 2700 ohms, ±10%, 1 watt.	P/O T109	RC30GF272K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
S101	SWITCH, rotary: shorting, 4 positions, double pole; glass melamine ins., contacts and wipers - silver alloy, 1/4 in. shaft, 11/32 in. lg., 1/4 in. flatted - 2 sides.	USB Switch	SW-181
S102	SWITCH, rotary: shorting, 4 positions, double pole; glass melamine ins., contacts and wipers - silver alloy, 1/4 in. shaft, 11/32 in. lg., 1/4 in. flatted - 2 sides.	LSB Switch	SW-181
S103	SWITCH, toggle: SPST; solder lug terminals, 110/250 volts AC or DC.	Xmitter ON/OFF	ST-103-1-62
S104	SWITCH, toggle: SPST; solder lug terminals, 110/250 volts AC or DC. (Same as S103)	Xmitter ON/OFF	ST-103-1-62
S105	SWITCH, toggle: SPST; solder lug terminals, 110/250 volts AC or DC. (Same as S103)	Exciter ON/STANDBY	ST-103-1-62
S106A	WAFER, switch: four positions, shorting type.	RF Band, V120	WS-101
S106B	WAFER, switch: four positions, shorting type. (Same as S106A)	RF Band, V119	WS-101
S106C	WAFER, switch: four positions, shorting type. (Same as S106A)	RF Band, V118	WS-101
S106D	WAFER, switch: four positions, shorting type.	Sideband Reversal, V103	WS-103
S107	SWITCH, rotary.	MF-Xtal Switch	SW-200
S108A	WAFER, switch: 15 positions, single pole, shorting type.	HF Mod. Switch	WS-102
S108B	SWITCH, rotary: 15 positions; single pole, 20° detent.	HF Mod. Switch	SW-191
S109	SWITCH, rotary.	Meter Switch	SW-199
S110	SWITCH, sensitive: bi-metallic; 70° breaking temperature.	Thermostat Oven Heaters	SS-100-2
T101	TRANSFORMER , audio: pri. imp. 150/600 ohms: sec. imp. 600 CT ohms: 7 terminals.	Input Channel 1	TF-170
T102	TRANSFORMER, audio: pri. imp. 150/600 ohms: sec. imp. 600 CT ohms: 7 terminals. (Same as T101)	Input Channel 2	TF-170
T103	TRANSFORMER, audio: pri. imp. 20,000 ohms CT: sec. imp. 150/600 ohms: 7 terminals.	Audio, V102	TF-138

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
T104	TRANSFORMER, audio: pri. imp. 20,000 ohms CT: sec. imp.150/600 ohms: 7 terminals. (Same as T103)	Audio, V102	TF-138
T105	TRANSFORMER, audio: pri. imp. 20,000 ohms CT: sec. imp. 150/600 ohms: 7 terminals. (Same as T103)	Output 17 Kc, V104	TF-138
T106	TRANSFORMER, audio: pri. imp. 20,000 ohms CT: sec. imp. 150/600 ohms: 7 terminals. (Same as T103)	CF Amp, V108	TF-138
T107	TRANSFORMER, R.F.: 270 Kc; double tuned.	LF Transformer, V109	A-1444
T108	TRANSFORMER, R.F.: 270 Kc; double tuned. (Same as T107)	LF Transformer, V109	A-1444
T109	TRANSFORMER, R.F.: 2-4 Mc; single tuned.	MF Transformer, V113	A-1512
T110	TRANSFORMER, R.F.: 2-4 Mc; single tuned.	MF Transformer, V114	A-1511
T111	TRANSFORMER, R.F.: 2-4 Mc; double tuned.	Mod. Trans-former, Z107	TF-172
T112	TRANSFORMER, R.F.: 16-32 Mc; slug tuned.	16-32 Mc Band, V120	A-1519-2
T113	TRANSFORMER, R.F.: 4-8 Mc; slug tuned.	4-8 Mc Band, V118	A-1451-3
T114	TRANSFORMER, R.F.: 16-32 Mc; slug tuned.	16-32 Mc Band, V118	A-1519-1
T115	TRANSFORMER, R.F.: 8-16 Mc; slug tuned.	8-16 Mc Band, V118	A-1451-4
T116	TRANSFORMER, R.F.: 2-4.3 Mc; slug tuned.	2-4.3 Mc Band, V119	A-1451-2
T117	TRANSFORMER, R.F.: 4-8 Mc; slug tuned. (Same as T113)	4-8 Mc Band, V119	A-1451-3
T118	TRANSFORMER, R.F.: 16-32 Mc; slug tuned. (Same as T114)	16-32 Mc Band, V119	A-1519-1
T119	TRANSFORMER, R.F.: 8-16 Mc; slug tuned. (Same as T115)	8-16 Mc Band, V119	A-1451-4
T120	TRANSFORMER, R.F.: 2-4.3 Mc; slug tuned.	2-4.3 Mc Band, V120	A-1451-1
T121	TRANSFORMER, R.F.: 4-8 Mc; slug tuned. (Same as T113)	4-8 Mc Band, V120	A-1451-3
T122	TRANSFORMER, R.F.: 8-16 Mc; slug tuned.	8-16 Mc Band, V120	A-1451-5

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
T123	TRANSFORMER, H.F. Osc. output; ferrite core.	HF Output Xfmr Z107	TF-173
T124	TRANSFORMER, H.F.: VMO output.	VMO Output Xfmr V115	TF-183
V101	TUBE, electron: RF triode; 7 pin miniature.	Mike Preamplifier	6AB4
V102	TUBE, electron: RF triode; 7 pin miniature. (Same as V101)	Audio Amp	6AB4
V103	TUBE, electron: RF triode; 7 pin miniature. (Same as V101)	Audio Amp.	6AB4
V104	TUBE, electron: 9 pin miniature.	17 Kc Osc.	6U8
V105	TUBE, electron: medium-mu duo-triode, 9 pin miniature.	287 Kc Osc.	12AU7
V106	TUBE, electron: voltage regulator; 7 pin miniature.	150 Volt Regulator	OA2
V107	TUBE, electron: duo triode; 9 pin miniature.	Meter Amp.	12AT7
V108	TUBE, electron: duo triode; 9 pin miniature. (Same as V107)	LF Amp.	12AT7
V109	TUBE, electron: duo triode; 9 pin miniature. (Same as V107)	Relay Amp 270 Kc Amp.	12AT7
V110	TUBE, electron: 9 pin miniature. (Same as V104)	Squelch & VOX Amp.	6U8
V111	TUBE, electron: duo diode; 7 pin miniature.	Squelch & VOX Rect.	6AL5
V112	TUBE, electron: medium-mu duo-triode, 9 pin miniature. (Same as V105)	Meter Tube	12AU7
V113	TUBE, electron: duo triode; 9 pin miniature. (Same as V107)	MF Modulator	12AT7
V114	TUBE, electron: sharp cutoff RF pentode; 7 pin miniature.	MF Amp.	6AH6
V115	TUBE, electron: medium-mu duo-triode, 9 pin miniature. (Same as V105)	2-4 Mc Osc.	12AU7
V116	TUBE, electron: power pentode; wide band amp., 9 pin miniature.	H.F. Osc. Amp.	6CL6
V117	TUBE, electron: 9 pin miniature. (Same as V104)	HF Osc.	6U8
V118	TUBE, electron: sharp cutoff R.F. pentode; 7 pin miniature. (Same as V114)	1st RF Amp.	6AH6

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
V119	TUBE, electron: power pentode; wide band amp., 9 pin miniature. (Same as V116)	2nd RF Amp.	6CL6
V120	TUBE, electron: beam power; large wafer octal base with sleeve.	RF Power Amp.	6146
XCR101	SOCKET, octal: moulded plastic.	Socket for CR101	TS-101-P01
XCR102	SOCKET, octal: moulded plastic. (Same as XCR101)	Socket for CR102	TS-101-P01
XCR103	SOCKET, octal: moulded plastic. (Same as XCR101)	Socket for CR103	TS-101-P01
XI101	SOCKET, lens, miniature bayonet: red indicator lens.	Socket for I101	TS-106-1
XI102	SOCKET, lens, miniature bayonet: white indicator lens.	Socket for I102	TS-106-2
XI103	SOCKET, bracket, miniature bayonet.	Socket for I103	TS-107-2
XK101	SOCKET, octal: moulded plastic. (Same as XCR101)	Socket for K101	TS-101-P01
XV100	SOCKET, octal: moulded plastic. (Same as XCR101)	Socket for V100	TS-101-P01
XV101	SOCKET, 7 pin miniature: moulded plastic.	Socket for V101	TS-102-P01
XV102	SOCKET, 7 pin miniature: moulded plastic. (Same as XV101)	Socket for V102	TS-102-P01
XV103	SOCKET, 7 pin miniature: moulded plastic. (Same as XV101)	Socket for V103	TS-102-P01
XV104	SOCKET, plug in: w/can; 9 pin miniature socket.	Socket for V104	PO-148-9-2
XV105	SOCKET, plug in: w/can; 9 pin miniature socket. (Same as XV104)	Socket for V105	PO-148-9-2
XV106	SOCKET, 7 pin miniature; moulded plastic. (Same as XV101)	Socket for V106	TS-102-P01
XV107	SOCKET, 9 pin miniature: moulded plastic.	Socket for V107	TS-103-P01
XV108	SOCKET, 9 pin miniature: moulded plastic. (Same as XV107)	Socket for V108	TS-103-P01
XV109	SOCKET, 9 pin miniature: moulded plastic. (Same as XV107)	Socket for V109	TS-103-P01
XV110	SOCKET, 9 pin miniature: moulded plastic. (Same as XV107)	Socket for V110	TS-103-P01

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
XV111	SOCKET, 7 pin miniature: moulded plastic. (Same as XV101)	Socket for V111	TS-102-P01
XV112	SOCKET, 9 pin miniature: moulded plastic. (Same as XV107)	Socket for V112	TS-103-P01
XV113	SOCKET, 9 pin miniature: moulded plastic. (Same as XV107)	Socket for V113	TS-103-P01
XV114	SOCKET, 7 pin miniature: moulded plastic. (Same as XV101)	Socket for V114	TS-102-P01
XV115	SOCKET, 9 pin miniature: moulded plastic. (Same as XV107)	Socket for V115	TS-103-P01
XV116	SOCKET, 9 pin miniature: moulded plastic. (Same as XV107)	Socket for V116	TS-103-P01
XV117	SOCKET, 9 pin miniature: moulded plastic. (Same as XV107)	Socket for V117	TS-103-P01
XV118	SOCKET, 7 pin miniature: moulded plastic. (Same as XV101)	Socket for V118	TS-102-P01
XV119	SOCKET, 9 pin miniature: moulded plastic. (Same as XV107)	Socket for V119	TS-103-P01
XV120	SOCKET, octal: moulded plastic. (Same as XCR101)	Socket for V120	TS-101-P01
XY101	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts.	Xtal Holder, Y101	TS-104-1
XY102	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y102	TS-104-1
XY103	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y103	TS-104-1
XY104	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y104	TS-104-1
XY105	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y105	TS-104-1
XY106	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y106	TS-104-1
XY107	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y107	TS-104-1
XY108	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY-101)	Xtal Holder, Y108	TS-104-1

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
XY109	NOT USED.		
XY110	NOT USED.		
XY111	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y111	TS-104-1
XY112	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y112	TS-104-1
XY113	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y113	TS-104-1
XY114	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y114	TS-104-1
XY115	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y115	TS-104-1
XY116	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y116	TS-104-1
XY117	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y117	TS-104-1
XY118	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y118	TS-104-1
XY119	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y119	TS-104-1
XY120	SOCKET, xtal: steatite; cad. plated phosphor bronze contacts. (Same as XY101)	Xtal Holder, Y120	TS-104-1
XZ103	SOCKET, octal: moulded plastic. (Same as XCR101)	Socket for Z103	TS-101-P01
XZ104	SOCKET, octal: moulded plastic. (Same as XCR101)	Socket for Z104	TS-101-P01
XZ105	SOCKET, octal: moulded plastic. (Same as XCR101)	Socket for Z105	TS-101-P01
Y101	CRYSTAL, quartz: 8 mc.	HF Mod. Osc. 8 mc.	CR27/U-8.000P
Y102	CRYSTAL, quartz: 10 mc.	HF Mod. Osc. 10 mc.	CR27/U-10.000P

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
Y103	CRYSTAL, quartz: 12 mc.	HF Mod. Osc. 12 mc.	CR27/U-12.000P
Y104	CRYSTAL, quartz: 14 mc.	HF Mod. Osc. 14 mc.	CR27/U-14.000P
Y105	CRYSTAL, quartz: 18 mc.	HF Mod. Osc. 18 mc.	CR27/U-18.000P
Y106	CRYSTAL, quartz: 11 mc.	HF Mod. Osc. 11 mc.	CR27/U-11.000P
Y107	CRYSTAL, quartz: 13 mc.	HF Mod. Osc. 13 mc.	CR27/U-13.000P
Y108	CRYSTAL, quartz: 17 mc.	HF Mod. Osc. 17 mc.	CR27/U-17.000P
Y109	CRYSTAL, quartz: 17 Kc.	17 Kc. Osc.	CR-50/U
Y110	CRYSTAL, quartz: 287 Kc.	287 Kc. Osc.	CR47/U-.287P
Z101	FILTER, bandpass.	Lower Side Band	FX-154
Z102	FILTER, bandpass.	Upper Side Band	FX-155
Z103	ASSEMBLY, 287 Kc. Osc.	287 Kc. Osc.	A-1458
Z104	OVEN, crystal: 17 and 287 Kc.	Oven	PO-147
Z105	ASSEMBLY, 17 Kc Osc.	17 Kc. Osc.	A-1459
Z106	REJECTION NETWORK, 17 Kc.	17 Kc. Notch	A-1591
Z107	MODULATOR ASSEMBLY, H.F.	H.F. Mod.	A-1454

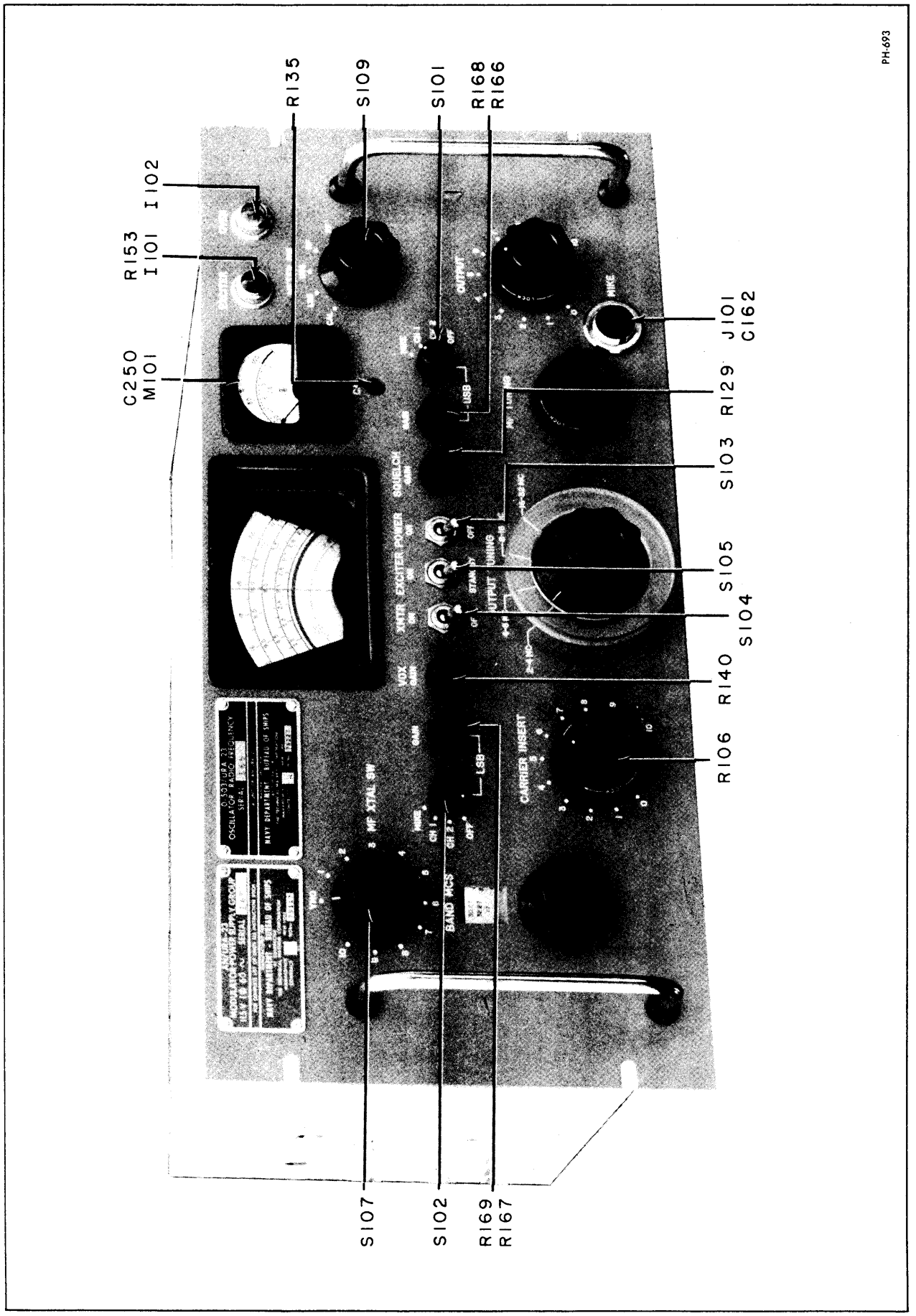


Figure E-28 Front View Exciter Unit

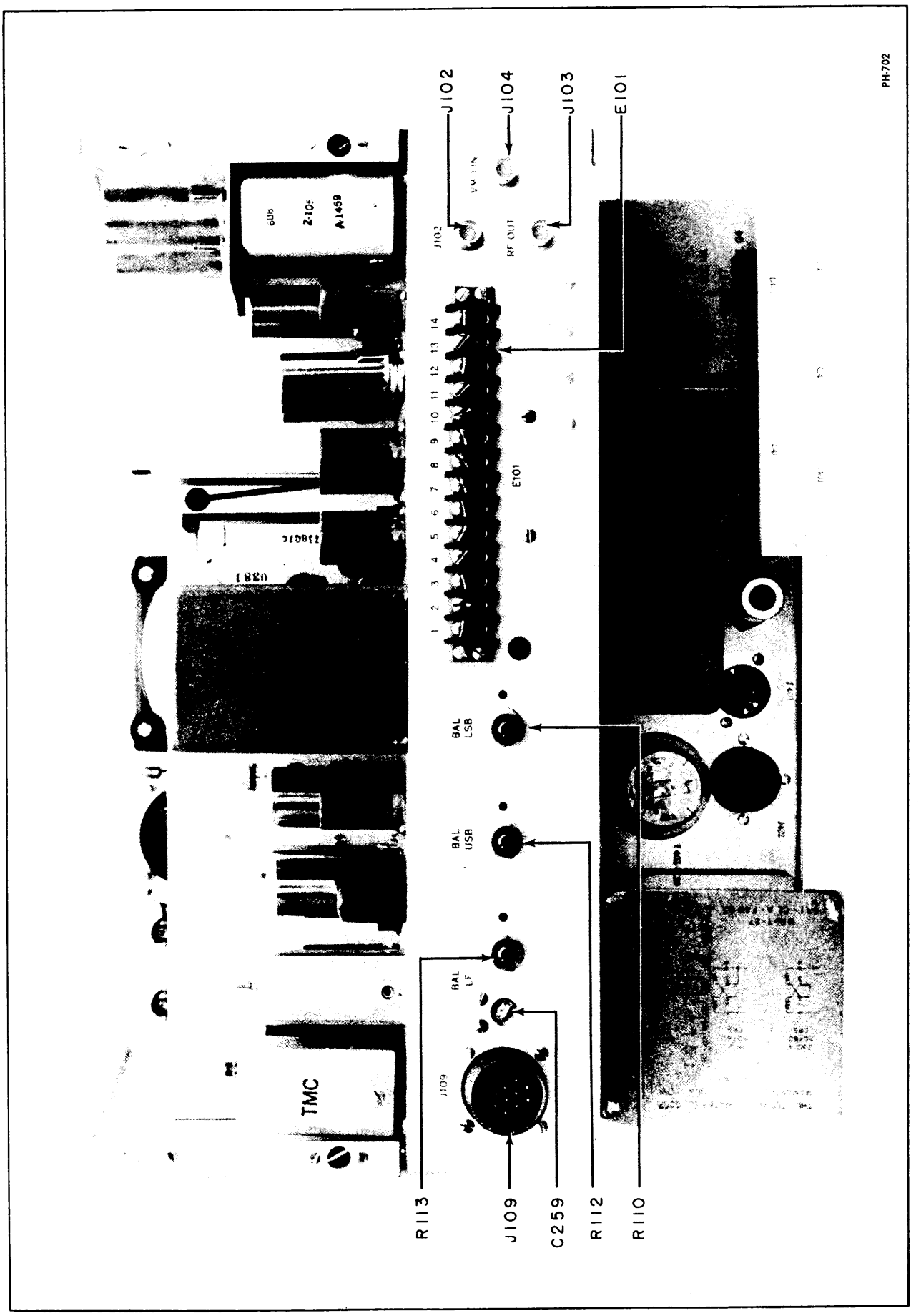


Figure E-29 Rear View Exciter Unit

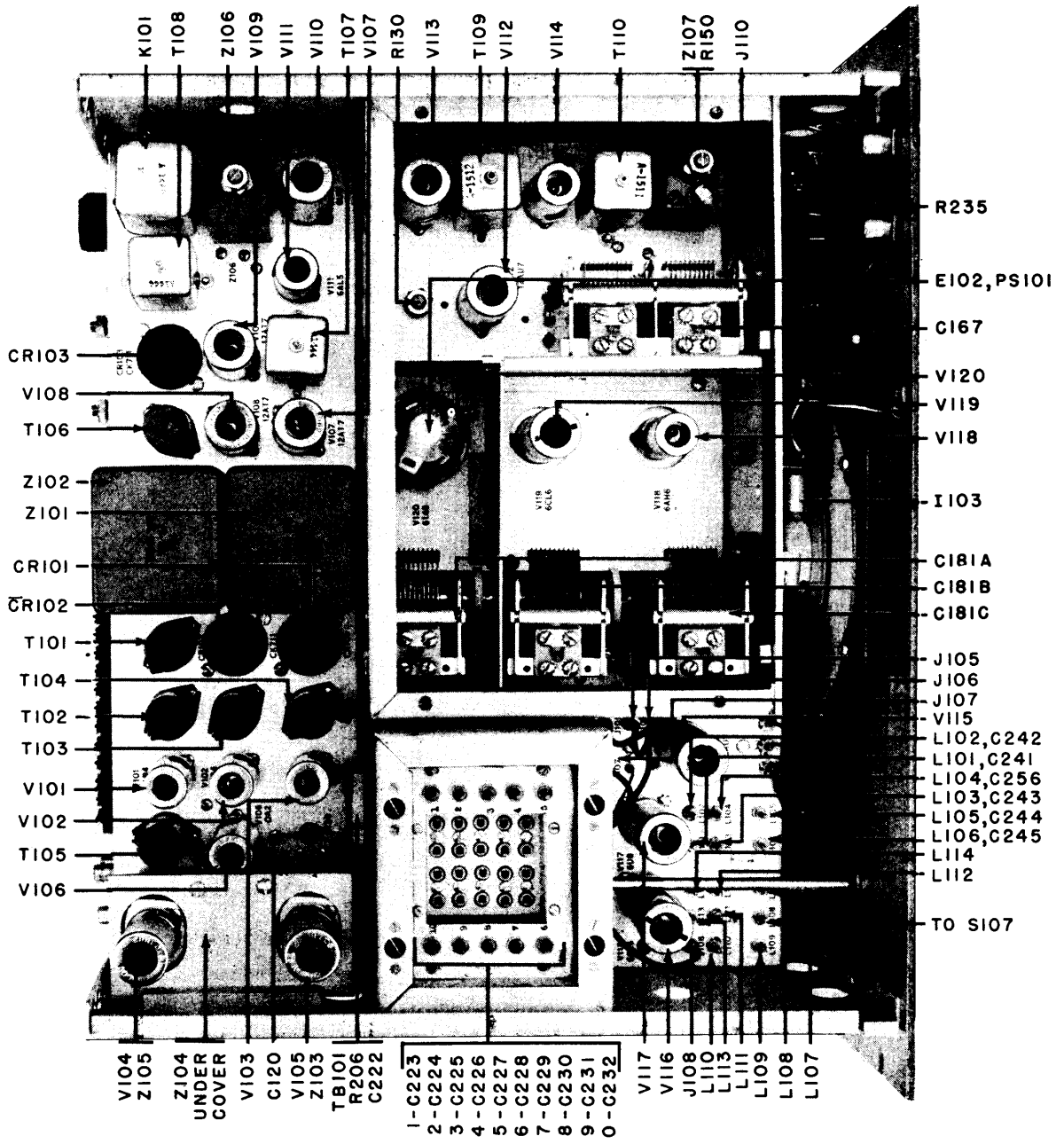


Figure E-30 Top View Exciter Unit

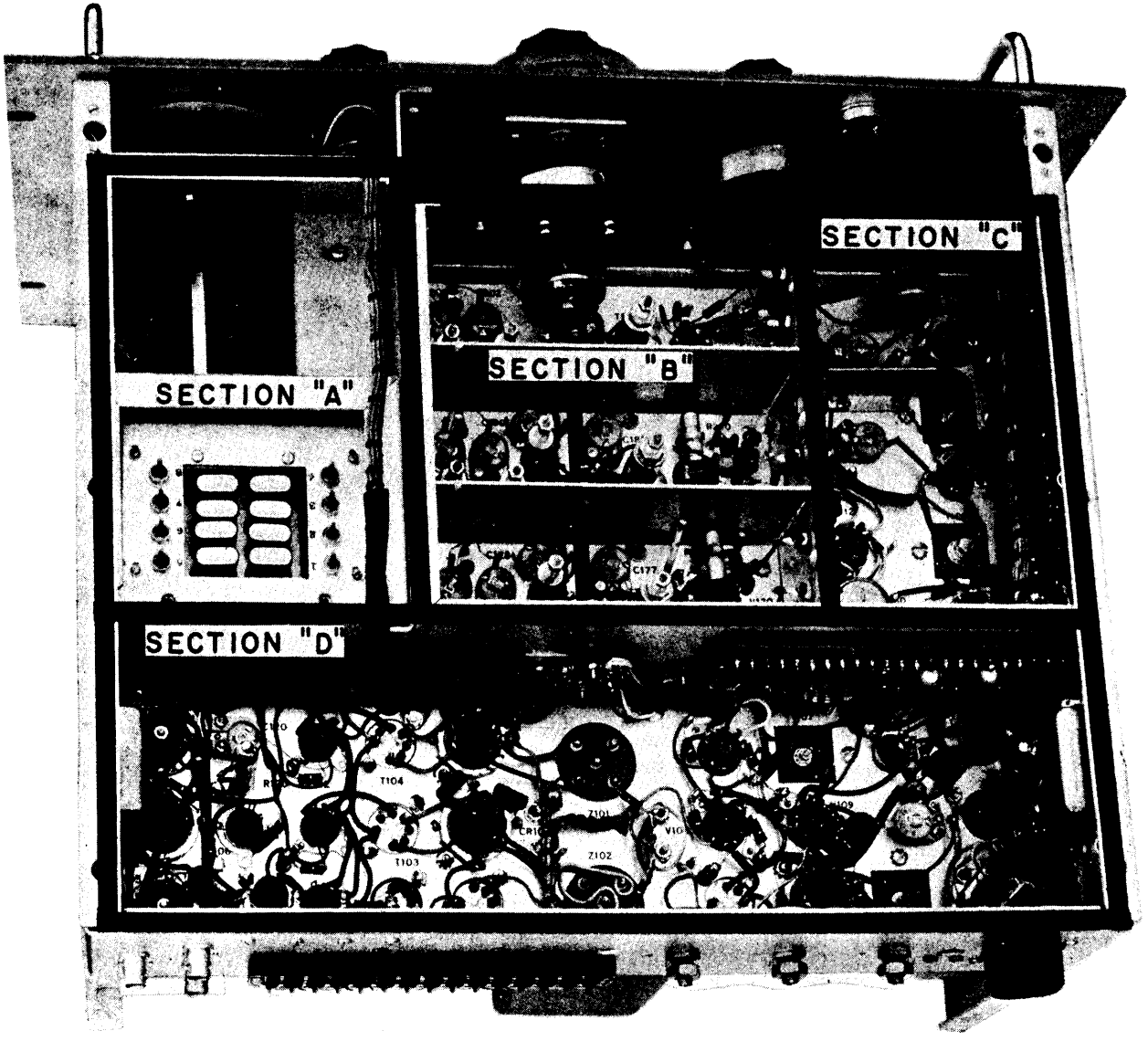


Figure E-31 Bottom View Exciter Unit Sections Defined

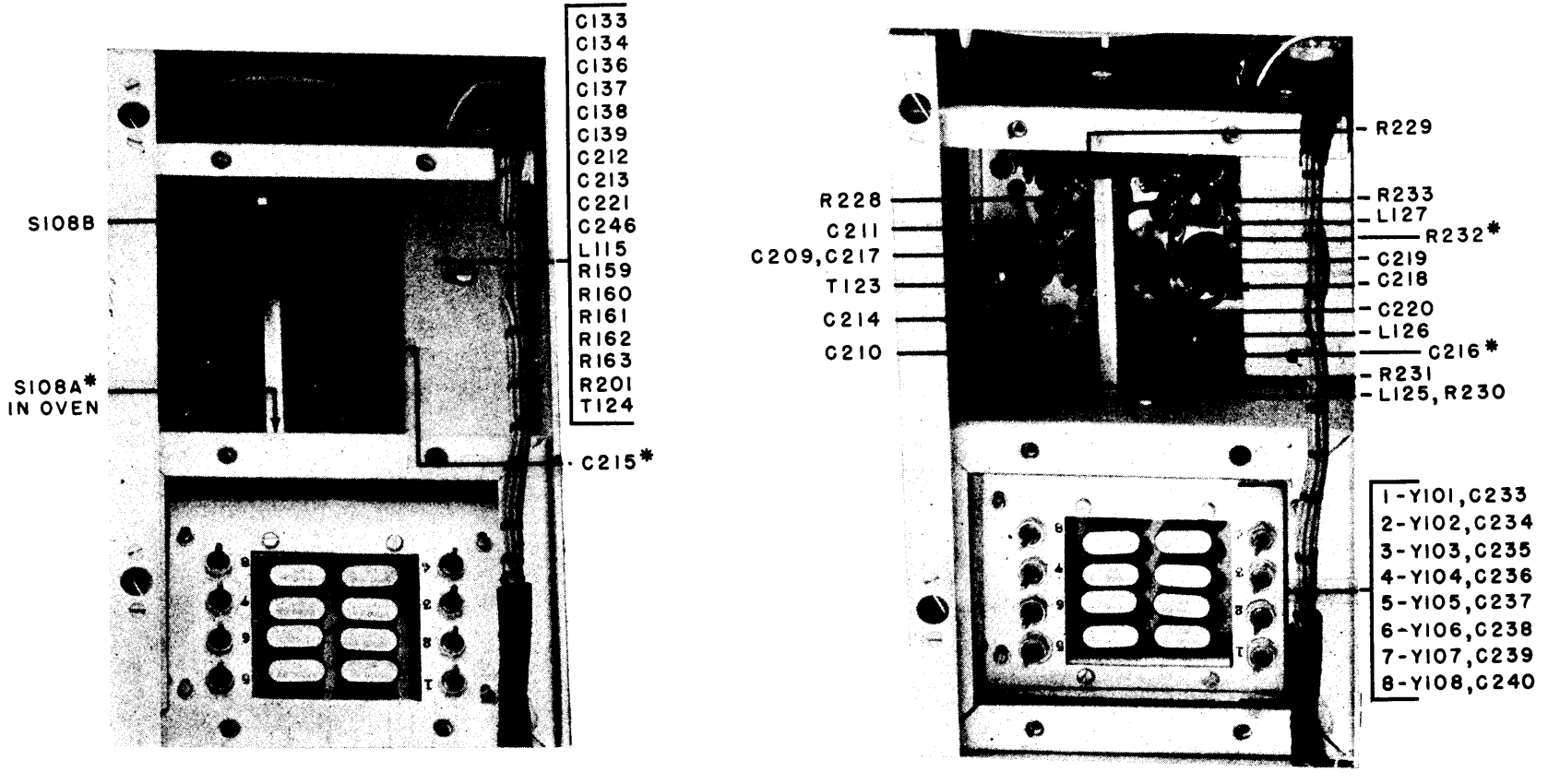


Figure E-32 Section "A"

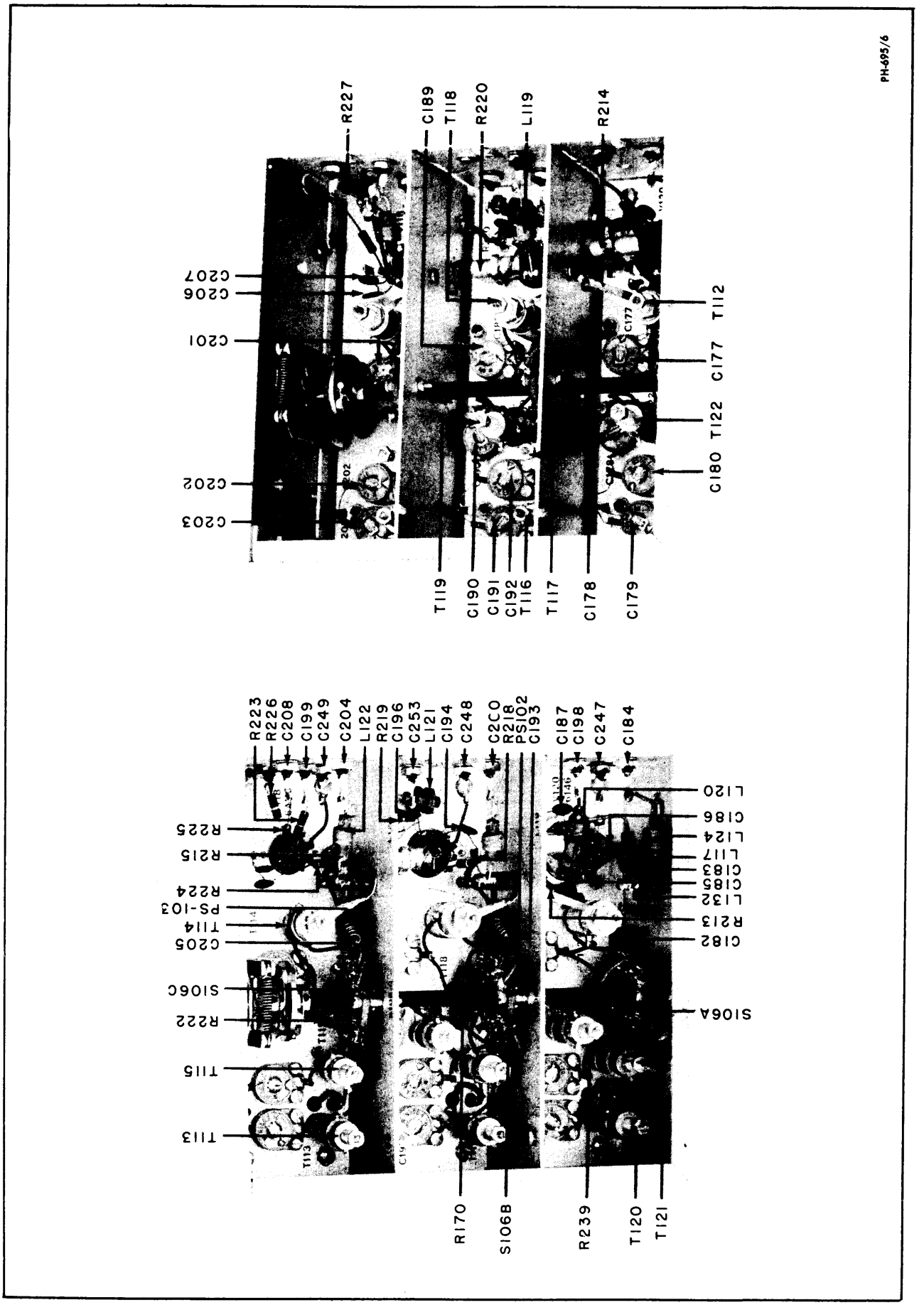
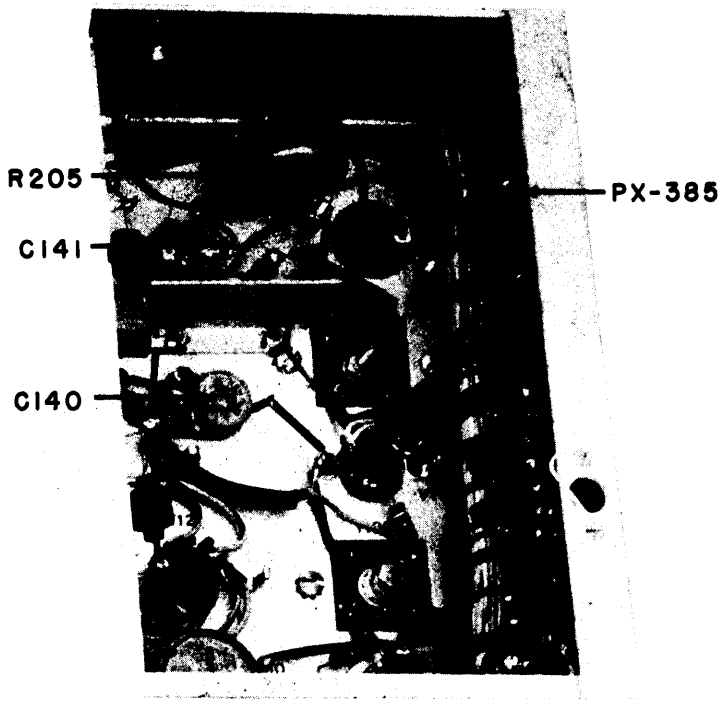


Figure E-33 Section "B"



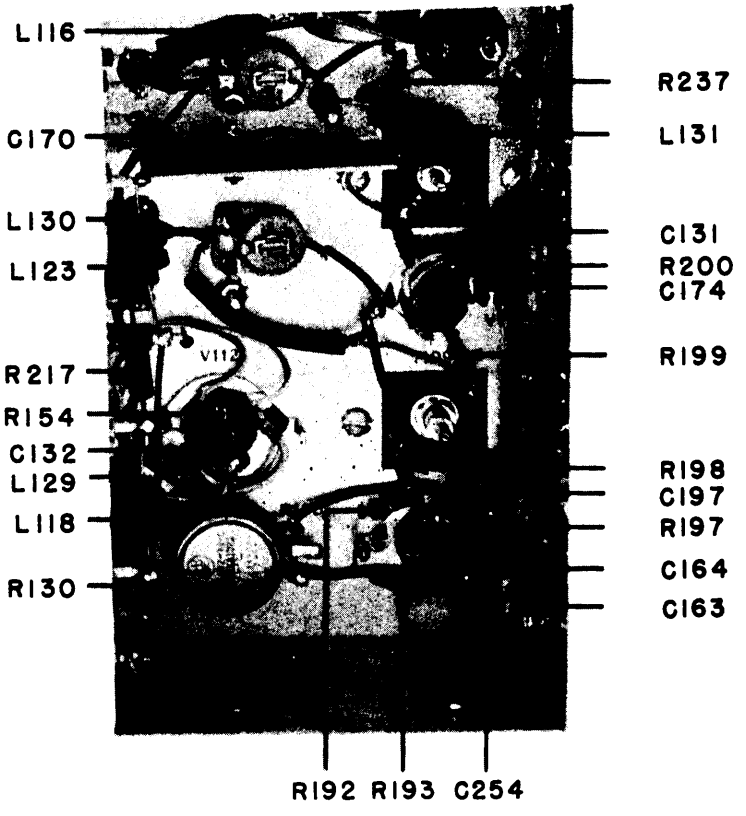


Figure E-34 Section "C"

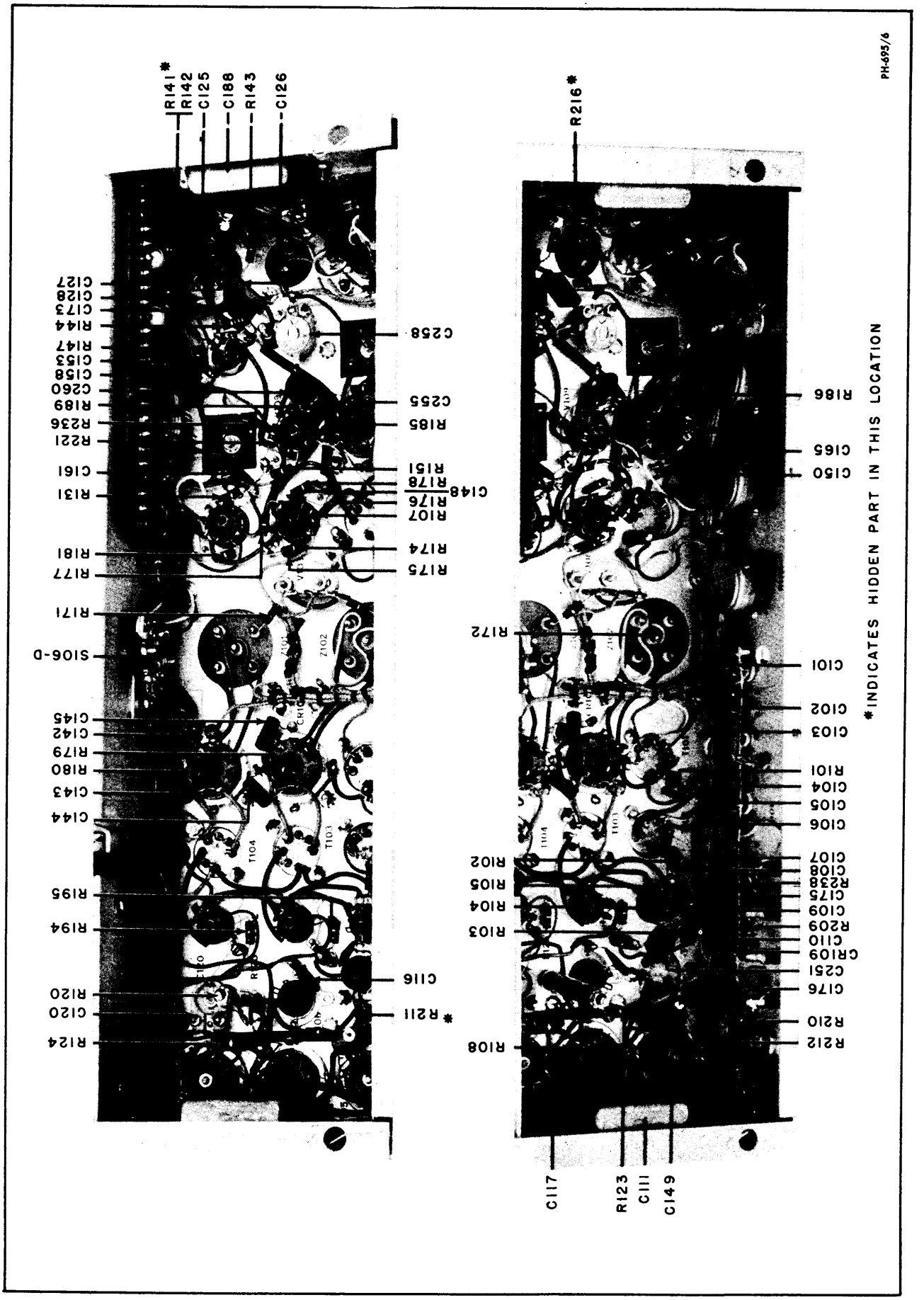


Figure E-35 Section "D"

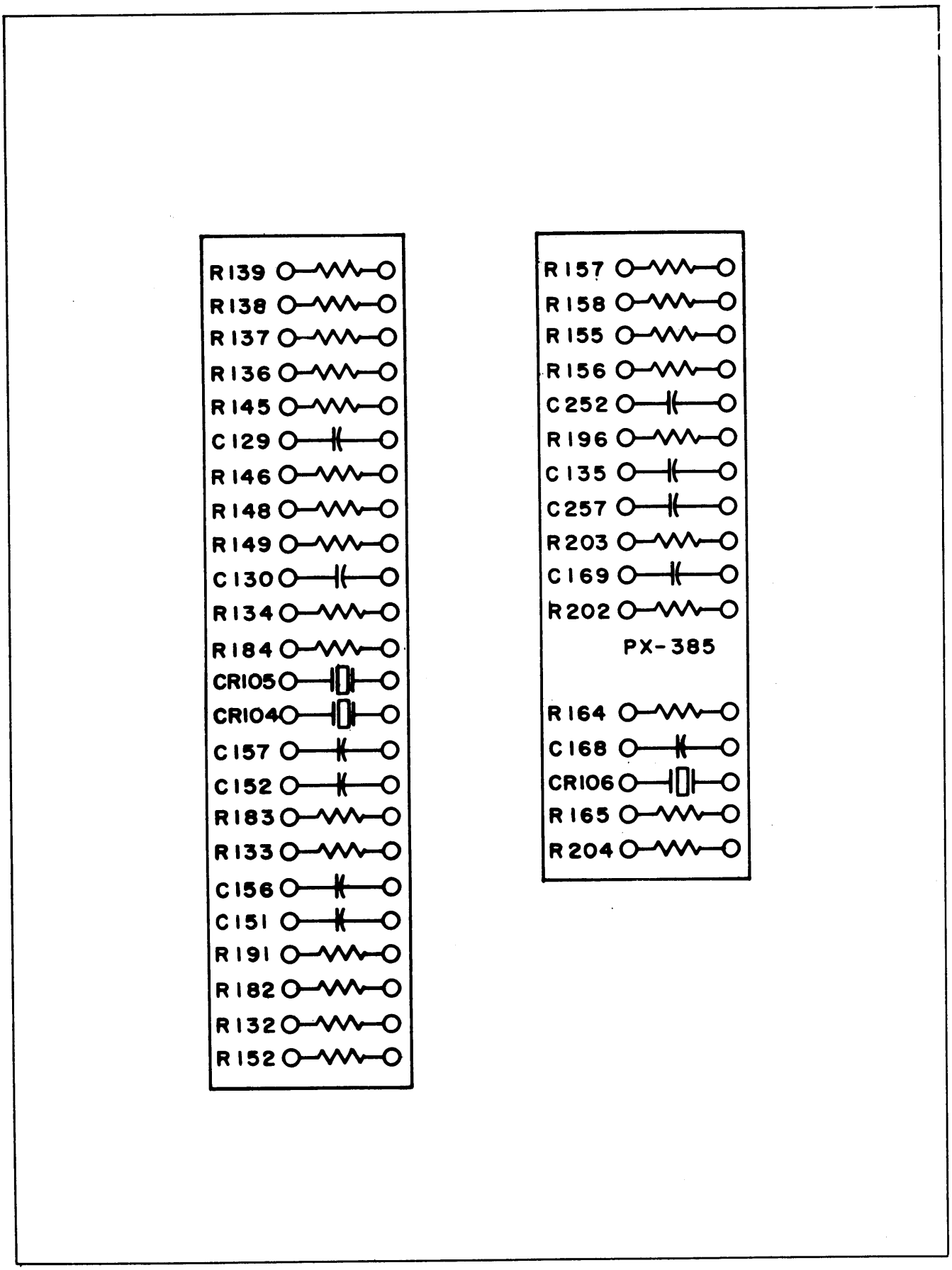


Figure E-36 Terminal Board Layout Exciter Unit

PARTS LIST
PARTS ILLUSTRATIONS
MODEL XFK

FREQUENCY SHIFT EXCITER, MODEL XFK

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C1	CAPACITOR, fixed: ceramic; 1000 mmfd., ±1%, 500 wvdc.	200 Kc Osc. Tank Cap.	CC-102-4
C2	CAPACITOR, variable: ceramic; 3-12 mmfd., 500 wvdc.	React. Tube Linear Adj.	CV11A120
C3	CAPACITOR, fixed: ceramic; 68 mmfd., ±5%, 500 wvdc.	Output Coupling Cap.	CC-102-1
C4	CAPACITOR, fixed: ceramic; 68 mmfd., ±5%, 500 wvdc. (Same as C3)	Output Coupling Cap.	CC-102-1
C5	CAPACITOR, fixed: mica; 680 mmfd., ±2%; char. E; 500 wvdc.	Output Divider Cap.	CM20E681G
C6	CAPACITOR, fixed: mica; 680 mmfd., ±2%; char. E; 500 wvdc. (Same as C5)	Output Divider Cap.	CM20E681G
C7	CAPACITOR, variable: air dielectric; dual section, 26 plates; 4.6 to 51 mmfd. each section.	200 Kc Osc. Fine Control	CB-103-2
C8	CAPACITOR, variable: air dielectric; dual section, 50 plates; 6.8 to 99 mmfd. each section.	200 Kc Osc. Coarse Adj.	CB-103-3
C9	CAPACITOR, fixed: mica; .01 mfd., ±10%; char. B, 300 wvdc.	200 Kc Osc. Plate Bypass Cap.	CM35B103K
C10	CAPACITOR, fixed: mica; 100 mmfd., ±5%; char. C, 500 wvdc.	200 Kc Osc. Grid Coupling Cap.	CM20C101J
C11	CAPACITOR, fixed: mica; 100 mmfd., ±5%; char. C, 500 wvdc. (Same as C10)	200 Kc Osc. Grid Coupling Cap.	CM20C101J
C12	CAPACITOR, fixed: mica; 27 mmfd., ±2%; char. E, 500 wvdc.	React. Tube Phase Cap.	CM20E270G
C13	CAPACITOR, fixed: mica; 1000 mmfd., ±10%; char. B, 500 wvdc.	Reactance Tube Phase Shift Cap.	CM20B102K
C14	CAPACITOR, fixed: mica; 27 mmfd., ±5%; char. C, 500 wvdc.	Reactance Tube Phase Shift Cap.	CM20C270J
C15	CAPACITOR, fixed: 5 mmfd., ±20%; char. B, 500 wvdc.	Mixer Input Padder Cap.	CM20B050M
C16	CAPACITOR, fixed: mica; .01 mfd., ±10%; char. B, 300 wvdc. (Same as C9)	200 Kc Plate Bypass Cap.	CM35B103K
C17	CAPACITOR, fixed: mica; .01 mfd., ±10%; char. B, 300 wvdc. (Same as C9)	200 Kc Plate Bypass Cap.	CM35B103K
C18	CAPACITOR, variable: air dielectric; three sections, 19 plates per section; 11 to 362 mmfd. each section.	Mixer Input, Mixer Output, Amp. Output Tuning	CB-107

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C19	CAPACITOR, variable: ceramic; 3-12 mmfd., 500 wvdc. (Same as C2)	Band 1 Mixer Input Trimmer	CV11A120
C20	CAPACITOR, fixed: mica; 1000 mmfd., ±10%; char. B, 500 wvdc. (Same as C13)	Bal. Modulator Screen Bypass Cap.	CM20B102K
C21	CAPACITOR, fixed: mica; 1000 mmfd., ±10%; char. B, 500 wvdc. (Same as C13)	Bal. Modulator Screen Bypass Cap.	CM20B102K
C22	CAPACITOR, fixed: mica; .01 mfd., ±10%; char. B, 300 wvdc. (Same as C9)	200 Kc. Osc. Plate Bypass Cap.	CM35B103K
C23	CAPACITOR, fixed: mica; 1000 mmfd., ±10%; char. B, 500 wvdc. (Same as C13)	Bal. Modulator Screen Bypass Cap.	CM20B102K
C24	CAPACITOR, variable: ceramic; 3-12 mmfd., 500 wvdc. (Same as C2)	Band 1 Mixer Output Trimmer	CV11A120
C25	CAPACITOR, fixed: mica; .01 mfd., ±5%; char. C, 300 wvdc.	Mixer Output Grid Bypass Cap.	CM35C103J
C26	CAPACITOR, fixed: mica; 5 mmfd., ±20%; char. B, 500 wvdc. (Same as C15)	Amp. Neutralizing Cap.	CM20B050M
C27	CAPACITOR, variable: ceramic; 1.5-7 mmfd., 500 wvdc.	Amp. Neutralizing Cap.	CV11A070
C28	CAPACITOR, variable: ceramic; 3-12 mmfd., 500 wvdc. (Same as C2)	Band 1 Amp. Tuning Cap.	CV11A120
C29	CAPACITOR, fixed: mica; .01 mfd., ±5%; char. C, 300 wvdc. (Same as C25)	Amp. Plate Cap.	CM35C103J
C30	CAPACITOR, variable: ceramic; 3-12 mmfd., 500 wvdc. (Same as C2)	Band 2 Mixer Input Trimmer	CV11A120
C31	CAPACITOR, fixed: mica; 1500 mmfd., ±2%; char. C, 500 wvdc.	Band 1 Amp. Padder	CM30C152G
C32	CAPACITOR, fixed: mica; 51 mmfd., ±10%; char. B, 500 wvdc.	Xtal Osc. Grid Cap.	CM20B510K
C33	CAPACITOR, fixed: mica; 1000 mmfd., ±10%; char. B, 500 wvdc. (Same as C9)	Xtal Osc. Grid Cap.	CM20B102K
C34	CAPACITOR, fixed: mica; 27 mmfd., ±10%; char. B, 500 wvdc.	Xtal Osc. Output Coupling Cap.	CM20B270K
C35	CAPACITOR, fixed: mica; 10 mmfd., ±10%; char. B, 500 wvdc.	Xtal Osc. Output Divider Cap.	CM20B100K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C36	CAPACITOR, fixed: mica; 1000 mmfd., ±10%; char. B, 500 wvdc. (Same as C13)	Cath. Follower Plate Bypass Cap.	CM20B102K
C37	CAPACITOR, fixed: mica; .01 mfd., ±10%; char. B, 300 wvdc. (Same as C9)	Cath. Follower Output Coupling Cap.	CM35B103K
C38	CAPACITOR, fixed: mica; 100 mmfd., ±5%; char. C, 500 wvdc. (Same as C10)	Mixer Xtal Input Coupling Cap.	CM20C101J
C39	CAPACITOR, fixed: mica; 1500 mmfd., ±2%; char. C, 500 wvdc. (Same as C31)	Band 1 Amp. Padder	CM30C152G
C40	CAPACITOR, fixed: mica; 5100 mmfd., ±2%; char. C, 500 wvdc.	Band 2 Amp. Input Padder	CM35C512G
C41	CAPACITOR, fixed: mica; 5100 mmfd., ±2%; char. C, 500 wvdc. (Same as C40)	Band 2 Amp. Output Padder	CM35C512G
C42	CAPACITOR, fixed: mica; 1000 mmfd., ±10%; char. B, 500 wvdc. (Same as C13)	Amp. Screen Bypass Cap.	CM20B102K
C43	CAPACITOR, variable: ceramic; 1.5-7 mmfd., 500 wvdc. (Same as C27)	Band 2 Mixer Output Tuning Trimmer	CV11A070
C44	CAPACITOR, fixed: ceramic; 15 mmfd., ±.5 mmfd.; char. N750, 600 wvdc.	200 Kc Osc. Compensator	CC-103-1
C45	NOT USED.		
C46	CAPACITOR, variable: ceramic; 3-12 mmfd., 500 wvdc. (Same as C2)	Band 2 Amp. Output Tuning Trimmer	CV11A120
C47	CAPACITOR, fixed: paper; dual unit; .05 mfd., ±15% each section; char. E; 600 wvdc; oil filled and impregnated, hermetically sealed metal case.	Thermostat Osc. Suppressor	CP69B4EF503L
C48	CAPACITOR, fixed: paper; dual unit; .05 mfd., ±15% each section; char. E; 600 wvdc; oil filled and impregnated, hermetically sealed metal case. (Same as C47)	Thermostat Osc. Suppressor	CP69B4EF503L
C49	CAPACITOR, fixed: mica; .01 mfd., ±10%; char. B, 300 wvdc. (Same as C9)	External Osc. Coupling	CM35B103K
C50	CAPACITOR, fixed: paper; 4 mfd., ±10%; char. F; 600 wvdc; oil filled and impregnated, hermetically sealed cylindrical metal case.	Power Supply Filter Cap.	CP40C2FF405K
C51	CAPACITOR, fixed: paper; 4 mfd., ±10%; char. F; 600 wvdc; oil filled and impregnated, hermetically sealed cylindrical metal case. (Same as C50)	Power Supply Filter Cap.	CP40C2FF405K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
C52	CAPACITOR, fixed: paper; 4 mfd., ±10%; char. F; 600 wvdc; oil filled and impregnated, hermetically sealed cylindrical metal case. (Same as C50)	Power Supply Filter Cap.	CP40C2FF405K
C53	CAPACITOR, fixed: paper; 4 mfd., ±10%; char. F; 600 wvdc; oil filled and impreganted, hermetically sealed cylindrical metal case. (Same as C50)	Power Supply Filter Cap.	CP40C2FF405K
C54	CAPACITOR, fixed: paper; 4 mfd., ±10%; char. F; 600 wvdc; oil filled and impregnated, hermetically sealed cylindrical metal case. (Same as C50)	Power Supply Filter Cap.	CP40C2FF405K
C55	CAPACITOR, fixed: paper; dual unit, .5 mfd., ±15% each section; char. E, 600 wvdc; oil filled and impregnated, hermetically sealed metal case.	Line Filter Cap.	CP69B4EF504L
C56	CAPACITOR, fixed: paper; dual unit, .5 mfd., ±15% each section; char. E, 600 wvdc; oil filled and impregnated, hermetically sealed metal case. (Same as C55)	Line Filter Cap.	CP69B4EF504L
C57	CAPACITOR, fixed: ceramic; 110 mmfd., ±2%; char. N750; 500 wvdc.	200 Kc Osc. Temp. Comp.	CC26UJ111G
C58	CAPACITOR, fixed: ceramic; 110 mmfd., ±2%; char. N750; 500 wvdc. (Same as C57)	200 Kc. Osc. Temp. Comp.	CC26UJ111G
C59	CAPACITOR, fixed: mica; 10 mmfd., ±10%; char. B, 500 wvdc. (Same as C35)	Coupling Cap.	CM20B100K
E1	BOARD, terminal: general purpose barrier type; eight brass nickel plated 6-32 binding head machine screws; moulded phenolic body.	Input-Output Terminals	TM-100-8
F1	FUSE, cartridge: 3 amp.	Power Supply Fuse	FU-100-3
F2	FUSE, cartridge: 3 amp. (Same as F1)	Power Supply Fuse	FU-100-3
I1	LAMP, incandescent: 6-8 volts, 250 ma DC; T-3-1/4 clear bulb; miniature bayonet base.	Power Indicator	BI-101-44
I2	LAMP, neon: 110 volts, 1/25 watt; T-3-1/4 clear bulb; miniature bayonet base.	200 Kc Osc. Oven Indicator	BI-100-51
I3	LAMP, neon: 110 volts, 1/25 watt; T-3-1/4 clear bulb; miniature bayonet base. (Same as I2)	200 Kc Osc. Oven Indicator	BI-100-51

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
J1	CONNECTOR, jack: female, coaxial; 75 ohms; mica filled bakelite dielectric.	Output Jack	SO-239
J2	CONNECTOR, jack: female, coaxial; 75 ohms; mica filled bakelite dielectric. (Same as J1)	Test Jack	SO-239
J3	CONNECTOR, receptacle: female; polarized; two contacts.	Mult. Ratio 1 Patch Jack	JJ-119-2
J4	CONNECTOR, receptacle: female; polarized; two contacts. (Same as J3)	Mult. Ratio 2 Patch Jack	JJ-119-2
J5	CONNECTOR, receptacle: female; polarized; two contacts. (Same as J3)	Mult. Ratio 3 Patch Jack	JJ-119-2
J6	CONNECTOR, receptacle: female; polarized; two contacts. (Same as J3)	Mult. Ratio 4 Patch Jack	JJ-119-2
J7	CONNECTOR, receptacle: female; polarized; two contacts. (Same as J3)	Mult. Ratio 6 Patch Jack	JJ-119-2
J8	CONNECTOR, receptacle: female; polarized; two contacts. (Same as J3)	Mult. Ratio 8 Patch Jack	JJ-119-2
J9	CONNECTOR, receptacle: female; polarized; two contacts. (Same as J3)	Mult. Ratio 9 Patch Jack	JJ-119-2
J10	CONNECTOR, receptacle: female; polarized; two contacts. (Same as J3)	Mult. Ratio 12 Patch Jack	JJ-119-2
J11	CONNECTOR, receptacle: female; polarized; two contacts. (Same as J3)	External Patch Jack	JJ-119-2
J12	CONNECTOR, receptacle: female; polarized; two contacts. (Same as J3)	External Patch Jack	JJ-119-2
J13	CONNECTOR, receptacle: female; polarized; two contacts. (Same as J3)	Xtal #1 Patch Jack	JJ-119-2
J14	CONNECTOR, receptacle: female; polarized; two contacts. (Same as J3)	Xtal #1 Patch Jack	JJ-119-2
J15	CONNECTOR, jack: female; coaxial; 75 ohms; mica filled bakelite dielectric. (Same as J1)	Output Jack	SO-239
J16	CONNECTOR, receptacle: male; two contacts, 10 amps at 250 volts, 15 amps at 125 volts; twist lock type.	Line Input Connector	JJ-100
L1	COIL, RF: fixed; 193 turns of #34 DSC wire; 5 pi; 250 microhenries, ±2 microhenries, Q greater than 100; ceramic coil form, 1/4 in. dia. x 1-3/4 in. lg.	200 Kc Osc. Tank Coil	A-337

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
L2	COIL, RF: fixed; 193 turns of #34 DSC wire; 5 pi; 250 microhenries, ±2 microhenries, Q greater than 100; ceramic coil form, 1/4 in. dia. x 1-3/4 in. lg. (Same as L1)	200 Kc Osc. Tank Coil	A-337
L3	COIL, RF: 2.5 millihenries; 125 ma. max. current; DC resistance approx. 44 ohms; ceramic body.	Amp. Plate Choke	CL-104-1
L4	REACTOR, filter: 10 henries, 125 ma. DC, DC resistance approx. 150 ohms; steel case, ceramic insulated terminals; insulated for 1000 volts in accordance with MIL-T-27, GR. 1, CL. A, FAM. 04.	Power Supply Filter	TF-5001
M1	METER, milliameter: DC; 0-50 ma.; square case.	Output Tuning Meter	MR-100-2
P1	CONNECTOR, plug: male; polarized; two contacts, w/cable clamps.	External Mult. Patch Plug	PL-105-1
P2	CONNECTOR, plug: male; polarized; two contacts, w/cable clamps. (Same as P1)	Xtal 1 Mult. Patch Plug	PL-105-1
P3	CONNECTOR, plug: male; polarized; two contacts, w/cable clamps. (Same as P1)	Xtal 2 Mult. Patch Plug	PL-105-1
P4	CONNECTOR, plug: male; polarized, two contacts, w/cable clamps. (Same as P1)	Xtal 3 Mult. Patch Plug	PL-105-1
R1	RESISTOR, fixed: composition; 100,000 ohms, ±10%; 1/2 watt.	200 Kc Osc. Grid Leak Res.	RC20GF104K
R2	RESISTOR, fixed: composition; 100,000 ohms, ±10%; 1/2 watt. (Same as R1)	200 Kc Osc. Grid Leak Res.	RC20GF104K
R3	RESISTOR, fixed: composition; 1800 ohms, ±10%; 1/2 watt.	200 Kc Osc. Plate Load Res.	RC20GF182K
R4	RESISTOR, fixed: metallized film; 5800 ohms, ±1%; 1/2 watt.	React. Tube Phase Shift Res.	RR-104-582
R5	RESISTOR, fixed: metallized film; 67000 ohms, ±1%; 1/2 watt.	React. Tube Phase Shift Res.	RR-104-673
R6	RESISTOR, fixed: composition; 100,000 ohms, ±10%; 1/2 watt. (Same as R1)	200 Kc Osc. Grid Leak Res.	RC20GF104K
R7	RESISTOR, fixed: composition; 3900 ohms, ±10%; 1/2 watt.	React. Tube Cath. Bias Res.	RC20GF392K
R8	RESISTOR, variable: wire wound; 10,000 ohms, ±10%; 3 watts.	FS Control Res.	RA100ASRL103A

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R9	RESISTOR, fixed: composition; 24,000 ohms, ±5%; 1/2 watt.	Mixer Grid Leak Res.	RC20GF243J
R10	RESISTOR, fixed: composition; 100 ohms, ±10%; 1/2 watt.	Mixer Cathode Bias Res.	RC20GF101K
R11	RESISTOR, fixed: composition; 39,000 ohms, ±10%; 1/2 watt.	Screen Voltage Divider Res.	RC20GF393K
R12	RESISTOR, fixed: composition; 39,000 ohms, ±10%; 1/2 watt. (Same as R11)	Screen Voltage Divider Res.	RC20GF393K
R13	RESISTOR, variable: wire wound; 10,000 ohms, ±10%; 3 watts.	Mixer Balance Res.	RA100ASSC103A
R14	RESISTOR, fixed: wire wound; 10,000 ohms, ±10%; 10 watts.	Mixer Screen Dropping Res.	RW-109-34
R15	RESISTOR, fixed: composition; 4700 ohms, ±10%; 1 watt.	Mixer Plate Filter Res.	RC30GF472K
R16	RESISTOR, fixed: composition; 39 ohms, ±10%; 1/2 watt.	Power Amp. Parasitic Suppressor	RC20GF390K
R17	RESISTOR, fixed: composition; 15,000 ohms, ±10%; 2 watts.	P.A. Screen Dropping Res.	RC42GF153K
R18	RESISTOR, fixed: composition; 100,000 ohms, ±10%; 1 watt.	P.A. Screen Bleeder Res.	RC30GF104K
R19	RESISTOR, fixed: composition; 6800 ohms, ±10%; 1/2 watt.	Monitor Voltage Divider Res.	RC20GF682K
R20	RESISTOR, fixed: composition; 39 ohms, ±10%; 1/2 watt. (Same as R16)	Monitor Voltage Divider Res.	RC20GF390K
R21	RESISTOR, fixed: composition; 4700 ohms, ±10%; 1/2 watt.	P.A. Bias Divider Res.	RC20GF472K
R22	RESISTOR, variable: wire wound; 10,000 ohms, ±10%; 3 watts.	FS Control Res.	RA100ASRD103A
R23	RESISTOR, fixed: composition; 2700 ohms, ±10%; 1/2 watt.	P.A. Bias Divider Res.	RC20GF272K
R24	RESISTOR, fixed: composition; 1000 ohms, ±10%; 1/2 watt.	Cath. Follower Bias Res.	RC20GF102K
R25	RESISTOR, fixed: composition; 4700 ohms, ±10%; 1 watt. (Same as R15)	Cath. Follower Plate Filter Res.	RC30GF472K
R26	RESISTOR, fixed: composition; 100,000 ohms, ±10%; 1/2 watt. (Same as R1)	Cath. Follower Grid Leak Res.	RC20GF104K
R27	RESISTOR, fixed: composition; 10,000 ohms, ±10%; 1/2 watt.	Xtal Osc. Plate Load Res.	RC20GF103K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R28	RESISTOR, fixed: composition; 100,000 ohms, ±10%; 1/2 watt. (Same as R1)	Xtal Osc. Grid Leak Res.	RC20GF104K
R29	RESISTOR, fixed: composition; 12 ohms, ±10%; 2 watts.	Xtal Osc. Input Short Res.	RC42GF120K
R30	RESISTOR, fixed: composition; 470,000 ohms, ±10%; 1/2 watt.	Voltage Divider Res.	RC20GF474K
R31	RESISTOR, fixed: composition; 470,000 ohms, ±10%; 1/2 watt. (Same as R30)	Voltage Divider Res.	RC20GF474K
R32	RESISTOR, fixed: composition; 470,000 ohms, ±10%; 1/2 watt. (Same as R30)	Voltage Divider Res.	RC20GF474K
R33	RESISTOR, fixed: composition; 22,000 ohms, ±10%; 1 watt.	Voltage Divider Res.	RC30GF223K
R34	RESISTOR, fixed: composition; 3300 ohms, ±10%; 1/2 watt.	Keyer Fixed Bias Res.	RC20GF332K
R35	RESISTOR, fixed: composition; 1 megohm, ±10%; 1/2 watt.	Keyer Plate Load Res.	RC20GF105K
R36	RESISTOR, fixed: composition; 47,000 ohms, ±5%; 1 watt.	Voltage Divider Res.	RC30GF473J
R37	RESISTOR, fixed: composition; 15,000 ohms, ±5%; 1 watt.	Voltage Divider Res.	RC30GF153J
R38	RESISTOR, variable: wire wound; 10,000 ohms, ±10%; 3 watts. (Same as R13)	Phase Shift Balance Control	RA100ASSC103A
R39	RESISTOR, fixed: composition; 33,000 ohms, ±10%; 1 watt.	Voltage Divider Res.	RC30GF333K
R40	RESISTOR, variable: wire wound; 10,000 ohms, ±10%; 3 watts. (Same as R13)	Phase Shift Amp. Res.	RA100ASSC103A
R41	RESISTOR, fixed: composition; 6800 ohms, ±10%; 2 watts.	Voltage Divider Res.	RC42GF682K
R42	RESISTOR, fixed: metallized film; 10,000 ohms, ±1%; 1/2 watt.	Mult. Ratio 2 Series Divider	RR-104-103
R43	RESISTOR, fixed: metallized film; 20,000 ohms, ±1%; 1/2 watt.	Mult. Ratio 2 Shunt Divider	RR-104-203
R44	RESISTOR, fixed: metallized film; 20,000 ohms, ±1%; 1/2 watt. (Same as R43)	Mult. Ratio 3 Series Divider	RR-104-203
R45	RESISTOR, fixed: metallized film; 15,000 ohms, ±1%; 1/2 watt.	Mult. Ratio 3 Shunt Divider	RR-104-153
R46	RESISTOR, fixed: metallized film; 30,000 ohms, ±1%; 1/2 watt.	Mult. Ratio 4 Series Divider	RR-104-303

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R47	RESISTOR, fixed: metallized film; 13,300 ohms, ±1%; 1/2 watt.	Mult. Ratio 4 Shunt Divider	RR-104-1332
R48	RESISTOR, fixed: metallized film; 50,000 ohms, ±1%; 1/2 watt.	Mult. Ratio 6 Series Divider	RR-104-503
R49	RESISTOR, fixed: metallized film; 12,000 ohms, ±1%; 1/2 watt.	Mult. Ratio 8 Shunt Divider	RR-104-123
R50	RESISTOR, fixed: metallized film; 70,000 ohms, ±1%; 1/2 watt.	Mult. Ratio 8 Series Divider	RR-104-703
R51	RESISTOR, fixed: metallized film; 11,400 ohms, ±1%; 1/2 watt.	Mult. Ratio 8 Shunt Divider	RR-104-1142
R52	RESISTOR, fixed: metallized film; 80,000 ohms, ±1%; 1/2 watt.	Mult. Ratio 9 Series Divider	RR-104-803
R53	RESISTOR, fixed: metallized film; 11,250 ohms, ±1%; 1/2 watt.	Mult. Ratio 9 Shunt Divider	RR-104-11251
R54	RESISTOR, fixed: metallized film; 110,000 ohms, ±1%; 1/2 watt.	Mult. Ratio 12 Series Divider	RR-104-114
R55	RESISTOR, fixed: metallized film; 10,900 ohms, ±1%; 1/2 watt.	Mult. Ratio 12 Shunt Divider	RR-104-1092
R56	RESISTOR, fixed: wire wound; cartridge heater type; 20 watts at 115 volts AC, ±10%; 1000 v. insulated to shell.	200 Kc Osc. Oven Heater	RR-102-1
R57	RESISTOR, fixed: wire wound; cartridge heater type; 20 watts at 115 volts AC, ±10%; 1000 v. insulated to shell. (Same as R56)	200 Kc Osc. Oven Heater	RR-102-1
R58	RESISTOR, fixed: composition; 220,000 ohms, ±10%; 1/2 watt.	Neon Current Limiting Res.	RC20GF224K
R59	RESISTOR, fixed: wire wound; cartridge heater type; 20 watts at 115 volts AC, ±10%; 1000 v. insulated to shell. (Same as R56)	200 Kc Osc. Oven Heater	RR-102-1
R60	RESISTOR, fixed: wire wound; cartridge heater type; 20 watts at 115 volts AC, ±10%; 1000 v. insulated to shell. (Same as R56)	200 Kc Osc. Oven Heater	RR-102-1
R61	RESISTOR, fixed: composition; 220,000 ohms, ±10%; 1/2 watt. (Same as R58)	Neon Current Limiting Res.	RC20GF224K
R62	RESISTOR, fixed: composition; 1000 ohms, ±10%; 1/2 watt. (Same as R24)	React. Tube Cath. Bias Res.	RC20GF102K
R63	RESISTOR, fixed: composition; 1000 ohms, ±10%; 1/2 watt. (Same as R24)	React. Tube Cath. Bias Res.	RC20GF102K
R64	RESISTOR, fixed: composition; 12 ohms, ±10%; 2 watts. (Same as R29)	Pilot Current Limiting Res.	RC42GF120K

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R65	RESISTOR, fixed: composition; 22,000 ohms, ±10%; 1/2 watt.	Amp. Grid Leak Res.	RC20GF223K
R66	RESISTOR, fixed: composition; 470,000 ohms, ±10%; 1/2 watt. (Same as R30)	Mixer Grid Leak Res.	RC20GF474K
R67	RESISTOR, fixed: composition; 470,000 ohms, ±10%; 1/2 watt. (Same as R30)	Mixer Grid Leak Res.	RC20GF474K
R68	RESISTOR, fixed: composition; 100 ohms, ±10%; 1/2 watt. (Same as R10)	Parasitic Suppressor	RC20GF101K
R69	RESISTOR, fixed: composition; 470,000 ohms, ±10%; 1/2 watt. (Same as R30)	Voltage Divider Res.	RC20GF474K
R70	RESISTOR, fixed: composition; 470 ohms, ±10%; 2 watts.	Bias Supply Res.	RC42GF471K
R71	RESISTOR, fixed: wire wound; 7500 ohms, ±10%; 20 watts.	Series Supply Filter Res.	RW-110-32
R72	RESISTOR, fixed: wire wound; 10,000 ohms, ±10%; 20 watts.	Bias Supply Filter Res.	RW-110-33
R73	RESISTOR, fixed: wire wound; 5000 ohms, ±10%; 20 watts.	Bias Supply Filter Res.	RW-110-30
R74	RESISTOR, fixed: composition; 100 ohms, ±10%; 1/2 watt. (Same as R10)	Thermostat Arc Suppressor	RC20GF101K
R75	RESISTOR, fixed: composition; 100 ohms, ±10%; 1/2 watt. (Same as R10)	Thermostat Arc Suppressor	RC20GF101K
R76	RESISTOR, fixed: composition; 100,000 ohms, ±10%; 1/2 watt. (Same as R1)	Fax. Input Load Res.	RC20GF104K
R77	RESISTOR, fixed: composition; 470,000 ohms, ±10%; 1/2 watt. (Same as R30)	Power Supply Bleeder Res.	RC20GF474K
R78	RESISTOR, fixed: composition; 470,000 ohms, ±10%; 1/2 watt. (Same as R30)	Power Supply Bleeder Res.	RC20GF474K
R79	RESISTOR, fixed: composition; 68 ohms, ±10%; 2 watts.	External Osc. Load Res.	RC42GF680K
R80	RESISTOR, fixed: composition; 100 ohms, ±10%; 1/2 watt. (Same as R10)	Parasitic Suppressor	RC20GF101K
R81	RESISTOR, fixed: composition; 100,000 ohms, ±10%; 1 watt. (Same as R18)	Keying Line Load Res.	RC30GF104K
R82	RESISTOR, fixed: composition; 1000 ohms, ±10%; 1/2 watt. (Same as R24)	Plate Filter Res.	RC20GF102K
R83	RESISTOR, adjustable: wire wound; 2000 ohms, ±10%; 10 watts.	Keying Bridging Res.	RA108-202-10
R84	RESISTOR, variable: wire wound; 10,000 ohms, ±10%; 3 watts. (Same as R13)	Balance Control, Band 2	RA100ASSC103A

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
S1	SWITCH, rotary: non-shorting; three sections, two positions; mycalex insulation; contacts and wipers silver plated; 1/4 in. dia. drive shaft, 1 in. lg., flatted 3/8 in.	Band Switch	SW-110
S2	SWITCH, rotary: non-shorting; three sections, four positions; sections 1 and 2, bakelite insulation; section 3, mycalex insulation; contacts and wipers silver plated; 1/4 in. dia. drive shaft, 1 in. lg., flatted 3/8 in.	Xtal Selector	SW-109
S3	SWITCH, rotary: non-shorting; one section, three positions; bakelite insulation; contacts and wipers silver plated; 1/4 in. dia. drive shaft, flatted 3/8 in.	Test Switch	SW-111
S4	SWITCH, toggle: SPST; 3 amp, 250 volts; phenolic body.	Plate Power Switch	ST12A
S5	SWITCH, toggle: DPDT; 3 amp, 250 volts; phenolic body.	Key-Fax Input Switch	ST22N
S6	SWITCH, thermostatic; operates at 70 deg. C, ±2 deg. C; 1-1/2 in. lg. x 3/8 in. dia.; solder type terminals.	200 Kc Oven Control	SS-100-2
S7	SWITCH, thermostatic; operates at 70 deg. C, ±2 deg. C; 1-1/2 in. lg. x 3/8 in. dia.; solder type terminals. (Same as S6)	Xtal Oven Control	SS-100-2
S8	SWITCH, toggle: DPST; 3 amp, 250 volts; phenolic body.	Power ON/OFF Switch	ST22K
S9	SWITCH, rotary: non-shorting; one section, two positions; mycalex insulation; contacts and wipers silver plated; 1/4 in. dia. drive shaft, 3/4 in. lg.	P.A. Band Switch	SW-116
T1	TRANSFORMER, RF: primary, 7 turns of #30 DSC; 1.2 microhenries min. L, Q = 65; secondary, winding 1-3, 20 turns of #30 DSC, 5 microhenries min. L, Q= 90; winding 1-4, 13.0 microhenries, ±3.5 microhenries, Q=105, ±15.	Band 2 Mixer Input	A-338
T2	TRANSFORMER, RF: primary, 15 turns of #5/41 SSC, Q = 20; secondary, winding 1-3, 45 turns of #5/41 SSC, 47 microhenries min. L, Q = 45; winding 1-4, 115.5 microhenries, ±14.5 microhenries, Q = 67.5, ±22.5; slug tuned.	Band 1 Mixer Input	A-339

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
T3	TRANSFORMER, RF: primary, 18 turns of #36 DSC, 4 microhenries, center tapped, Q = 35; secondary, winding 1-3, 20 turns of #30 DSC, 5.2 microhenries min. L, Q = 90; winding 1-4, 31 turns of #30 DSC, 13.3 microhenries, ±3.5 microhenries, Q = 108, ±12; slug tuned.	Band 2 Mixer Output	A-340
T4	TRANSFORMER, RF: primary, winding 5-6, 21 turns of #5/41 SSC, 10.6 microhenries min. L, Q = 50; winding 6-7, 21 turns of #5/41 SSC, 10.9 microhenries min. L, Q = 36; secondary, winding 1-3, 42 turns of #5/41 SSC, 40 microhenries min. L, Q = 50; winding 1-4, 60 turns of #5/41 SSC, 95.5 microhenries, ±13.5 microhenries, Q = 70, ±25; slug tuned.	Band 1 Mixer Output	A-341
T5	TRANSFORMER, RF: slug tuned; two sections, Main and Tuning; Main section, winding 5-6, 9.2 microhenries; Q = 160; winding 7-8, .75 microhenries, Q = 25; Tuning section, winding 1-3, 1.35 microhenries, ±.35 microhenries, Q = 92.5, ±2.5,	Band 2 Amp. Output	A-752
T6	TRANSFORMER, RF: slug tuned; two sections, Main and Tuning; Main section, winding 5-6, 59 microhenries, Q = 170; winding 7-8, 3 microhenries, Q = 50; Tuning section, winding 1-3, 9.75 microhenries, ±2.35 microhenries, Q = 110, ±60.	Band 1 Amp. Output	A-753
T7	TRANSFORMER, power and filament: primary, 110/220 VAC, 50/60 cps.; secondary #1, 350-0-350 volts, 125 ma., secondary #2, 6.3 volts, 4 amps, secondary #3, 5 volts, 3 amps; insulated for 1250 volts, in accordance with MIL-T-27, GR. 1, CL. A, FAM. 03; electrostatic shield between pri. and sec., hermetically sealed rectangular metal case.	Power Transformer	TF-105
T8	TRANSFORMER, filament: primary, 115 VAC, 60 cps; secondary, 6.3 volts, 1.2 amps; insulated for 2500 volts.	Filament Transformer	TF-111
V1	TUBE, electron: duo triode; 7 pin miniature.	200 Kc Osc.	6J6
V2	TUBE, electron: medium mu duo triode; 9 pin miniature.	Reactance Tube	12AU7
V3	TUBE, electron: heptode converter; 7 pin miniature.	Mixer	6BE6

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
V4	TUBE, electron: heptode converter; 7 pin miniature. (Same as V3)	Mixer	6BE6
V5	TUBE, electron: beam power amplifier; 8 pin octal.	Amplifier	2E26
V6	TUBE, electron: medium mu duo triode; 9 pin miniature. (Same as V2)	Xtal Osc. Cathode Follower	12AU7
V7	TUBE, electron: medium mu duo triode; 9 pin miniature. (Same as V2)	Keying Tube	12AU7
V8	TUBE, electron: full-wave rectifier; 8 pin octal.	Rectifier	5U4G
V9	TUBE, electron: full-wave rectifier; 7 pin miniature.	Rectifier	6X4
V10	TUBE, electron: voltage regulator; 7 pin miniature.	Regulator	OB2
V11	TUBE, electron: voltage regulator; 7 pin miniature. (Same as V10)	Regulator	OB2
W1	CABLE, power: consists of one moulded non-polarized male plug; six feet of 16/30 SJ cable; and one phenolic twist lock connector, female. (PL-100)	AC Input Cable	CA-103
W2	CABLE, patch, RF: consists of 9-1/4 in. of shielded cable, two conductor, WI-109-6; tape, vinyl plastic; and one connector, male, two prong, PL-105-1. (P2)	Patch Cord, Xtal 1	CA-209-1
W3	CABLE, patch, RF: consists of 9-1/4 in. of shielded cable, two conductor, WI-109-6; tape; vinyl plastic; and one connector, male, two prong, PL-105-1. (P3) (Same as W2)	Patch Cord, Xtal 2	CA-209-1
W4	CABLE, patch, RF: consists of 10-1/4 in. of shielded cable, two conductor, WI-109-6; tape, vinyl plastic; and one connector, male, two prong, PL-105-1. (P4)	Patch Cord, Xtal 3	CA-209-2
W5	CABLE, patch, RF; consists of 10-1/4 in. of shielded cable, two conductor, WI-109-6; tape, vinyl plastic; and one connector, male two prong, PL-105-1. (P1) (Same as W4)	Patch Cord, External	CA-209-2
XF1	HOLDER, fuse: extractor post type for single AGC type fuse; stationary end terminal.	F1 Socket	FH-100-2

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
XF2	HOLDER, fuse: extractor post type for single AGC type fuse; stationary end terminal. (Same as XF1)	F2 Socket	FH-100-2
XI1	LIGHT, indicator: w/red frosted lens, for miniature bayonet base T-3-1/4 bulb.	I1 Socket	TS-106-1
XI2	LIGHT, indicator: w/clear white lens, for miniature bayonet base T-3-1/4 bulb.	I2 Socket	TS-106-2
XI3	LIGHT, indicator: w/clear white lens, for miniature bayonet base T-3-1/4 bulb. (Same as XI2)	I3 Socket	TS-106-2
XV1	SOCKET, tube: 7 pin miniature.	V1 Socket	TS102P01
XV2	SOCKET, tube: 9 pin miniature.	V2 Socket	TS103P01
XV3	SOCKET, tube: 7 pin miniature. (Same as XV1)	V3 Socket	TS102P01
XV4	SOCKET, tube: 7 pin miniature. (Same as XV1)	V4 Socket	TS102P01
XV5	SOCKET, tube: octal; ceramic.	V5 Socket	TS101P01
XV6	SOCKET, tube: 9 pin miniature. (Same as XV2)	V6 Socket	TS103P01
XV7	SOCKET, tube: 9 pin miniature. (Same as XV2)	V7 Socket	TS103P01
XV8	SOCKET, tube: octal; ceramic. (Same as XV5)	V8 Socket	TS101P01
XV9	SOCKET, tube: 7 pin miniature. (Same as XV1)	V9 Socket	TS102P01
XV10	SOCKET, tube: 7 pin miniature. (Same as XV1)	V10 Socket	TS102P01
XV11	SOCKET, tube: 7 pin miniature. (Same as XV1)	V11 Socket	TS102P01
XY1	SOCKET, crystal: .487 in. spacing for .095 in. dia. pins; oval shaped, steatite; 1-3/8 in. lg. x 7/16 in. wide x 7/8 in. high o/a; phosphor bronze contacts, silver plated.	Xtal #1 Socket, Socket A	TS-105-1
XY2	SOCKET, crystal: .487 in. spacing for .050 in. dia. pins; oval shaped, steatite; 55/64 in. lg. x 3/8 in. wide x 43/64 in. high o/a; phosphor bronze contacts, cadmium plated.	Xtal #1 Socket, Socket B	TS-104-1

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
XY3	SOCKET, crystal: .487 in. spacing for .095 in. dia. pins; oval shaped, steatite; 1-3/8 in. lg. x 7/16 in. wide x 7/8 in. high o/a; phosphor bronze contacts, silver plated. (Same as XY1)	Xtal #2 Socket, Socket A	TS-105-1
XY4	SOCKET, crystal: .487 in. spacing for .050 in. dia. pins; oval shaped, steatite; 55/64 in. lg. x 3/8 in. wide x 43/64 in. high o/a; phosphor bronze contacts, cadmium plated. (Same as XY2)	Xtal #2 Socket, Socket B	TS-104-1
XY5	SOCKET, crystal: .487 in. spacing for .095 in. dia. pins; oval shaped, steatite; 1-3/8 in. lg. x 7/16 in. wide x 7/8 in. high o/a; phosphor bronze contacts, silver plated. (Same as XY1)	Xtal #3 Socket, Socket A	TS-105-1
XY6	SOCKET, crystal: .487 in. spacing for .050 in. dia. pins; oval shaped, steatite; 55/64 in. lg. x 3/8 in. wide x 43/64 in. high o/a; phosphor bronze contacts, cadmium plated. (Same as XY2)	Xtal #3 Socket, Socket B	TS-104-1
	CRYSTAL UNIT, quartz: 800-15,000 Kcs., ±0.002%. (Supplied only on customers request) Freq. to be specified by customer.	Xtal	CR-27/U

PH-529

Figure E-37 Front View Model XFK

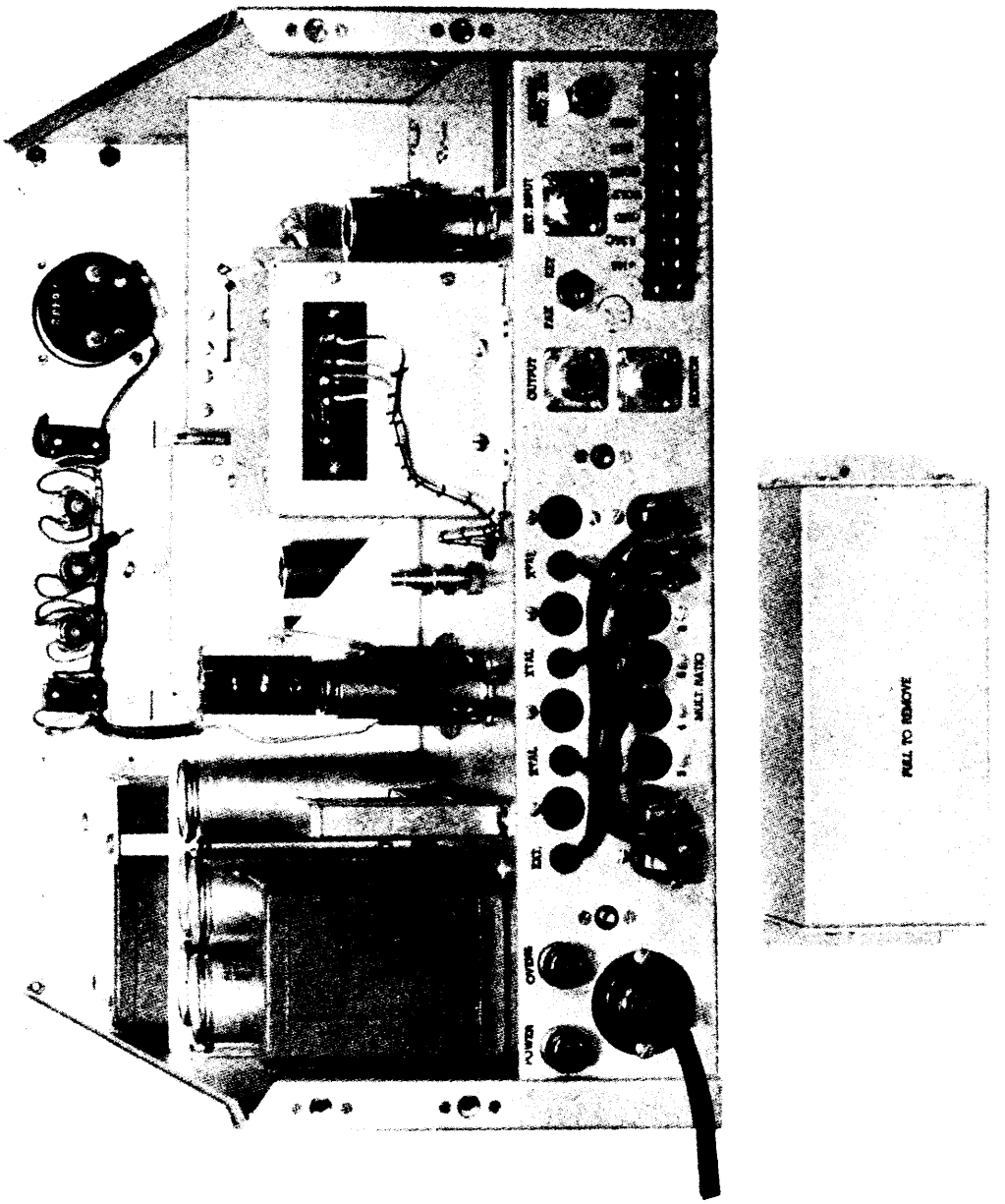


Figure E-38 Rear View Model XFK

PH-623

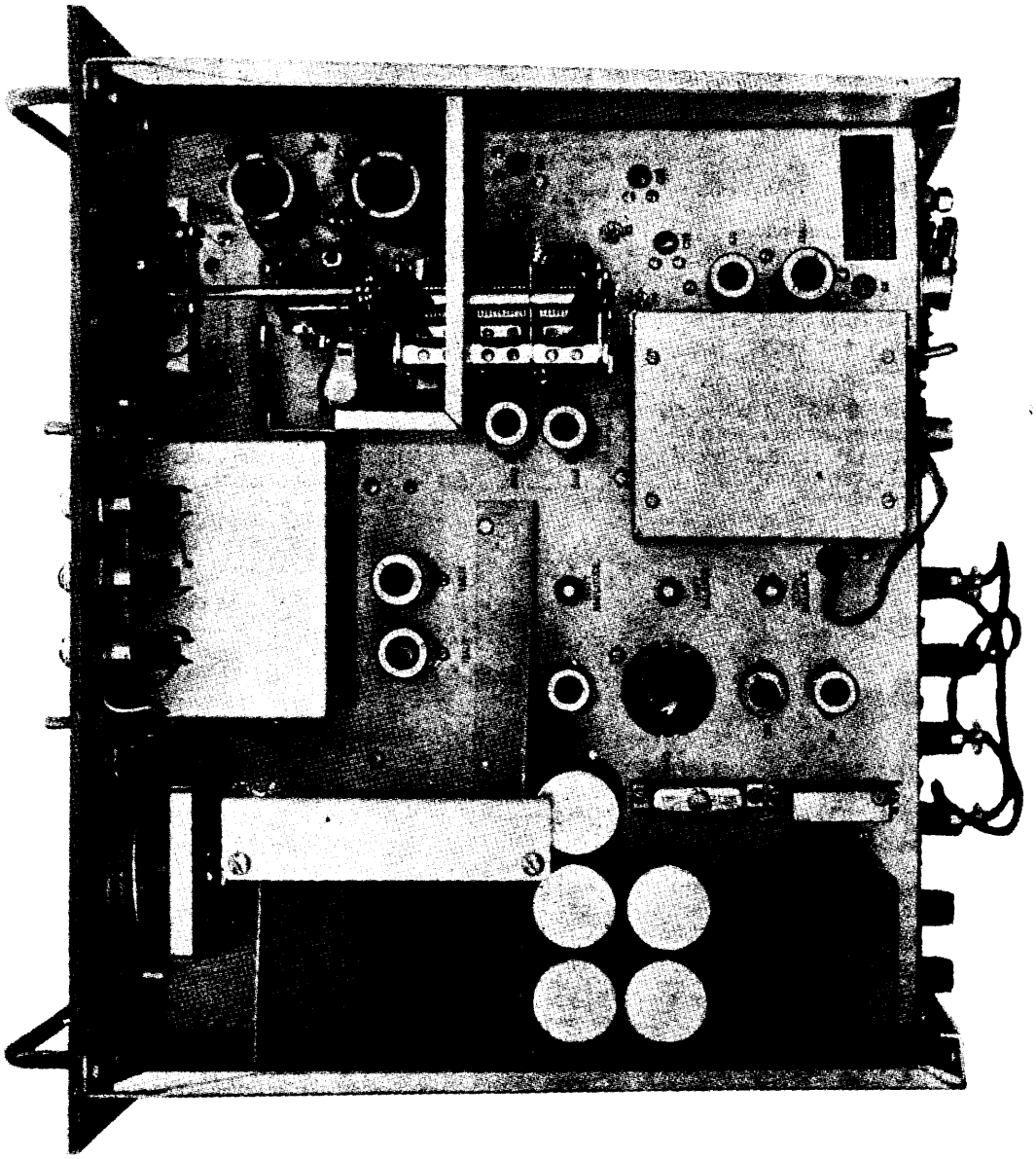


Figure E-39 Top View Model XFK

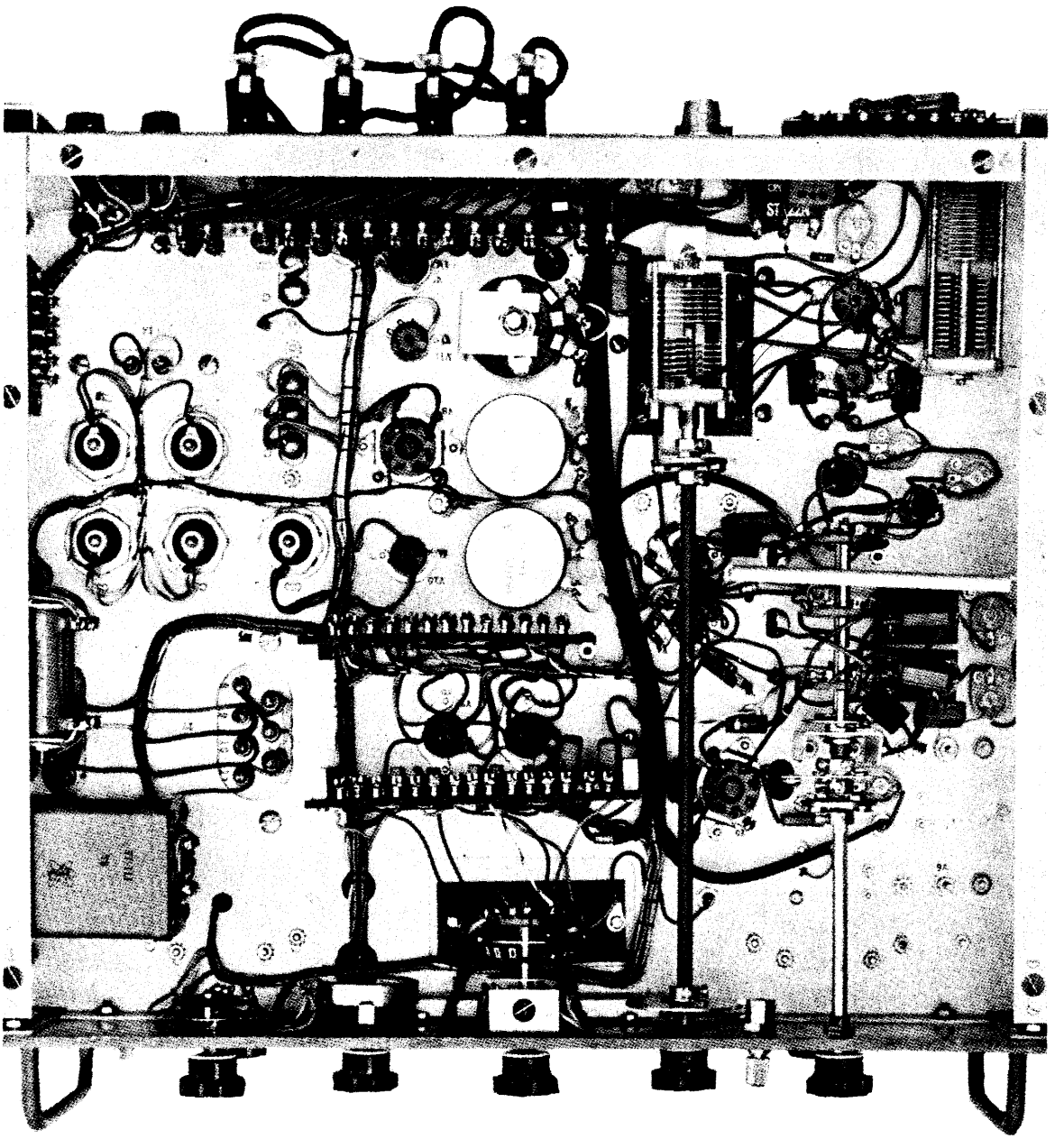


Figure E-40 Bottom View Model XFK

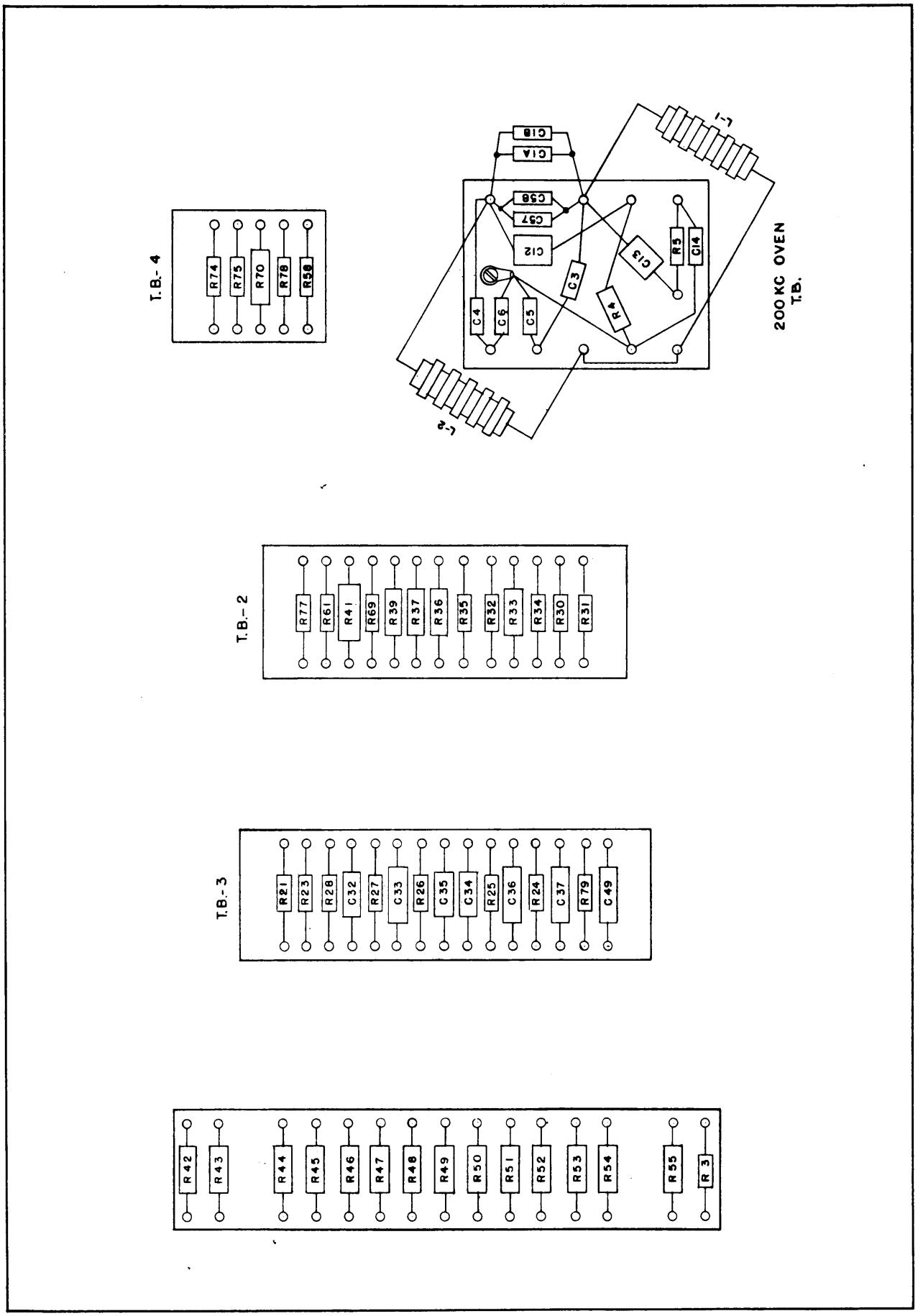
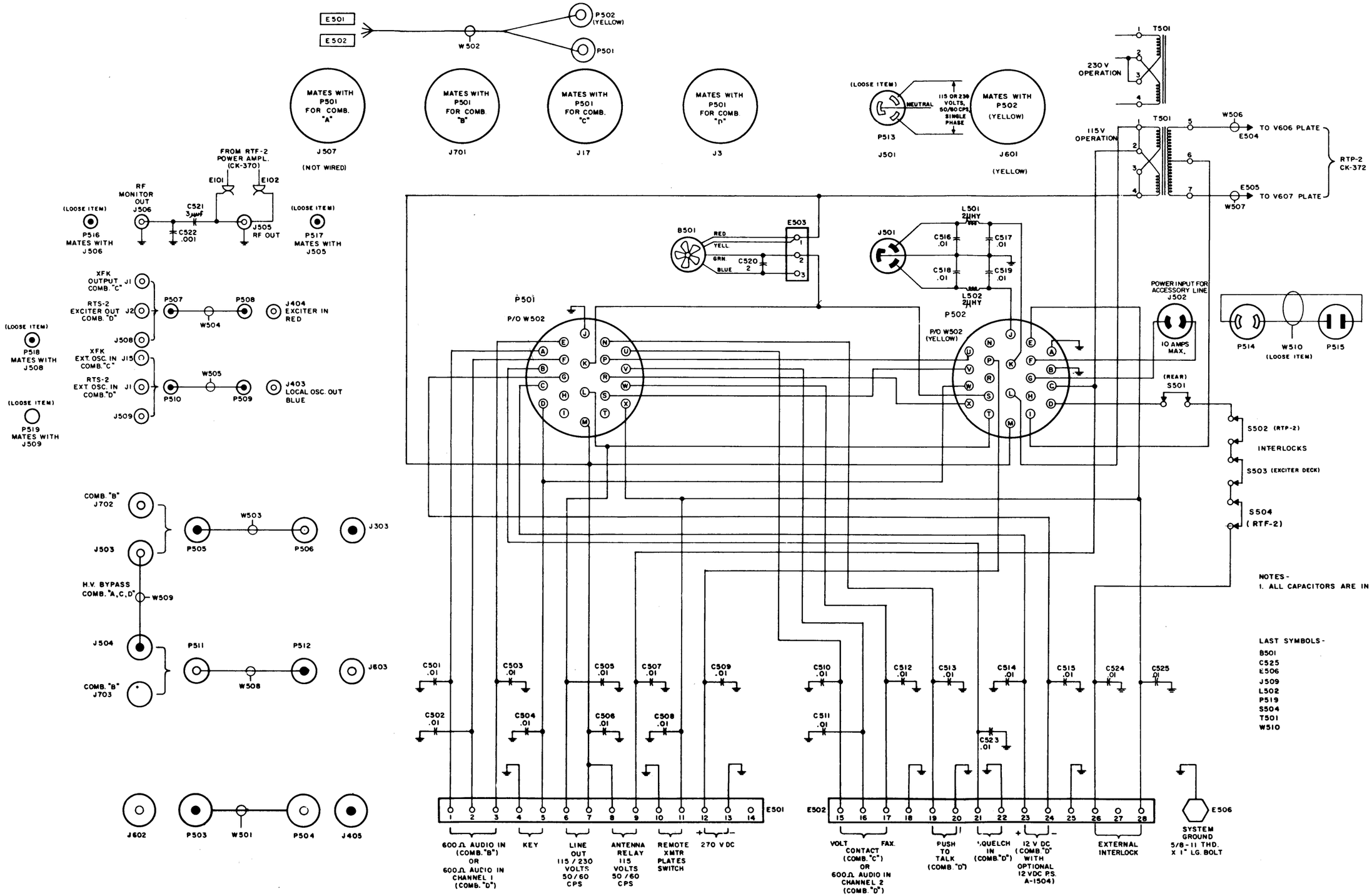


Figure E-41 Terminal Board Layout Model XFK



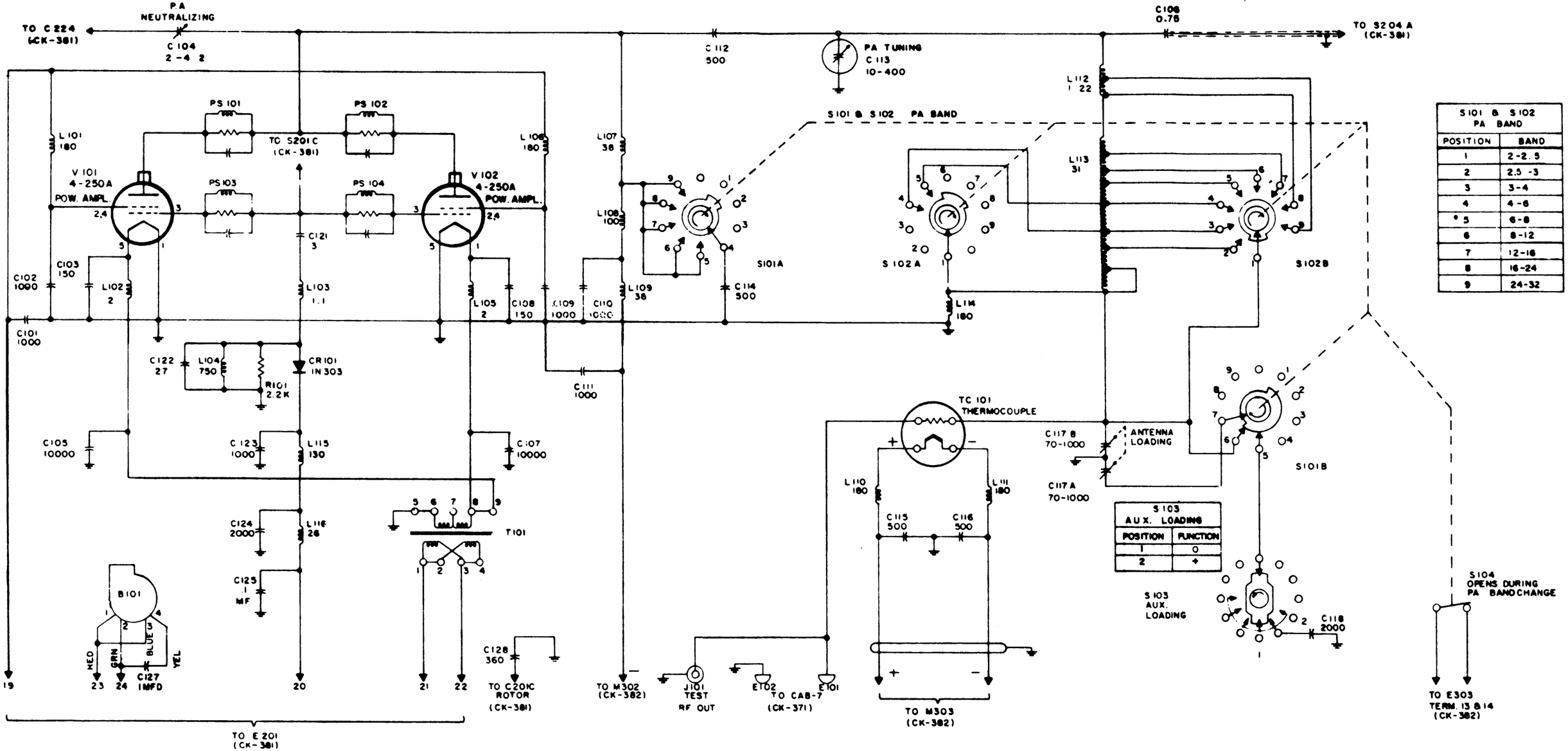
NOTES -
1. ALL CAPACITORS ARE IN MFD. UNLESS OTHERWISE NOTED.

LAST SYMBOLS -
B501
C525
E506
J509
L502
P519
S504
T501
W510

CK-371

Original

Figure E42 Schematic Diagram, Model CAB-7



S101 & S102 PA BAND	
POSITION	BAND
1	2-2.5
2	2.5 -3
3	3-4
4	4-6
5	6-8
6	8-12
7	12-16
8	16-24
9	24-32

NOTES:

1. ALL CAPACITORS ARE IN MMFD UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/2 WATT.
3. ALL COILS ARE IN MICROHENRIES
4. ALL SWITCHES SHOWN IN POSITION NO. 1

LAST SYMBOLS

B 101
C 128
CR 101
E 102
J 101
L 116
PS 104
R 101
S 104
T 101
TC 101
V 102

CK-370

Figure E43 Schematic Diagram, Power Amplifier Section, Model RTF-2

S201 & S202 DRIVER BAND SWITCH	
POSITION	BAND (MCS)
1	2-4
2	4-8
3	8-16
4	16-32

S 203 MULTI METER SWITCH	
POSITION	FUNCTION
1	PA EBB
2	DRIVER IP (MA)
3	PA ISG (MA)
4	PA IG (MA)
5	PA EG (RF)

S204	
POSITION	FUNCTION
1	NORMAL
2	SSB

NOTES-1. ALL CAPACITORS ARE IN mmfd, UNLESS OTHERWISE SPECIFIED.
2. RESISTORS ARE 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
3. ALL COILS ARE IN MICROHENRIES UNLESS OTHERWISE SPECIFIED.
4. ALL SWITCHES ARE SHOWN IN POSITION NO. 1.

LAST SYMBOL	MISSING SYMBOLS
C 243	C 236
E 202	
J 201	
L 218	
PS 202	
R 234	
S 204	
V 206	

CK-381

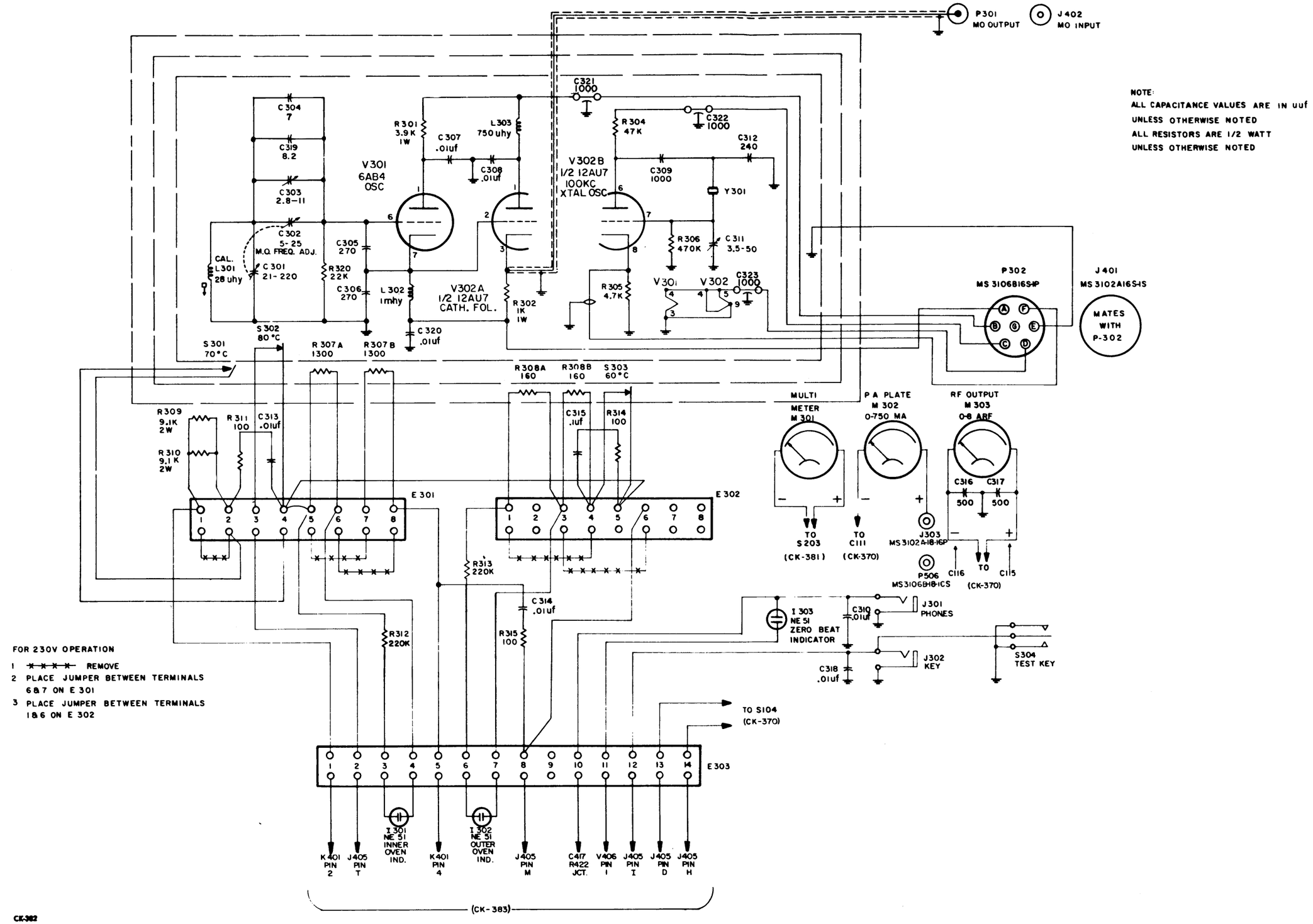
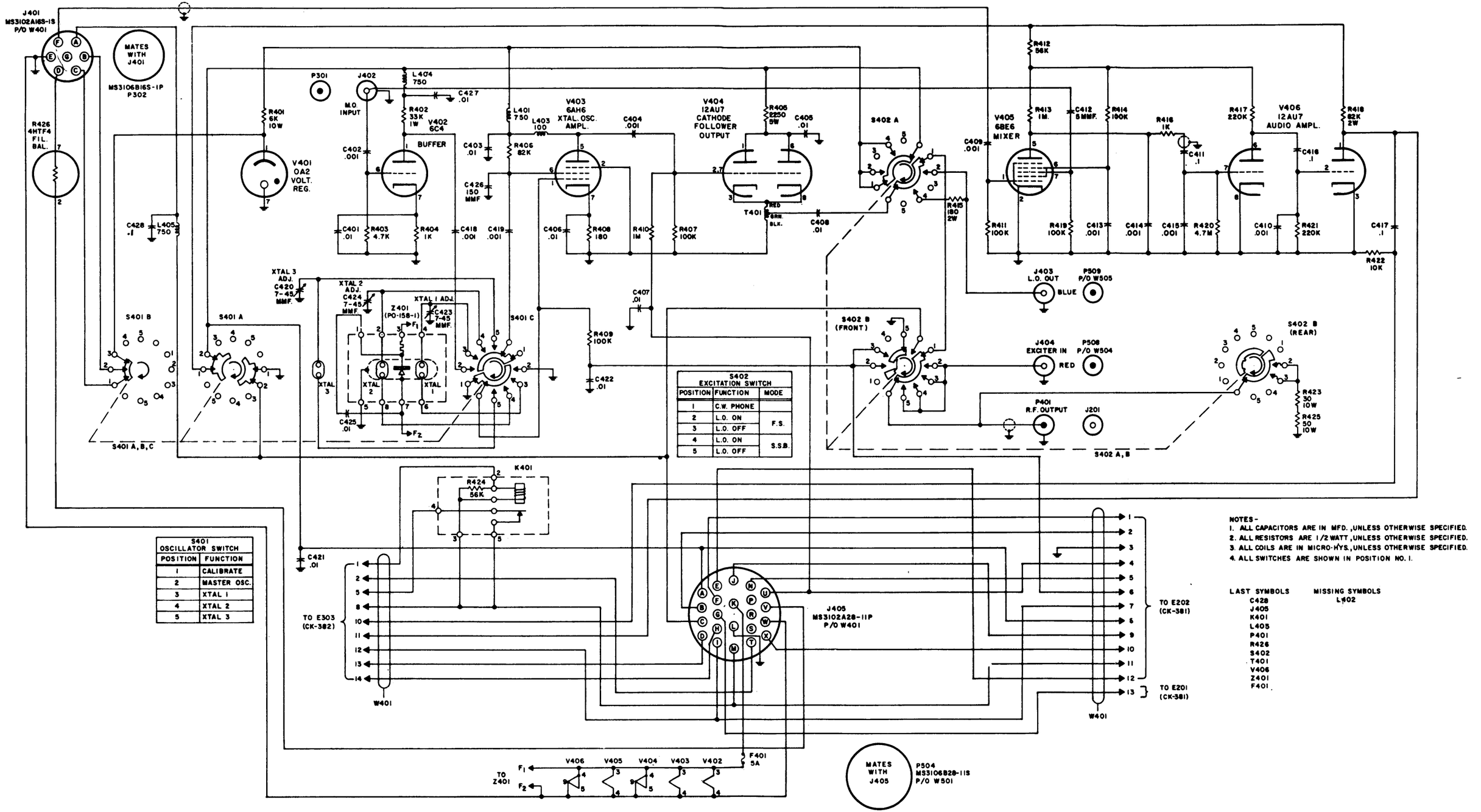


Figure E45 Schematic Diagram, Master Oscillator and Front Panel, Model RTF-2



S402 EXCITATION SWITCH		
POSITION	FUNCTION	MODE
1	C.W. PHONE	
2	L.O. ON	F.S.
3	L.O. OFF	
4	L.O. ON	S.S.B.
5	L.O. OFF	

S401 OSCILLATOR SWITCH	
POSITION	FUNCTION
1	CALIBRATE
2	MASTER OSC.
3	XTAL 1
4	XTAL 2
5	XTAL 3

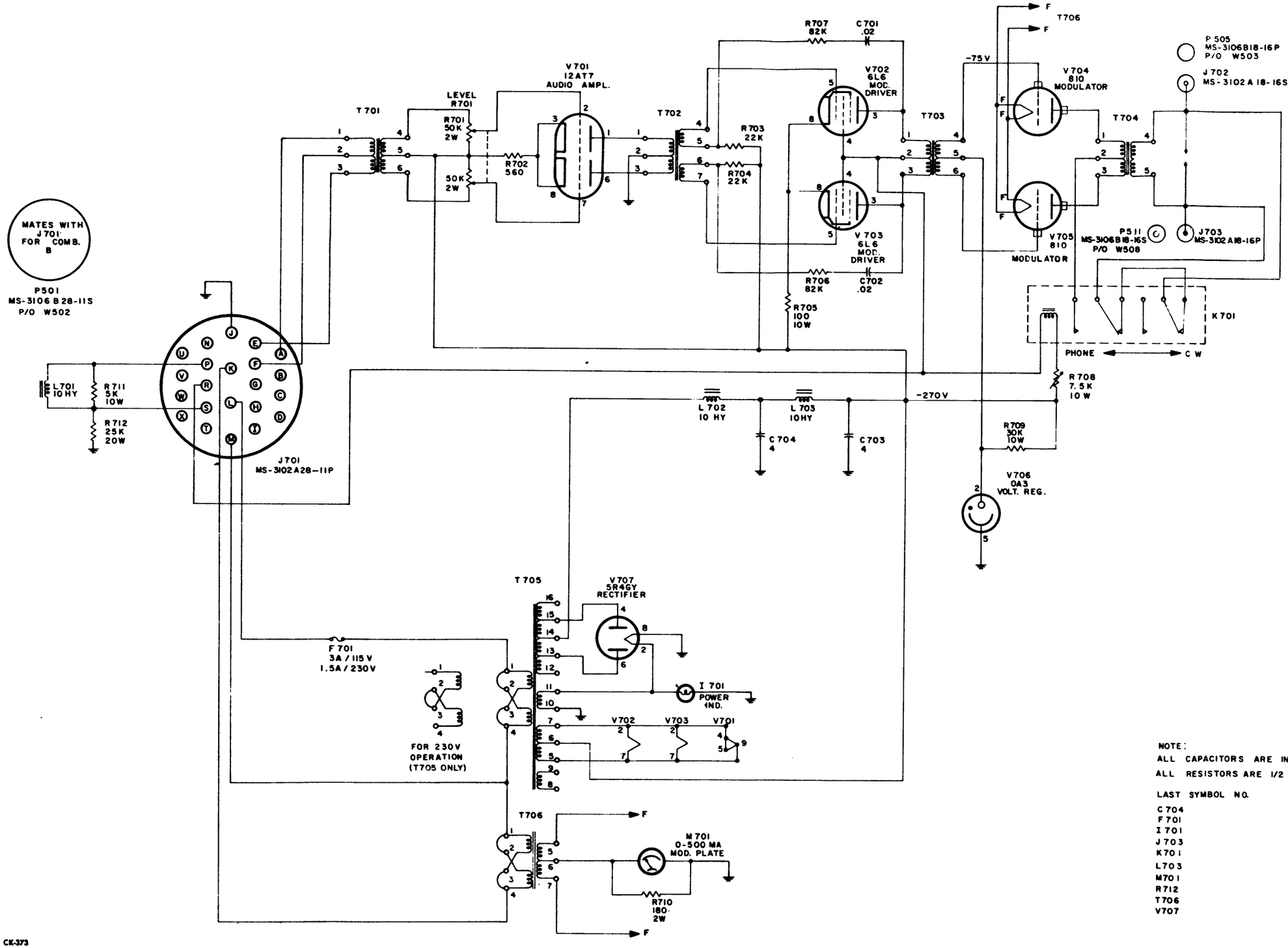
NOTES -
1. ALL CAPACITORS ARE IN MFD., UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
3. ALL COILS ARE IN MICRO-HYS, UNLESS OTHERWISE SPECIFIED.
4. ALL SWITCHES ARE SHOWN IN POSITION NO. 1.

LAST SYMBOLS	MISSING SYMBOLS
C428	L402
J405	
K401	
L405	
P401	
R426	
S402	
T401	
V406	
Z401	
F401	

CK-383

Original

Figure E46 Schematic Diagram, Interconnect Chassis, Model RTF-2



NOTE:
ALL CAPACITORS ARE IN MFD.
ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED.

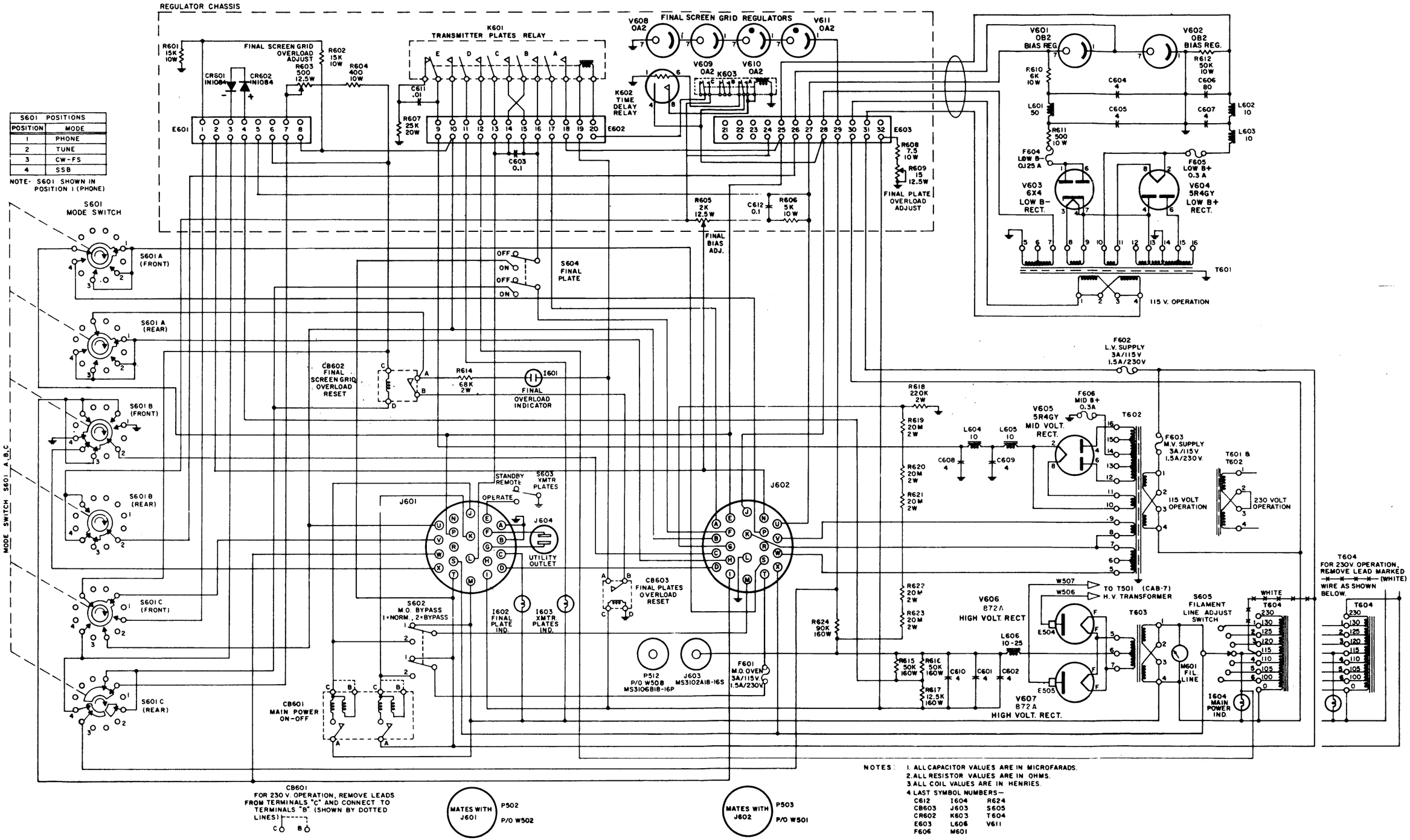
LAST SYMBOL NO.

C 704
F 701
I 701
J 703
K 701
L 703
M 701
R 712
T 706
V 707

CK-373

Original

Figure E47 Schematic Diagram, Model RTM-2



CK-372

Original

Figure E48 Schematic Diagram, Model RTP-2

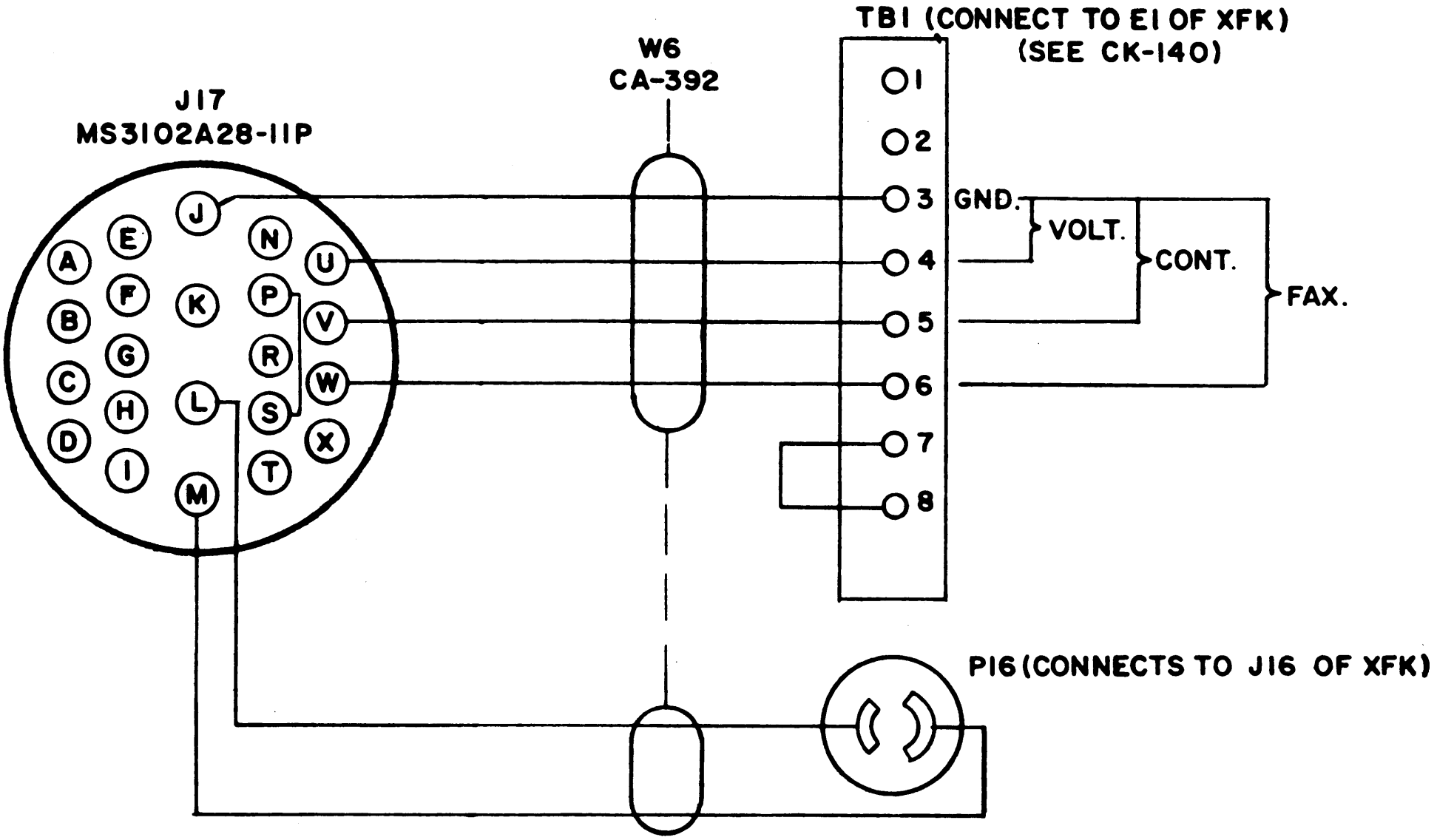
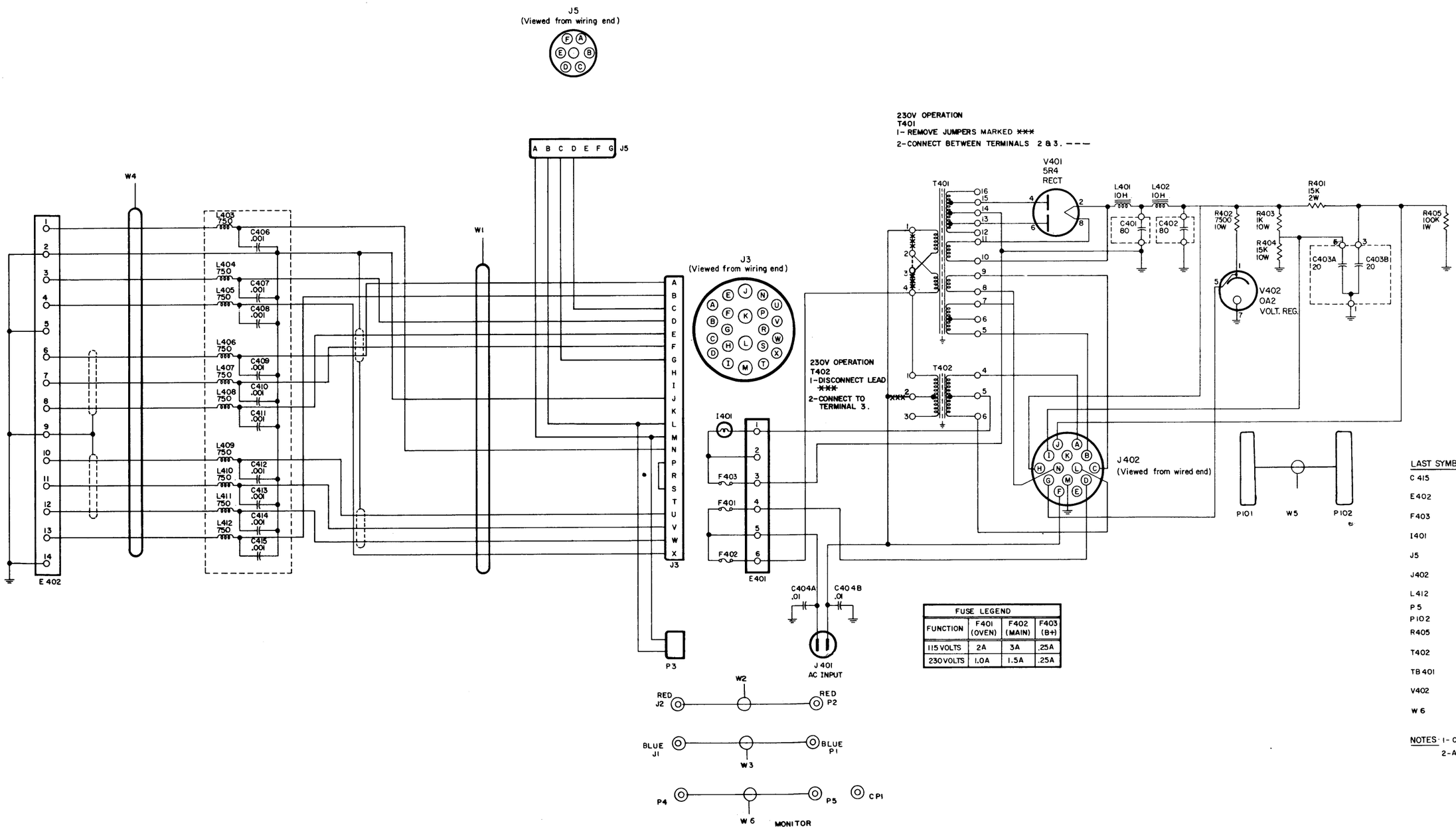


Figure E49 Schematic Diagram, Model RTX-2

CK-369



FUSE LEGEND			
FUNCTION	F401 (OVEN)	F402 (MAIN)	F403 (B+)
115 VOLTS	2A	3A	.25A
230 VOLTS	1.0A	1.5A	.25A

LAST SYMBOLS	MISSING SYMBOLS
C 415	
E402	C 4 0 5
F403	
I401	
J5	J4
J402	
L412	
P 5	
P102	
R405	
T402	
TB 401	
V402	
W 6	

NOTES: 1- COILS - MICROHENRIES
2- ALL CAPACITORS ARE IN MFD.

CK-601