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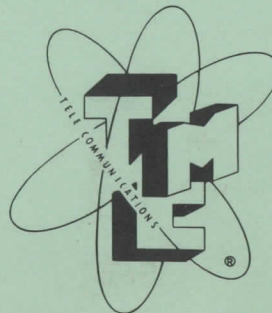
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TECHNICAL MANUAL  
*for*  
FREQUENCY AMPLIFIER  
MODEL CHG-1  
(AM-2505/URA-31)

FREQUENCY AMPLIFIER  
MODEL CHG-2  
(AM-2505A/URA-31)

POWER SUPPLY, MODEL CPP-1  
(PP-2561/URA-31)

POWER SUPPLY, MODEL CPP-5  
(PP-2561A/URA-31)



THE TECHNICAL MATERIEL CORPORATION  
MAMARONECK, N.Y.

OTTAWA, ONTARIO



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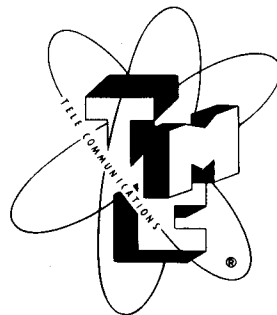
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Issue Date: 1 January 1962



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## **FOREWORD**

Frequency Amplifiers, Models CHG-1 and CHG-2 are units of the Controlled Precision Oscillator Model CPO-1 (AN/URA-31). Differences between the CHGs may readily be ascertained by comparison of equal-numbered simplified schematics in Section 4 and of the overall schematics in Section 8. These differences, except where otherwise stated, do not affect the technical accuracy of the text in following Sections 1 through 6.

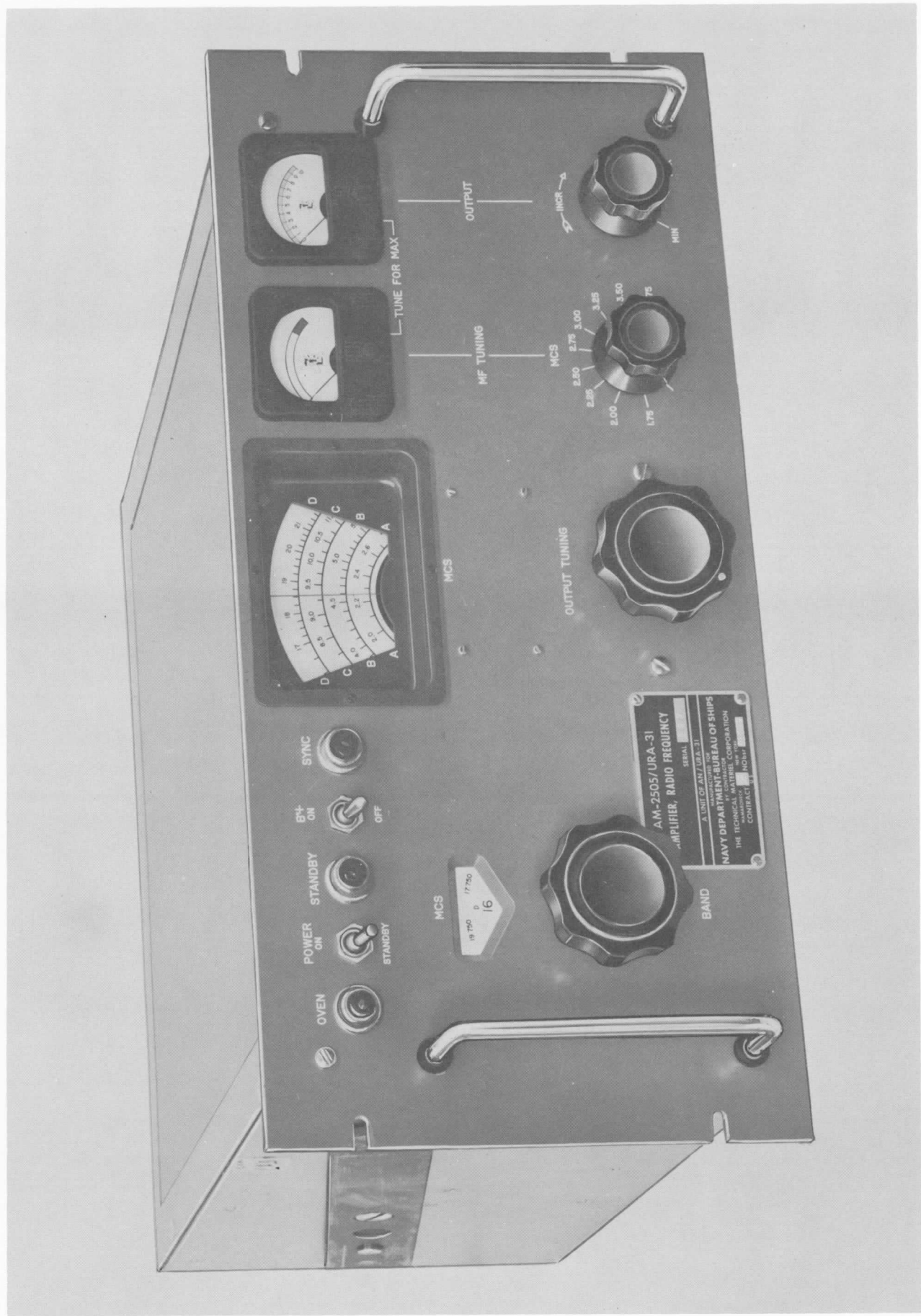


Figure III(A)-1-1a. Frequency Amplifier CHG-1, Front View



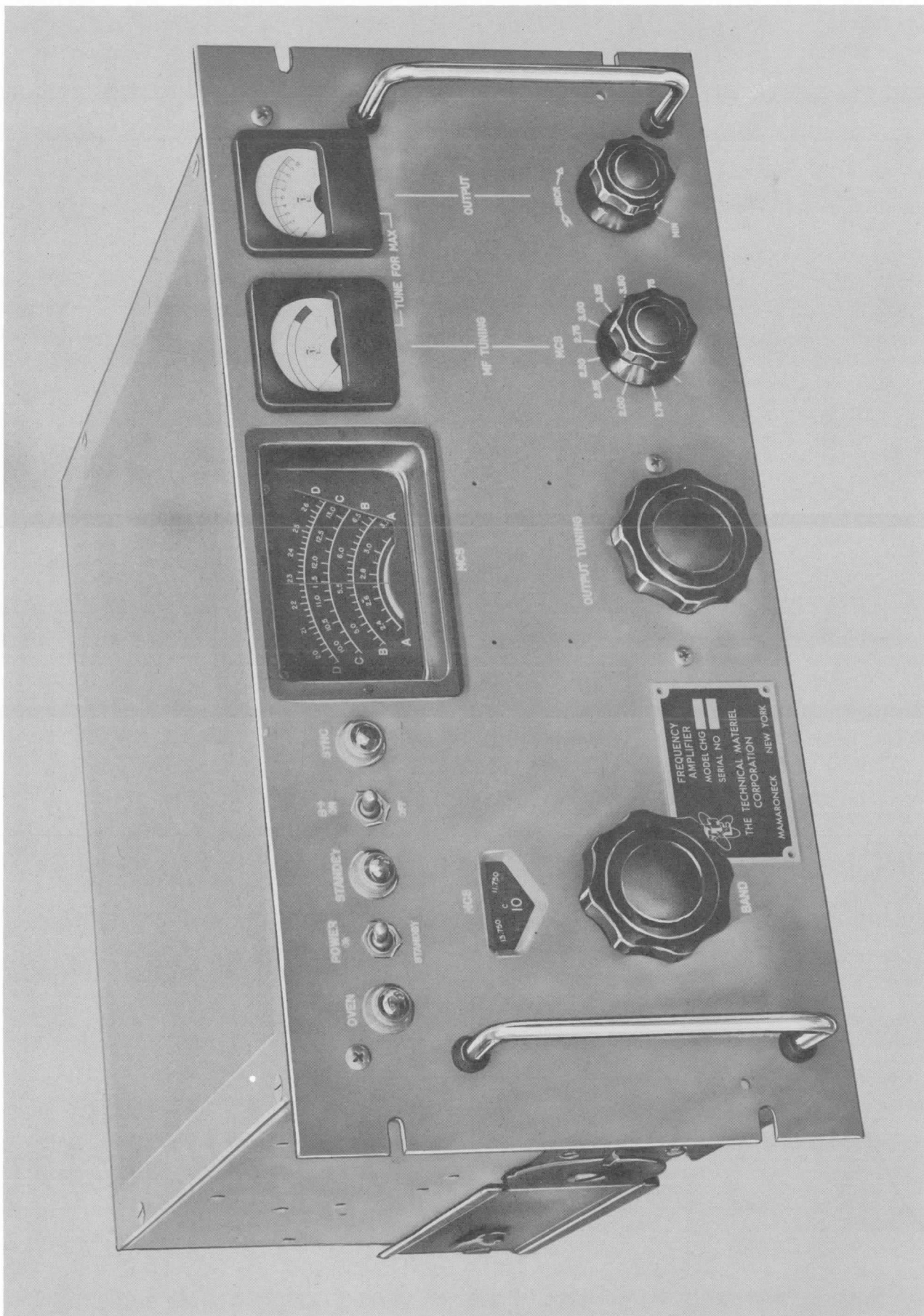


Figure III(A)-1-1b. Frequency Amplifier CHG-2, Front View

## SECTION 1

### GENERAL DESCRIPTION

#### III(A)-1-1. PURPOSE AND BASIC PRINCIPLES.

Technical Materiel Corporation's Frequency Amplifier, CHG (high frequency loop), supplies controlled frequencies in the 1.75- to 33.75-mc range in 100-cps steps. The frequency stability of the CHG is one cycle in 100,000,000 per day.

CHG is associated with five other units in the Controlled Precision Oscillator, CPO-1, as follows:

a. Controlled Master Oscillator, CMO-1, provides an input of 2- to 4-mc in 100-cps steps to the CHG.

b. Primary Standard, CSS-1, provides a 1-mc standard input to the CHG.

c. Power Supply, CPP-1, provides +200V DC (unregulated), +150V DC (regulated), and 6.3V AC for the CHG, where the application is to GPT-10K(R) and GPT-40K(A) transmitters.

d. Power Supply, CPP-5, provides the same voltages listed in step c. above, where the application is to a SBT-1K (E, F, G, H) transmitter. The CPP-5 contains a regulated transformer which is unnecessary in the CPP-1 because the 10K and 40K transmitters are supplied with regulated 115V AC.

e. CHG is associated with either of two other units in the Sideband Generator, SBG. Sideband Exciter, CBE-1, provides a 0.25-mc input, modulated in the 0- to 7.5-kc frequency range to the CHG. Sideband Exciter, CBE-2, provides a 0.25-mc input, modulated in the 0- to 3.3-kc frequency range to the CHG.

CHG accomplishes its function as follows:

a. CHG's modulator and amplifier is fed by the CMO and the associated CBE. It passes the difference frequency (lower sideband),  $F_{cmo} - F_{cbe}$ . If the CBE supplies unmodulated carrier, CHG's modulator-amplifier output is  $F_{cmo}$  minus 0.25-mc.

b. The CMO output frequency is synthesized in 100-cycle steps in the 2- to 4-mc range. CHG's modulator-amplifier's output ranges from 1.75- to 3.75-mc, synthesized in 100-cycle steps.

c. The modulator-amplifier's output is frequency translated in the CHG to yield the final output of 1.75- to 33.75-mc synthesized in 100-cycle steps.

The CHG has five subassemblies. These are:

a. Regenerative Divider.

b. Oven and Oscillator.

c. Synthesizer.

d. IF Chassis.

e. Mid-frequency and RF deck.

#### III(A)-1-2. DESCRIPTION OF UNITS.

The CHG is shown in figures III(A)-1-1 and III(A)-1-2. The front panel is 3/16-inch thick by 19 inches long and 10-1/2 inches high and is finished in TMC gray enamel. The chassis extends 19-1/4 inches behind the panel and is self-supporting.

The CPP is shown in figures III(A)-1-3. The front panel is 3/16-inch thick by 19 inches long and 5-1/4 inches high and is finished in TMC gray enamel. The chassis extends 16-1/2 inches behind the panel and is self-supporting.

Controls and indicators for the operation of the CHG are located on its front panel. Fuses for the operation of the CPP are located on its front panel. The equipment is manufactured in accordance with JAN/MIL Standards, whenever practicable. All parts and assemblies meet or exceed highest quality standards.

#### III(A)-1-3. REFERENCE DATA.

The crated dimensions of the CHG, crated with the CMO, are 23-1/8 by 32-1/2 by 27 inches. These units weigh 204 pounds, gross, packed for shipment. The crated dimensions of the CPP-1 crated with CHL and CSS are 23-1/4 by 28-3/4 by 23-1/4 inches. These units weigh 165 pounds, gross, packed for shipment. Tables III(A)-1-1 through III(A)-1-5 contain additional reference data pertinent to the CHG and CPP.

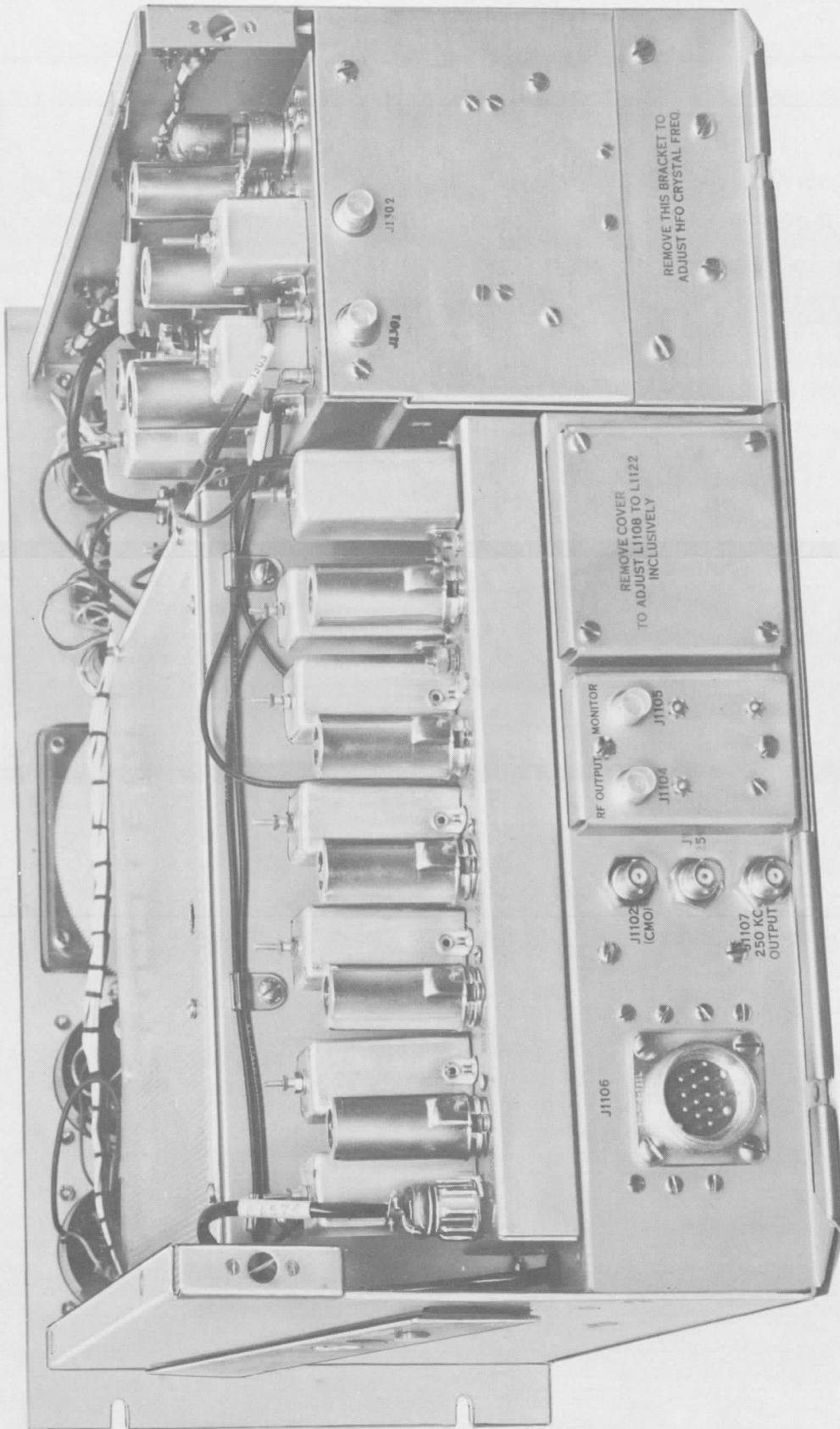


Figure III(A)-1-2a. Frequency Amplifier CHG-1, Rear View



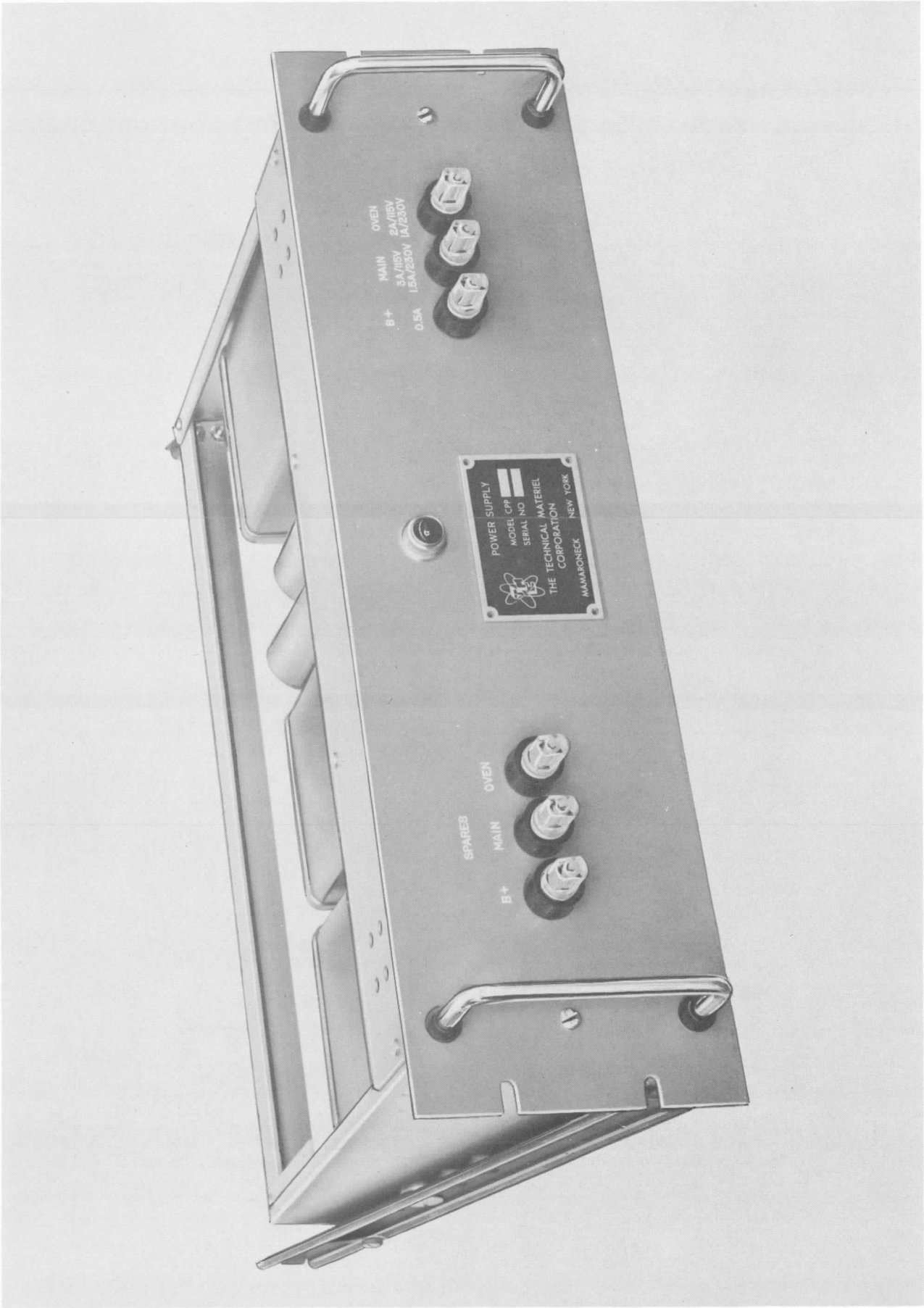


Figure III(A)-1-3a. Power Supply CPP-1, Top View



Figure III(A)-1-3b. Power Supply CPP-5, Top View

**TABLE III(A)-1-1. ELECTRICAL CHARACTERISTICS, CHG**

ITEM	CHARACTERISTICS
Input Frequencies: From CMO From CBE-1 or From CBE-2 From CSS	2 to 4-mc, synthesized in 100 cycle steps. 0.25-mc audio modulated in 0- to 7.5-kc frequency range. 0.25-mc audio modulated in 0- to 3.3-kc frequency range. 1-mc (Standard).
Output Frequencies:	1.75- to 33.75-mc, synthesized in 100-cycle steps.
Output Power (Maximum):	1-watt (PEP) into 70-ohms.
Output Stability:	At the 100-cps discrete frequency steps, the automatic phase control system stabilizes frequency to one part in 100,000,000 per day.
Power Requirements (CPP-1 or CPP-5):	115- or 230V AC, 50 to 60-cps, 200 watts (maximum).

**TABLE III(A)-1-2. FRONT PANEL CONTROLS, CHG**

CONTROL	FUNCTIONS
B+ ON/OFF toggle switch:	Supplies +200V to RF amplifier when in ON position.
BAND knob:	Used to set band of output frequency.
MCS dial:	Indicates band of output frequency.
MCS meter:	Used to check peak tuning of output frequency.
MF TUNING MCS knob:	Used to peak tune CMO's and CBE's 1.75- to 3.75-mc product.
MF TUNING meter:	Indicates peak tuning of CMO's and CBE's 1.75- to 3.75-mc product.
OUTPUT INCR MIN/MAX knob:	Used to adjust output level of CHG.
OUTPUT meter:	Indicates power output of CHG.
OUTPUT TUNING knob:	Used to obtain peak tuning of output frequency.
OVEN indicator:	Lights when oven is receiving power.

**TABLE III(A)-1-2. FRONT PANEL CONTROLS, CHG (Cont.)**

CONTROL	FUNCTIONS
POWER ON/STANDBY switch:	Supplies power to oven only, when in STANDBY position.
STANDBY indicator:	Lights when POWER ON/STANDBY switch is in STANDBY position.
SYNC indicator:	Lights when 2-mc output of Synthesizer's mixer (V1503 or V2503) syncs with 2-mc output of Synthesizer's doubler (V1505 or V2505).

**TABLE III(A)-1-3. VACUUM TUBE COMPLEMENT, CHG-1**

SYMBOL	TYPE	FUNCTION
V1101	12AT7	Balanced Modulator
V1102	6AH6	Mid-frequency Amplifier
V1103	6AH6	Metering
V1104	6AH6	HF Amplifier
V1105	6AH6	1st RF Amplifier
V1106	6CL6	2nd RF Amplifier
V1107	6146	RF Output
V1201	6AH6	18-mc Generator
V1202	6AU6	18-mc Amplifier
V1203	6AH6	1st IF Amplifier
V1204	6AH6	2nd IF Amplifier
V1205	6AH6	3rd IF Amplifier
V1206	6AH6	IF Output
V1301	6AH6	1-mc Output
V1302	6U8	1-mc Oscillator/Amplifier
V1303	6AB4	HF Oscillator
V1304	6H4	HF Output
V1501	6AH6	Isolation Amplifier
V1502	6AH6	Harmonic Generator
V1503	6BA7	Mixer



**TABLE III(A)-1-3. VACUUM TUBE COMPLEMENT, CHG-1 (Cont.)**

SYMBOL	TYPE	FUNCTION
V1504	6C56	Sync
V1505	6AH6	Doubler
V1601	6BE6	Mixer
V1602	6U8	Tripler/250-KC Output

**TABLE III(A)-1-4. VACUUM TUBE COMPLEMENT, CHG-2**

SYMBOL	TYPE	FUNCTION
V2701	12AT7	Balanced Modulator
V2702	6AH6	Mid-frequency Amplifier
V2703	6AH6	Metering
V2704	6AU6	HF Amplifier
V2705	6AU6	HF Amplifier
V2706	6AH7	1st RF Amplifier
V2707	6CL6	2nd RF Amplifier
V2708	6146	RF Output
V2201	6AH6	18-mc Generator
V2202	6AH6	18-mc Amplifier
V2203	6AU6	1st IF Amplifier
V2204	6AU6	2nd IF Amplifier
V2205	6AU6	3rd IF Amplifier
V2206	6AU6	IF Output
V2301	6AH6	1-mc Output
V2302	6U8	1-mc Oscillator/Amplifier
V2401	6J4	HF Oscillator
V2402	6J4	HF Output
V2501	6AH6	Isolation Amplifier
V2502	6AH6	Harmonic Generator
V2503	6BA7	Mixer
V2504	6C56	Sync

**TABLE III(A)-1-4. VACUUM TUBE COMPLEMENT, CHG-2 (Cont.)**

SYMBOL	TYPE	FUNCTION
V2505	6AH6	Doubler
V2601	6BE6	Mixer
V2602	6U8	Tripler/250-KC Output

**TABLE III(A)-1-5. VACUUM TUBE COMPLEMENT, CPP-1, 5**

SYMBOL	TYPE	FUNCTION
V401	OA2	Regulator

## SECTION 2

### INSTALLATION

#### III(A)-2-1. GENERAL.

Technical Materiel Corporation packages test and exciter units as follows:

- a. The unit is wrapped with paper to prevent scratching and wedged in a card board carton with heavy card board corrugated fillers. Desiccant, accessories, and spare parts, if practical, are placed in the carton and it is sealed.
  - b. The carton is sealed in a moisture-proof barrier bag.
  - c. The carton in the barrier bag is placed in a water-proof outer carton and it is sealed.
  - d. The sealed carton is wedged to tightness in a strong wooden packing box.
  - e. The packing box is encircled with two steel straps. The top side of the box may be located by observing the seals on the straps. When the seals are removed, this side of the box may be readily pried open.
- a. Power Supply (J1106, CHG-1 or J2707, CHG-2) to J402 of CPP-1 via W3002 (P3038, P3039).
  - b. 1-MC INPUT (J1301, CHG-1 or J2303, CHG-2) to 1-MC OUT (J602) of CSS-1 via CA-572 (P3011).
  - c. 1-MC OUTPUT (J1302, CHG-1 or J2304, CHG-2) to HFL.
  - d. 250-KC IN (J1101, CHG-1 or J2701, CHG-2) to OUTPUT (J202) of CBE via CA-572 (P3009, P3013).
  - e. CMO (J1102, CHG-1 or J2702, CHG-2) to Pad A-2048 (P3012, P3046) to Pad A-2048 (J3015, J3016) to RF OUT (J305) of CMO via CA-572 (P3019, P3047).
  - f. RF OUT (J1104, CHG-1 or J2704, CHG-2) to EXCITER OUTPUT (J3001) of Center Shield Assembly via CA-572 (P3001, P3015).
  - g. MON (J1105, CHG-1 or J2705, CHG-2) to S1(A) of APP-3 via CA-572 (P3016, P3034).
  - h. 250-KC OUT (J1107, CHG-1 or J2706, CHG-2) to 250-KC IN (P3010) of CBE via CA-572 (P3010, P3014).

#### III(A)-2-2. INITIAL INSPECTION.

Each CHG and CPP has been tested and calibrated before shipment. Only minor preparations are required to put the units into operation.

Upon arrival at the operating site, inspect the packing case and its contents immediately for possible damage. Unpack the equipment carefully. Inspect all packing material for parts which may have been shipped as "loose items". Although the carrier is liable for any damage to the equipment, Technical Materiel Corporation will assist in describing and providing for repair or replacement of damaged items.

The equipment is shipped with plug-in components installed. Check that all such components are properly seated in their sockets.

#### III(A)-2-3. 115- VS 230-VOLT POWER SUPPLY CONNECTIONS.

CPP is normally operated from 115- or 230-volt, 60-cycle, single-phase power; it is factory wired for 115 volts. If 230-volt operation is required, make the connections shown in figure III(A)-8-1.

#### III(A)-2-4. INTERCONNECTIONS.

Figure III(A)-2-1 indicates the following interconnections in rack AX-239, used with synthesized models of GPT-10K and GPT-40K transmitters:

Figure III(A)-2-2 indicates the following interconnections in rack RAK-11:

- a. Power Supply (J1106, CHG-1 or J2707, CHG-2) to J402 of CPP-5 via CA-576 (P925, P926).
- b. 1-MC INPUT (J1301, CHG-1 or J2303, CHG-2) to 1-MC OUT (J602) of CSS via CA-590 (P906, P921).
- c. 1-MC OUTPUT (J1302, CHG-1 or J2304, CHG-2) to HFL.
- d. 250-KC IN (J1101, CHG-1 or J2701, CHG-2) to OUTPUT (J202) of CBE via CA-590 (P902, P904).
- e. CMO (J1102, CHG-1 or J2702, CHG-2) to Pad A-2048 (P903, P923) to Pad A-2048 (J901, J902) to RF OUT (J305) of CMO via CA-590 (P909, P924).
- f. RF OUT (J1104, CHG-1 or J2704, CHG-2) to MS-2500-S (J912) via CA-480-8 (W907).
- g. MON (J1105, CHG-1 or J2705, CHG-2) to customers monitoring equipment.
- h. 250-KC OUT (J1107, CHG-1 or J2706, CHG-2) to 250-KC IN (P901) of CBE via CA-590 (P901, P905).

#### III(A)-2-5. INITIAL ADJUSTMENTS.

See alignment procedure contained in III(G)-8, Test Procedure for Frequency Amplifier CHG.

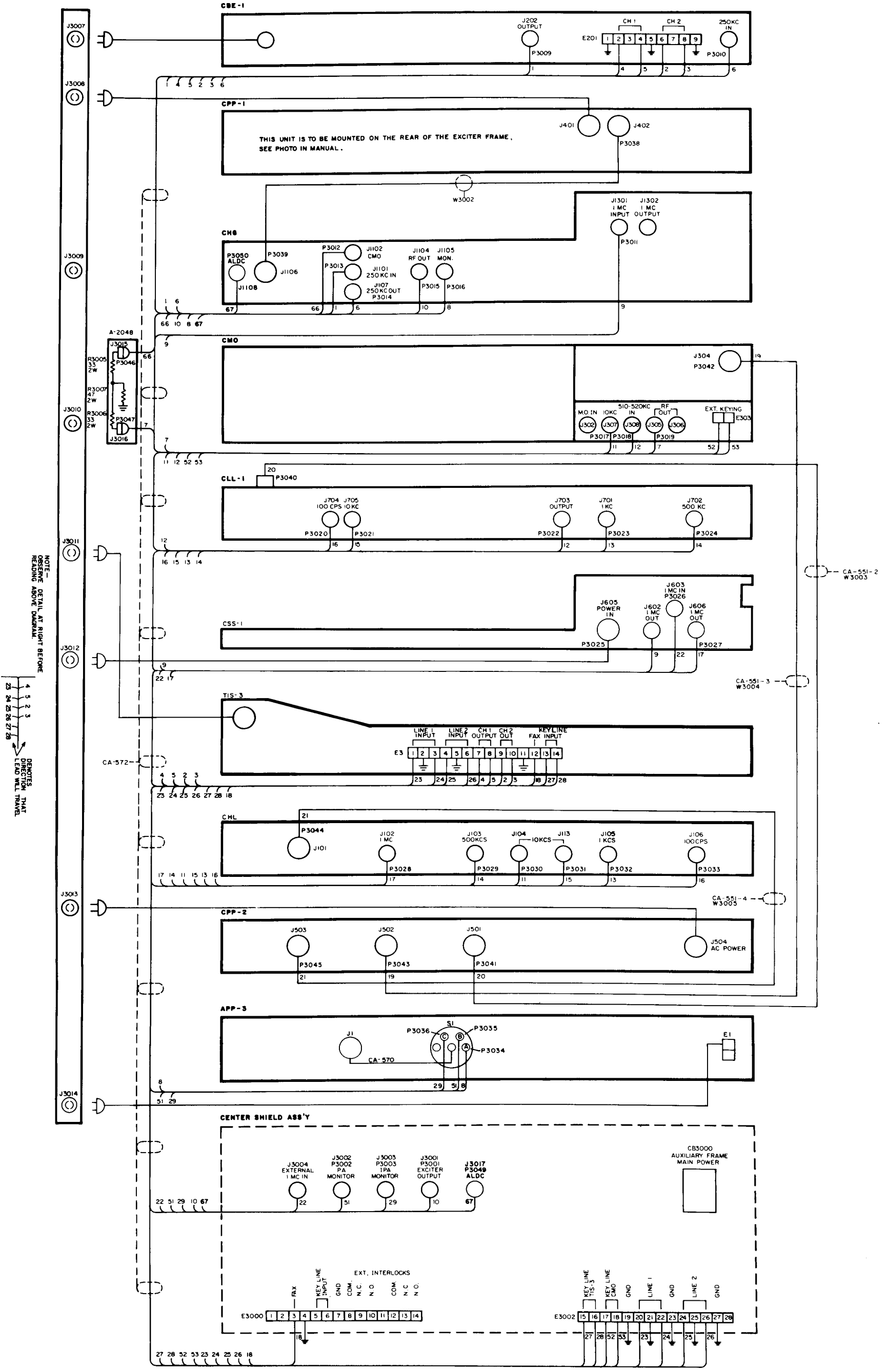


Figure III(A)-2-1. Rack Wiring Assembly for Synthesized GPT-10K and -40K Transmitters (AX-239 w/KIT-109; CK466E)

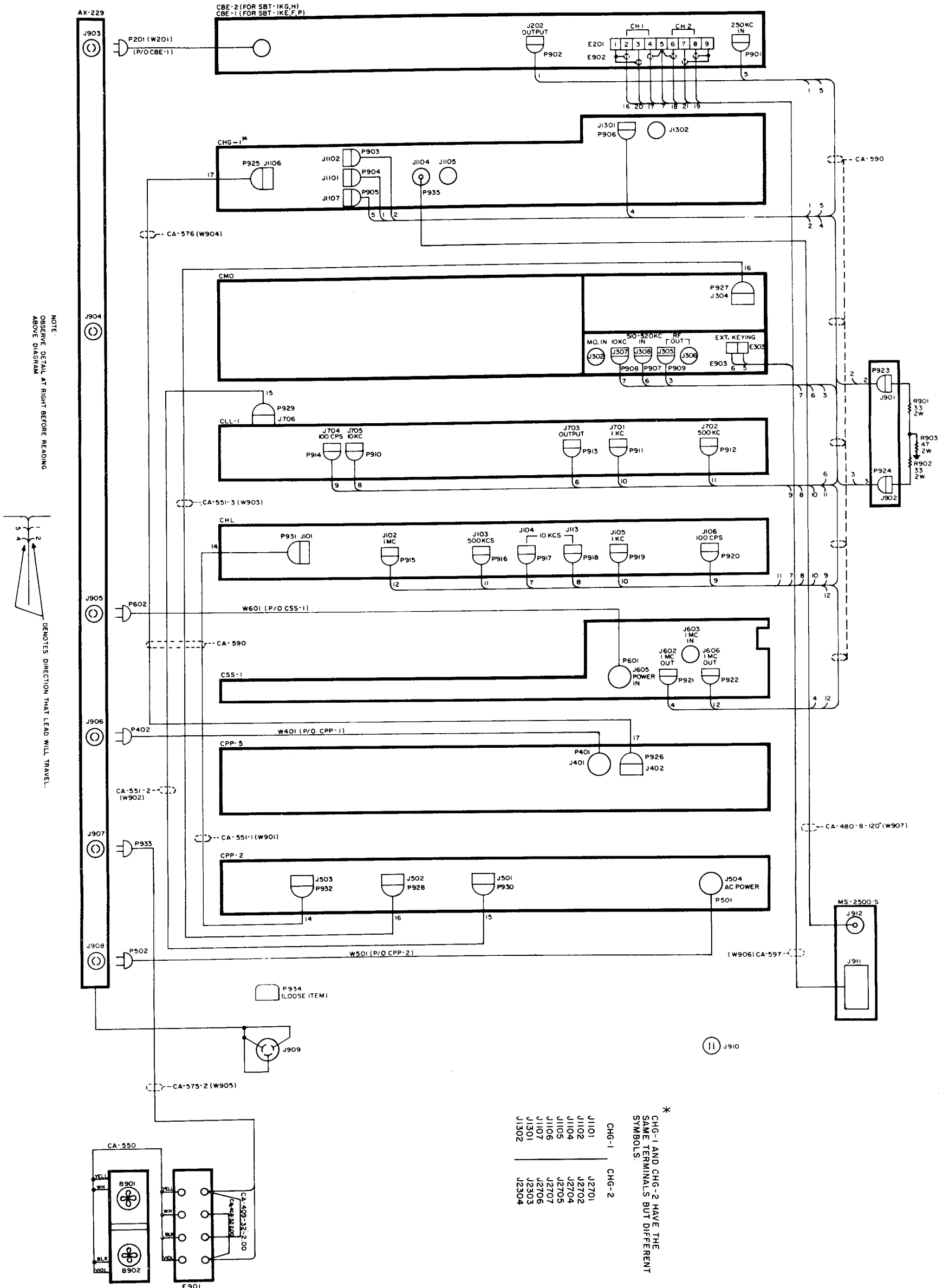


Figure III(A)-2-2. Rack Wiring Assembly for Synthesized SBT-1K Transmitters (Rack 11; CK-481C)

## SECTION 3 OPERATOR'S SECTION

**III(A)-3-1.** CHG and CPP are units of the Controlled Precision Oscillator CPO-1. The operating chart contained in Table I-3-1 (see Part I of manual) provides the information necessary for operation of the CHG and CPP as a component of the CPO-1.

## SECTION 4 PRINCIPLES OF OPERATION

### III(A)-4-1. INTRODUCTION.

CHG and CPP are described briefly in paragraphs I-4-3 and I-4-4, and figures I-4-5 through I-4-7 (see Part I of manual).

CHG has five sub-assemblies as follows:

- a. Regenerative Divider.
- b. Oven and Oscillator.
- c. Synthesizer.
- d. IF Chassis.
- e. Mid-frequency and RF deck.

CPP provides:

- a. +200V DC (unregulated).
- b. +150V DC (regulated).
- c. 6.3V AC.

Figures III(A)-8-1a, III(A)-8-1b, III(A)-8-2a, and III(A)-8-2b are overall schematic diagrams of the CHG's and the CPP's. Figures III(A)-4-1a, b through III(A)-4-7a, b are simplified schematic diagrams associated with stage-by-stage descriptions.

**III(A)-4-2. REGENERATIVE DIVIDER.** (See figures III(A)-4-1a and III(A)-4-1b.)

The Regenerative Divider is supplied with precise 1-mc voltages and supplies precise 250-kc voltages obtained from frequency division of the 1-mc voltages by regeneration. Figures III(A)-4-1a and III(A)-4-1b show the process used.

Tripler (V1602A, CHG-1 or V2602A, CHG-2) has a weak noise spectrum on grid 9. Plate 1 is tuned for 750-kc. The 750-kc component of the noise spectrum takes the path indicated by the heavy solid line.

Mixer (V1601, CHG-1 or V2601, CHG-2) receives a 1-mc voltage from J1601 (CHG-1) or J2601 (CHG-2) and the 750-kc voltage described in the preceding paragraph. Plate 5 of the mixer is tuned to 250-kc. The 250-kc product of the mixer takes the path indicated by the heavy dashed lines. Note that the 250-kc product reaches grid 9 of V1602A (CHG-1) or V2602A (CHG-2).

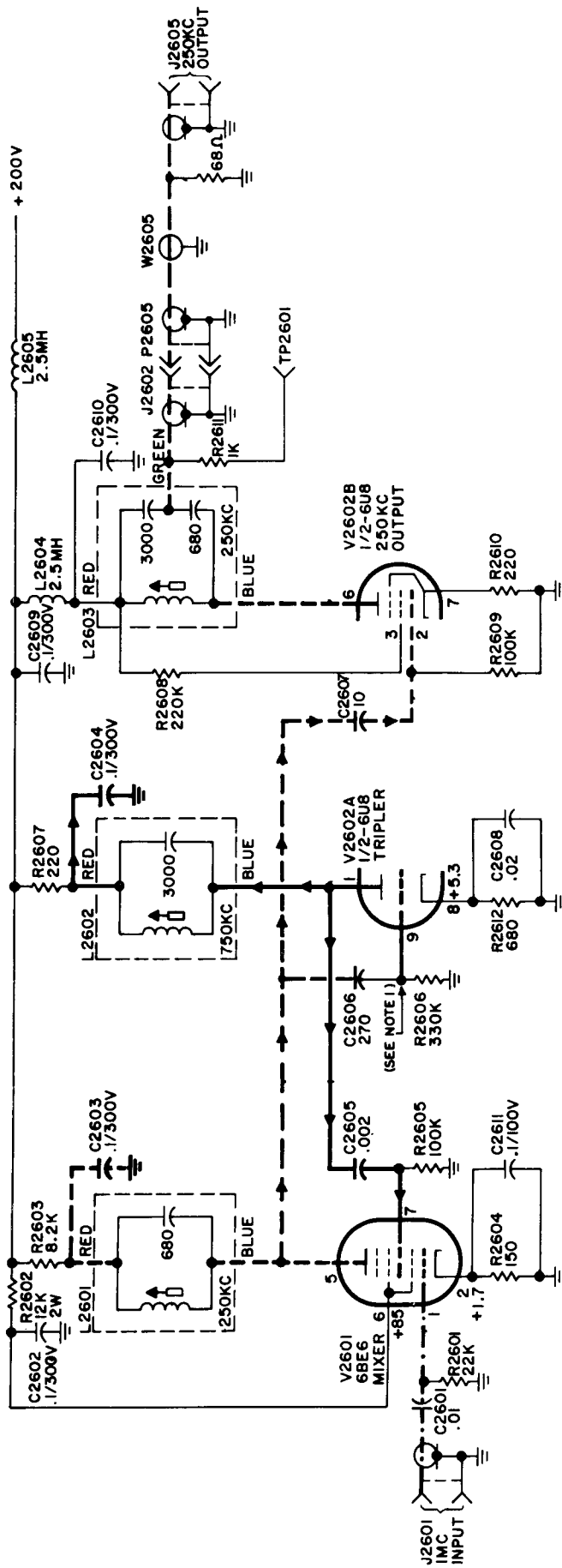
V1602A (CHG-1) or V2602A (CHG-2) now functions as a tripler, converting its 250-kc input into 750-kc due to its 750-kc tuned plate tank. This starts successive cycles of regeneration until a substantial 250-kc level is built up. The 250-kc output stage V1602B (CHG-1) or V2602B (CHG-2) amplifies this built-up level and feeds it to output jack J1107 (CHG-1) or J2706 (CHG-2).

**III(A)-4-3. OVEN AND OSCILLATOR.** (See figures III(A)-4-2a and III(A)-4-2b.)

The Oven and Oscillator has two inputs and five outputs as follows:

- a. Precise 1-mc input from CSS via J1301 (CHG-1) or J2303 (CHG-2).
- b. Phase detector DC input from the Synthesizer via J1305 (CHG-1) or J2311 (CHG-2).
- c. 1-mc output from oven/oscillator 1-mc amplifier via J1303 (CHG-1) or J2305 (CHG-2).
- d. 1-mc output from oven/oscillator 1-mc amplifier via J1304 (CHG-1) or J2306 (CHG-2).





NOTES

- I. INITIAL INPUT TO V2602A IS NOISE SPECTRUM, SUBSEQUENTLY BY REGENERATIVE INPUT IS 250KC AND V2602A AMPLIFIES THIRD HARMONIC (750 KC).

LEGEND	
---	250KC SIGNAL PATH
----	750KC SIGNAL PATH
.....	1000KC SIGNAL PATH

Figure III(A)-4-1b. Schematic Diagram, Regenerative Divider of CHG-2



e. 1-mc output from oven/oscillator 1-mc internal oscillator via J1302 (CHG-1) or J2304 (CHG-2).

f. Synthesized 8- to 15-mc voltages in 1-mc steps from oven/oscillator HF output stage via J1306 (CHG-1) or J2308 (CHG-2).

g. Synthesized 8- to 15-mc voltages in 1-mc steps from oven/oscillator HF output stage via J1307 (CHG-1) or J2309 (CHG-2).

The circuit shown in heavy solid lines begins at J1301 (CHG-1) or J2303 (CHG-2) (item a., above) and terminates at (1) J1302 (CHG-1) or J2304 (CHG-2) (item e., above) and (2) J1303 (CHG-1) or J2305 (CHG-2) (item c., above) and J1304 (CHG-1) or J2306 (CHG-2): provided selector switch S1301 (CHG-1) or S2301 (CHG-2) is in 1-MC EXT position (see figures III(A)-4-2a and III(A)-4-2b, top of chassis in rear left section). If selector switch S1301 (CHG-1) or S2301 (CHG-2) is in 1-MC INT position, 1-mc oscillator V1302A (CHG-1) or V2302A (CHG-2), rather than the external 1-mc standard, provides a 1-mc output. This is applied to J1302 (CHG-1) or J2304 (CHG-2); J1303 (CHG-1) or J2305 (CHG-2); and J1304 (CHG-1) or J2306 (CHG-2). (See heavy dashed line.)

High frequency oscillator V1303 (CHG-1) or V2401 (CHG-2) generates synthesized 8- to 15-mc voltages in 1-mc steps because of 16-position BAND selector switch-component S1402 (CHG-1) or S2401 (CHG-2) (in oven), whose positions are associated with 8- to 15-mc crystals and capacitors (also in oven), inductors-components L1306 and L1307 (CHG-1) or L2401 and L2402 (CHG-2), and a solid state vari-capacitor-component C1319 (CHG-1) or C2425 (CHG-2) whose capacitance varies with DC input. The path of the synthesized 8- to 15-mc voltages is shown in heavy dot-dash lines ending at J1306 (CHG-1) or J2308 (CHG-2) (item f., above) and J1307 (CHG-1) or J2309 (CHG-2) (item g., above).

The frequency of high frequency oscillator V1303 (CHG-1) or V2401 (CHG-2) is controlled by DC from a phase detector located in the Synthesizer. DC from the Synthesizer's phase detector enters the Oven and Oscillator via J1305 (CHG-1) or J2311 (CHG-2). The path is shown in heavy double-dot dash lines ending at vari-capacitor C1319 (CHG-1) or C2425 (CHG-2).

Switch S1402 (REAR) (CHG-1) or S2401 (REAR) (CHG-2) is a member of a 16-position 8-wafer switch assembly whose gear train simultaneously actuates a 4-position 8-wafer switch assembly. The arrangement is shown schematically in figures III(A)-4-7a and III(A)-4-7b. The front panel knob designated BAND simultaneously actuates the BAND [indicated by (16)] and RANGE [indicated by (4)] switches.

Phase detector T1501 (figure III(A)-4-3a) (CHG-1) or T2501 (figure III(A)-4-3b) (CHG-2) controls V1303, V1304 (CHG-1) or V2401, V2402 (CHG-2) frequency. This is done by controlling the supply of DC via J1305 (CHG-1) or J2311 (CHG-2) (item b., above) to vari-capacitor C1319 (CHG-1) or C2425 (CHG-2).

Comparison of figures III(A)-4-2a and III(A)-4-2b shows that CHG-2 contains a connector-filter ele-

ment assembly (J2302 to J2301) in order to suppress unwanted RF from the oscillator chassis. The HF oscillator's output section in the CHG-2 is closer to its crystals in order to minimize lead length. This and larger trimmer capacitors permits the use of crystals with greater tolerances. The crystals in the CHG-1 are selected for optimum performance.

### III(A)-4-4. SYNTHESIZER. (See figures III(A)-4-3a and III(A)-4-3b.)

The Synthesizer has three inputs and three outputs as follows:

a. Precise 1-mc input from J1303 to P1509 (CHG-1) or J2305 to P2405 (CHG-2) of Oven and Oscillator to capacitor C1549 (figure III(A)-4-2a) (CHG-1) or C2548 (figure III(A)-4-2b) (CHG-2) of Synthesizer via wire W1506 (CHG-1) or W2504 (CHG-2) through a grommet located in Synthesizer.

b. Precise 1-mc input from J1304 (CHG-1) or J2306 (CHG-2) of Oven and Oscillator to Synthesizer via P1501 (CHG-1) or P2505 (CHG-2) and wire W1501 (CHG-1) or W2505 (CHG-2) to harmonic generator V1502 (CHG-1) or V2502 (CHG-2).

c. Synthesized 8- to 15-mc voltage (1-mc steps) input from J1307 (CHG-1) or J2308 (CHG-2) of Oven and Oscillator via wire W1502 (CHG-1) or W2502 (CHG-2) through a grommet located in the Synthesizer (same grommet mentioned in a., above).

d. DC Output of phase detector T1501 (CHG-1) or T2501 (CHG-2) via wire W1503 (CHG-1) or W2501 (CHG-2) through a grommet located in the Synthesizer (same grommet mentioned in a., above) to P1505 (figure III(A)-4-2a) (CHG-1) or P2403 (figure III(A)-4-2b) (CHG-2) Oven and Oscillator, thence to vari-capacitor C1319 (figure III(A)-4-2a) (CHG-1) or C2425 (figure III(A)-4-2b) (CHG-2).

e. ON CHG-1, precise 2-mc output from Synthesizer doubler V1505 via wire W1505 and P1503 on Synthesizer chassis to J1201 on IF chassis, thence to IF's 18-mc harmonic generator V1201 (figure III(A)-4-4a). ON CHG-2, precise 18-mc harmonic output from Synthesizer doubler V2505 via transformer T2502, wire W2503 and P2503 on Synthesizer chassis to J2201 on IF chassis, thence to 18-mc amplifier V2201 (figure III(A)-4-4b).

f. Precise 1-mc output from capacitor C1549 (CHG-1) or C2548 (CHG-2) in Synthesizer to J1502 (CHG-1) or J2601 (CHG-2) of Regenerative Divider, thence to mixer V1601 (figure III(A)-4-1a) (CHG-1) or V2601 (figure III(A)-4-1b) (CHG-2).

The circuit shown in heavy solid lines begins at P1501, (CHG-1) or P2505 (CHG-2) (item b., above) with a precise 1-mc input and goes to grid 1 of V1502 (CHG-1) or V2502 (CHG-2). Sixteen position Selector Switch S1501 REAR (CHG-1) or S2501 REAR (CHG-2) provides selection of eight plate-tank circuits tuned from 6- to 13-mc in 1-mc steps. As shown in figures III(A)-4-7a and III(A)-4-7b, Selector Switch S1501 (REAR) (CHG-1) or S2501 (REAR) (CHG-2) is one of many switches

ganged to the BAND knob on CHG's front panel. The selected harmonic (see block diagrams on figures III(A)-4-3a and III(A)-4-3b) is fed to grid 7 of mixer V1503 (CHG-1) or V2503 (CHG-2).

The circuit shown in heavy dot dash lines begins at J1307, (CHG-1) or J2308 (CHG-2) in Oven and Oscillator, passes through the Synthesizer's grommet (item c., above) and goes to grid 1 of V1501 (CHG-1) or V2501 (CHG-2). The circuit voltages are synthesized 8- to 15-mc in 1-mc steps. The selected harmonic A (see block diagrams on figures III(A)-4-3a and III(A)-4-3b) reaches grid 2 of mixer V1503 (CHG-1) or V2503 (CHG-2) via the output of isolation amplifier V1501 (CHG-1) or V2501 (CHG-2).

Referring to figures III(A)-4-7a and III(A)-4-7b, the position of ganged switch wafer S1402 (CHG-1) or S2401 (CHG-2) in the oven compartment, and of wafer S1501 (CHG-1) or S2501 (CHG-2) in the Synthesizer compartment are such that frequency A is exactly (when synthesized) 2-mc greater than frequency C. In this condition the output of mixer V1503 (CHG-1) or V2503 (CHG-2) is exactly 2-mc and is fed to SYNC indicator V1504 (CHG-1) or V2504 (CHG-2) and to phase detector T1501 (CHG-1) or T2501 (CHG-2).

The circuit shown in heavy dot and dash lines begins at J1303 (figure III(A)-4-2a) (CHG-1) or J2305 (figure III(A)-4-2b) (CHG-2) on the Oven and Oscillator. One arm includes doubler V1505 (CHG-1) or V2505 (CHG-2) and phase detector T1501 (CHG-1) or T2501 (CHG-2) (item a., above); a second arm goes to P1508 (CHG-1) or P2506 (CHG-2) on the Synthesizer; thence to J1601, and C1601 (figure III(A)-4-1a) (CHG-1) or J2601 and C2601 (figure III(A)-4-1b) (CHG-2) on the Regenerative Divider (item f., above); a third arm (applicable to CHG-2 only) includes doubler V2505 and P2503 on the Synthesizer subassembly; thence to J2202 on the IF Subassembly (item d., above).

Phase detector T1501 (CHG-1) or T2501 (CHG-2) compares the 2-mc product of mixer V1503 (CHG-1) or V2503 (CHG-2) (frequency A minus frequency C) with the precisely doubled 1-mc frequency output of doubler V1505 (CHG-1) or V2505 (CHG-2). If the two 2-mc frequencies are equal, the phase detector passes a DC voltage to the Oven and Oscillator to lock in its high frequency oscillator V1303 (CHG-1) or V2401 (CHG-2). The path of the DC is shown by heavy dot and dash lines (item d., above).

### III(A)-4-5. IF CHASSIS. (See figures III(A)-4-4a and III(A)-4-4b).

Figure I-4-6 shows that the IF strip is used by the mid-frequency and RF deck only on bands 2, 3, 4, 5. On these bands, IF's balanced modulator receives CMO/CBE's 1.75- to 3.75-mc voltages. On all other bands, IF's output is grounded in the mid-frequency and RF deck.

Figures III(A)-4-4a and III(A)-4-4b show the frequency amplifier IF section. The CHG-1 IF strip receives precise 2-mc voltages from the synthesizer via J1201, P1506 on the IF chassis. This is fed to

harmonic generator V1201, plate tuned to 18-mc. The CHG-2 IF strip receives 18-mc voltages from the synthesizer via J2202, P2503 on the IF chassis. Thus, V2201 (the counterpart of V1201 in the CHG-1 unit) serves only as an amplifier instead of a harmonic generator. Amplifier V1202 (CHG-1) or V2202 (CHG-2) amplifies the 18-mc output of V1201 (CHG-1) or V2201 (CHG-2) and feeds balanced modulator CR1201, CR1202 (CHG-1) or CR2201, CR2202 (CHG-2).

On bands 2, 3, 4, and 5, when the IF strip receives CMO/CBE's 1.75- to 3.75-mc voltages from the mid-frequency and RF deck via J1202, P1101 (CHG-1) or J2203, P2701 (CHG-2) this 1.75- to 3.75-mc voltage is mixed with the 18-mc voltage. This mixed signal is filtered and the 14.25- to 16.25-mc differenced voltages are then amplified by the 4-stage IF amplifier. The 14.25- to 16.25-mc output of the 4-stage amplifier is returned to the mid-frequency and RF deck via J1203, P1102 (CHG-1) or J2204, P2702 (CHG-2).

### III(A)-4-6. MID-FREQUENCY AND RF DECK. (See figures III(A)-4-5a, III(A)-4-5b, III(A)-4-6a, and III(A)-4-6b).

Analysis of the circuits is in two parts--figures III(A)-4-5a and III(A)-4-5b that deal with the mid-frequency to RF frequency translation feature, and figures III(A)-4-6a and III(A)-4-6b that deal with the three-stage RF amplifier.

Referring to figure I-4-6 and to the balanced modulator in figures III(A)-4-5a and III(A)-4-5b, balanced modulator V1101 (CHG-1) or V2701 (CHG-2) receives 2- to 4-mc input from CMO on cathodes 3, 8 and audio-modulated 250-kc input from CBE on grids 2, 7. The balanced modulator's output (lower sideband) is in the 1.75- to 3.75-mc frequency range. The following amplifier V1102 (CHG-1) or V2702 (CHG-2) is equipped with transformer coupled T1102 (CHG-1) or T2702 (CHG-2) two-section grid tuning and transformer coupled T1103 (CHG-1) or T2703 (CHG-2) two-section output tuning. V1102's (CHG-1) or V2702's (CHG-2) output circuit is equipped with a metering circuit containing metering amplifier V1103 (CHG-1) or V2703 (CHG-2) and meter M1001 (CHG-1) or M2101 (CHG-2). V2701's input circuit is provided with ALDC via J2703 which is fed by associated GPT-10K(R) or GPT-40K(A) drivers or by SBT-1K's PS-4A unit. This feature is absent in CHG-1.

The next circuit element consists of wafers of the 16-position 3-wafer BAND Selector Switch which is ganged to 4-position 8-wafer RANGE Selector Switch. In the 2, 3, 4, 5 positions, bands 2, 3, 4, 5 are routed to and from the IF strip (see heavy solid line) to balanced modulator T1104 (CHG-1) or V2704 and V2705 (CHG-2). The unused 1, 6 through 16-positions on S1101A, B, (FRONT) (CHG-1) or S2701A, B (FRONT) (CHG-2) are grounded via the 2, 3, 4, 5 positions on S1101A, B (REAR) (CHG-1) or the 7, 8, 9, 10 positions on S2701A, B (REAR) (CHG-2). In the 1, 6 through 16-positions, bands 1, 6 through 16 are routed directly from T1103 (CHG-1) or T2703 (CHG-2) (FRONT) (CHG-1) or to S201A, B (FRONT) (CHG-2) to balanced modulator T1104 (CHG-1) or V2704 and V2705 (CHG-2).

The balanced modulator also receives high frequency voltages from the Oven and Oscillator via J1306, P1194, wire W1104, grid 1 of HF AMP V1104, plate tank circuits of V1104, to balanced modulator T1104 via P1103 and J1103, all of CHG-1 or via J2309, P2703, wire W2703, grid 1 of HF AMP V2709, plate tank circuits of V2709, to cathode 7 on balanced modulator V2704, all of CHG-2 (see heavy dotted lines).

The plate tank circuits of V1104 (CHG-1) or V2709 (CHG-2) are associated with two wafers of the 16-position 8-wafer BAND Selector Switch. Table III(A)-4-1 shows the frequencies of the wanted voltages at various terminals of balanced modulator T1104 (CHG-1) or V2704 and V2705 (CHG-2) versus position of the 16-position 8-wafer BAND Selector Switch.

The output of balanced modulator T1104 (CHG-1) or V2704 and V2705 (CHG-2) is fed to the commutator or 1 segment of S1103 (REAR) (CHG-1) or S2703 (REAR) (CHG-2). Gain control is provided by OUTPUT gain control resistor R1125 (CHG-1) or R2725 (CHG-2).

Figures III(A)-4-6a and III(A)-4-6b show the final circuits in the mid-frequency and RF deck. The solid heavy lines indicate signal flow in the 1.75- to 3.75-mc range. The signals are amplified by four amplifiers which are grid and plate tuned. The heavy dash lines indicate signal flow in the 3.75- to 7.35-mc range. The signals are amplified by the same four amplifiers.

The heavy dot-dash lines indicate signal flow in the 7.75- to 15.75-mc range. The signals are amplified by the same four amplifiers. The heavy double-dot dash lines indicate signal flow in the 15.75- to 33.75-mc range. The signals are again amplified by the same four amplifiers.

Meter M1002 (CHG-1) or M2102 (CHG-2) indicates output level throughout the 1.75- to 33.75-mc frequency range.

**III(A)-4-7. POWER SUPPLY CPP-1, 5.** (See figure III(A)-8-2.)

The CHG's require 200V DC (unregulated), 150V AC (regulated), 6.3V AC and 115/530V AC from the CPP-1.

200V DC reaches CHG's via terminal H of J402 and is obtained by a "dry" rectifier composed of CR401 through CR404 selenium rectifiers.

150V DC reaches CHG's via terminal G of J402 and is obtained by OA2 regulator tube fed by 200V DC unregulated bus.

6.3V AC output reach CHG's via terminals NC, BF, and AJ of J402. POWER ON indicator 1401 operates on 3.15V AC to ground. Terminal J402 interconnects with J1106 (CHG-1) or J2701 (CHG-2).

**TABLE III(A)-4-1. FREQUENCIES VS BAND SELECTOR SWITCH POSITION**

Switch Position	Band	MCS Dial Designation	Frequency A Oven/Oscillator	Input freq. from S1101A	Input freq. V1103	Output freq. to S1103
1	1	OA	10-mc	1.75-3.75mc	20-mc	1.75-3.75mc
2	2	2B	10-mc	14.25-16.25mc	20-mc	3.75-5.75mc
3	3	4B	11-mc	14.25-16.25mc	22-mc	5.75-7.75mc
4	4	6C	12-mc	14.25-16.25mc	24-mc	7.75-9.75mc
5	5	8C	13-mc	14.25-16.25mc	26-mc	9.75-11.75mc
6	6	10C	10-mc	1.75-3.75mc	10-mc	11.75-13.75mc
7	7	12C	12-mc	1.75-3.75mc	12-mc	13.75-15.75mc
8	8	14D	14-mc	1.75-3.75mc	14-mc	15.75-17.75mc
9	9	16D	16-mc	1.75-3.75mc	16-mc	17.75-19.75mc
10	10	18D	9-mc	1.75-3.75mc	18-mc	19.75-21.75mc
11	11	20D	10-mc	1.75-3.75mc	20-mc	21.75-23.75mc
12	12	22D	11-mc	1.75-3.75mc	22-mc	23.75-25.75mc
13	13	24D	12-mc	1.75-3.75mc	24-mc	25.75-27.75mc
14	14	26D	13-mc	1.75-3.75mc	26-mc	27.75-29.75mc
15	15	28D	14-mc	1.75-3.75mc	28-mc	29.75-31.75mc
16	16	30D	15-mc	1.75-3.75mc	30-mc	31.75-33.75mc

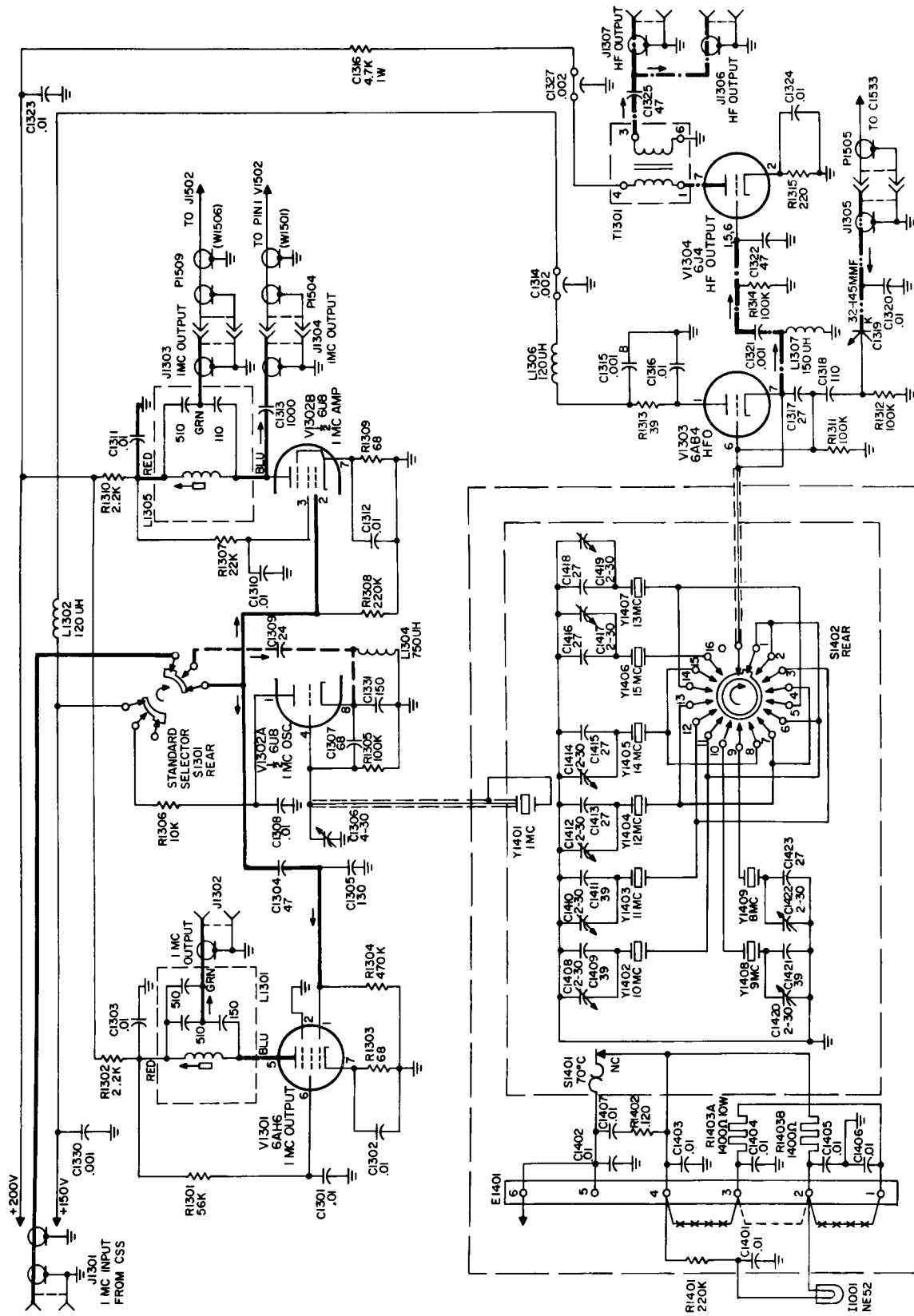


FIGURE III (A)-4-2a. Schematic Diagram, Oven/Oscillator of CHG-1.

FOR 220V OPERATION OF E1401  
 REMOVE JUMPERS MARKED \* FROM TERMINALS 1, 2, 3, 4.  
 ADD JUMPER MARKED --- BETWEEN TERMINALS 2 & 3.

LEGEND  
 (SOLID) 1 MC STANDARD FROM CSS.  
 (DASHED) 1 MC FROM INTERNAL OSCILLATOR.  
 (DOT-DASHED) HFO OUTPUT (A MC).  
 (DOUBLE-DOT-DASHED) DC FEEDBACK FROM SYNTHESIZERS PHASE DETECTOR T1501.

Figure III(A)-4-2a. Schematic Diagram, Oven/Oscillator of CHG-1



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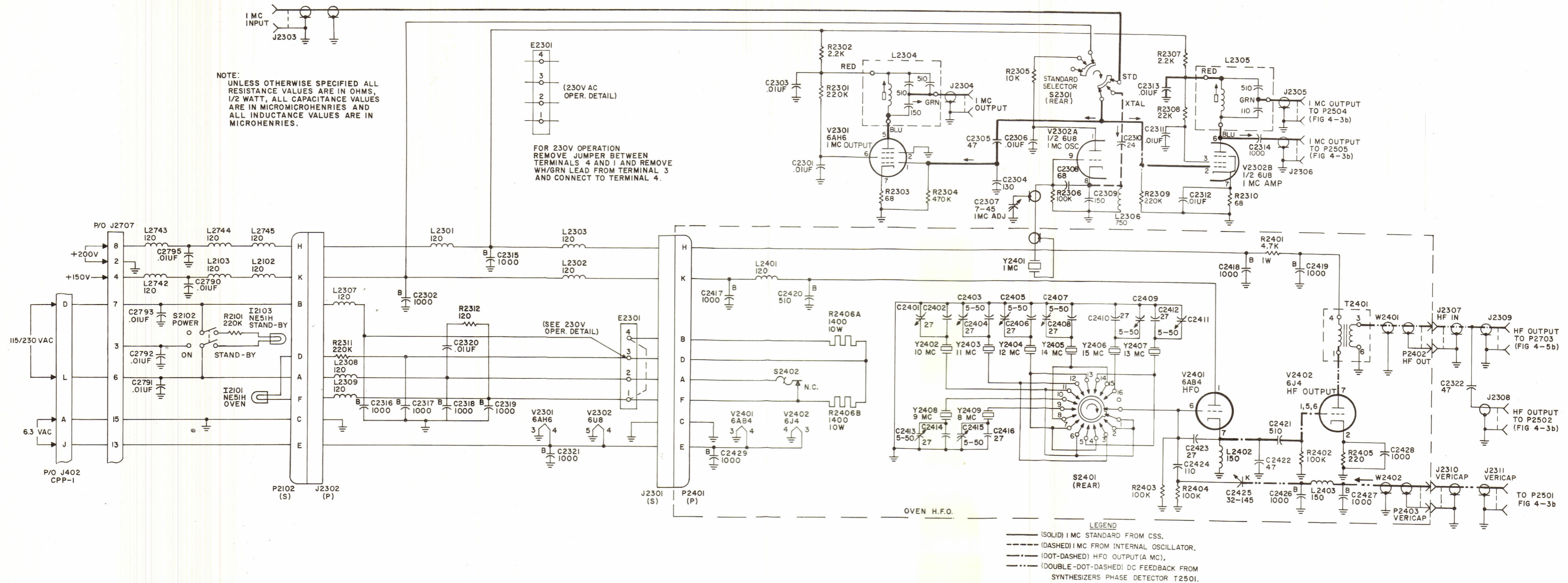


Figure III(A)-4-2b. Schematic Diagram, Oven/Oscillator of CHG-2

- LEGEND
- SOLID - HARMONICS OF I-MC STD (C-MC)
  - DOTTED - HFO INPUT (A-MC)
  - .-.- DOT/DASH, 2ND HARMONIC OF I-MC STD
  - DOUBLE DOT/DASH (DC OUTPUT OF PHASE DETECTION)
  - \*-\*-\* 2 MC DIFFERENCE OF A-MC (---) AND C-MC (---) SIGNALS.

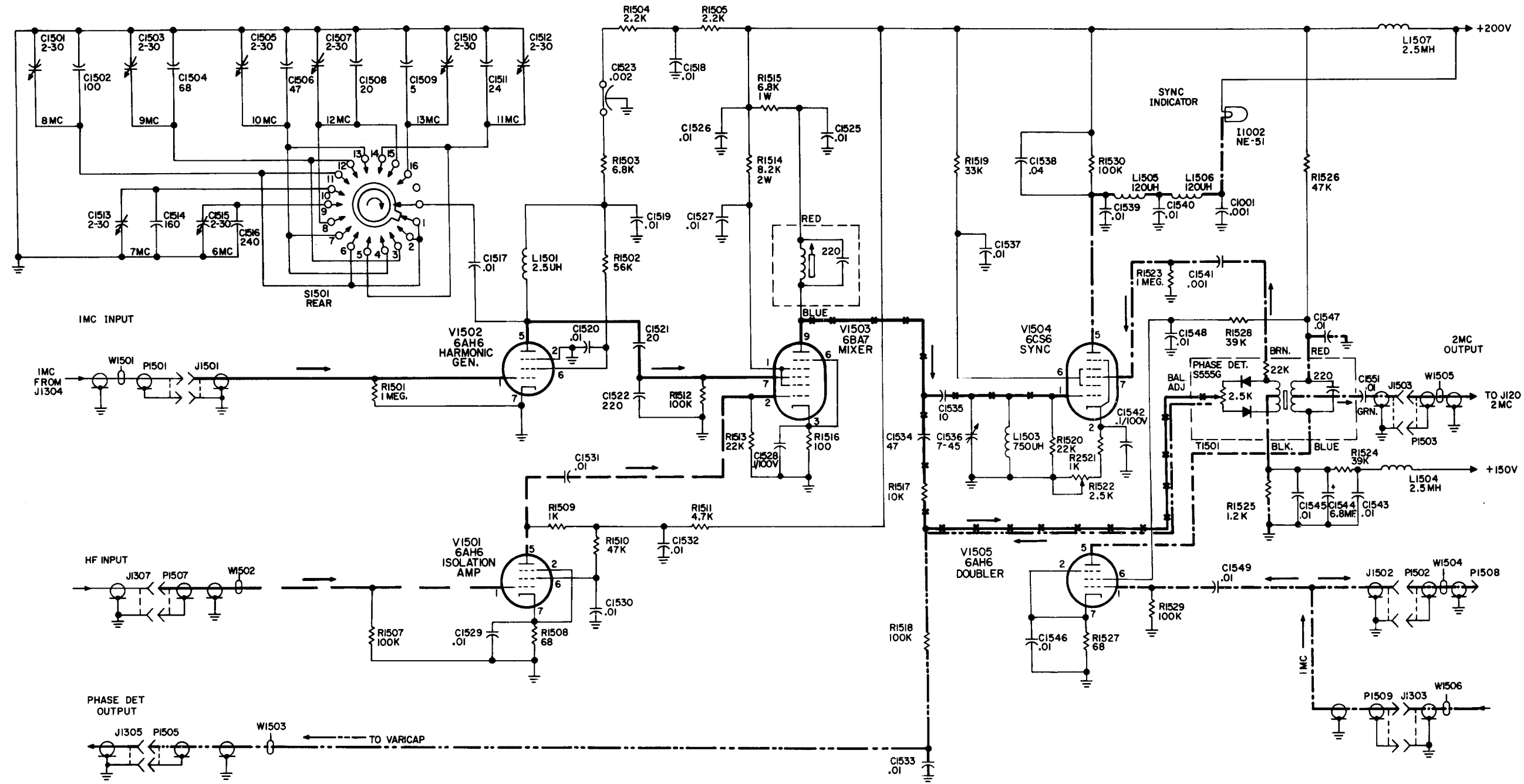
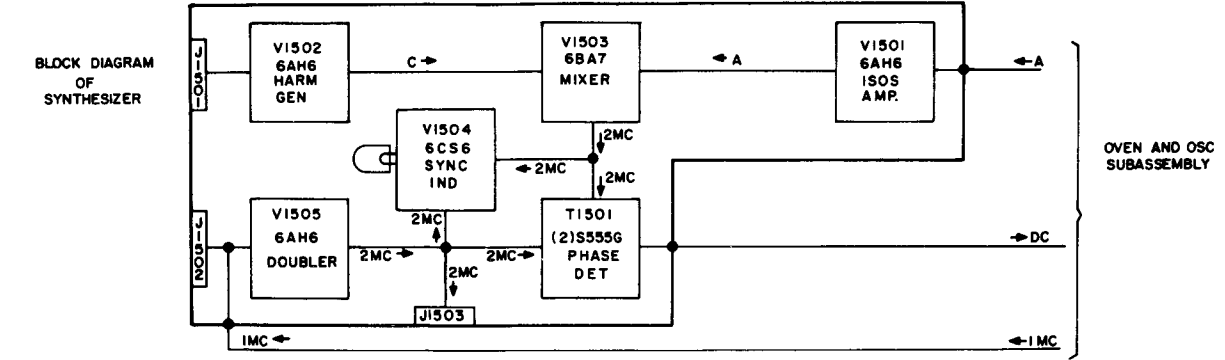
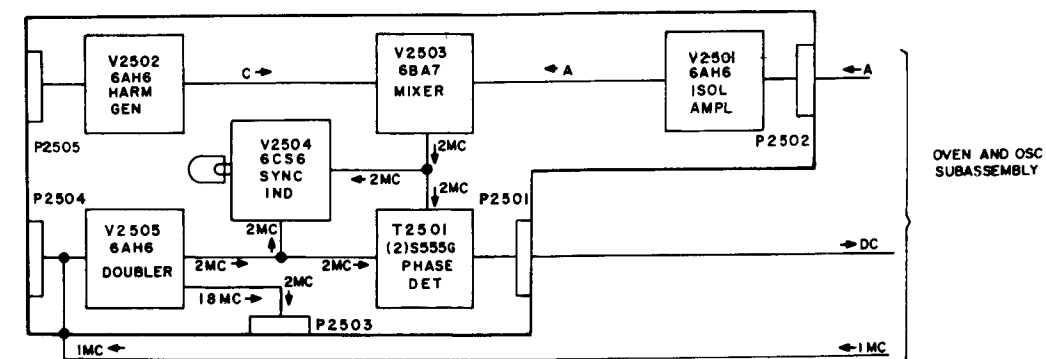


Figure III(A)-4-3a. Schematic Diagram, Synthesizer of CHG-1

- LEGEND
- SOLID-1-MC OR HARMONICS OF 1-MC STD (C-MC)
  - - - DOTTED-HFO INPUT (A-MC)
  - · · · · DOT/DASH, 2ND HARMONIC OF 1-MC STD
  - · - · - · DOUBLE DOT/DASH (DC OUTPUT OF PHASE DETECTION)
  - \* \* \* \* \* 2 MC DIFFERENCE OF A-MC (-----) AND C-MC (——) SIGNALS.

NOTE:  
UNLESS OTHERWISE SPECIFIED ALL RESISTANCE VALUES ARE IN OHMS, 1/2 WATT, ALL CAPACITANCE VALUES ARE IN MICROMICROFARADS AND ALL INDUCTANCE VALUES ARE IN MICROHENRIES.

BLOCK DIAGRAM OF SYNTHESIZER



OVEN AND OSC SUBASSEMBLY

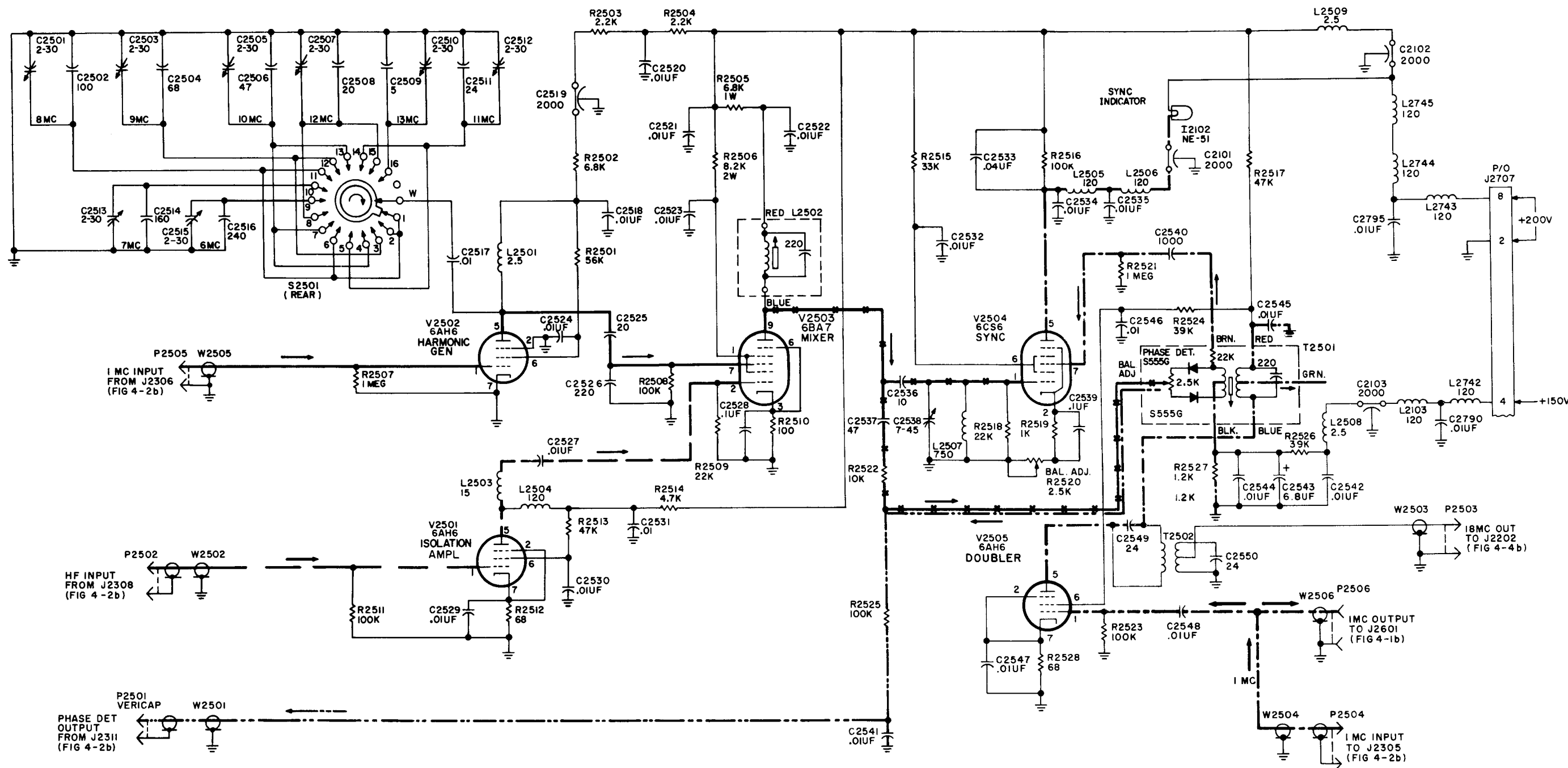


Figure III(A)-4-3b. Schematic Diagram, Synthesizer of CHG-2



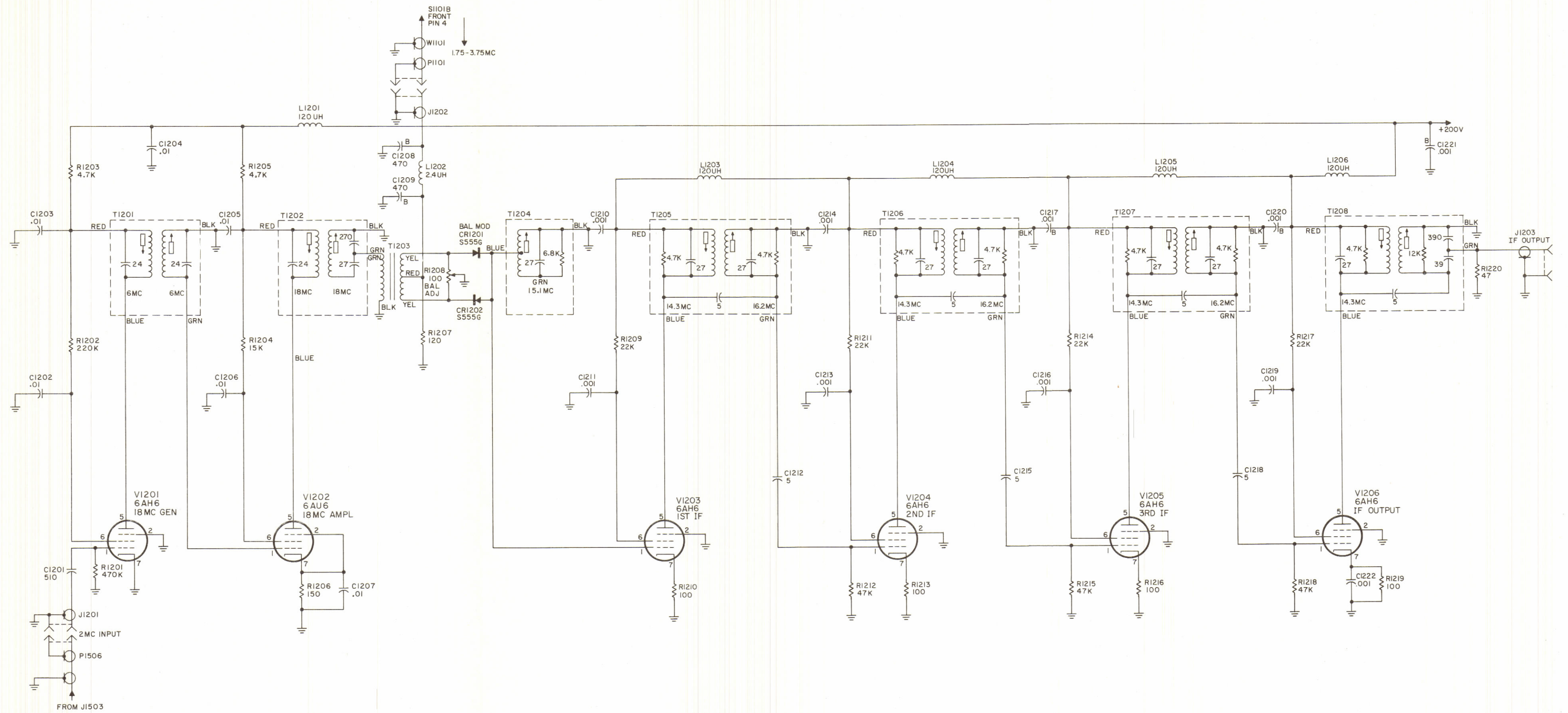
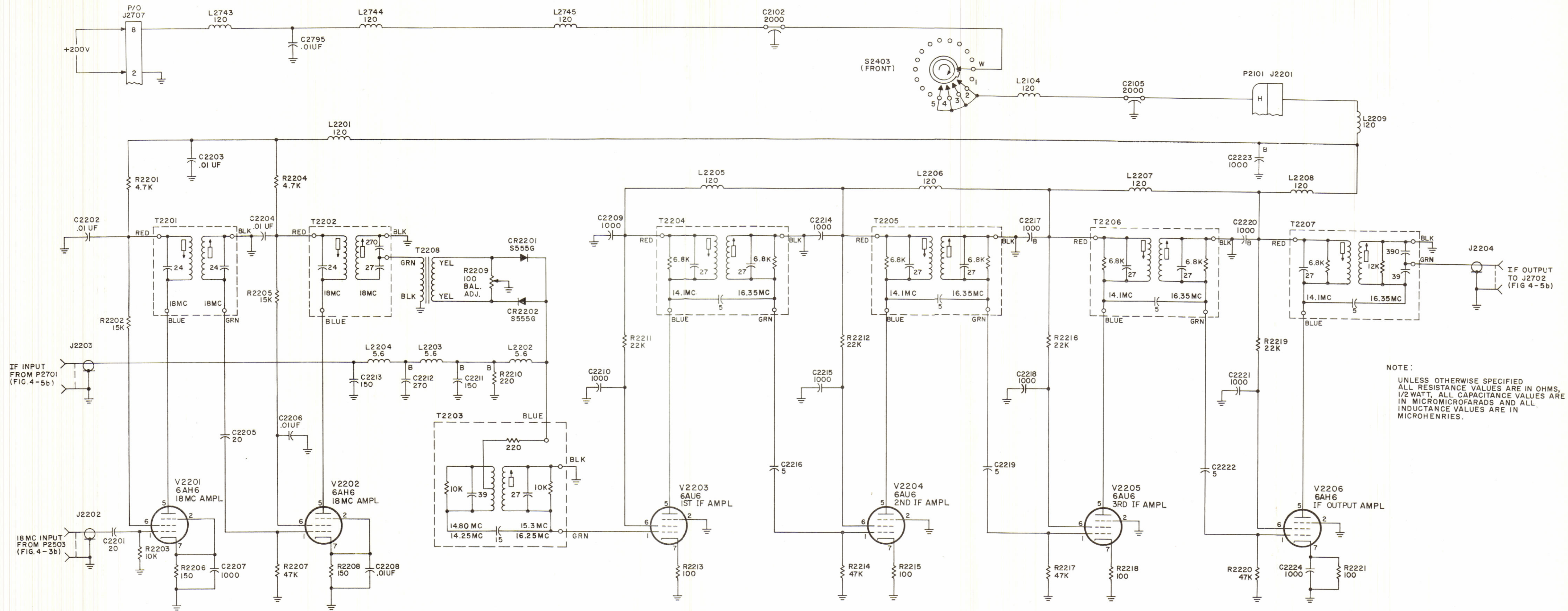


Figure III(A)-4-4a. Schematic Diagram, IF Section of CHG-1



NOTE:  
 UNLESS OTHERWISE SPECIFIED  
 ALL RESISTANCE VALUES ARE IN OHMS,  
 1/2 WATT, ALL CAPACITANCE VALUES ARE  
 IN MICROMICROFARADS AND ALL  
 INDUCTANCE VALUES ARE IN  
 MICROHENRIES.

Figure III(A)-4-4b. Schematic Diagram, IF Section of CHG-2

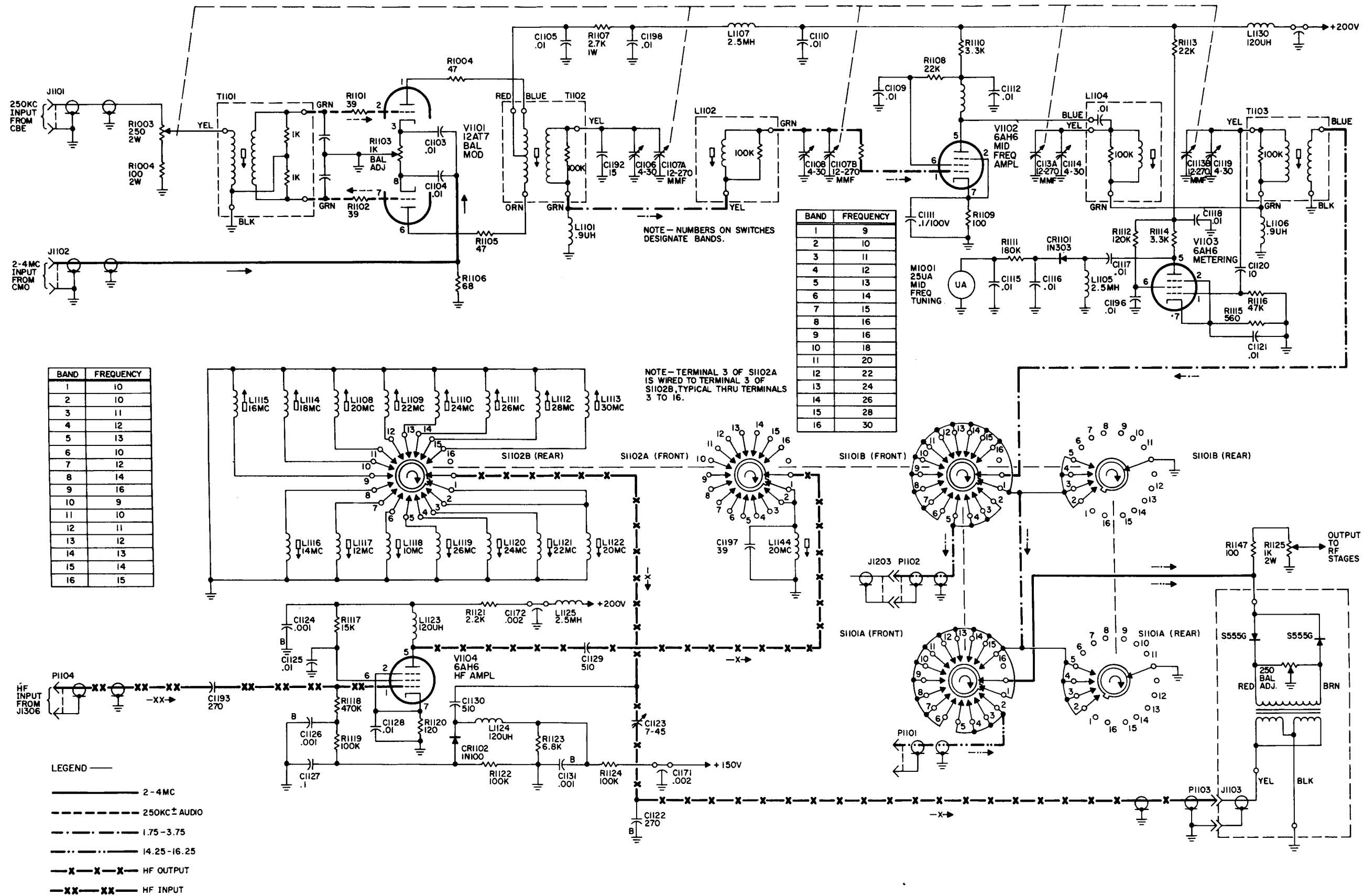


Figure III(A)-4-5a. Schematic Diagram, Mid Frequency and RF Deck Subassembly (MF to RF Component) of CHG-1

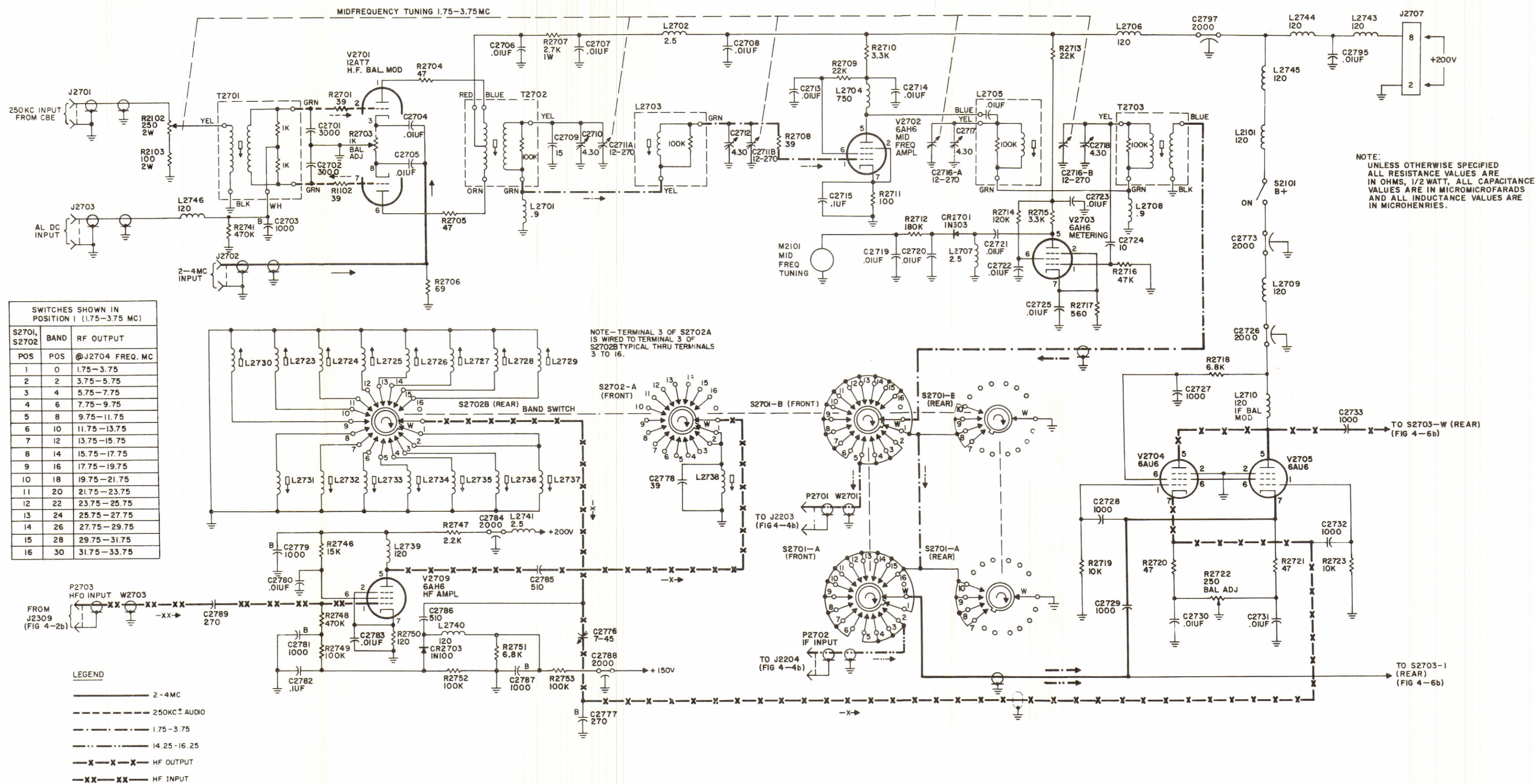


Figure III(A)-4-5b. Schematic Diagram, Mid Frequency and RF Deck Subassembly (MF to RF Component) of CHG-2

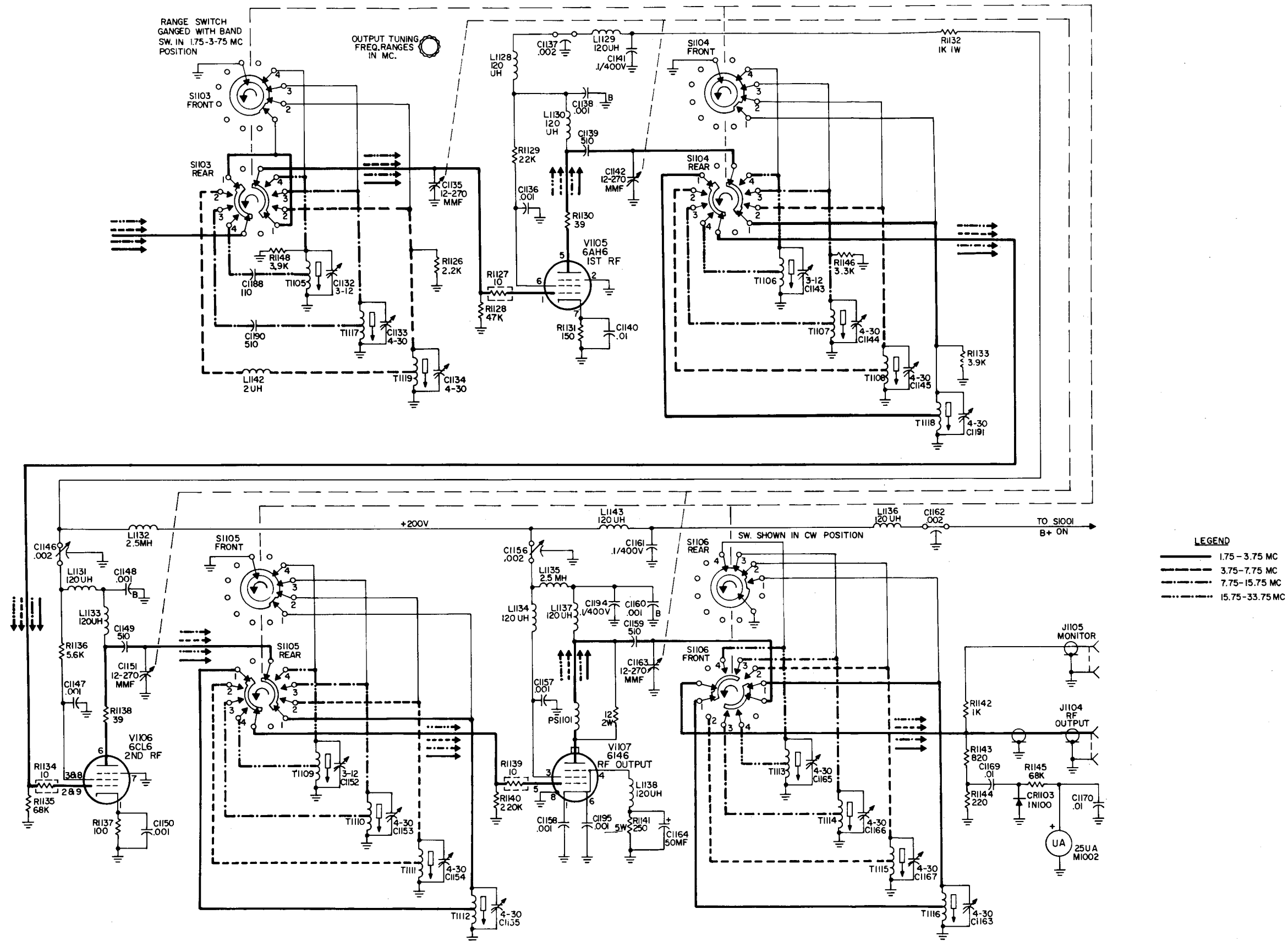


Figure III(A)-4-6a. Schematic Diagram, RF Deck of CHG-1

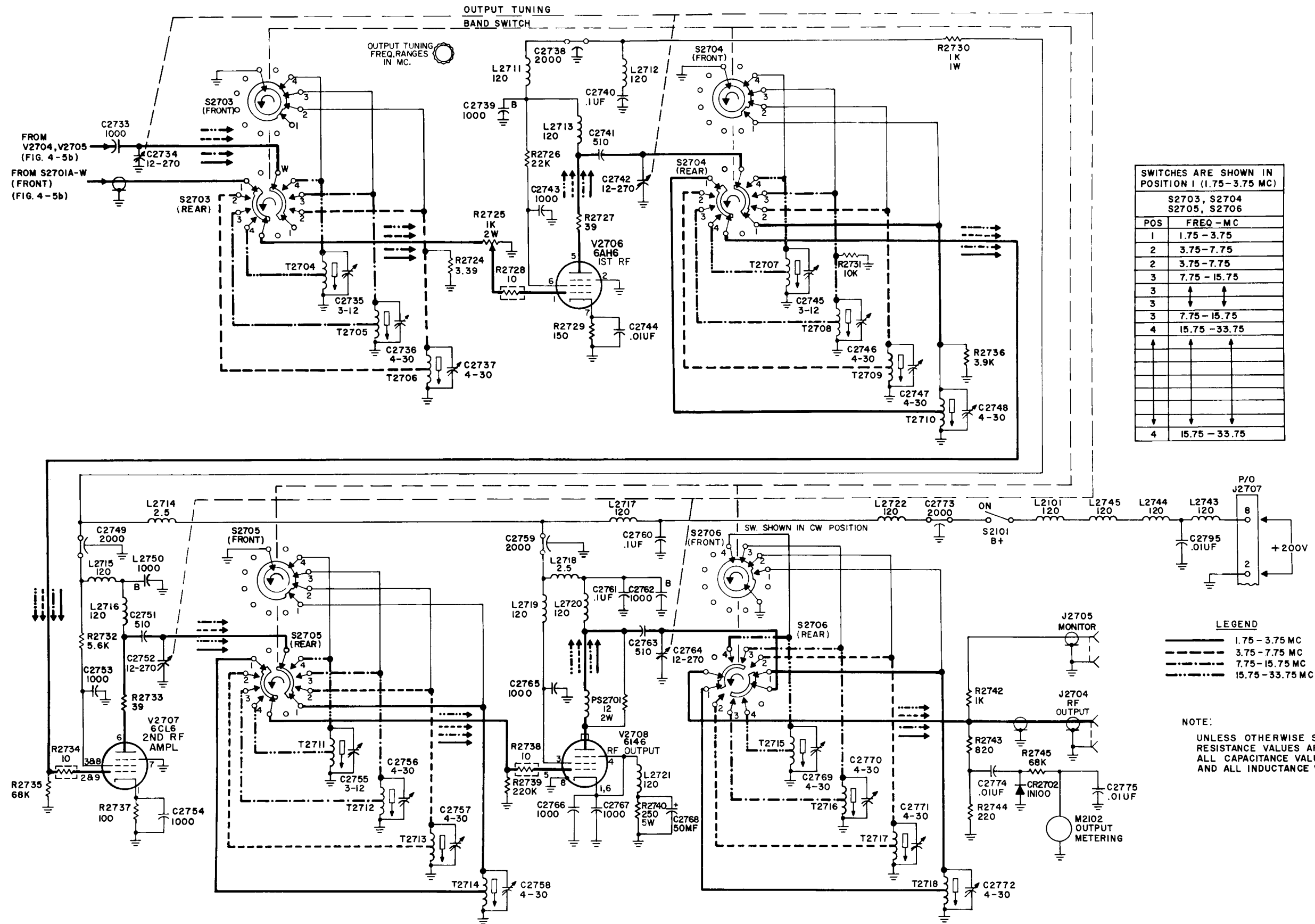


Figure III(A)-4-6b. Schematic Diagram, RF Deck of CHG-2

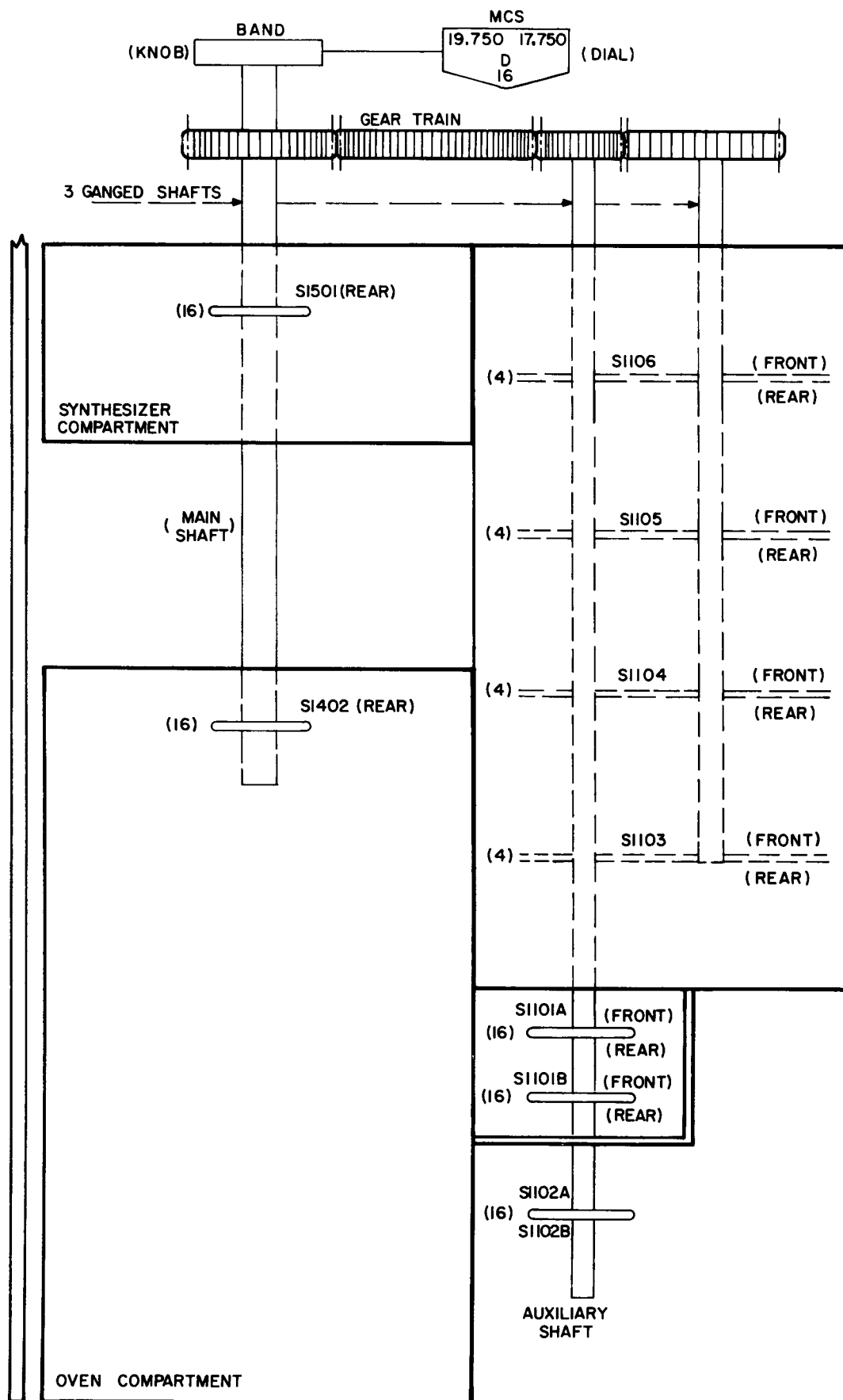


Figure III(A)-4-7a. Gear Train Arrangement of Band/Range Switches, CHG-1

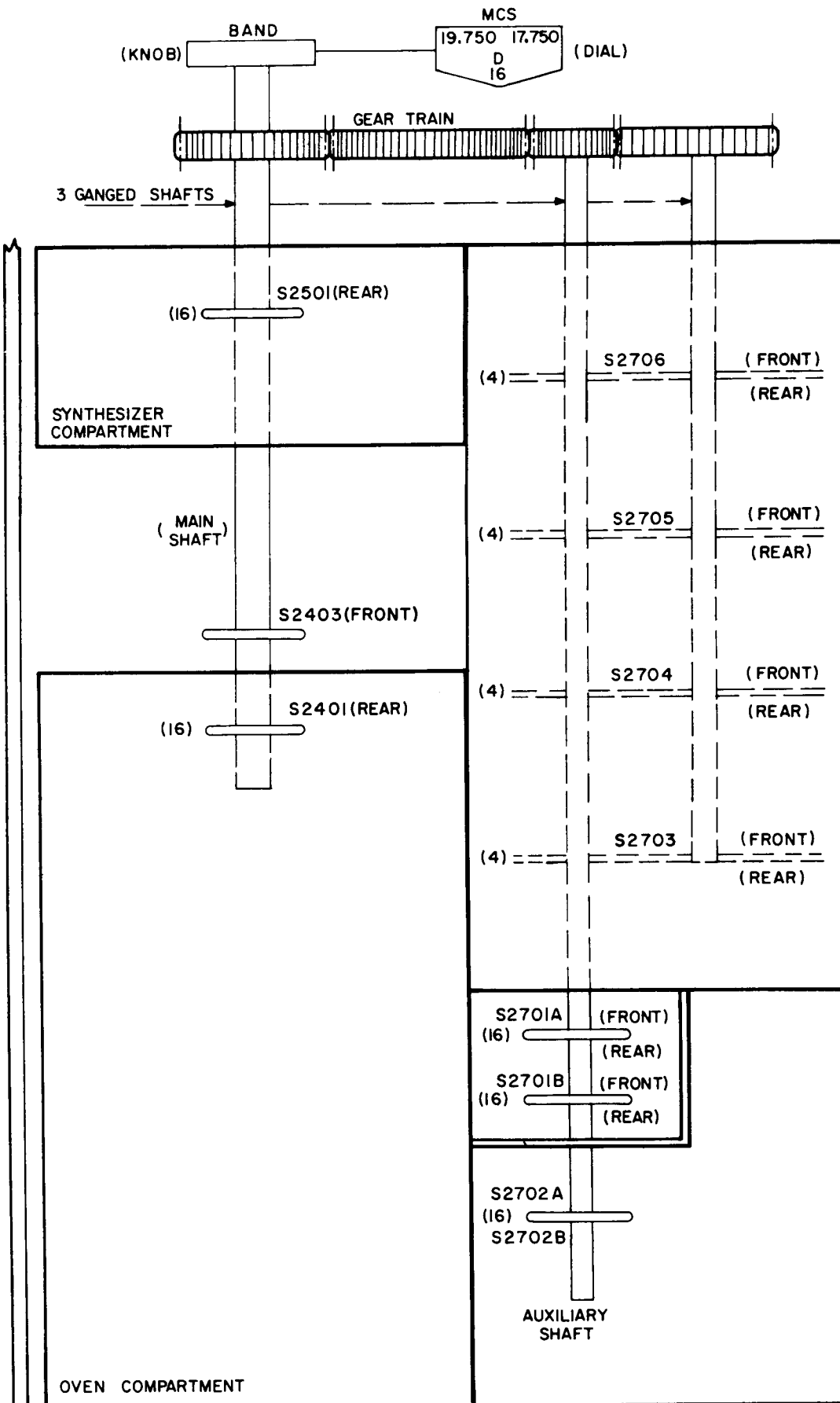


Figure III(A)-4-7b. Gear Train Arrangement of Band/Range Switches, CHG-2



## **SECTION 5 TROUBLE-SHOOTING**

### **III(A)-5-1. INTRODUCTION.**

General trouble-shooting involving CHG's and CPP's is discussed in I-5. Detailed trouble-shooting involving CHG's and CPP's is discussed below.

### **III(A)-5-2. VOLTAGE AND RESISTANCES.**

Table III(A)-5-1a and III(A)-5-1b list voltages and resistance measurements at tube pins in the CHG's. Table III(A)-5-2 lists stage gains in the CHG-1. Table III(A)-5-3 lists RF voltage measurements in the CHG-2.

### **III(A)-5-3. PARTS LOCATION DATA.**

Figures III(A)-5-1 through III(A)-5-4 locate major electronic components in the CHG's and CPP's.

### **III(A)-5-4. TROUBLE-SHOOTING BASED ON CIRCUIT SECTIONALIZATION.**

Refer to III(G)-6.

**TABLE III(A)-5-1a. VOLTAGE AND RESISTANCE MEASUREMENTS, CHG-1**

DC VOLTAGES (BAND MC SWITCH IN POSITION "8", 2-4 MC INSERTION AND 250 KC INSERTION REMOVED, OUTPUT - FULL CW, MF TUNE - 2 MC, ALL VOLTAGES POSITIVE TO GROUND UNLESS OTHERWISE INDICATED.)

DC VOLTAGES TO CHASSIS CHG-1

TUBE	PIN NO.									
	1	2	3	4	5	6	7	8	9	CAP
V1101	170		2.25			170		1.95		
V1102		1.0			160	115	1.0			
V1103		1.25			130	85	1.25			
V1104	.73	.85			170	150	.85			
V1105		0			180	115	1.3			
V1106	3.5					190	0	153		
V1107	21		193	21		21		0		
V1201	-.3	0			180	70	0			
V1202		1			160	130	1			
V1203		0			195	130	1.35			
V1204		0			195	130	1.35			
V1205		0			195	142	1.1			
V1206		0			195	125	1.38			
V1301	-.3	0			160	125	.35			
V1302	110	-3	145			178	.3	.05	-.3	
V1303	145					-.25				
V1304		1.55					150			
V1501	-.25	.45			155	105	.45			
V1502	-16	0			160	130	0			
V1503	90		1.5			1.5			170	
V1504		6.2			155	120				
V1505	-20	.35			165	120	.35			
V1601		1.25			175	105				
V1602	190	.55	65			195	.55	3.6		

**TABLE III(A)-5-1a. VOLTAGE AND RESISTANCE MEASUREMENTS, CHG-1 (Cont.)**

RESISTANCES (MAIN POWER OFF)

TUBE	PIN NO.									
	1	2	3	4	5	6	7	8	9	CAP
V1101	inf.	520	520			inf.	520	550		
V1102	39	100			inf.	inf.	100			
V1103	47K	560			inf.	inf.	560			
V1104	550K	120			inf.	inf.	120			
V1105	10	G			inf.	inf.	150			
V1106	100	10				inf.	G	inf.		
V1107	250		inf.	250	10	250		G		
V1201	470K	G			inf.	inf.	G			
V1202	0	150			inf.	inf.	150			
V1203	0	G			inf.	inf.	100			
V1204	47K	G			inf.	inf.	100			
V1205	47K	G			inf.	inf.	100			
V1206	47K	G			inf.	inf.	100			
V1301	470K	G			inf.	inf.	68			
*V1302	inf.	220K	inf.			inf.	68	16	100K	
*V1303	inf.					100K	1.8			
V1304		220			100K		inf.			
V1501	100K	68			inf.	inf.	68			
V1502	1M	G			inf.	inf.	G			
V1503	inf.	22K	100			100	100K		inf.	
V1504	16	2.5K			inf.	inf.	1M			
V1505	100K	68			inf.	inf.	68			
V1601										
V1602										

\*J1308 DISCONNECTED

**TABLE III(A)-5-1b. VOLTAGE AND RESISTANCE MEASUREMENTS, CHG-2**

DC VOLTAGES (BAND MC SWITCH IN POSITION "8", 2-4 MC INSERTION AND 250 KC INSERTION REMOVED, OUTPUT - FULL CW, MF TUNE - 2 MC, ALL VOLTAGES POSITIVE TO GROUND UNLESS OTHERWISE INDICATED.)

DC VOLTAGES TO CHASSIS

TUBE	PIN NO.									
	1	2	3	4	5	6	7	8	9	CAP
V2201	0	1.2	0	H	155	130	1.2			
V2202	0	1.2	0	H	153	130	1.2			
V2203	0	0	0	H	195	135	.9			
V2204	0	0	0	H	195	137	.95			
V2205	0	0	0	H	195	133	1.0			
V2206	0	0	0	H	195	147	1.1			
V2301	-.15	0	0	H	190	80	.15			
V2302	107	-.45	140	H	0	180	.5	.1	-.3	
V2401	142	0	H	0	0	-.45	0			
V2402	0	2	0	H	0	0	.150			
V2501	-.1	.4	H	0	165	115	.4			
V2502	-32	0	H	0	157	125	0			
V2503	105	-.9	1.4	0	H	1.4	0	0	.172	
V2504	0	5.3	0	H	122	122	0			
V2505	-38	.5	H	0	165	122	.5			
V2601	-32	1.45	H	0	180	100	-1.25			
V2602	195	-.7	65	H	0	195	.5	4	-5.6	
V2701	175	0	1.85	H	H	175	0	2.0	0	
V2702	0	.8	0	H	168	123	.8			
V2703	0	1.25	0	H	138	100	1.25			
V2704	0	0	0	H	195	160	1.8			
V2705	0	0	0	H	195	160	1.8			
V2706	0	0	0	H	180	135	1.05			
V2707	3.3	0	NC	0	H	195	0	156	NC	
V2708	21.5	H	195	21.5	0	21.5	0	0		195
V2709	-.3	1.0	H	0	180	155	1.0			

**TABLE III(A)-5-1b. VOLTAGE AND RESISTANCE MEASUREMENTS, CHG-2 (Cont.)**

RESISTANCES (MAIN POWER OFF)

TUBE	PIN NO.									
	1	2	3	4	5	6	7	8	9	CAP
V2201	10K	150	0	0	inf.	inf.	150			
V2202	47K	150	0	0	inf.	inf.	150			
V2203	0	0	0	0	inf.	inf.	100			
V2204	47K	0	0	0	inf.	inf.	100			
V2205	47K	0	0	0	inf.	inf.	100			
V2206	47K	0	0	0	inf.	inf.	100			
V2301	450K	0	0	0	0	0	60			
V2302	inf.	210K	inf.	0	0	inf.	70	17	90K	
V2401	80K	inf.	0	0	inf.	90K	0			
V2402	90K	200	0	0	inf.	inf.	inf.			
V2501	100K	60	0	0	inf.	inf.	60			
V2502	1M	0	0	0	0	inf.	0			
V2503	inf.	22K	100	0	0	100	100K	inf.	inf.	
V2504	17	1.7K	0	0	inf.	inf.	100K			
V2505	90K	70	0	0	inf.	inf.	70			
V2601	22K	150	0	0	inf.	inf.	100K			
V2602	inf.	90K	inf.	0	0	inf.	220	650	300K	
V2701	inf.	450K	560	0	0	inf.	450K	560	0	
V2702	40	100	0	0	inf.	inf.	100			
V2703	47K	600	0	0	inf.	inf.	600			
V2704	1K	0	0	0	inf.	inf.	220			
V2705	1K	0	0	0	inf.	inf.	220			
V2706	12	0	0	0	inf.	inf.	100			
V2707	100	10	NC	0	0	inf.	0	inf.	NC	
V2708	220	0	inf.	220	10	220	0	0		inf.
V2709	560K	120	0	0	inf.	inf.	120			
V2709	3	1.0	H	0	180	155	1.0			

TABLE III(A)-5-2. STAGE GAINS, CHG-1

GENERAL	
Taken with H. P. VTVM Mod. 410B Voltages R. F. (RMS) unless otherwise indicated $\pm 10\%$ Voltages taken with B+ "ON" Band Mcs to Position "0"	
SYNC SECTION	
V1501 (Isol. Amp.):	Pin #1 (Grid) - 1.25v, Pin #5 (Plate) - 2.9v
V1502 (Har. Gen.):	Pin #1 (Grid) - 96v, Pin #6 (Plate) - 14.5v
V1503 (Mixer):	Pin #2 (1st Grd) - 2.9v, Pin #7 (2nd Grd) - 2.3v, Pin #9 (Plt) - 11.5v
V1504 (Sync.):	Pin #1 (1st Grd) - 1.5v, Pin #7 (2nd Grd) - 2.2v, Pin #5 (Plt) - 0v
V1505 (Doubler):	Pin #1 (Grid) - 19v, Pin #5 (Plate) - 51v, J1503 (2 mc out) - 13v
H. F. SECTION	
<u>Band Mcs in Pos. "0"</u>	
V1104 (H. F. Amp.):	Pin #1 (Grid) - 2.9v, Pin #5 (Plate) - 8v
M. F. SECTION	
<u>M. F. up to Red</u>	
V1101 (Bal. Mod.):	Pin #1 (Plate) - .18v, Pin #6 (Plate) - .18v
V1102 (M. F. Amp.):	Pin #1 (Grid) - Negligible, Pin #5 (Plate) - 1.5v
V1103 (Metering):	Pin #1 (Grid) - .33v, Pin #5 (Plate) - 3.3v
R. F. SECTION	
<u>M. F. up to Red (1.75), Band Mcs to Pos. "0", Out-tuning to 1.75 (A), Output to 10</u>	
V1105 (1st R. F.):	Pin #1 (Grid) - Negligible, Pin #5 (Plate) - .35v
V1106 (2nd R. F.):	Pin #2 & 9 (Grid) - .13v, Pin #6 (Plate) - 10v
V1107 (R. F. Out):	Pin #5 (Grid) - 4v, Top of T116 - 42v, Output Pin on Switch - 8v
OSCILLATOR CHASSIS	
<u>Band Mcs Switch to Pos. "0", 1mc Switch to "1mc Int."</u>	
V1301 (1mc Out):	Pin #1 (Grid) - 1.3v, Pin #5 (Plate) - 60v
V1302A (1mc Osc):	Pin #9 (Grid) - 30v, Pin #1 (Plate) - DCV
V1302B (1mc Amp):	Pin #2 (Grid) - 5v, Pin #6 (Plate) - 110v (J1304 Connected)
V1303 (HFO Amp):	Pin #6 (Grid) - 2.5v, Pin #1 (Plate) - DCV, Pin #7 (Cath) - 1v
V1304 (HFO Out)	Pin #1, 5, 6 (Grid) - 1v, Pin #7 (Plate) - 6v
J1303 (1mc):	22v
J1304 (1mc):	18v
J1305 (HFO):	(DCV to Varicap)
J1306 (HFO):	3v
J1307 (HFO):	2.5v

**TABLE III(A)-5-3. RF VOLTAGE MEASUREMENTS, CHG-2**

TEST CONDITIONS: Unit tuned for maximum output on 10 mcs. 0 db carrier, CHAN. A & B off, use external 1 mc standard.		
1 mc INPUT	J-2303	0.9
1 mc OUTPUT	J-2304	2.1
1 mc OUTPUT	J-2305, P-2504, P-2309, J-2601	13.0
1 mc OUTPUT	J-2306, P-2505	13.0
HFO OUTPUT	P-2402, J-2307, J-2309, P-2703	6.0
HFO OUTPUT	J-2308, P-2502	0.9
250 kc OUTPUT	J-2602, P-2704, J-2706	1.4
250 kc INPUT	J-2702	0.14
2-4 mc INPUT	J-2702	1.0
RF OUTPUT	J-2704	3.0

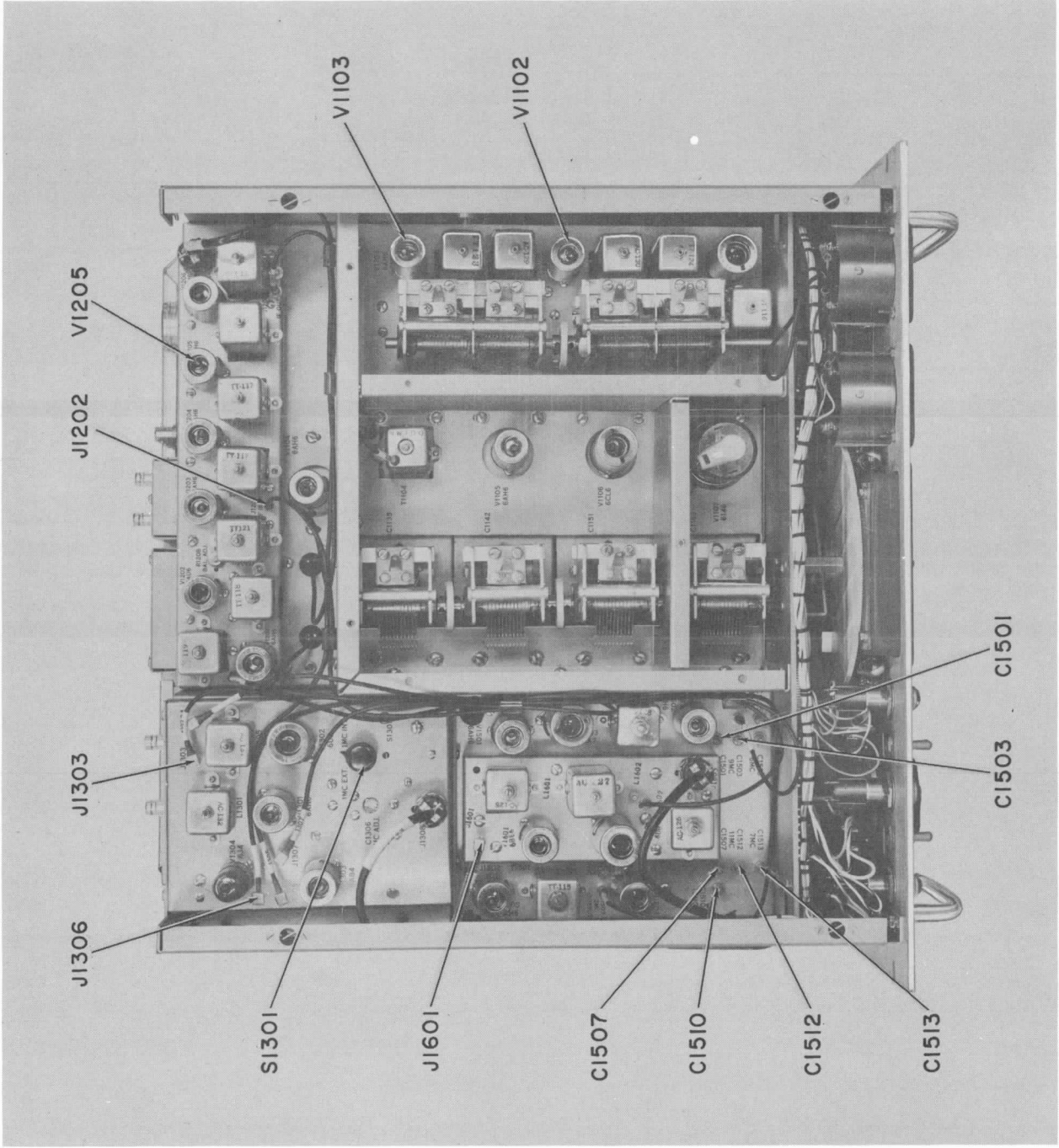


Figure III(A)-5-1a. Reference Designations for Above Chassis Components of Frequency Amplifier, Model CHG-1



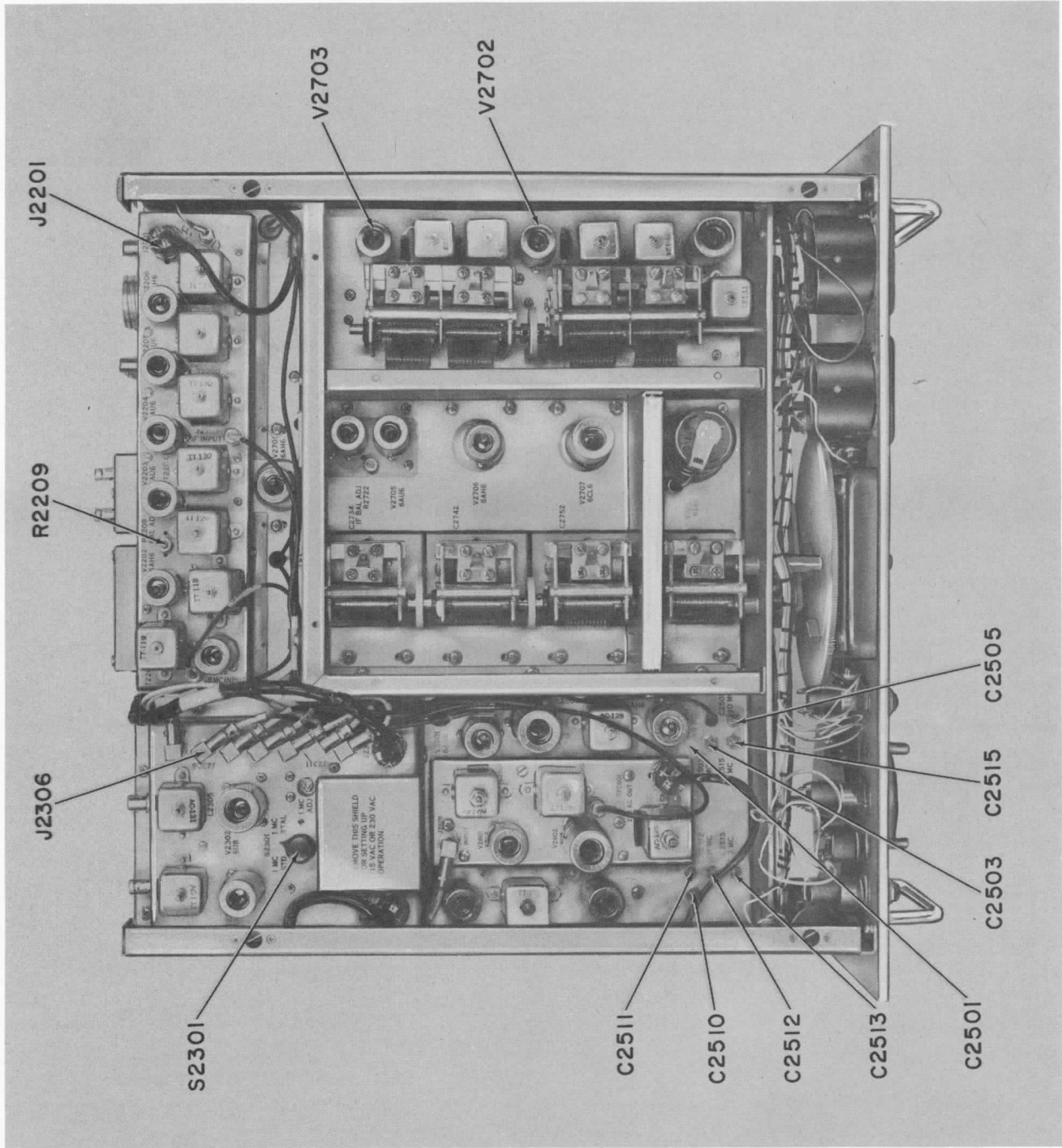


Figure III(A)-5-1b. Reference Designations for Above Chassis Components of Frequency Amplifier, Model CHG-2

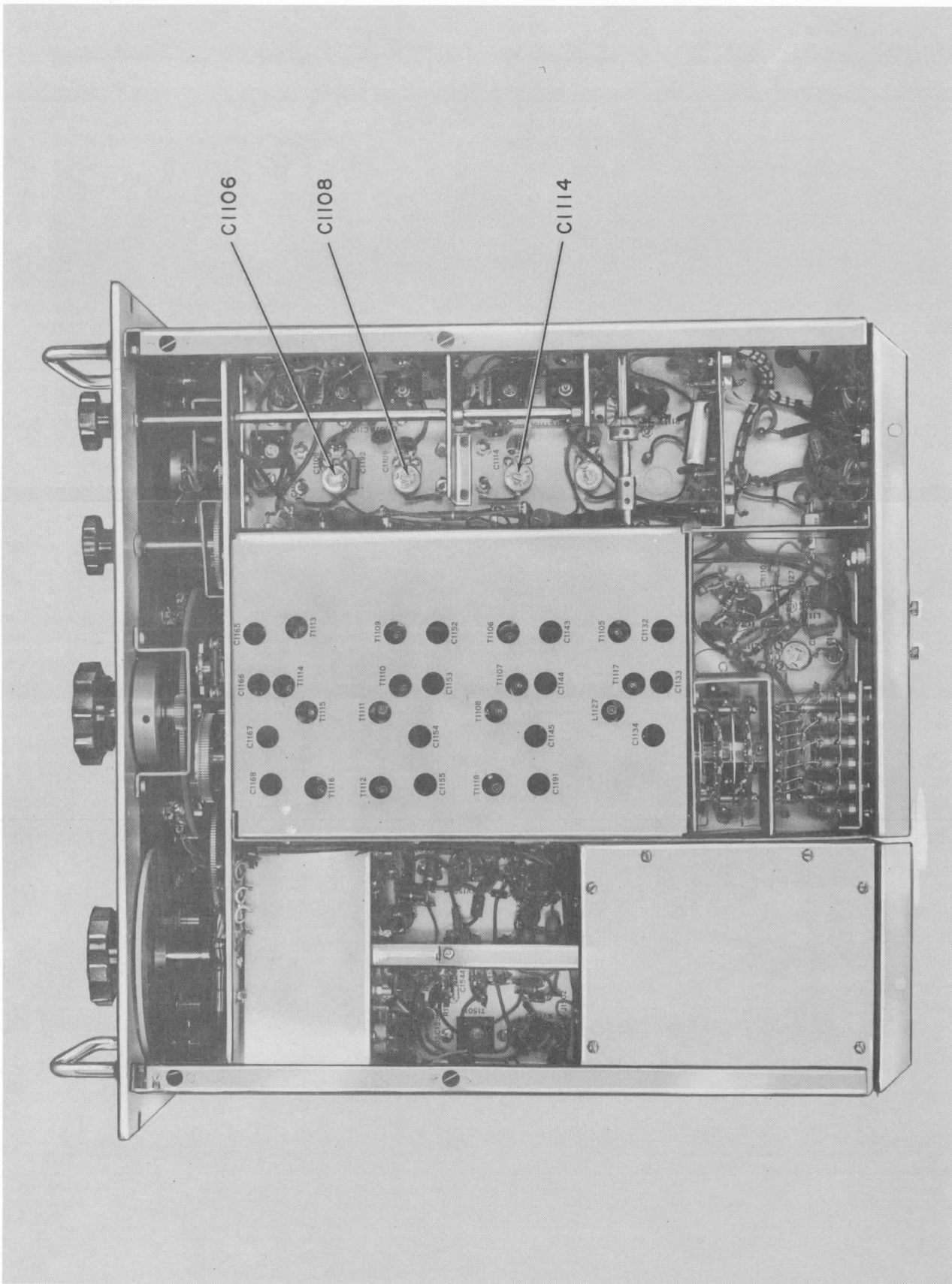


Figure III(A)-5-2a. Reference Designations for Below Chassis Components of Frequency Amplifier, Model CHG-1



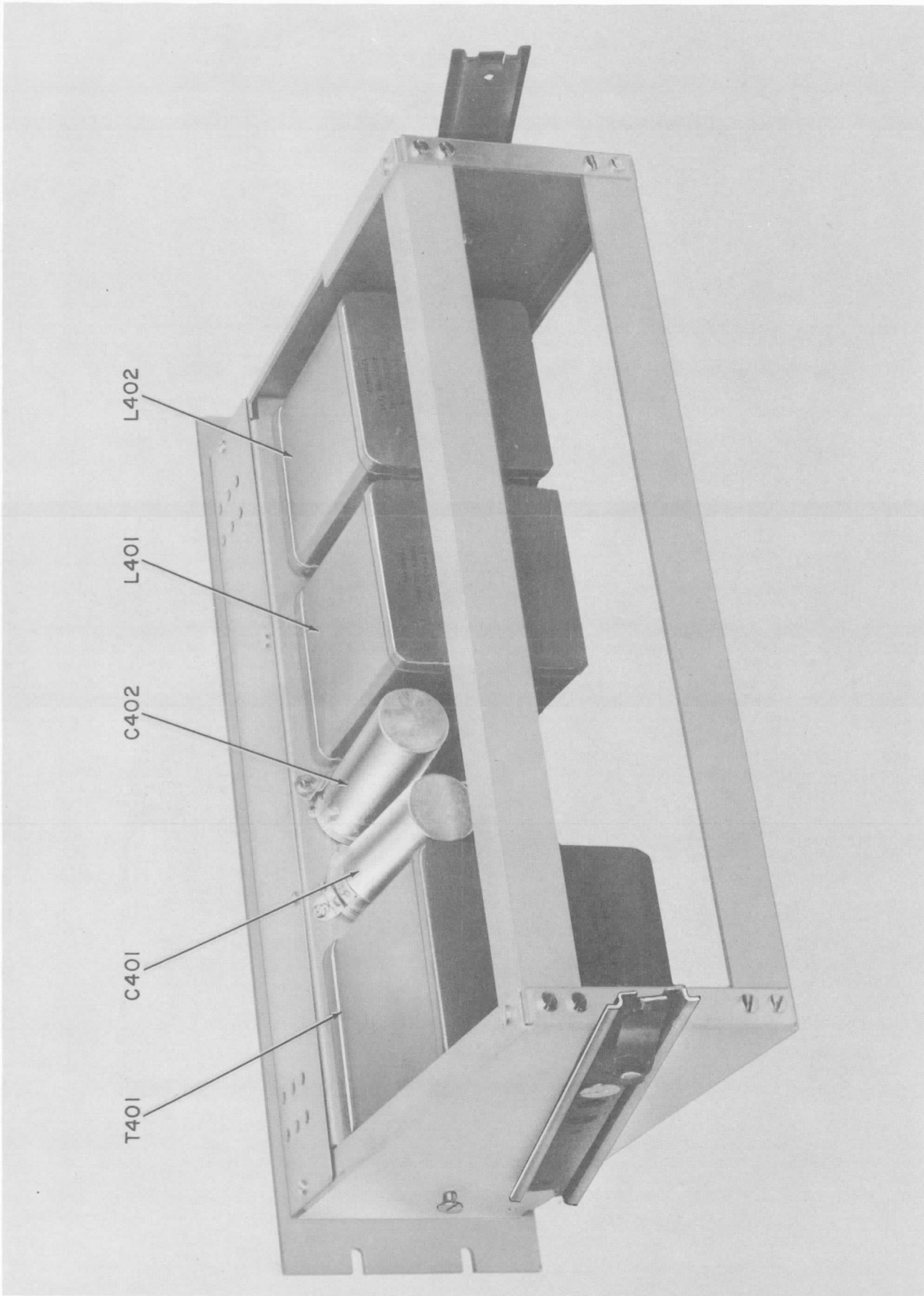


Figure III(A)-5-3a. Reference Designations for Lower Rear Components of Power Supply, Model CPP-1

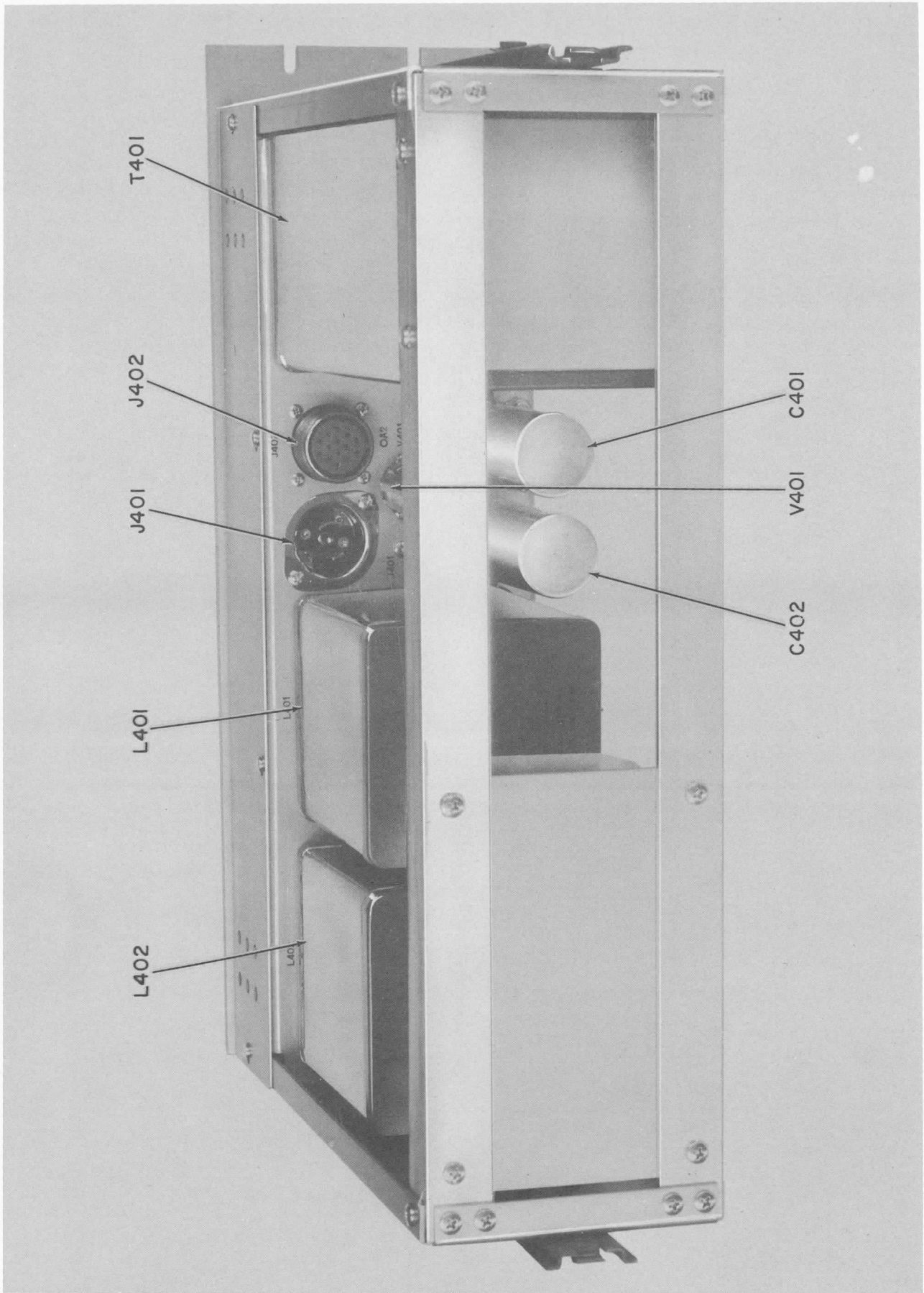


Figure III(A)-5-3b. Reference Designations for Lower Rear Components of Power Supply Model CPP-5

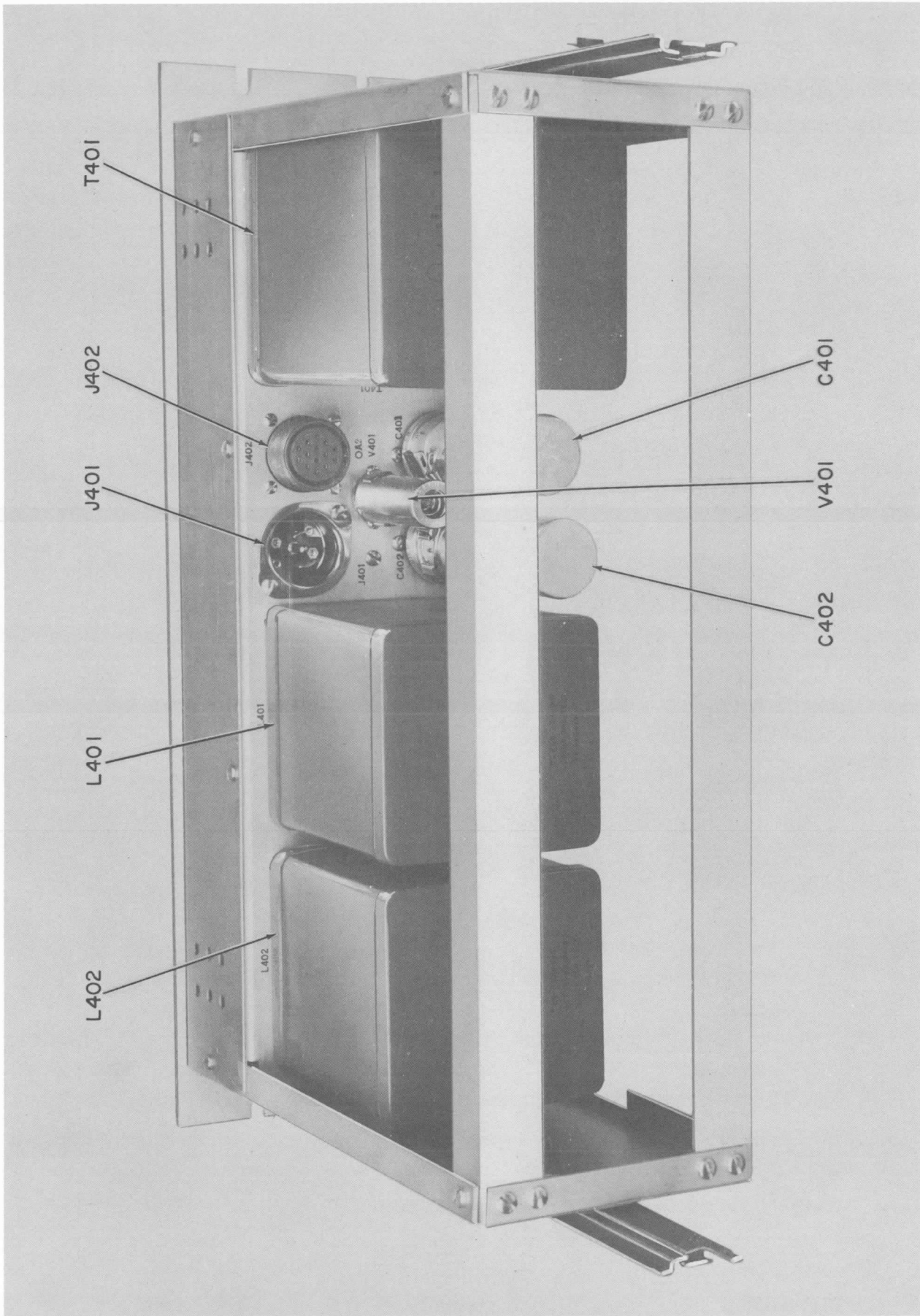


Figure III(A)-5-4a. Reference Designations for Upper Rear Components of Power Supply, Model CPP-1

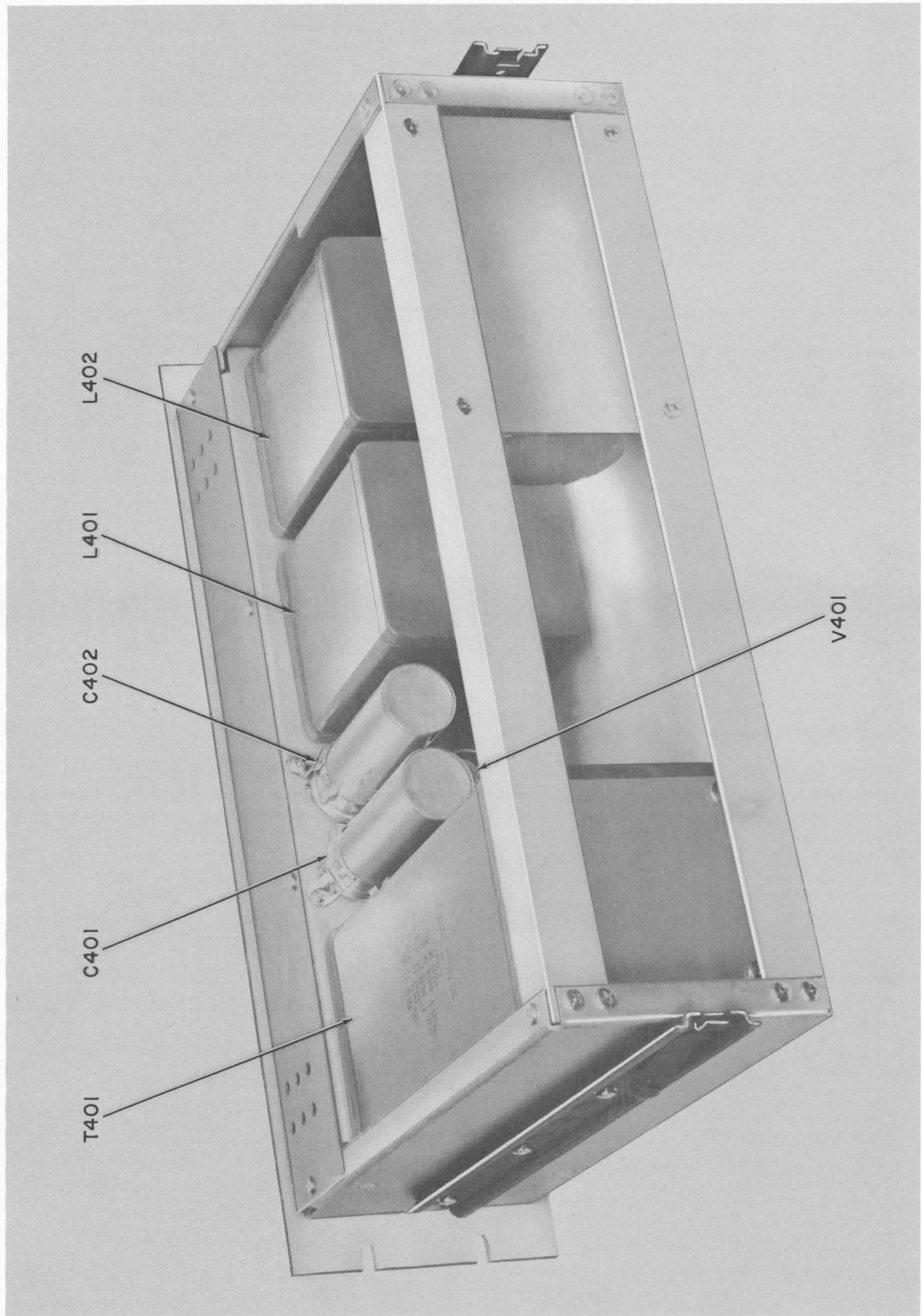


Figure III(A)-5-4b. Reference Designations for Upper Rear Components of Power Supply, Model CPP-5

## **SECTION 6 MAINTENANCE**

### **III(A)-6-1. INTRODUCTION.**

General maintenance involving CHG's and CPP's is discussed in I-6. Detailed maintenance involving CHG's and CPP's is discussed below.

### **III(A)-6-2. CORRECTIVE MAINTENANCE.**

Refer to III(G)-6.

## **SECTION 7 PARTS LIST**

### **INTRODUCTION**

Reference designations have been assigned to identify all maintenance parts of the equipment. They are used for marking the equipment (adjacent to the part they identify) and are included on drawings, diagrams and the parts list. The letters of a reference designation indicate the kind of part (generic group), such as a resistor, amplifier, electron tube, etc. The number differentiates between parts of the same generic group. Sockets associated with a particular plug-in device, such as electron tube or fuse, are identified by reference designation which include the

reference designation of the plug-in device. For example, the socket for tube V1101 is designated XV1101. Column 1 of the parts lists gives reference designations of the parts in alphabetical and numerical order. Column 2 gives the name and describes the various parts. Major part assemblies are listed in their entirety; subparts of a major assembly are listed in alphabetical and numerical order with reference to its major assembly. Column 3 indicates how the part is used within a major component. Column 4 lists each Technical Materiel Corporation part number.



**FREQUENCY AMPLIFIER CHG-1  
FINAL CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C1001	CAPACITOR, fixed: ceramic disc; .001 uf, GMV, 500 wvdc.	RF Bypass	CC-100-29
I1001	LAMP, neon: miniature bayonet base; 110 volt, 1/25 watt, T-3-1/4 bulb.	OVEN Indicator	BI-100-51H
I1002	LAMP, neon: miniature bayonet base; 110 volt, 1/25 watt, T-3-1/4 bulb.	SYNC Indicator	BI-100-51
I1003	Same as I1101.	STANDBY Indicator	
I1004	LAMP, incandescent: miniature bayonet base; 6-8 v; 250 ma; T-3-1/4 bulb, bayonet base.	Dial Illumination	BI-101-44
I1005	Same as I1004.	Same as I1004	
M1001	METER, MF tuning: 0-25 ua; approx. resistance 2200 ohms; pointer type, knife edge.	Mid-Fre- quency Tuning	MR-148
M1002	METER, output: 0-25 ua; approx. resistance 2200 ohms, pointer type, knife edge.	Output Meter	MR-149
P1001	CONNECTOR, plug: female; miniature hexagon, 9 pin.	IF Amplifier Filament Connector	PL-189-9S
P1002	Same as P1001.	Oscillator Filament Connector	
P1003	Same as P1001.	Divider Chain Filament Connector	
R1001	RESISTOR, fixed: composition; 220,000 ohms, $\pm 10\%$ , 1/2 watt.	Voltage Dropping	RC20GF224K
R1002	NOT USED		
R1003	RESISTOR, variable: composition; 250 ohms, linear, $\pm 10\%$ 2 watts.	Input Gain Adjustment	RV4ATRE251B
R1004	RESISTOR, fixed: composition; 100 ohms, $\pm 10\%$ , 500 wvdc.	Series Input Voltage Divider	RC42GF101K
S1001	SWITCH, toggle: SPST; 6 amps, 125 VAC; 28° angle of throw; solder lug terminals.	B+ ON-OFF	ST12A
S1002	SWITCH, toggle: DPDT; 3 amps, 250 V.	POWER ON- STANDBY	ST22N
XI1001	LIGHT, indicator: w/clear white lens; for miniature bayonet base, T-3-1/4 bulb.	Socket for I1001	TS-106-2
XI1002	Same as XI1001.	Socket for I1002	

**FREQUENCY AMPLIFIER CHG-1  
FINAL CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
XI1003	Same as XI1001.	Socket for I1003	
XI1004	SOCKET, bracket: for miniature bayonet base, T-3-1/4 bulb; right angle, down turned.	Socket for I1004	TS-107-2
XI1005	Same as XI1004.	Socket for I1005	

**FREQUENCY AMPLIFIER CHG-1  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C1101	CAPACITOR, fixed: mica; 3000 uuf, $\pm 2\%$ , char. D, 500 wvdc.	Equalizer	CM30D302G
C1102	Same as C1101.	Same as C1101	
C1103	CAPACITOR, fixed: ceramic; .01 uf, GMV, 500 wvdc.	Coupling	CC-100-16
C1104	Same as C1103.	Same as C1103	
C1105	Same as C1103.	Decoupling	
C1106	CAPACITOR, variable: ceramic; 4-30 uuf, char. C, 500 wvdc.	Trimmer	CV11C300
C1107 A, B	CAPACITOR, variable: air; 2 sections, 21 plates, 12.5-282 uuf.	p/o MF Tuning Control	CB-156-2
C1108	Same as C1106.	Same as C1106	
C1109	Same as C1103.	Same as C1105	
C1110	Same as C1103.	Same as C1105	
C1111	CAPACITOR, fixed: ceramic; .1 uf, $+80 -20\%$ , 500 wvdc.	Cathode Bypass	CC-100-28
C1112	Same as C1103.	Same as C1105	
C1113 A, B	CAPACITOR, variable: air; 2 sections, 21 plates, 12.5-280 uuf.	Same as C1107 A, B	CB-156-1
C1114	Same as C1106.	Same as C1106	
C1115	Same as C1103.	RF Bypass	
C1116	Same as C1103.	Same as C1115	
C1117	Same as C1103.	Same as C1103	
C1118	Same as C1103.	Same as C1105	
C1119	Same as C1106.	Same as C1106	
C1120	CAPACITOR, fixed: mica dielectric; 10 uuf, $\pm 5\%$ , char. C., 300 wvdc.	Same as C1103	CM15C100J
C1121	Same as C1103.	Same as C1111	
C1122	CAPACITOR, fixed: mica; button type; 270 uuf, $\pm 10\%$ , char. W, 300 wvdc.	Bypass	CB21QW271K
C1123	CAPACITOR, variable: ceramic; 7-45 uuf, char. C, 500 wvdc.	Same as C1106	CV11C450
C1124	CAPACITOR, fixed: mica; button type; 1000 uuf, $\pm 10\%$ , char. W., 300 wvdc.	Same as C1105	CB21QW102K
C1125	Same as C1103.	Same as C1105	

**FREQUENCY AMPLIFIER CHG-1  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C1126	Same as C1124.	p/o Voltage Divider Network	
C1127	Same as C1111.	p/o Voltage Divider Network	
C1128	Same as C1103.	Same as C1111	
C1129	CAPACITOR, fixed: mica; dielectric, 510 uuf, $\pm 5\%$ , char. B., 300 wvdc.	Same as C1103	CM15B511J
C1130	Same as C1129.	DC Blocking	
C1131	Same as C1124.	Same as C1122	
C1132	CAPACITOR, variable: ceramic; 3-12 uuf, 500 wvdc.	p/o 1st RF Amplifier Tank Oscillator	CV11A120
C1133	Same as C1106.	Same as C1132	
C1134	Same as C1106.	Same as C1132	
C1135	CAPACITOR, variable: air; 1 section, 21 plates, 12.5-282 uuf.	p/o Output Tuning Control Decoupling	CB-157-1
C1136	CAPACITOR, fixed: ceramic; disc type; .001 uf, $\pm 10\%$ , 500 wvdc.	Same as C1105	CC-100-9
C1137	CAPACITOR, fixed: ceramic; feed-thru type; 2000 uuf, $\pm 20\%$	Same as C1115	CK70A202M
C1138	Same as C1124.	Same as C1115	
C1139	Same as C1129.	Same as C1103	
C1140	Same as C1103.	Same as C1111	
C1141	CAPACITOR, fixed: paper; .1 uf, +40 -10%, 400 wvdc.	Same as C1105	CN-100-4
C1142	Same as C1135.	p/o Output Tuning Control	
C1143	Same as C1132.	p/o 2nd RF Amplifier Tank Oscillator	
C1144	Same as C1106.	Same as C1143	
C1145	Same as C1106.	Same as C1143	
C1146	Same as C1137.	Same as C1115	
C1147	Same as C1136.	Same as C1105	
C1148	Same as C1124.	Same as C1115	

**FREQUENCY AMPLIFIER CHG-1  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C1149	Same as C1129.	Same as C1103	
C1150	Same as C1136.	Same as C1111	
C1151	Same as C1135.	Same as C1142.	
C1152	Same as C1132.	p/o RF Output Amplifier Tank Oscillator	
C1153	Same as C1106.	Same as C1152	
C1154	Same as C1106.	Same as C1152	
C1155	Same as C1106.	Same as C1152	
C1156	Same as C1137.	Same as C1115	
C1157	Same as C1136.	Same as C1105	
C1158	Same as C1136.	Same as C1122	
C1159	Same as C1129.	Same as C1103	
C1160	Same as C1124.	Plate Decoupling	
C1161	Same as C1141.	Same as C1115	
C1162	Same as C1137.	Same as C1115	
C1163	CAPACITOR, variable: air; 1 section, 21 plates, 12.5-282 uuf.	Same as C1142	CB-157-2
C1164	CAPACITOR, electrolytic: tantalum; 5 uf, +50 -15%, 60 wvdc.	Same as C1111	CE-107-1
C1165	Same as C1106.	Same as C1152	
C1166	Same as C1106.	Same as C1152	
C1167	Same as C1106.	Same as C1152	
C1168	Same as C1106.	Same as C1152	
C1169	Same as C1103.	Same as C1103	
C1170	Same as C1103.	Meter Bypass	
C1171 thru C1187	Same as C1137.	Same as C1115	
C1188	CAPACITOR, fixed: mica dielectric; 110 uuf, $\pm 5\%$ , 300 wvdc.	Same as C1103	CM15B111J
C1189	Same as C1188.	p/o Filter Network	
C1190	Same as C1129.	Same as C1115	

**FREQUENCY AMPLIFIER CHG-1  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C1191	Same as C1106.	Same as C1143	
C1192	CAPACITOR, fixed: mica dielectric; 15 uuf, $\pm 10\%$ , 300 wvdc.	Padder	CM15B150K
C1193	CAPACITOR, fixed: mica; 270 uuf, $\pm 5\%$ , char. C, 300 wvdc.	Same as C1103	CM15C271J
C1194	Same as C1141.	Same as C1160	
C1195	Same as C1136.	Same as C1122	
C1196	Same as C1103.	Same as C1105	
C1197	CAPACITOR, fixed: mica dielectric; 39 uuf, $\pm 5\%$ , char. C., 300 wvdc.	p/o 20 Mc Tank Circuit	CM15C390J
C1198	Same as C1103.	Filter	
CR1101	DIODE, bonded silicon.	Meter Rectifier	1N303
CR1102	DIODE, germanium.	Rectifier	1N100
CR1103	Same as CR1102.	Same as CR1101	
J1101	JACK, bulkhead.	250 Kc Input from CBE	JJ-172
J1102	Same as J1101.	2-4 Mc Input from CMO	
J1103	CONNECTOR, receptacle: male; one contact, 50 ohm.	Bal. Mod. Input	JJ-154
J1104	CONNECTOR, receptacle: electrical; 1 female contact; 52 ohms, BNC type.	RF Output	UG-625/U
J1105	Same as J1104.	Monitor	
J1106	CONNECTOR, receptacle: male; 16 contacts, aluminum alloy cadmium plated.	Power Connector	JJ-183
J1107	Same as J1101.	250 Kc Output	
L1101	COIL, R. F. : fixed; .9 uhy, $\pm 5\%$ , Q = 110, test frequency at 2.5 mcs.	RF Choke	CL-241
L1102	COIL, R. F. : tuned; 1.75 - 3.75 mc, 22 uf, $\pm 1$ uh, Q = 30 or greater; test frequency 2.5 mc.	Mid-Frequency Amplifier Grid Coil	AC-130
L1103	COIL, R. F. : 750 microhenries, $\pm 20\%$ , 100 ma max. current; DC resistance approx. 17 ohms; bakelite body.	RF Choke	CL-100-5
L1104	COIL, R. F. : tuned; 1.75-3.75 mc, 22 uh, $\pm 1$ uh, Q = 30 or greater, test frequency 2.5 mc.	p/o MF Amplifier Plate Oscillator	AC-129

**FREQUENCY AMPLIFIER CHG-1  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
L1105	COIL, R. F. : 2.5 uhy, 100 ma.	Same as L1101	CL-140-1
L1106	Same as L1101.	Same as L1101	
L1107	Same as L1105.	Same as L1101	
L1108	COIL, R. F. : tuned; 20 mc, 0.92 uhy, Q=55 or greater, test frequency - 7.9 mc.	Bands 12 & 11 Multiplier	CL-247
L1109	COIL, R. F. : tuned; 22 mc, 0.63 uhy, Q=90 or greater, test frequency - 25 mc.	Bands 3 & 12 Multiplier	CL-249
L1110	Same as L1109.	Bands 1, 4 & 13 Multiplier	
L1111	COIL, R. F. : tuned; 26 mc, 0.45 uhy, Q=85 or greater, test frequency 25 mc.	Bands 5 & 14 Multiplier	CL-251
L1112	Same as L1111.	Band 15 Multiplier	
L1113	COIL, R. F. : tuned; 30 mc, 0.36 uhy, Q=80 or greater, test frequency - 25 mc.	Band 16 Multiplier	CL-253
L1114	Same as L1108.	Band 10 Multiplier	
L1115	COIL, R. F. : tuned; 16 mc, 1.23 uhy, Q=65 or greater, test frequency 7.9 mc.	Band 9 Multiplier	CL-246
L1116	COIL, R. F. : tuned; 14 mc, 1.7 uhy, Q=50 or greater, test frequency 7.9 mc.	Band 8 Multiplier	CL-245
L1117	COIL, R. F. : tuned; 12 mc, 2.45 uhy, Q=50 or greater, test frequency 7.9 mc.	Band 7 Multiplier	CL-244
L1118	COIL, R. F. : tuned; 10 mc, 3.35 uhy, Q=50 or greater, test frequency 7.9 mc.	Band 6 Multiplier	CL-243
L1119	Same as L1111.	Same as L1111	
L1120	Same as L1109.	Same as L1110	
L1121	Same as L1109.	Same as L1109	
L1122	Same as L1108.	Same as L1108	
L1123	COIL, R. F. : fixed; moulded w/powder iron core; 20 mc, 120 uhy, $\pm 10\%$ , Q=55 at 790 kc.	Same as L1101	CL-240-120
L1124	Same as L1123.	Same as L1101	
L1125	Same as L1105.	Same as L1101	
L1126	NOT USED.		
L1127	NOT USED.		

**FREQUENCY AMPLIFIER CHG-1  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
L1128 thru L1131	Same as L1123.	Same as L1101	
L1132	Same as L1105.	Same as L1101	
L1133	Same as L1123.	Same as L1101	
L1134	Same as L1123.	Same as L1101	
L1135	Same as L1105.	Same as L1101	
L1136 thru L1141	Same as L1123.	Same as L1101	
L1142	COIL, R. F. , 2 uhy: $\pm 5\%$ ; Q=100 or greater, test frequency - 7.9 mcs.	Same as L1101	CL-262
L1143	Same as L1123.	Same as L1101	
L1144	Same as L1108.	Same as C1197	
MP1101 thru MP1184	CORE, toroid: bead.	Filament Parasitic Suppressors	CI-120-1
P1101	CONNECTOR, plug: miniature coaxial type.	IF Input	PL-154
P1102	Same as P1101.	IF Output	
P1103	CONNECTOR, plug: miniature coaxial, angle type.	Balanced Modulator Input	PL-155
P1104	Same as P1103.	HF Input	
P1105	Same as P1101.	Divider Output	
PS1101	SUPPRESSOR, parasitic.	Parasitic Suppressor	AX-164
R1101	RESISTOR, fixed: composition; 39 ohms, $\pm 10\%$ , 1/2 watt.	Grid Leak Bias	RC20GF390K
R1102	Same as R1101.	Same as R1101	
R1103	RESISTOR, variable: composition; 1000 ohms, $\pm 10\%$ , 1/2 watt.	Balance Adjust	RV106UX8B102A
R1104	RESISTOR, fixed: composition; 47 ohms, $\pm 10\%$ , 1/2 watt.	Plate Load, V1101	RC20GF470K
R1105	Same as R1104.	Same as R1104	
R1106	RESISTOR, fixed: composition; 68 ohms, $\pm 10\%$ , 1/2 watt.	Input Termination	RC20GF680K
R1107	RESISTOR, fixed: composition; 2700 ohms, $\pm 10\%$ , 1 watt.	Voltage Dropping	RC32GF272K



**FREQUENCY AMPLIFIER CHG-1  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
R1108	RESISTOR, fixed: composition; 22,000 ohms, $\pm 10\%$ , 1/2 watt.	Screen Load	RC20GF223K
R1109	RESISTOR, fixed: composition; 100 ohms, $\pm 10\%$ , 1/2 watt.	Cathode Bias	RC20GF101K
R1110	RESISTOR, fixed: composition; 3300 ohms, $\pm 10\%$ , 1/2 watt.	Plate Load	RC20GF332K
R1111	RESISTOR, fixed: composition; 180,000 ohms, $\pm 10\%$ , 1/2 watt.	Meter Load	RC20GF184K
R1112	RESISTOR, fixed: composition; 120,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1108	RC20GF124K
R1113	Same as R1108.	Same as R1107	
R1114	Same as R1110.	Same as R1110	
R1115	RESISTOR, fixed: composition; 560 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1109	RC20GF561K
R1116	RESISTOR, fixed: composition; 47,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1101	RC20GF473K
R1117	RESISTOR, fixed: composition; 15,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1108	RC20GF153K
R1118	RESISTOR, fixed: composition; 470,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1101	RC20GF474K
R1119	RESISTOR, fixed: composition; 100,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1107	RC20GF104K
R1120	RESISTOR, fixed: composition; 120 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1109	RC20GF121K
R1121	RESISTOR, fixed: composition; 2200 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1110	RC20GF222K
R1122	Same as R1119.	Voltage Divider	
R1123	RESISTOR, fixed: composition; 6800 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1122	RC20GF682K
R1124	Same as R1119.	Same as R1107	
R1125	RESISTOR, variable: composition; 1000 ohms, linear $\pm 10\%$ , 2 watts.	Output Gain Adjust	RV4ATRD102A
R1126	Same as R1121.	Tank Oscillator Load	
R1127	RESISTOR, fixed: composition; 10 ohms, $\pm 10\%$ , 1/2 watt.	Grid Limiter	RC20GF100K
R1128	Same as R1116.	Same as R1101	
R1129	Same as R1108.	Same as R1108	

**FREQUENCY AMPLIFIER CHG-1  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
R1130	Same as R1101.	Same as R1110	
R1131	RESISTOR, fixed: composition; 150 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1109	RC20GF151K
R1132	RESISTOR, fixed: composition; 1000 ohms, $\pm 10\%$ , 1 watt.	Same as R1107	RC32GF102K
R1133	RESISTOR, fixed: composition; 3900 ohms, $\pm 10\%$ , 1/2 watt.	Load	RC20GF392K
R1134	Same as R1127.	Same as R1127	
R1135	RESISTOR, fixed: composition; 68,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1101	RC20GF683K
R1136	RESISTOR, fixed: composition; 5600 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1108	RC20GF562K
R1137	Same as R1109.	Same as R1109	
R1138	Same as R1101.	Same as R1110	
R1139	Same as R1127.	Same as R1127	
R1140	RESISTOR, fixed: composition; 220,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1101	RC20GF224K
R1141	RESISTOR, fixed: ceramic; wire wound, 250 ohms, 5 watts.	Same as R1109	RW-107-23
R1142	RESISTOR, fixed: composition; 1000 ohms, $\pm 10\%$ , 1/2 watt.	p/o Voltage Divider	RC20GF102K
R1143	RESISTOR, fixed: composition; 820 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1142	RC20GF821K
R1144	RESISTOR, fixed: composition; 220 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1142	RC20GF221K
R1145	Same as R1135.	Same as R1111	
R1146	Same as R1110.	Tank Load	
R1147	Same as R1109.	Same as R1107	
R1148	Same as R1133.	Same as R1146	
R1149	Same as R1101.	Same as R1127	
S1101 A, B	SWITCH, rotary: two sections, 16 positions, shorting type contacts, bakelite insulation.	Bandswitch	SW-279
S1102 A	WAFER, switch: 16 positions; 1 section, silver plated contacts.	p/o Bandswitch	WS-122
S1102 B	WAFER, rotary: 1 section; 16 positions, contacts and rotors are silver plated brass.	Same as S1102A	WS-121

**FREQUENCY AMPLIFIER CHG-1  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
S1103	WAFER, switch: four positions; shorting type.	Range Switch; p/o Bandswitch	WS-101
S1104	Same as S1103.	Same as C1142	
S1105	Same as S1103.	Same as S1102A	
S1106	Same as S1103.	Same as C1107 A, B	
T1101	TRANSFORMER, R. F. : tuned; primary - 90 uhy, secondary 200 uhy, Q=25 or greater at 790 kc.	250 Kc Input	TT-116
T1102	TRANSFORMER, R. F. : tuned; 3 winding, operating frequency 1.75 - 3.75 mc.	BAL. MOD. In	TT-124
T1103	TRANSFORMER, R. F. : tuned; 1.75-3.75 mc, primary winding 21 uh, secondary 4.3 uh, Q=40 at 5 mc.	MF Output	TT-123
T1104	NETWORK, balance modulator.	Bal. Mod.	NW-100
T1105	TRANSFORMER, R. F. : tuned; 15.75 - 33.75 mc operating frequency; total inductance, .40 uh, ± .01 uh; consists of 110 uf capacitor, symbol no. C1188.	p/o 1st Ampl. Tank Osc.	TT-125
T1106	TRANSFORMER, R. F. : 16-32 mc; slug tuned.	Same as C1143	CL-188
T1107	TRANSFORMER, R. F. : 8-16 mc; slug tuned.	Same as C1143	CL-164
T1108	TRANSFORMER, R. F. : 4-8 mc; slug tuned.	Same as C1143	CL-163
T1109	TRANSFORMER, R. F. : 15.75 - 33.75 mc operating frequency; L = .39-.41 uh, Q=170 or greater; test frequency-25 mcs.	Same as C1152.	CL-264
T1110	Same as T1107.	Same as C1152	
T1111	Same as T1108.	Same as C1152	
T1112	TRANSFORMER, R. F. : tuned; 1.75 - 3.75 mc; 3 uhy, Q=60 or greater; test frequency 2.5 mc.	Same as C1152	TT-127
T1113	TRANSFORMER, R. F. : 16-32 mc; slug tuned.	Same as C1152	CL-189
T1114	TRANSFORMER, R. F. : 8-16 mc; slug tuned.	Same as C1152	CL-165
T1115	Same as T1108.	Same as C1152	
T1116	TRANSFORMER, R. F. : tuned; 1.75 - 3.75 mc; 3 uhy, Q=60 or greater; test frequency = 2.5 mc.	Same as C1152	TT-126
T1117	Same as T1107.	Same as C1132	
T1118	Same as T1112.	Same as C1143	
T1119	Same as T1108.	Same as C1132	

**FREQUENCY AMPLIFIER CHG-1  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
V1101	TUBE, electron: duo triode; 9 pin miniature.	Balance Modulator	12AT7
V1102	TUBE, electron: sharp cutoff R. F. pentode; 7 pin miniature.	Mid-Frequency Amplifier	6AH6
V1103	Same as V1102.	Metering Tube	
V1104	Same as V1102.	HF Amplifier	
V1105	Same as V1102.	1st RF Amplifier	
V1106	TUBE, electron: power pentode; wide band amp., 9 pin miniature.	2nd RF Amplifier	6CL6
V1107	TUBE, electron: beam power; large wafer octal base with sleeve, duo triode; 9 pin miniature.	RF Output	6146
W1101	CABLE ASSEMBLY, RF: consisting of 13 inches of RG-174/U coaxial wire; one straight plug, PL-154 (symbol P1101).	IF Input	CA-350-13.00
W1102	CABLE ASSEMBLY, RF: consisting of 17 inches of RG-174/U coaxial wire; one straight plug, PL-154 (symbol P1102).	IF Output	CA-350-17.00
W1103	CABLE ASSEMBLY, RF: consisting of 12-1/2 inches of RG-174/U coaxial wire; one angle plug PL-155 (symbol P1103).	BAL. MOD. Input	CA-586-12.50
W1104	CABLE ASSEMBLY, RF: consisting of 16 inches of RG-174/U coaxial wire; one angle plug PL-155 (symbol P1104).	HF Input	CA-586-16.00
W1105	CABLE ASSEMBLY, RF: consisting of 41 inches of RG-174/U coaxial wire; one straight plug, PL-154 (symbol P1105), and JJ-172 (symbol J1107).	Divider Output	CA-602-41.00
XV1101	SOCKET, electron tube: 9 pin miniature.	Socket for V1101	TS103P01
XV1102	SOCKET, electron tube: 7 pin miniature.	Socket for V1102	TS102P01
XV1103	Same as XV1102.	Socket for V1103	
XV1104	Same as XV1102.	Socket for V1104	
XV1105	Same as XV1102.	Socket for V1105	
XV1106	Same as XV1101.	Socket for V1106	
XV1107	SOCKET, electron tube: octal.	Socket for V1107	TS101P01

**FREQUENCY AMPLIFIER CHG-1  
IF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C1201	CAPACITOR, fixed: mica; 510 uuf, $\pm 5\%$ , char. B, 300 wvdc.	Coupling	CM15B511J
C1202	CAPACITOR, fixed: ceramic; .01 uf, GMV, 500 wvdc.	Decoupling	CC-100-16
C1203	Same as C1202.	Same as C1202	
C1204	Same as C1202.	Same as C1202	
C1205	Same as C1202.	Same as C1201	
C1206	Same as C1202.	Same as C1202	
C1207	Same as C1202.	Cathode Bypass	
C1208	CAPACITOR, fixed: terminal type; 470 uuf, $\pm 10\%$ , char. W.	RF Bypass	CB21QW471K
C1209	Same as C1208.	Same as C1208	
C1210	CAPACITOR, fixed: ceramic; .001 uf, $\pm 10\%$ , 500 wvdc; disc type.	Same as C1201	CC-100-9
C1211	Same as C1210.	Same as C1202	
C1212	CAPACITOR, fixed: mica; 5 uuf, $\pm 20\%$ , char. B, 300 wvdc.	Same as C1201	CM15B050M
C1213	Same as C1210.	Same as C1202	
C1214	Same as C1210.	Same as C1201	
C1215	Same as C1212.	Same as C1201	
C1216	Same as C1210.	Same as C1202	
C1217	CAPACITOR, fixed: mica; 1000 uuf, $\pm 10\%$ , 300 wvdc, char. W.	Same as C1201	CB21QW102K
C1218	Same as C1212.	Same as C1201	
C1219	Same as C1210.	Same as C1202	
C1220	Same as C1217.	Same as C1201	
C1221	Same as C1217.	Same as C1202	
C1222	Same as C1210.	Same as C1207	
CR1201	DIODE, germanium: gold bonded; fast switching type.	Bal. Mod.	DD-102-1
CR1202	Same as CR1201.	Same as CR1201	
J1201	CONNECTOR, receptacle: male; one contact, 50 ohms.	2 Mc Input	JJ-154
J1202	Same as J1201.	IF Input	
J1203	Same as J1201.	IF Output	

**FREQUENCY AMPLIFIER CHG-1  
IF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
J1204	CONNECTOR, receptacle: miniature; hexagon, 9 contacts, male. Mates with PL-189.	Power Connector	JJ-193-9P
L1201	COIL, R. F. : fixed; moulded with powder iron core, 20 mc 120 uhy, $\pm 10\%$ , Q=55 at 790 kc.	RF Choke	CL-240-120
L1202	COIL, R. F. : tuned; 18 mcs, trap coil.	Same as L1201	CL-255
L1203 thru L1206	Same as L1201.	Same as L1201	
R1201	RESISTOR, fixed: composition; 470,000 ohms, $\pm 10\%$ , 1/2 watt.	Grid Leak Bias	RC20GF474K
R1202	RESISTOR, fixed: composition; 220,000 ohms, $\pm 10\%$ , 1/2 watt.	Screen Load	RC20GF224K
R1203	RESISTOR, fixed: composition; 4700 ohms, $\pm 10\%$ , 1/2 watt.	Voltage Dropping	RC20GF472K
R1204	RESISTOR, fixed: composition; 15,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1202	RC20GF153K
R1205	Same as R1203.	Same as R1203	
R1206	RESISTOR, fixed: composition; 150 ohms, $\pm 10\%$ , 1/2 watt.	Cathode Bias	RC20GF151K
R1207	RESISTOR, fixed: composition; 120 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1203	RC20GF121K
R1208	RESISTOR, variable: composition; 100 ohms, $\pm 10\%$ , 1/2 watt.	Bal. Adjust	RV106UX8B101A
R1209	RESISTOR, fixed: composition; 22,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1202	RC20GF223K
R1210	RESISTOR, fixed; composition; 100 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1206	RC20GF101K
R1211	Same as R1209.	Same as R1202	
R1212	RESISTOR, fixed: composition; 47,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1201	RC20GF473K
R1213	Same as R1210.	Same as R1206	
R1214	Same as R1209.	Same as R1202	
R1215	Same as R1212.	Same as R1201	
R1216	Same as R1210.	Same as R1206	
R1217	Same as R1209.	Same as R1202	
R1218	Same as R1212.	Same as R1201	
R1219	Same as R1210.	Same as R1206	

**FREQUENCY AMPLIFIER CHG-1  
IF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
R1220	RESISTOR, fixed: composition; 47 ohms, $\pm 10\%$ , 1/2 watt.	Terminating	RC20GF470K
T1201	TRANSFORMER, R. F. : tuned; 18 mcs.	18 mc Generator	TT-119
T1202	TRANSFORMER, R. F. : tuned; 18 mcs.	18 mc Amplifier Oscillator	TT-118
T1203	TRANSFORMER ASSEMBLY, R. F. : 2-30 mc.	RF Coupling	TR-163
T1204	TRANSFORMER, R. F. : tuned; 15 mcs.	IF Input	TT-121
T1205	TRANSFORMER, R. F. : tuned; 14 - 16 mc.	1st IF Mixer	TT-117
T1206	Same as T1205.	2nd IF Mixer	
T1207	Same as T1205.	3rd IF Mixer	
T1208	TRANSFORMER, R. F. : tuned; 14-16 mc.	IF Output	TT-120
V1201	TUBE, electron: sharp cutoff R. F. pentode; 7 pin miniature.	Same as T1201	6AH6
V1202	TUBE, electron: sharp cutoff R. F. pentode; 7 pin miniature.	Same as T1201	6AU6
V1203	Same as V1201.	1st IF Amplifier	
V1204	Same as V1201.	2nd IF Amplifier	
V1205	Same as V1201.	3rd IF Amplifier	
V1206	Same as V1201.	IF Output Amplifier	
XV1201	SOCKET, electron tube: 7 pin miniature.	Socket for V1201	TS102P01
XV1202	Same as XV1201.	Socket for V1202	
XV1203	Same as XV1201.	Socket for V1203	
XV1204	Same as XV1201.	Socket for V1204	
XV1205	Same as XV1201.	Socket for V1205	
XV1206	Same as XV1201.	Socket for V1206	

**FREQUENCY AMPLIFIER CHG-1  
OSCILLATOR CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C1301	CAPACITOR, fixed: ceramic; .01 uf, GMV, 500 wvdc.	Decoupling	CC-100-16
C1302	Same as C1301.	Cathode Bypass	
C1303	Same as C1301.	Same as C1301	
C1304	CAPACITOR, fixed: mica dielectric; 47 uuf, $\pm 5\%$ , char. C., 300 wvdc.	Coupling	CM15C470J
C1305	CAPACITOR, fixed: mica dielectric; 130 uuf, $\pm 2\%$ , char. C., 300 wvdc.	RF Bypass	CM15C131G
C1306	CAPACITOR, variable: ceramic; 4-30 uuf, char. C, 500 wvdc.	Trimmer	CV11C300
C1307	CAPACITOR, fixed: mica dielectric; 68 uuf, $\pm 5\%$ , char. C., 300 wvdc.	Same as C1304	CM15B680J
C1308	Same as C1301.	Same as C1301	
C1309	CAPACITOR, fixed: mica dielectric; 24 uuf, $\pm 5\%$ , char. C., 300 wvdc.	Same as C1304	CM15C240J
C1310	Same as C1301.	Same as C1301	
C1311	Same as C1301.	Same as C1301	
C1312	Same as C1301.	Same as C1302	
C1313	CAPACITOR, fixed: mica; 1000 uuf, $\pm 5\%$ , char. B., 500 wvdc.	Same as C1304	CM20B102J
C1314	CAPACITOR, fixed: ceramic; feed-thru type, 2000 uuf, $\pm 20\%$ , char. A., 500 wvdc.	Same as C1305	CK70A202M
C1315	CAPACITOR, fixed: mica; button type, 1000 uuf, $\pm 10\%$ , char. W., 300 wvdc.	Same as C1305	CB21QW102K
C1316	Same as C1301.	Same as C1301	
C1317	CAPACITOR, fixed: mica; 27 uf, $\pm 5\%$ , char. C., 300 wvdc.	p/o Voltage Divider Network	CM15C270J
C1318	CAPACITOR, fixed: mica dielectric; 110 uuf, $\pm 5\%$ , 300 wvdc.	Same as C1304	CM15B111J
C1319	CAPACITOR, voltage variable silicon: 32-145 uuf; hermetically sealed glass to metal, 15 wvdc.	Varicap	CX-106-1
C1320	Same as C1301.	Same as C1301	
C1321	Same as C1313.	Same as C1304	
C1322	Same as C1304.	Bypass	
C1323	Same as C1301.	Same as C1301	
C1324	Same as C1301.	Same as C1302	



**FREQUENCY AMPLIFIER CHG-1  
OSCILLATOR CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C1325	Same as C1304.	Same as C1304	
C1326	NOT USED.		
C1327	Same as C1314.	Same as C1305	
C1328	Same as C1315.	Same as C1301	
C1329	Same as C1314.	Same as C1305	
C1330	Same as C1315.	Same as C1301	
C1331	CAPACITOR, fixed: mica dielectric; 150 uuf, $\pm 5\%$ , char. B., 300 wvdc.	Same as C1317	CM15B151J
J1301	CONNECTOR, receptacle: electrical; 1 female contact; 52 ohms, BNC type.	1 Mc Input	UG-625/U
J1302	Same as J1301.	1 Mc Output	
J1303	CONNECTOR, receptacle: male; one contact, 50 ohms.	Same as J1302	JJ-154
J1304	Same as J1303.	Same as J1302	
J1305	Same as J1303.	HF Input from Phase Detector	
J1306	Same as J1303.	HF Output	
J1307	Same as J1303.	Same as J1306	
J1308	CONNECTOR, receptacle: miniature hexagon; 9 contacts, male, mates with PL-189.	Power Connector	JJ-193-9P
L1301	COIL, R. F. : tuned; 140 uh, $\pm 10\%$ , Q=40 at 790 kc; oper. freq. 1 mc; includes one 150 uhf and two 510 uuf capacitors.	1 Mc Output Transformer	AC-132
L1302	COIL, R. F. : fixed; molded, with powder iron core; 20 mc, 120 uh $\pm 10\%$ , Q=55 at 790 kc.	RF Choke	CL-240-120
L1303	Same as L1302.	Same as L1302	
L1304	COIL, R. F. : 750 microhenries, $\pm 20\%$ , 100 ma max. current; DC resistance approx. 17 ohms; bakelite body.	Same as L1302	CL-100-5
L1305	COIL, R. F. : tuned; 140 uh, $\pm 10\%$ , Q=40 at 790 kc; oper. freq. 1 mc; includes one 110 uuf & one 510 uuf capacitor.	1 Mc Oscillator Tank	AC-131
L1306	Same as L1302.	Same as L1302	
L1307	COIL, R. F. : fixed; 150 uh, Q=39 at 790 kc, max. current rating - 330 ma; molded case.	Same as L1302	CL-238-2
MP1301 thru MP1318	CORE, toroid: bead.	Capacitance Compensator	CI-120-1

**FREQUENCY AMPLIFIER CHG-1  
OSCILLATOR CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
R1301	RESISTOR, fixed: composition; 56, 000 ohms, $\pm 10\%$ , 1/2 watt.	Screen Load	RC20GF563K
R1302	RESISTOR, fixed: composition; 2200 ohms, $\pm 10\%$ , 1/2 watt.	Plate Load	RC20GF222K
R1303	RESISTOR, fixed: composition; 68 ohms, $\pm 10\%$ , 1/2 watt.	Cathode Bias	RC20GF680K
R1304	RESISTOR, fixed: composition; 470, 000 ohms, $\pm 10\%$ , 1/2 watt.	Grid Leak Bias	RC20GF474K
R1305	RESISTOR, fixed: composition; 100, 000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1304	RC20GF104K
R1306	RESISTOR, fixed: composition; 10, 000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1302	RC20GF103K
R1307	RESISTOR, fixed: composition; 22, 000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1301	RC20GF223K
R1308	RESISTOR, fixed: composition; 220, 000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1304	RC20GF224K
R1309	Same as R1303.	Same as R1303	
R1310	Same as R1302.	Same as R1302	
R1311	Same as R1305.	Same as R1304	
R1312	Same as R1305.	Voltage Dropping	
R1313	RESISTOR, fixed; composition; 39 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1302	RC20GF390K
R1314	Same as R1305.	Same as R1304	
R1315	RESISTOR, fixed: composition; 220 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1303	RC20GF221K
R1316	RESISTOR, fixed: composition; 4700 ohms, $\pm 10\%$ , 1 watt.	Same as R1302	RC32GF472K
S1301	SWITCH, rotary: 1 section; 2 positions, mycalex insulation; contacts and wipers nickel plated.	Standard Selector	SW-150
T1301	TRANSFORMER, pulse: metal case (tubular); 3 windings; turn ratio = 3:3:1; primary winding = 0.1 mh, 500 wvdc.	Pulse Transformer	TF-228U13
V1301	TUBE, electron: sharp cutoff R. F. pentode; 7 pin miniature.	1 Mc Output Amplifier	6AH6
V1302 A, B	TUBE, electron: 9 pin miniature.	1 Mc Oscillator/ 1 Mc Amplifier	6U8
V1303	TUBE, electron: RF triode; 7 pin miniature.	HFO	6AB4
V1304	TUBE, electron: triode; 7 pin miniature.	HF Output	6J4

**FREQUENCY AMPLIFIER CHG-1  
OSCILLATOR CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
XV1301	SOCKET, electron tube: 7 pin miniature.	Socket for V1301	TS102P01
XV1302	SOCKET, electron tube: 9 pin miniature.	Socket for V1302	TS103P01
XV1303	Same as XV1301.	Socket for V1303	
XV1304	Same as XV1301.	Socket for V1304	

**FREQUENCY AMPLIFIER CHG-1  
OVEN CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C1401 thru C1406	CAPACITOR, fixed: ceramic; .01 uf, GMV, 500 wvdc.	Bypass	CC-100-16
C1407	Same as C1401.	Coupling	
C1408	CAPACITOR, variable: glass; 2.0-30.0 uuf, -100 to +100, 1000 wvdc.	10 Mc Trimmer	CV-104-1
C1409	CAPACITOR, fixed: mica; 39 uuf, $\pm 5\%$ , char. B, 300 wvdc.	10 Mc Padder	CM15B390J
C1410	Same as C1408.	11 Mc Trimmer	
C1411	Same as C1409.	11 Mc Padder	
C1412	Same as C1408.	12 Mc Trimmer	
C1413	CAPACITOR, fixed: mica dielectric; 27 uuf, $\pm 5\%$ , 300 wvdc.	12 Mc Padder	CM15B270J
C1414	Same as C1408.	14 Mc Trimmer	
C1415	Same as C1413.	14 Mc Padder	
C1416	Same as C1413.	15 Mc Padder	
C1417	Same as C1408.	15 Mc Trimmer	
C1418	Same as C1413.	13 Mc Padder	
C1419	Same as C1408.	13 Mc Trimmer	
C1420	Same as C1408.	9 Mc Trimmer	
C1421	Same as C1409.	9 Mc Padder	
C1422	Same as C1408.	8 Mc Trimmer	
C1423	Same as C1413.	8 Mc Padder	
E1401	TERMINAL STRIP, barrier type: 6 terminals.	Oven Terminal Board	TM-102-6
MP1401 thru MP1436	CORE, toroid: bead type.	Capacitance Compensator	CI-120-1
R1401	RESISTOR, fixed: composition; 220,000 ohms, $\pm 10\%$ , 1/2 watt.	Voltage Dropping	RC20GF224K
R1402	RESISTOR, fixed: composition; 120 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1402	RC20GF121K
R1403 A, B	ELEMENT, heater: series resistance = 2800 ohms, parallel resistance = 700 ohms, 20 watts; asbestos insulation.	Heater Element	RR-129-1
S1401	SWITCH, thermostatic: $70^\circ \pm 5\%$ ; hermetically sealed contacts, normally closed; max. volts 250 AC or DC.	$70^\circ$ Thermostat	SS-103-0-70

**FREQUENCY AMPLIFIER CHG-1  
OVEN CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
S1402	WAFER, rotary: 1 section; 16 positions, contacts 8, rotors silver plated brass.	p/o Bandswitch	WS-121
XY1401	SOCKET, crystal: .486" spacing for .050" pin dia.	Socket for Y1401	TS-104-1
XY1402	Same as XY1401.	Socket for Y1402	
XY1403	Same as XY1401.	Socket for Y1403	
XY1404	Same as XY1401.	Socket for Y1404	
XY1405	Same as XY1401.	Socket for Y1405	
XY1406	Same as XY1401.	Socket for Y1406	
XY1407	Same as XY1401.	Socket for Y1407	
XY1408	Same as XY1401.	Socket for Y1408	
XY1409	Same as XY1401.	Socket for Y1409	
Y1401	CRYSTAL, quartz: 1 mc.	1 Mc Crystal	CR-27/U-1.000P
Y1402	CRYSTAL, quartz: 10 mc.	10 Mc Crystal	CR-27/U-10.000P
Y1403	CRYSTAL, quartz: 11 mc.	11 Mc Crystal	CR-27/U-11.000P
Y1404	CRYSTAL, quartz: 12 mc.	12 Mc Crystal	CR-27/U-12.000P
Y1405	CRYSTAL, quartz: 14 mc.	14 Mc Crystal	CR-27/U-14.000P
Y1406	CRYSTAL, quartz: 15 mc.	15 Mc Crystal	CR-27/U-15.000P
Y1407	CRYSTAL, quartz: 13 mc.	13 Mc Crystal	CR-27/U-13.000P
Y1408	CRYSTAL, quartz: 9 mc.	9 Mc Crystal	CR-27/U-9.000P
Y1409	CRYSTAL, quartz: 8 mc.	8 Mc Crystal	CR-27/U-8.000P

**FREQUENCY AMPLIFIER CHG-1  
SYNTHESIZER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C1501	CAPACITOR, variable: glass; 2.0-30.0 uuf, -100 to +100, 1000 wvdc.	8 Mc Trimmer	CV-104-1
C1502	CAPACITOR, fixed: mica; 100 uuf, $\pm 5\%$ , char. B, 300 wvdc.	8 Mc Padder	CM15B101J
C1503	Same as C1501.	9 Mc Trimmer	
C1504	CAPACITOR, fixed: mica dielectric; 68 uuf, $\pm 5\%$ , 300 wvdc, char. B.	9 Mc Padder	CM15B680J
C1505	Same as C1501.	10 Mc Trimmer	
C1506	CAPACITOR, fixed: mica; 47 uuf, $\pm 5\%$ , char. B, 300 wvdc.	10 Mc Padder	CM15B470J
C1507	Same as C1501.	12 Mc Trimmer	
C1508	CAPACITOR, fixed: mica; 20 uuf, $\pm 5\%$ , char. C, 300 wvdc.	12 Mc Padder	CM15C200J
C1509	CAPACITOR, fixed: mica; 5 uuf, $\pm 20\%$ , char. B, 300 wvdc.	13 Mc Trimmer	CM15B050M
C1510	Same as C1501.	13 Mc Padder	
C1511	CAPACITOR, fixed: mica; 24 uuf, $\pm 5\%$ , 300 wvdc, char. B.	11 Mc Trimmer	CM15B240J
C1512	Same as C1501.	11 Mc Padder	
C1513	Same as C1501.	7 Mc Trimmer	
C1514	CAPACITOR, fixed: mica; 160 uuf, $\pm 5\%$ , 300 wvdc, char. B.	7 Mc Padder	CM15B161J
C1515	Same as C1501.	6 Mc Trimmer	
C1516	CAPACITOR, fixed: mica; 240 uuf, $\pm 5\%$ , 300 wvdc, char. B.	6 Mc Padder	CM15B241J
C1517	CAPACITOR, fixed: ceramic; .01 uf, GMV, 500 wvdc.	Coupling	CC-100-16
C1518 thru C1520	Same as C1517.	Decoupling	
C1521	Same as C1508.	Coupling	
C1522	CAPACITOR, fixed: mica; 220 uuf, $\pm 5\%$ , 300 wvdc, char. C.	p/o Voltage Divider Network	CM15C221J
C1523	CAPACITOR, fixed: ceramic; feed-thru type; 2000 uuf, $\pm 20\%$ , char. A, 500 wvdc.	RF Bypass	CK70A202M
C1524	NOT USED		

**FREQUENCY AMPLIFIER CHG-1  
SYNTHESIZER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C1525 thru C1527	Same as C1517.	Same as C1518	
C1528	CAPACITOR, fixed: ceramic; .1 uf, +80-20%, 500 wvdc.	Cathode Bypass	CC-100-28
C1529	Same as C1517.	Same as C1528	
C1530	Same as C1517.	Same as C1518	
C1531	Same as C1517.	Same as C1521	
C1532	Same as C1517.	Same as C1518	
C1533	Same as C1517.	Same as C1518	
C1534	Same as C1506.	DC Blocking	
C1535	CAPACITOR, fixed: mica; 10 uuf, ±10%, char. B, 300 wvdc.	Same as C1521	CM15B100K
C1536	CAPACITOR, variable: ceramic; 7-45 uuf, char. C, 500 wvdc.	Trimmer	CV11C450
C1537	Same as C1517.	Same as C1518	CV11C450
C1538	CAPACITOR, fixed: metallized paper; .05 uf, 200 wvdc.	Plate Bypass	CN-111-5
C1539	Same as C1517.	Same as C1523	
C1540	Same as C1517.	Same as C1523	
C1541	CAPACITOR, fixed: ceramic; .001 uf, ±10%, 500 wvdc, disc type.	Same as C1521	CC-100-9
C1542	Same as C1528.	Same as C1528	
C1543	Same as C1517.	Same as C1523	
C1544	CAPACITOR, solid electrolytic tantalum; 6.8 uf, ±20%, 6 vdc; plastic film insulating sleeve; hermetically sealed.	Time Constant	CE-106
C1545	Same as C1517.	Same as C1518	
C1546	Same as C1517.	Same as C1528	
C1547	Same as C1517.	Same as C1518	
C1548	Same as C1517.	Same as C1518	
C1549	Same as C1517.	Same as C1521	
C1550	Same as C1523.	Same as C1523	
C1551	Same as C1517.	Same as C1534	

**FREQUENCY AMPLIFIER CHG-1  
SYNTHESIZER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
J1501	CONNECTOR, receptacle: male, one contact, 50 ohms.	1 Mc Input	JJ-154
J1502	Same as J1501.	1 Mc Junction	
J1503	Same as J1501.	2 Mc Output	
L1501	COIL, toroidal: 2.5 uh; $\pm 5\%$ , $Q=250$ at 20 mc; operating frequency range 9-20 mc.	RF Choke	CL-239
L1502	COIL, R. F. : tuned; 20 uh, $\pm 1$ uh, $Q=70$ or greater; frequency resonance = 2.5 mc.	2 Mc Mixer Oscillator	AC-128
L1503	COIL, R. F. : 750 microhenries, $\pm 20\%$ , 100 ma max. current; DC resistance approx. 17 ohms; bakelite body.	Same as L1501	CL-100-5
L1504	COIL, R. F. : 2.5 mh, 100 ma; molded.	Same as L1501	CL-140-1
L1505	COIL, R. F. : fixed; moulded, with powder iron core, 20 mc, 120 uh, $\pm 10\%$ , $Q=55$ at 790 kc.	Same as L1501	CL-240-120
L1506	Same as L1505.	Same as L1501	
L1507	Same as L1504.	Same as L1501	
MP1501 thru MP1518	CORE, toroid: bead.	Capacitance Compensator	CI-120-1
P1501	CONNECTOR, plug: min. coaxial type.	1 Mc Input	PL-154
P1502	Same as P1501.	Divider Chassis 1 Mc Input	
P1503	Same as P1501.	2 Mc Output	
P1504	CONNECTOR, plug: min. coaxial; angle type.	Harmonic Generator 1 Mc Output	PL-155
P1505	Same as P1504.	HFO Input from Phase Detector	
P1506	Same as P1501.	2 Mc Input	
P1507	Same as P1504.	HFO Output	
P1508	Same as P1504.	1 Mc Input	
P1509	Same as P1504.	1 Mc Output	
R1501	RESISTOR, fixed: composition; 1 megohm, $\pm 10\%$ , 1/2 watt.	Grid Leak Bias	RC20GF105K
R1502	RESISTOR, fixed: composition; 56,000 ohms, $\pm 10\%$ , 1/2 watt.	Screen Load	RC20GF563K
R1503	RESISTOR, fixed: composition; 6800 ohms, $\pm 10\%$ , 1/2 watt.	Plate Load	RC20GF682K



**FREQUENCY AMPLIFIER CHG-1  
SYNTHESIZER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
R1504	RESISTOR, fixed: composition; 2200 ohms, $\pm 10\%$ , 1/2 watt.	Voltage Dropping	RC20GF222K
R1505	Same as R1504.	Same as R1504	
R1506	NOT USED	Same as R1504	
R1507	RESISTOR, fixed: composition; 100,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1501	RC20GF104K
R1508	RESISTOR, fixed: composition; 68 ohms, $\pm 10\%$ , 1/2 watt.	Cathode Bias	RC20GF680K
R1509	RESISTOR, fixed: composition; 1000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1503	RC20GF102K
R1510	RESISTOR, fixed: composition; 47 K ohms, $\pm 10\%$ , 1/2 watt.	Same as R1502	RC20GF473K
R1511	RESISTOR, fixed: composition; 4700 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1504	RC20GF472K
R1512	Same as R1507.	Same as R1501	
R1513	RESISTOR, fixed: composition; 22,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1501	RC20GF223K
R1514	RESISTOR, fixed: composition; 8200 ohms, $\pm 10\%$ , 2 watts.	Same as R1502	RC42GF822K
R1515	RESISTOR, fixed: composition; 6800 ohms, $\pm 10\%$ , 1 watt.	Same as R1503	RC32GF682K
R1516	RESISTOR, fixed: composition; 100 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1508	RC20GF101K
R1517	RESISTOR, fixed: composition; 10,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1504	RC20GF103K
R1518	Same as R1507.	Same as R1504	
R1519	RESISTOR, fixed: composition; 33,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1502	RC20GF333K
R1520	Same as R1513.	Same as R1501	
R1521	Same as R1509.	Same as R1508	
R1522	RESISTOR, variable: composition; 2500 ohms, $\pm 10\%$ , 1/2 watt, slotted locking shaft.	Synchronization Balance Adjustment	RV106UX8B252A
R1523	Same as R1501.	Same as R1501	
R1524	RESISTOR, fixed: composition; 39,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1504	RC20GF393K
R1525	RESISTOR, fixed: composition; 1200 ohms, $\pm 5\%$ , 1/2 watt.	Same as R1504	RC20GF122J

**FREQUENCY AMPLIFIER CHG-1  
SYNTHESIZER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
R1526	Same as R1511.	Same as R1503	
R1527	Same as R1508.	Same as R1508	
R1528	Same as R1524.	Same as R1502	
R1529	Same as R1507.	Same as R1501	
R1530	Same as R1507.	Same as R1503	
S1501	SWITCH, rotary: 16 positions; 1 section, bakelite insulation; silver plated brass contacts.	p/o Bandswitch	SW-278
T1501	TRANSFORMER, R. F. : tuned; 2 mc, 540 uh, $\pm 15$ uh, Q=50 or greater; frequency 790 kc.	2 Mc Tank & Phase Detector	TT-115
V1501	TUBE, electron: sharp cutoff R. F. pentode; 7 pin miniature.	Isolation Amplifier	6AH6
V1502	Same as V1501.	Harmonic Generator	
V1503	TUBE, vacuum: pentagrid converter.	Mixer	6BA7
V1504	TUBE, vacuum: pentagrid amplifier.	SYNC	6CS6
V1505	Same as V1501.	Doubler	
W1501	CABLE ASSEMBLY, R. F. : consists of 19 inches of RG-174/U coaxial wire; one straight plug PL-154 (Symbol P1501) and one angle plug PL-155 (Symbol P1504).	Harmonic Generator 1 Mc Output	CA-349-19.00
W1502	CABLE ASSEMBLY, R. F. : consists of 16-3/4 inches of RG-174/U coaxial wire; one angle plug PL-155 (Symbol P1507).	HFO Output to Isolation Amplifier	CA-586-16.75
W1503	CABLE ASSEMBLY, R. F. : consists of 22 inches of RG-174/U coaxial wire; one angle plug PL-155 (Symbol P1505).	Phase Detector Output to Varicap	CA-586-22.00
W1504	CABLE ASSEMBLY, R. F. : consists of 1-5/8 inches of RG-174/U coaxial wire; one straight plug PL-154 (Symbol P1502) and one angle plug PL-155 (Symbol P1508).	Divider Input	CA-349-1.62
W1505	CABLE ASSEMBLY, R. F. : consists of 25 inches of RG-174/U coaxial wire; two straight plugs PL-154 (Symbols P1503 and P1506 respectively).	2 Mc Output	CA-565-25.00
W1506	CABLE ASSEMBLY, R. F. : consists of 21-1/2 in. of RG-174/U coaxial wire; one angle plug PL-155 (Symbol P1509).	1 Mc Output	CA-586-21.50
XV1501	SOCKET, electron tube: 7 pin miniature.	Socket for V1501	TS102P01
XV1502	Same as XV1501.	Socket for V1502	

**FREQUENCY AMPLIFIER CHG-1  
SYNTHESIZER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
XV1503	SOCKET, electron tube; 9 pin miniature.	Socket for V1503	TS103P01
XV1504	Same as XV1501.	Socket for V1504	
XV1505	Same as XV1501.	Socket for V1505	

**FREQUENCY AMPLIFIER CHG-1  
DIVIDER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C1601	CAPACITOR, fixed: ceramic; .01 uf, GMV, 500 wvdc.	Coupling	CC-100-16
C1602	CAPACITOR, fixed: mylar; dielectric, .1 uf, $\pm 20\%$ , 300 wvdc.	Decoupling	CN106D1003M
C1603	Same as C1602.	Same as C1602	
C1604	Same as C1602.	Same as C1602	
C1605	CAPACITOR, fixed: ceramic; .002 uf, GMV, 500 wvdc.	Same as C1601	CC-100-11
C1606	CAPACITOR, fixed: mica; 270 uuf, $\pm 2\%$ , char. C., 300 wvdc.	Same as C1601	CM15C271G
C1607	CAPACITOR, fixed: mica; 10 uuf, $\pm 10\%$ , char. B., 500 wvdc.	Same as C1601	CM20B100K
C1608	CAPACITOR, fixed: ceramic dielectric; .02 uf, $+80-20\%$ , 500 wvdc.	Cathode Bypass	CC-100-24
C1609	Same as C1602.	Same as C1602	
C1610	Same as C1602.	Same as C1602	
C1611	CAPACITOR, fixed: ceramic; .1 uf, $+80 -20\%$ , 500 wvdc.	Same as C1608	CC-100-28
J1601	CONNECTOR, receptacle: male, one contact, 50 ohms.	1 Mc Input	JJ-154
J1602	Same as J1601.	250 Kc Output	
J1603	CONNECTOR, receptacle: miniature hexagon; 9 contacts, male.	Power Connector	JJ-193-9-P
L1601	COIL, R. F. : tuned; 250 kc, 540 uh, $\pm 15\%$ ; Q=50 or greater; frequency = 790 kc.	Mixer Plate, 250 Kc Oscillator	AC-125
L1602	COIL, R. F. : tuned; 750 kc; 11 uh, $\pm 5\%$ , Q=50 or greater, frequency = 2.5 mc.	750 Kc Tripler	AC-127
L1603	COIL, R. F. : tuned; 250 kc; 540 uh, $\pm 15\%$ , Q=50 or greater; frequency = 790 kc.	250 Kc Output Oscillator	AC-126
L1604	COIL, R. F. : 2.5 mh, 100 ma.	RF Choke	CL-140-1
L1605	Same as L1604.	Same as L1604	
MP1601 thru MP1612	CORE, toroid: bead.	Capacitance Compensator	CI-120-1
R1601	RESISTOR, fixed: composition; 22,000 ohms, $\pm 10\%$ , 1/2 watt.	Grid Leak Bias	RC20GF223K
R1602	RESISTOR, fixed: composition; 12,000 ohms, $\pm 10\%$ , 2 watts.	Screen Load	RC42GF123K

**FREQUENCY AMPLIFIER CHG-1  
DIVIDER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
R1603	RESISTOR, fixed: composition; 8200 ohms, $\pm 10\%$ , 1/2 watt.	Plate Load	RC20GF822K
R1604	RESISTOR, fixed: composition; 150 ohms, $\pm 10\%$ , 1/2 watt.	Cathode Bias	RC20GF151K
R1605	RESISTOR, fixed: composition; 100,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1601	RC20GF104K
R1606	RESISTOR, fixed: composition; 330,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1601	RC20GF334K
R1607	RESISTOR, fixed: composition; 220 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1603	RC20GF221K
R1608	RESISTOR, fixed: composition; 220,000 ohms, $\pm 10\%$ , 1 watt.	Same as R1602	RC32GF224K
R1609	Same as R1605.	Same as R1601	
R1610	Same as R1607.	Same as R1604	
R1611	RESISTOR, fixed: composition; 1000 ohms, $\pm 10\%$ , 1/2 watt.	Terminating Load	RC20GF102K
R1612	RESISTOR, fixed: composition; 680 ohms, $\pm 10\%$ , 1/2 watt.	Same as R1604	RC20GF681K
TP1601	FEED-THRU, teflon: press fit; capacitance = 1.0 uuf; voltage rating = 2000.	Test Point	TE-169-1
V1601	TUBE, electron: pentagrid converter; 7 pin miniature.	Mixer	6BE6
V1602 A & B	TUBE, electron: 9 pin miniature.	Tripler/250 Kc Output	6U8
XV1601	SOCKET, electron tube: 7 pin miniature.	Socket for V1601	TS102P01
XV1602	SOCKET, electron tube: 9 pin miniature.	Socket for V1602	TS103P01

**FREQUENCY AMPLIFIER CHG-2  
FINAL CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C2101	CAPACITOR, fixed: ceramic.	RF Bypass	CK70A202M
C2102	Same as C2101.		
C2103	Same as C2101.		
C2104	Same as C2101.		
C2105	Same as C2101.		
I2101	LAMP, neon: miniature bayonet base; 110 volt, 1/25 watt, T-3-1/4 bulb.	OVEN Indicator	BI-100-51H
I2102	LAMP, neon: miniature bayonet base; 110 volt, 1/25 watt, T-3-1/4 bulb.	SYNC Indicator	BI-100-51
I2103	Same as I2101.	STANDBY Indicator	
I2104	LAMP, incandescent: miniature bayonet base; 6-8 v; 250 ma; T-3-1/4 bulb, bayonet base.	Dial Illumination	BI-101-44
I2105	Same as I2104.	Same as I2104	
L2101	COIL, R. F. : fixed; 120 uhy.	RF Choke	CL-240-120
L2102	Same as L2101.		
L2103	Same as L2101.		
L2104	Same as L2101.		
M2101	METER, MF tuning: 0-25 ua; approx. resistance 2200 ohms; pointer type, knife edge.	Mid-Frequency Tuning	MR-148
M2102	METER, output: 0-25 ua; approx. resistance 2200 ohms, pointer type, knife edge.	Output Meter	MR-149
P2101	CONNECTOR, plug: female; miniature hexagon, 9 pin.	IF Amplifier Filament Connector	PL-189-9S
P2102	Same as P2101.	Oscillator Filament Connector	
P2103	Same as P2101.	Divider Chain Filament Connector	
R1001	RESISTOR, fixed: composition; 220,000 ohms, $\pm 10\%$ , 1/2 watt.	Voltage Dropping	RC20GF224K
R2102	RESISTOR, variable: composition; 250 ohms, linear, $\pm 10\%$ , 2 watts.	Input Gain Adjustment	RV4ATRE251B
R2103	RESISTOR, fixed: composition; 100 ohms, $\pm 10\%$ , 500 wvdc.	Series Input Voltage Divider	RC42GF101K

**FREQUENCY AMPLIFIER CHG-2  
FINAL CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
S2101	SWITCH, toggle: SPST; 6 amps, 125 VAC; 28° angle of throw; solder lug terminals.	B+ ON-OFF	ST12A
S2102	SWITCH, toggle: DPDT; 3 amps, 250 V.	Power ON- STANDBY	ST22N
XI2101	LIGHT, indicator: w/clear white lens; for miniature bayonet base, T-3-1/4 bulb.	Socket for I2101	TS-106-2
XI2102	Same as XI2101.	Socket for I2102	
XI2103	Same as XI2101.	Socket for I2103	
XI2104	SOCKET, bracket: for miniature bayonet base, T-3-1/4 bulb; right angle, down turned.	Socket for I2104	TS-107-2
XI2105	Same as XI2104.	Socket for I1005	

**FREQUENCY AMPLIFIER CHG-2  
IF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C2201	CAPACITOR, fixed: mica; 20 uf.	Coupling	CM15B200J
C2202	CAPACITOR, fixed: ceramic; .01 uf, GMV, 500 wvdc.	Decoupling	CC-100-16
C2203	Same as C2202.		
C2204	Same as C2202.		
C2206	Same as C2202.	Same as C2201	
C2207	CAPACITOR, fixed: ceramic; .001 uf, $\pm 10\%$ , 500 wvdc; disc type.	Same as C2201	CC-100-9
C2208	Same as C2202.	Same as C2202	
C2209	Same as C2207.	Same as C2202	
C2210	Same as C2207.	Same as C2202	
C2211	CAPACITOR, fixed: mica, button, 150 uuf.	Same as C2202	CB21QB151K
C2212	CAPACITOR, fixed: mica, button, 270 uuf.	Same as C2202	CB21QB271K
C2213	Same as C2211.	Same as C2202	
C2214	Same as C2207.	Same as C2201	
C2215	Same as C2207.	Same as C2202	
C2216	CAPACITOR, fixed: mica; 5 uuf, $\pm 20\%$ , char. B, 300 wvdc.	Same as C2201	CM15B050M
C2217	CAPACITOR, fixed: mica, button, .001 uf.	Same as C2201	CB21QB102K
C2218	Same as C2207.	Same as C2202	
C2219	Same as C2216.	Same as C2201	
C2220	Same as C2217.	Same as C2201	
C2221	Same as C2207.	Cathode Bypass	
C2222	Same as C2216.	Same as C2201	
C2223	Same as C2217.	Same as C2202	
C2224	Same as C2207.	Same as C2201	
CR2201	DIODE, germanium: gold bonded; fast switching type.	Bal. Mod.	DD-102-1
CR2202	Same as CR2201.		
J2201	CONNECTOR, receptacle: miniature; hexagon, 9 contacts, male. Mates with PL-189.	Power Connector	JJ-193-9P
J2202	CONNECTOR, receptacle: male; one contact, 50 ohms.	2 Mc Input	JJ-154
J2203	Same as J2202.	IF Input	



**FREQUENCY AMPLIFIER CHG-2  
IF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
J2204	Same as J2202.	IF Output	
L2201	COIL, R. F. : fixed; moulded with powder iron core, 20 mc 120 uhy, $\pm 10\%$ , Q=55 at 790 kc.	RF Choke	CL-240-120
L2202	COIL, R. F. : fixed; moulded 5.6 uh.	Same as L2201	CL-240-5.6
L2203	Same as L2202.		
L2204	Same as L2202.		
L2205	Same as L2201.		
L2206	Same as L2201.		
L2207	Same as L2201.		
L2208	Same as L2201.		
L2209	Same as L2201.		
MP2201 thru MP2236	CORE, toroid: bead type.	Capacitance Compensator	CI-120-1
R2201	RESISTOR, fixed: composition; 4700 ohms, $\pm 10\%$ , 1/2 watt.	Voltage Dropping	RC20GF472K
R2202	RESISTOR, fixed: composition; 15,000 ohms, $\pm 10\%$ , 1/2 watt.	Screen Load	RC20GF153K
R2203	RESISTOR, fixed: composition.	Grid Leak Bias	RC20GF103K
R2204	Same as R2203.	Same as R2201	
R2205	Same as R2202.	Same as R2201	
R2206	RESISTOR, fixed: composition; 150 ohms, $\pm 10\%$ , 1/2 watt.	Cathode Bias	RC20GF151K
R2207	RESISTOR, fixed: composition; 47,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2203	RC20GF473K
R2208	Same as R2206.	Same as R2203	
R2209	RESISTOR, variable: composition; 100 ohms, $\pm 10\%$ , 1/2 watt.	Bal. Adjust	RV106UX8B101A
R2210	RESISTOR, fixed: composition.	Same as R2202	RC20GF221K
R2211	RESISTOR, fixed: composition; 22,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2202	RC20GF223K
R2212	Same as R2211.	Same as R2202	
R2213	RESISTOR, fixed; composition; 100 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2206	RC20GF101K
R2214	Same as R2207.		

**FREQUENCY AMPLIFIER CHG-2  
IF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
R2215	Same as R2213.	Same as R2206	
R2216	Same as R2211.	Same as R2202	
R2217	Same as R2207.		
R2218	Same as R2213.	Same as R2206	
R2219	Same as R2211.	Same as R2202	
R2220	Same as R2207.	Same as R2202	
R2221	Same as R2213.	Same as R2206	
T2201	TRANSFORMER, R. F. : tuned; 18 mcs.	18 mc Generator	TT-119
T2202	TRANSFORMER, R. F. : tuned; 18 mcs.	18 mc Amplifier Oscillator	TT-118
T2203	TRANSFORMER, R. F. : tuned; 15 mcs.	IF Input	TT-121
T2204	TRANSFORMER, R. F. : tuned; 14 - 16 mc.	1st IF Mixer	TT-117
T2205	Same as T2204.		
T2208	TRANSFORMER, R. F. : fixed		TR-165
V2201	TUBE, electron: sharp cutoff R. F. pentode; 7 pin miniature.	18 mc Amplifier	6AH6
V2202	Same as V2201.		
V2203	TUBE, electron: sharp cutoff R. F. pentode; 7 pin miniature.	1st IF Amplifier	6AU6
V2204	Same as V2203.	2nd IF Amplifier	
V2205	Same as V2203.	3rd IF Amplifier	
V2206	Same as V2201.	IF Output Amplifier	
XV2201	SOCKET, electron tube: 7 pin miniature.	Socket for V2201	TS-102-P01
XV2202	Same as XV2201.	Socket for V2202	
XV2203	Same as XV2201.	Socket for V2203	
XV2204	Same as XV2201.	Socket for V2204	
XV2205	Same as XV2201.	Socket for V2205	
XV2206	Same as XV2201.	Socket for V2206	

**FREQUENCY AMPLIFIER CHG-2  
OSCILLATOR CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C2301	CAPACITOR, fixed: ceramic; .01 uf, GMV, 500 wvdc.	Decoupling	CC-100-16
C2302	CAPACITOR, fixed: mica, button, 1000 uuf.	Same as C2301	CB21QB102K
C2303	Same as C2301.	Cathode Bypass	
C2304	CAPACITOR, fixed: mica dielectric; 130 uuf, $\pm 2\%$ , char. C., 300 wvdc.	RF Bypass	CM15C131G
C2305	CAPACITOR, fixed: mica dielectric; 47 uuf, $\pm 5\%$ , char. C., 300 wvdc.	Coupling	CM15C470J
C2306	Same as C2301.		
C2307	CAPACITOR, variable: ceramic, 7-45 uuf.		CV11C450
C2308	CAPACITOR, fixed: mica dielectric; 68 uuf, $\pm 5\%$ , char. C., 300 wvdc.	Same as C2305	CM15B680J
C2309	CAPACITOR, fixed: mica dielectric; 110 uuf, $\pm 5\%$ , 300 wvdc.	Same as C1304	CM15B111J
C2310	CAPACITOR, fixed: mica dielectric; 24 uuf, $\pm 5\%$ , char. C., 300 wvdc.	Same as C2305	CM15C240J
C2311	Same as C2301.		
C2312	Same as C2301.		
C2313	Same as C2301.		
C2314	CAPACITOR, fixed: mica; 1000 uuf, $\pm 5\%$ , char. B., 500 wvdc.	Same as C2305	CM20B102J
C2315	Same as C2302.		
C2316	Same as C2302.		
C2317	Same as C2302.		
C2318	Same as C2302.		
C2319	Same as C2302.		
C2320	Same as C2301.	Same as C2303	
C2321	Same as C2302.		
C2322	CAPACITOR, fixed: mica; 27 uf, $\pm 5\%$ , char. C., 300 wvdc.	p/o Voltage Divider Network	CM15C270J
J2301	CONNECTOR, receptacle: miniature hexagon; 9 contacts, male, mates with PL-189.	Power Connector	JJ-193-9P
J2302	Same as J2301.		
J2303	CONNECTOR, receptacle: electrical; 1 female contact; 52 ohms, BNC type.	1 Mc Input	UG-625/U

**FREQUENCY AMPLIFIER CHG-2  
OSCILLATOR CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
J2304	Same as J2303.	1 Mc Output	
J2305	CONNECTOR, receptacle.	Same as J2304	JJ-211
J2306	Same as J2303.	Same as J2304	
J2307	CONNECTOR, receptacle: male; one contact, 50 ohms.	Same as J2306	JJ-154
J2308	Same as J2307.	Same as J2306	
J2309	Same as J2307.	HF Input from Phase Detector	
J2310	Same as J2307.	HF Output	
J2311	Same as J2307.	Same as J2310	
L2301	COIL, R. F. : fixed; molded, with powder iron core; 20 mc, 120 uh $\pm 10\%$ , Q=55 at 790 kc.	RF Choke	CL-240-120
L2302	Same as L2301.		
L2303	Same as L2301.		
L2304	COIL, R. F. : tuned; 140 uh, $\pm 10\%$ , Q=40 at 790 kc; oper. freq. 1 mc; includes one 150 uhf and two 510 uuf capacitors.	1 Mc Output Transformer	AC-132
L2305	COIL, R. F. : tuned; 140 uh, $\pm 10\%$ , Q=40 at 790 kc; oper. freq. 1 mc; includes one 110 uuf and one 510 uuf capacitor.	1 Mc Oscillator Tank	AC-131
L2306	COIL, R. F. : 750 microhenries, $\pm 20\%$ , 100 ma max. current; DC resistance approx. 17 ohms; bakelite body.	Same as L2301	CL-100-5
L2307	Same as L2301.		
L2308	Same as L2301.		
L2309	Same as L2301.		
MP2301 thru MP2318	CORE, toroid: bead.	Capacitance Compensator	CI-120-1
R2301	RESISTOR, fixed: composition; 220,000 ohms, $\pm 10\%$ , 1/2 watt.	Grid Leak Bias	RC20GF224K
R2302	RESISTOR, fixed: composition; 2200 ohms, $\pm 10\%$ , 1/2 watt.	Plate Load	RC20GF222K
R2303	RESISTOR, fixed: composition; 68 ohms, $\pm 10\%$ , 1/2 watt.	Cathode Bias	RC20GF680K
R2304	RESISTOR, fixed: composition; 470,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2301	RC20GF474K

**FREQUENCY AMPLIFIER CHG-2  
OSCILLATOR CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
R2305	RESISTOR, fixed: composition; 10,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2302	RC20GF103K
R2306	RESISTOR, fixed: composition; 100,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2304	RC20GF104K
R2307	Same as R2302.		
R2308	RESISTOR, fixed: composition; 22,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2301	RC20GF223K
R2309	Same as R2301.		
R2310	Same as R2303.		
R2311	Same as R2301.		
R2312	RESISTOR, fixed: composition.		RC20GF121K
S2301	SWITCH, rotary: 1 section; 2 positions, mycalex insulation; contacts and wipers nickel plated.	Standard Selector	SW-150
V2301	TUBE, electron: sharp cutoff R. F. pentode; 7 pin miniature.	1 Mc Output Amplifier	6AH6
V2302 A, B	TUBE, electron: 9 pin miniature.	1 Mc Oscillator/ 1 Mc Amplifier	6U8
XV2301	SOCKET, electron tube: 7 pin miniature.	Socket for V2301	TS102P01
XV2302	SOCKET, electron tube: 9 pin miniature.	Socket for V2302	TS103P01

**FREQUENCY AMPLIFIER CHG-2  
OVEN CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C2401	CAPACITOR, variable: glass, 5-50 uuf.	10 Mc Tuning	CV-107-1
C2402	CAPACITOR, fixed: mica dielectric; 27 uuf, $\pm 5\%$ , 300 wvdc.	10 Mc Padder	CM15B270J
C2403	Same as C2401.	11 Mc Tuning	
C2404	Same as C2402.	11 Mc Padder	
C2405	Same as C2401.	12 Mc Tuning	
C2406	Same as C2402.	12 Mc Padder	
C2407	Same as C2401.	14 Mc Tuning	
C2408	Same as C2402.	14 Mc Padder	
C2409	Same as C2401.	15 Mc Tuning	
C2410	Same as C2402.	15 Mc Padder	
C2411	Same as C2401.	13 Mc Tuning	
C2412	Same as C2402.	13 Mc Padder	
C2413	Same as C2401.	9 Mc Tuning	
C2414	Same as C2402.	9 Mc Padder	
C2415	Same as C2401.	8 Mc Tuning	
C2416	Same as C2402.	8 Mc Padder	
C2417	CAPACITOR, fixed: mica, button, 1000 uuf.	Decoupling	CB21QB102K
C2418	Same as C2417.		
C2419	Same as C2417.		
C2420	CAPACITOR, fixed: mica, 510 uuf.	Same as C2417	CM15B511J
C2421	Same as C2420.	Coupling	
C2422	CAPACITOR, fixed: mica, 47 uuf.	Same as C2421	CM15C470J
C2423	Same as C2422.	Cathode Bypass	
C2424	CAPACITOR, fixed: mica; 110 uuf.	Same as C2423	CM15B111J
C2425	CAPACITOR, voltage variable.	Same as C2423	CX-106-1
C2426	Same as C2417.		
C2427	Same as C2417.		
C2428	CAPACITOR, fixed: mica; 110 uuf.	Same as C2423	CM20B162J
C2429	Same as C2417.		

**FREQUENCY AMPLIFIER CHG-2  
OVEN CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
MP2401 thru MP2406	CORE, toroid: bead type.	Capacitance Compensator	CI-120-1
P2401	CONNECTOR, plug: 9-pin male.		PL-189-9P
P2402	CONNECTOR, plug: RF miniature.	HF OUT	PL-205
P2403	Same as P2402.	VARICAP	
R2401	RESISTOR, fixed: composition.	Voltage Dropping	RC32GF472K
R2402	RESISTOR, fixed: composition.	Same as R2401	RC20GF104K
R2403	Same as R2402.		
R2404	Same as R2402.		
R2405	RESISTOR, fixed: composition.	Same as R2401	RC20GF221K
R2406 A, B	ELEMENT, heater: series resistance = 2800 ohms, parallel resistance = 700 ohms, 20 watts; asbestos insulation.	Heater Element	RR-129-1
S2401	WAFER, rotary: 1 section; 16 positions, contacts 8, rotors silver plated brass.	p/o Bandswitch	WS-121
S2402	SWITCH, thermostatic: 70° ±5%; hermetically sealed contacts, normally closed; max. volts 250 AC or DC.	70° Thermostat	SS-103-0-70
S2403	WAFER, rotary: 1 section; 5 positions.	Same as S2401	WS-123
T2401	TRANSFORMER, pulse.	Input	TF-228U13
V2401	TUBE, electron.	HF Oscillator	6AB4
V2402	TUBE, electron.	HF Output	6J4
W2401	CABLE, main.	HF Input	CA-617
W2402	CABLE, if.	HF Output	CA-623-14.00
XV2401	SOCKET, tube: 7 pin.	Socket for V2401	TS-102-P01
XV2402	Same as XV2401.	Socket for V2402	
XY2401	SOCKET, crystal: .486" spacing for .050" pin dia.	Socket for Y2401	TS-104-1
XY2402	Same as XY2401.	Socket for Y2402	
XY2403	Same as XY2401.	Socket for Y2403	
XY2404	Same as XY2401.	Socket for Y2404	

**FREQUENCY AMPLIFIER CHG-2  
OVEN CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
XY2405	Same as XY2401.	Socket for Y2405	
XY2406	Same as XY2401.	Socket for Y2406	
XY2407	Same as XY2401.	Socket for Y2407	
XY2408	Same as XY2401.	Socket for Y2408	
XY2409	Same as XY2401.	Socket for Y2409	
Y2401	CRYSTAL, quartz: 1 mc.	1 Mc Crystal	CR-27/U-1.000P
Y2402	CRYSTAL, quartz: 10 mc.	10 Mc Crystal	CR-27/U-10.000P
Y2403	CRYSTAL, quartz: 11 mc.	11 Mc Crystal	CR-27/U-11.000P
Y2404	CRYSTAL, quartz: 12 mc.	12 Mc Crystal	CR-27/U-12.000P
Y2405	CRYSTAL, quartz: 14 mc.	14 Mc Crystal	CR-27/U-14.000P
Y2406	CRYSTAL, quartz: 15 mc.	15 Mc Crystal	CR-27/U-15.000P
Y2407	CRYSTAL, quartz: 13 mc.	13 Mc Crystal	CR-27/U-13.000P
Y2408	CRYSTAL, quartz: 9 mc.	9 Mc Crystal	CR-27/U-9.000P
Y2409	CRYSTAL, quartz: 8 mc.	8 Mc Crystal	CR-27/U-8.000P



**FREQUENCY AMPLIFIER CHG-2  
SYNTHESIZER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C2501	CAPACITOR, variable: glass; 2.0-30.0 uuf, -100 to +100, 1000 wvdc.	8 Mc Trimmer	CV-104-1
C2502	CAPACITOR, fixed: mica; 100 uuf, $\pm 5\%$ , char. B, 300 wvdc.	8 Mc Padder	CM15B101J
C2503	Same as C2501.	9 Mc Trimmer	
C2504	CAPACITOR, fixed: mica dielectric; 68 uuf, $\pm 5\%$ , 300 wvdc, char. B.	9 Mc Padder	CM15B680J
C2505	Same as C2501.	10 Mc Trimmer	
C2506	CAPACITOR, fixed: mica; 47 uuf, $\pm 5\%$ , char. B, 300 wvdc.	10 Mc Padder	CM15B470J
C2507	Same as C2501.	12 Mc Trimmer	
C2508	CAPACITOR, fixed: mica; 20 uuf, $\pm 5\%$ , char. C, 300 wvdc.	12 Mc Padder	CM15C200J
C2509	CAPACITOR, fixed: mica; 5 uuf, $\pm 20\%$ , char. B, 300 wvdc.	13 Mc Trimmer	CM15B050M
C2510	Same as C2501.	13 Mc Padder	
C2511	CAPACITOR, fixed: mica; 24 uuf, $\pm 5\%$ , 300 wvdc, char. B.	11 Mc Trimmer	CM15B240J
C2512	Same as C2501.	11 Mc Padder	
C2513	Same as C2501.	7 Mc Trimmer	
C2514	CAPACITOR, fixed: mica; 160 uuf, $\pm 5\%$ , 300 wvdc, char. B.	7 Mc Padder	CM15B161J
C2515	Same as C2501.	6 Mc Trimmer	
C2516	CAPACITOR, fixed: mica; 240 uuf, $\pm 5\%$ , 300 wvdc, char. B.	6 Mc Padder	CM15B241J
C2517	CAPACITOR, fixed: ceramic; .01 uf, GMV, 500 wvdc.	Coupling	CC-100-16
C2518	Same as C2517.	Decoupling	
C2519	CAPACITOR, fixed: ceramic; feed-thru type; 2000 uuf, $\pm 20\%$ , char. A, 500 wvdc.	RF Bypass	CK70A202M
C2520	Same as C2517.	Same as C2518	
C2521	Same as C2517.	Same as C2518	
C2522 thru C2524	Same as C2517.	Same as C2518	
C2525	Same as C2508.	Coupling	

**FREQUENCY AMPLIFIER CHG-2  
SYNTHESIZER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C2526	CAPACITOR, fixed: mica; 220 uuf, $\pm 5\%$ , 300 wvdc, char. C.	p/o Voltage Divider Network	CM15C221J
C2527	Same as C2517.		
C2528	CAPACITOR, fixed: ceramic; .1 uf, $+80-20\%$ , 500 wvdc.	Cathode Bypass	CC-100-28
C2529	Same as C2517.	Same as C2518	
C2530	Same as C2517.	Same as C2525	
C2531	Same as C2517.	Same as C2518	
C2532	Same as C2517.	Same as C2518	
C2533	CAPACITOR, fixed: metallized paper; .05 uf, 200 wvdc.	Plate Bypass	CN-111-5
C2534	Same as C2517.	Same as C2518	CV11C450
C2535	Same as C2517.	Same as C2519	
C2536	CAPACITOR, fixed: mica; 10 uuf, $\pm 10\%$ , char. B, 300 wvdc.	Same as C2525	CM15B100K
C2537	Same as C2506.	DC Blocking	
C2538	CAPACITOR, variable: ceramic; 7-45 uuf, char. C, 500 wvdc.	Trimmer	CV11C450
C2539	Same as C2528.	Same as C2528	
C2540	CAPACITOR, fixed: ceramic; .001 uf, $\pm 10\%$ , 500 wvdc, disc type.	Same as C2525	CC-100-9
C2541	Same as C2517.	Same as C2519	
C2542	Same as C2517.	Same as C2519	
C2543	CAPACITOR, solid electrolytic tantalum; 6.8 uf, $\pm 20\%$ , 6 vdc; plastic film insulating sleeve; hermetically sealed.	Time Constant	CE-106
C2544	Same as C2517.	Same as C2518	
C2545	Same as C2517.	Same as C2528	
C2546	Same as C2517.	Same as C2518	
C2547	Same as C2517.	Same as C2518	
C2548	Same as C2517.	Same as C2525	
C2549	Same as C2511.	18 Mc Tuning	
C2550	Same as C2511.	Same as C2549	
C2551	Same as C2519.	Same as C2519	

**FREQUENCY AMPLIFIER CHG-2  
SYNTHESIZER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
L2501	COIL, toroidal: 2.5 uh; $\pm 5\%$ , Q=250 at 20 mc; operating frequency range 9-20 mc.	RF Choke	CL-239
L2502	COIL, R.F.: tuned; 20 uh, $\pm 1$ uh, Q=70 or greater; frequency resonance = 2.5 mc.	2 Mc Mixer Oscillator	AC-128
L2503	COIL, R.F.: fixed; 15 uhy.		CL-270-15
L2504	COIL, R.F.: fixed; moulded, with powder iron core, 20 mc, 120 uh, $\pm 10\%$ , Q=55 at 790 kc.	Same as L2501	CL-240-120
L2505	Same as L2504.	Same as L2501	
L2506	Same as L2504.		
L2507	COIL, R.F.: 750 microhenries, $\pm 20\%$ , 100 ma max. current; DC resistance approx. 17 ohms; bakelite body.	Same as L2501	CL-100-5
L2508	COIL, R.F.: 2.5 mh, 100 ma; molded.	Same as L2501	CL-140-1
L2509	Same as L2508.	Same as L2501	
MP2501 thru MP2518	CORE, toroid: bead.	Capacitance Compensator	CI-120-1
P2501	CONNECTOR, plug: min. coaxial type.	1 Mc Input	PL-154
P2502	Same as P2501.	Divider Chassis 1 Mc Input	
P2503	CONNECTOR, plug: min.	18 Mc Input	PL-204
P2504	Same as P2501.	2 Mc Output	
P2505	Same as P2501.	2 Mc Input	
P2506	Same as P2501.	1 Mc Output	
R2501	RESISTOR, fixed: composition; 56,000 ohms, $\pm 10\%$ , 1/2 watt.	Screen Load	RC20GF563K
R2502	RESISTOR, fixed: composition; 6800 ohms, $\pm 10\%$ , 1/2 watt.	Plate Load	RC20GF682K
R2503	RESISTOR, fixed: composition; 2200 ohms, $\pm 10\%$ , 1/2 watt.	Voltage Dropping	RC20GF222K
R2504	Same as R2503.	Same as R2503	
R2505	RESISTOR, fixed: composition; 6800 ohms, $\pm 10\%$ , 1 watt.	Same as R2502	RC32GF682K
R2506	RESISTOR, fixed: composition; 8200 ohms, $\pm 10\%$ , 2 watts.	Same as R2501	RC42GF822K
R2507	RESISTOR, fixed: composition; 1 megohm, $\pm 10\%$ , 1/2 watt.	Grid Leak Bias	RC20GF105K

**FREQUENCY AMPLIFIER CHG-2  
SYNTHESIZER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
R2508	RESISTOR, fixed: composition; 100,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2507	RC20GF104K
R2509	RESISTOR, fixed: composition; 22,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2507	RC20GF223K
R2510	RESISTOR, fixed: composition; 100 ohms, $\pm 10\%$ , 1/2 watt.	Cathode Bias	RC20GF101K
R2511	Same as R2508.	Same as R2507	
R2512	RESISTOR, fixed: composition; 68 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2510	RC20GF680K
R2513	RESISTOR, fixed: composition; 47 K ohms, $\pm 10\%$ , 1/2 watt.	Same as R2502	RC20GF473K
R2514	RESISTOR, fixed: composition; 4700 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2503	RC20GF472K
R2515	RESISTOR, fixed: composition; 33,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2501	RC20GF333K
R2516	Same as R2508.	Same as R2503	
R2517	Same as R2514.	Same as R2502	
R2518	Same as R2509.	Same as R2507	
R2519	RESISTOR, fixed: composition; 1000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2502	RC20GF102K
R2520	RESISTOR, variable: composition; 2500 ohms, $\pm 10\%$ , 1/2 watt, slotted locking shaft.	Synchronization Balance Adjustment	RV106UX8B252A
R2521	Same as R2507.	Same as R2507	
R2522	RESISTOR, fixed: composition; 10,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2503	RC20GF103K
R2523	Same as R2508.	Same as R2507	
R2524	RESISTOR, fixed: composition; 39,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2503	RC20GF393K
R2525	Same as R2508.	Same as R1502	
R2526	Same as R2524.	Same as R2501	
R2527	RESISTOR, fixed: composition; 1200 ohms, $\pm 5\%$ , 1/2 watt.	Same as R2503	RC20GF122J
R2528	Same as R2512.	Same as R2512	
S2501	SWITCH, rotary: 16 positions; 1 section, bakelite insulation; silver plated brass contacts.	p/o Bandswitch	SW-278
T2501	TRANSFORMER, R. F.: tuned; 2 mc, 540 uh, $\pm 15$ uh, Q=50 or greater; frequency 790 kc.	2 Mc Tank & Phase Detector	TT-115

**FREQUENCY AMPLIFIER CHG-2  
SYNTHESIZER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
T2502	TRANSFORMER, R. F.: tuned; 18 mc output.	18 Mc Tuning	TT-128
V2501	TUBE, electron: sharp cutoff R. F. pentode; 7 pin miniature.	Isolation Amplifier	6AH6
V2502	Same as V2501.	Harmonic Generator	
V2503	TUBE, vacuum: pentagrid converter.	Mixer	6BA7
V2504	TUBE, vacuum: pentagrid amplifier.	SYNC	6CS6
V2505	Same as V2501.	Doubler	
W2501	CABLE ASSEMBLY, R. F.	Varicap	CA-622-14.50
W2502	Same as W2501.	Isolation Amplifier	CA-622-13.00
W2503	Same as W2501.	2 Mc Output	CA-622-23.00
W2504	Same as W2501.	1 Mc Output	CA-622-16.50
W2505	Same as W2501.	Harmonic Generator	CA-622-16.50
W2506	Same as W2501.	Divider Input	CA-622-4.50
XV2501	SOCKET, electron tube: 7 pin miniature.	Socket for V2501	TS-102-P01
XV2502	Same as XV2501.	Socket for V2502	
XV2503	SOCKET, electron tube: 9 pin miniature.	Socket for V2503	TS-103-P01
XV2504	Same as XV2501.	Socket for V2504	
XV2505	Same as XV2501.	Socket for V2505	

**FREQUENCY AMPLIFIER CHG-2  
DIVIDER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C2601	CAPACITOR, fixed: ceramic; .01 uf, GMV, 500 wvdc.	Coupling	CC-100-16
C2602	CAPACITOR, fixed: mylar; dielectric, .1 uf, $\pm 20\%$ , 300 wvdc.	Decoupling	CN106D1003M
C2603	Same as C2602.	Same as C2602	
C2604	Same as C2602.	Same as C2602	
C2605	CAPACITOR, fixed: ceramic; .002 uf, GMV, 500 wvdc.	Same as C2601	CC-100-11
C2606	CAPACITOR, fixed: mica; 270 uuf, $\pm 2\%$ , char. C., 300 wvdc.	Same as C2601	CM15C271G
C2607	CAPACITOR, fixed: mica; 10 uuf, $\pm 10\%$ , char. B., 500 wvdc.	Same as C2601	CM20B100K
C2608	CAPACITOR, fixed: ceramic dielectric; .02 uf, $+80-20\%$ , 500 wvdc.	Cathode Bypass	CC-100-24
C2609	Same as C2602.	Same as C2602	
C2610	Same as C2602.	Same as C2602	
C2611	CAPACITOR, fixed: ceramic; .1 uf, $+80-20\%$ , 500 wvdc.	Same as C2608	CC-100-28
J2601	CONNECTOR, receptacle: male, one contact, 50 ohms.	1 Mc Input	JJ-211
J2602	Same as J2601.	250 Kc Output	
J2603	CONNECTOR, receptacle: miniature hexagon; 9 contacts, male.	Power Connector	JJ-193-9-P
L2601	COIL, R. F. : tuned; 250 kc, 540 uh, $\pm 15\%$ , Q=50 or greater; frequency = 790 kc.	Mixer Plate, 250 Kc Oscillator	AC-125
L2602	COIL, R. F. : tuned; 750 kc; 11 uh, $\pm 5\%$ , Q=50 or greater, frequency = 2.5 mc.	750 Kc Tripler	AC-127
L2603	COIL, R. F. : tuned; 250 kc; 540 uh, $\pm 15\%$ , Q=50 or greater; frequency = 790 kc.	250 Kc Output Oscillator	AC-126
L2604	COIL, R. F. : 2.5 mh, 100 ma.	RF Choke	CL-140-1
L2605	Same as L2604.	Same as L2604	
MP2601 thru MP2612	CORE, toroid: bead.	Capacitance Compensator	CI-120-1
R2601	RESISTOR, fixed: composition; 22,000 ohms, $\pm 10\%$ , 1/2 watt.	Grid Leak Bias	RC20GF223K
R2602	RESISTOR, fixed: composition; 12,000 ohms, $\pm 10\%$ , 2 watts.	Screen Load	RC42GF123K

**FREQUENCY AMPLIFIER CHG-2  
DIVIDER CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
R2603	RESISTOR, fixed: composition; 8200 ohms, $\pm 10\%$ , 1/2 watt.	Plate Load	RC20GF822K
R2604	RESISTOR, fixed: composition; 150 ohms, $\pm 10\%$ , 1/2 watt.	Cathode Bias	RC20GF151K
R2605	RESISTOR, fixed: composition; 100,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2601	RC20GF104K
R2606	RESISTOR, fixed: composition; 330,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2601	RC20GF334K
R2607	RESISTOR, fixed: composition; 220 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2603	RC20GF221K
R2608	RESISTOR, fixed: composition; 220,000 ohms, $\pm 10\%$ , 1 watt.	Same as R2602	RC32GF224K
R2609	Same as R2605.	Same as R2601	
R2610	Same as R2607.	Same as R2604	
R2611	RESISTOR, fixed: composition; 1000 ohms, $\pm 10\%$ , 1/2 watt.	Terminating Load	RC20GF102K
R2612	RESISTOR, fixed: composition; 680 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2604	RC20GF681K
TP2601	FEED-THRU, teflon: press fit; capacitance = 1.0 uuf; voltage rating = 2000.	Test Point	TE-169-1
V2601	TUBE, electron: pentagrid converter; 7 pin miniature.	Mixer	6BE6
V2602 A & B	TUBE, electron: 9 pin miniature.	Tripler/250 Kc Output	6U8
XV2601	SOCKET, electron tube: 7 pin miniature.	Socket for V2601	TS-102-P01
XV2602	SOCKET, electron tube: 9 pin miniature.	Socket for V2602	TS-103-P01

**FREQUENCY AMPLIFIER CHG-2  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C2701	CAPACITOR, fixed: mica; 3000 uuf, $\pm 2\%$ , char. D, 500 wvdc.	Equalizer	CM30D302G
C2702	Same as C2701.	Same as C2701	
C2703	CAPACITOR, fixed: mica; button type; 1000 uuf, $\pm 10\%$ , char. W., 300 wvdc.	Decoupling	CB21QW102K
C2704	CAPACITOR, fixed: ceramic; .01 uf, GMV, 500 wvdc.	Coupling	CC-100-16
C2705	Same as C2704.	Same as C2704	
C2706	Same as C2704.	Same as C2703	
C2707	Same as C2704.	Same as C2703	
C2708	Same as C2704.	Same as C2703	
C2709	CAPACITOR, fixed: mica dielectric; 15 uuf, $\pm 10\%$ , 300 wvdc.	Padder	CM15B150K
C2710	CAPACITOR, variable: ceramic; 4-30 uuf, char. C, 500 wvdc.	Trimmer	CV11C300
C2711 A, B	CAPACITOR, variable: air; 2 sections, 21 plates, 12.5-282 uuf.	p/o MF Tuning Control	CB-156-2
C2712	Same as C2710.	Same as C2710	
C2713	Same as C2704.	Same as C2704	
C2714	Same as C2704.	RF Bypass	
C2715	CAPACITOR, fixed: ceramic; .1 uf, +80 -20%, 500 wvdc.	Cathode Bypass	CC-100-28
C2716 A, B	CAPACITOR, variable: air; 2 sections, 21 plates, 12.5-280 uuf.	Same as C2711 A, B	CB-156-1
C2717	Same as C2710.	Same as C2710	
C2718	Same as C2710.	Same as C2710	
C2719	Same as C2704.	Same as C2714	
C2720	Same as C2704.	Same as C2704	
C2721	Same as C2704.	Same as C2703	
C2722	Same as C2704.	Same as C2715	
C2723	Same as C2704.	Same as C2703	
C2724	CAPACITOR, fixed: mica dielectric; 10 uuf, $\pm 5\%$ , char. C., 300 wvdc.	Same as C2704	CM15C100J
C2725	Same as C2704.	Same as C2715	



**FREQUENCY AMPLIFIER CHG-2  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C2726	CAPACITOR, fixed: ceramic; feed-thru type; 2000 uuf, $\pm 20\%$ .	Same as C2714	
C2727	CAPACITOR, fixed: ceramic; disc type; .001 uf, $\pm 10\%$ , 500 wvdc.	Same as C2703	
C2728	Same as C2727.	Same as C2703	
C2729	Same as C2727.	Same as C2715	
C2730	Same as C2704.	Same as C2704	
C2731	Same as C2704.	Same as C2704	
C2732	Same as C2727.	Same as C2703	
C2733	Same as C2727.	Bypass	
C2734	Same as C2710.	p/o 1st RF Amplifier Tank Oscillator	
C2735	CAPACITOR, variable: ceramic; 3-12 uuf, 500 wvdc.	Same as C2734	CV11A120
C2736	CAPACITOR, variable: air; 1 section, 21 plates, 12.5-282 uuf.	p/o Output Tun- ing Control	CB-157-1
C2737	Same as C2710.	Same as C2734	
C2738	Same as C2726.	Same as C2714	
C2739	Same as C2703.	p/o Voltage Divider Network	
C2740	CAPACITOR, fixed: paper; .1 uf, +40 -10%, 400 wvdc.	Same as C2703	CN-100-4
C2741	CAPACITOR, fixed: mica; dielectric, 510 uuf, $\pm 5\%$ , char. B., 300 wvdc.	Same as C2704	CM15B511J
C2742	Same as C2734.	Same as C2736	
C2743	Same as C2727.	Same as C2733	
C2744	Same as C2704.	Meter Bypass	
C2745	Same as C2735.	p/o 2nd RF Amplifier Tank Oscillator	
C2746	Same as C2710.	Same as C2745	
C2747	Same as C2710.	Same as C2745	
C2748	Same as C2726.	Same as C2714	
C2749	Same as C2726.	Same as C2714	
C2750	Same as C2703.	Same as C2733	

**FREQUENCY AMPLIFIER CHG-2  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C2751	Same as C2741.	DC Blocking	
C2752	Same as C2734.	Same as C2736	
C2753	Same as C2727.	Same as C2733	
C2754	Same as C2727.	Same as C2733	
C2755	Same as C2735.	p/o RF Output Amplifier Tank Oscillator	
C2756	Same as C2710.	Same as C2755	
C2757	Same as C2710.	Same as C2755	
C2758	Same as C2710.	Same as C2755	
C2759	Same as C2726.	Same as C2714	
C2760	Same as C2740.	Same as C2714	
C2761	Same as C2741.	Same as C2704	
C2762	Same as C2703.	Same as C2714	
C2763	Same as C2741.	Same as C2704	
C2764	CAPACITOR, variable: air; 1 section, 21 plates, 12.5-282 uuf.	Same as C2736	CB-157-2
C2765	Same as C2727.	Same as C2714	
C2766	Same as C2727.	Same as C2755	
C2767	Same as C2727.	Same as C2755	
C2768	CAPACITOR, electrolytic: tantalum; 5 uf, +50 -15%, 60 wvdc.	Same as C2715	CE-107-1
C2769	Same as C2710.	Same as C2755	
C2770	Same as C2710.	Same as C2755	
C2771	Same as C2710.	Same as C2755	
C2772	Same as C2710.	p/o 2nd RF Amplifier Tank Oscillator	
C2773	Same as C2726.	Same as C2714	
C2774	Same as C2704.	Same as C2714	
C2775	Same as C2704.	Same as C2714	
C2776	CAPACITOR, variable: ceramic; 7-45 uuf, char. C, 500 wvdc.	Same as C2710	CV11C450

**FREQUENCY AMPLIFIER CHG-2  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
C2777	CAPACITOR, fixed: mica; button type; 270 uuf, $\pm 10\%$ , char. W, 300 wvdc.	Same as C2733	CB21QW271K
C2778	CAPACITOR, fixed: mica dielectric; 39 uuf, $\pm 5\%$ , char. C., 300 wvdc.	p/o 20 Mc Tank Circuit	CM15C390J
C2779	Same as C2703.	Same as C2714	
C2780	Same as C2704.	Same as C2714	
C2781	Same as C2703.	Plate Decoupling	
C2782	Same as C2715.	Same as C2739	
C2783	Same as C2704.	Same as C2714	
C2784	Same as C2726.	Same as C2714	
C2785	Same as C2741.	Same as C2704	
C2786	Same as C2741.	Same as C2714	
C2787	Same as C2703.	Same as C2755	
C2788	Same as C2726.	Same as C2714	
C2789	CAPACITOR, fixed: mica; 270 uuf, $\pm 5\%$ , char. C, 300 wvdc.	Same as C2704	CM15C271J
C2790	Same as C2704.	Same as C2714	
C2791	Same as C2704.	Same as C2714	
C2792	Same as C2704.	Same as C2714	
C2793	Same as C2704.	Same as C2714	
C2794	Same as C2704.	Same as C2703	
C2795	Same as C2704.	Filter	
C2796	Same as C2704.	Same as C2795	
C2797	Same as C2726.	Same as C2714	
C2798	Same as C2726.	Same as C2714	
C2799	Same as C2726.	Same as C2714	
C2800	Same as C2726.	Same as C2714	
C2801	Same as C2726.	Same as C2714	
C2802	Same as C2726.	Same as C2714	
C2803	Same as C2726.	Same as C2714	
C2804	Same as C2726.	Same as C2714	
C2805	Same as C2704.	Same as C2714	

**FREQUENCY AMPLIFIER CHG-2  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
CR2701	DIODE, bonded silicon.	Meter Rectifier	1N303
CR2702	DIODE, germanium.	Rectifier	1N100
CR2703	Same as CR2702.	Same as CR2701	
J2701	JACK, bulkhead.	250 Kc Input from CBE	JJ-172
J2702	Same as J2701.	2-4 Mc Input from CMO	
J2703	Same as J2701.	250 Kc Output	
J2704	CONNECTOR, receptacle: electrical; 1 female contact; 52 ohms, BNC type.	RF Output	UG-625/U
J2705	Same as J2704.	Monitor	
J2706	Same as J2701.	Same as J2705	
J2707	CONNECTOR, receptacle: male; 16 contacts, aluminum alloy cadmium plated.	Power Connector	JJ-183
L2701	COIL, R. F. : fixed; .9 uhy, $\pm 5\%$ , Q = 110, test frequency at 2.5 mcs.	RF Choke	CL-241
L2702	COIL, R. F. : 2.5 uhy, 100 ma.	Same as L2701	CL-140-1
L2703	COIL, R. F. : tuned; 1.75-3.75 mc, 22 uf, $\pm 1$ uh, Q = 30 or greater; test frequency 2.5 mc.	Mid-Frequency Amplifier Grid Coil	AC-130
L2704	COIL, R. F. : 750 microhenries, $\pm 20\%$ , 100 ma max. current; DC resistance approx. 17 ohms; bakelite body.	Same as L2701	CL-100-5
L2705	COIL, R. F. : tuned; 1.75-3.75 mc, 22 uh, $\pm 1$ uh, Q = 30 or greater, test frequency 2.5 mc.	p/o MF Amplifier Plate Oscillator	AC-129
L2706	COIL, R. F. : fixed; moulded w/powder iron core; 20 mc, 120 uhy, $\pm 10\%$ , Q = 55 at 790 kc.	Same as L2701	CL-240-120
L2707	Same as L2702.	Same as L2701	
L2708	Same as L2701.	Same as L2701	
L2709	Same as L2706.	Same as L2701	
L2710 thru L2717	Same as L2706.	Same as L2701	
L2718	Same as L2702.	Same as L2701	
L2719 thru L2722	Same as L2706.	Same as L2701	

**FREQUENCY AMPLIFIER CHG-2  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
L2723	COIL, R. F.: tuned; 20 mc, 0.92 uhy, Q=55 or greater, test frequency - 7.9 mc.	Bands 12 & 11 Multiplier	CL-247
L2724	Same as L2723.	Band 10 Multiplier	
L2725	COIL, R. F.: tuned; 22 mc, 0.63 uhy, Q=90 or greater, test frequency - 25 mc.	Bands 3 & 12 Multiplier	CL-249
L2726	Same as L2725.	Bands 14 & 13 Multiplier	
L2727	COIL, R. F.: tuned; 26 mc, 0.45 uhy, Q=85 or greater, test frequency 25 mc.	Bands 5 & 14 Multiplier	CL-251
L2728	Same as L1111.	Band 15 Multiplier	
L2729	COIL, R. F.: tuned; 30 mc, 0.36 uhy, Q=80 or greater, test frequency - 25 mc.	Band 16 Multiplier	CL-253
L2730	COIL, R. F.: tuned; 16 mc, 1.23 uhy, Q=65 or greater, test frequency 7.9 mc.	Band 9 Multiplier	CL-246
L2731	COIL, R. F.: tuned; 14 mc, 1.7 uhy, Q=50 or greater, test frequency 7.9 mc.	Band 8 Multiplier	CL-245
L2732	COIL, R. F.: tuned; 12 mc, 2.45 uhy, Q=50 or greater, test frequency 7.9 mc.	Band 7 Multiplier	CL-244
L2733	COIL, R. F.: tuned; 10 mc, 3.35 uhy, Q=50 or greater, test frequency 7.9 mc.	Band 6 Multiplier	CL-243
L2734	Same as L2727.	Same as L2727	
L2735	Same as L2725.	Same as L2725	
L2736	Same as L2725.	Same as L2725	
L2737	Same as L2723	Same as L2723	
L2738	Same as L2723.	p/o 20-Mc Tank Circuit	
L2739	Same as L2706.	Same as L2701	
L2740	Same as L2706.	Same as L2701	
L2741	Same as L2702.	Same as L2701	
L2742	Same as L2706.	Same as L2701	
L2743	Same as L2706.	Same as L2701	
L2744	Same as L2706.	Same as L2701	
L2745	Same as L2706.	Same as L2701	
L2746	Same as L2706.	Same as L2701	

**FREQUENCY AMPLIFIER CHG-2  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
MP2701 thru MP2796	CORE, toroid: bead.	Filament Parasitic Suppressors	CI-120-1
P2701	CONNECTOR, plug: miniature coaxial type.	IF Input	PL-204
P2702	Same as P2701.	IF Output	
P2703	CONNECTOR, plug: miniature coaxial, angle type.	Balanced Modulator Input	PL-155
P2704	Same as P2701.	HF Input	
PS2701	SUPPRESSOR, parasitic.	Parasitic Suppressor	AX-164
R2701	RESISTOR, fixed: composition; 39 ohms, $\pm 10\%$ , 1/2 watt.	Grid Leak Bias	RC20GF390K
R2702	Same as R2701.	Same as R2701	
R2703	RESISTOR, variable: composition; 1000 ohms, $\pm 10\%$ , 1/2 watt.	Balance Adjust	RV106UX8B102A
R2704	RESISTOR, fixed: composition; 47 ohms, $\pm 10\%$ , 1/2 watt.	Plate Load, V2701	RC20GF470K
R2705	Same as R2704.	Same as R2704	
R2706	RESISTOR, fixed: composition; 68 ohms, $\pm 10\%$ , 1/2 watt.	Input Termination	RC20GF680K
R2707	RESISTOR, fixed: composition; 2700 ohms, $\pm 10\%$ , 1 watt.	Voltage Dropping	RC32GF272K
R2708	Same as R2701.	Plate load	
R2709	RESISTOR, fixed: composition; 22,000 ohms, $\pm 10\%$ , 1/2 watt.	Screen Load	RC20GF223K
R2710	RESISTOR, fixed: composition; 3300 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2708	RC20GF332K
R2711	RESISTOR, fixed: composition; 100 ohms, $\pm 10\%$ , 1/2 watt.	Cathode Bias	RC20GF101K
R2712	RESISTOR, fixed: composition; 180,000 ohms, $\pm 10\%$ , 1/2 watt.	Meter Load	RC20GF184K
R2713	Same as R2709.	Same as R2707	
R2714	RESISTOR, fixed: composition; 120,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2709	RC20GF124K
R2715	Same as R2710.	Same as R2708	
R2716	RESISTOR, fixed: composition; 47,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2701	RC20GF473K

**FREQUENCY AMPLIFIER CHG-2  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
R2717	RESISTOR, fixed: composition; 560 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2711	RC20GF561K
R2718	RESISTOR, fixed: composition; 6800 ohms, $\pm 10\%$ , 1/2 watt.	Voltage Divider	RC20GF682K
R2719	RESISTOR, fixed: composition.	Same as R2701	RC20GF103K
R2720	Same as R2704.	R. F. Bal	
R2721	Same as R2704.	R. F. Bal	
R2722	RESISTOR, variable: composition.	R. F. Bal. Adj	RV106UX8B251A
R2723	Same as R2711.	Grid leak Bias	
R2724	RESISTOR, fixed: composition; 3900 ohms, $\pm 10\%$ , 1/2 watt.	Load	RC20GF392K
R2725	RESISTOR, variable: composition; 1000 ohms, linear $\pm 10\%$ , 2 watts.	Output Gain Adjust	RV4ATRD102A
R2726	Same as R2709.		
R2727	Same as R2701.	Same as R2710	
R2728	RESISTOR, fixed: composition; 10 ohms, $\pm 10\%$ , 1/2 watt.	Grid Limiter	RC20GF100K
R2729	Same as R2711.	Same as R2711	
R2730	RESISTOR, fixed: composition; 1000 ohms, $\pm 10\%$ , 1 watt.	Same as R2707	RC32GF102K
R2731	Same as R2724.	Same as R2724	
R2732	RESISTOR, fixed: composition; 5600 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2709	RC20GF562K
R2733	Same as R2701.	Same as R2728	
R2734	Same as R2728.	Same as R2728	
R2735	RESISTOR, fixed: composition; 68,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2701	RC20GF683K
R2736	Same as R2724.	Same as R2724	
R2737	Same as R2711.	Same as R2707	
R2738	Same as R2728.	Same as R2728	
R2739	RESISTOR, fixed: composition; 220,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2701	RC20GF224K
R2740	RESISTOR, fixed: ceramic; wire wound, 250 ohms, 5 watts.	Same as R2711	RW-107-23

**FREQUENCY AMPLIFIER CHG-2  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
R2742	Same as R2730.		
R2743	RESISTOR, fixed: composition; 820 ohms, $\pm 10\%$ , 1/2 watt.	p/o Voltage Divider	RC20GF821K
R2744	RESISTOR, fixed: composition; 220 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2743	RC20GF221K
R2745	Same as R2735.	Same as R2712	
R2746	RESISTOR, fixed: composition; 15,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2709	RC20GF153K
R2747	RESISTOR, fixed: composition; 2200 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2710	RC20GF222K
R2748	RESISTOR, fixed: composition; 470,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2701	RC20GF474K
R2749	RESISTOR, fixed: composition; 100,000 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2707	RC20GF104K
R2750	RESISTOR, fixed: composition; 120 ohms, $\pm 10\%$ , 1/2 watt.	Same as R2711	RC20GF121K
R2751	Same as R2718.		
R2752	Same as R2749.	Voltage Divider	
R2753	Same as R2749.	Same as R2707	
S2701 A, B	SWITCH, rotary: two sections, 16 positions, shorting type contacts, bakelite insulation.	Bandswitch	SW-279
S2702 A	WAFER, switch: 16 positions; 1 section, silver plated contacts.	p/o Bandswitch	WS-122
S2702 B	WAFER, rotary: 1 section; 16 positions, contacts and rotors are silver plated brass.	Same as S1102A	WS-121
S2703	WAFER, switch: four positions; shorting type.	Range Switch; p/o Bandswitch	WS-101
S2704	Same as S2703.	Same as C2742	
S2705	Same as S2703.	Same as S2702A	
S2706	Same as S2703.	Same as C2711 A, B	
T2701	TRANSFORMER, R. F.: tuned; primary -90 uhy, secondary 200 uhy, $Q=25$ or greater at 790 kc.	250 Kc Input	TT-133
T2702	TRANSFORMER, R. F.: tuned; 3 winding, operating frequency 1.75 -3.75 mc.	Bal. Mod. In	TT-124
T2703	TRANSFORMER, R. F.: tuned; 1.75 -3.75 mc, primary winding 21 uh, secondary 4.3 uh, $Q=40$ at 5 mc.	MF Output	TT-123



**FREQUENCY AMPLIFIER CHG-2  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
T2704	TRANSFORMER, R. F.: tuned; 15.75 -33.75 mc operating frequency; total inductance, .40 uh, $\pm$ .01 uh; consists of 110 uf capacitor.	p/o 1st Ampl. Tank Osc.	TT-132
T2705	TRANSFORMER, R. F.: 8-16 mc; slug tuned.	Same as C2745	CL-164
T2706	TRANSFORMER, R. F.: 4-8 mc; slug tuned.	Same as C2745	CL-163
T2707	TRANSFORMER, R. F.: 16-32 mc; slug tuned.	Same as C2745	CL-188
T2708	Same as T2705.	Same as C2755	
T2709	Same as T2706.	Same as C2755	
T2710	TRANSFORMER, R. F.: tuned; 1.75 -3.75 mc; 3 uhy, Q=60 or greater; test frequency 2.5 mc.	Same as C2755	TT-127
T2711	TRANSFORMER, R. F.: 15.75 -33.75 mc operating frequency; L = .39-.41 uh, Q=170 or greater; test frequency -25 mcs.	Same as C2755	CL-264
T2712	Same as T2705.	Same as C2735	
T2713	Same as T2706.	Same as C2755	
T2714	Same as T2709.	Same as C2745	
T2715	TRANSFORMER, R. F.: 16-32 mc; slug tuned.	Same as C2755	CL-189
T2716	TRANSFORMER, R. F.: 8-16 mc; slug tuned.	Same as C2755	CL-165
T2717	Same as T2706.	Same as C2735	
T2718	TRANSFORMER, R. F.: tuned; 1.75 -3.75 mc; 3 uhy, Q=60 or greater; test frequency = 2.5 mc.	Same as C2755	TT-126
V2701	TUBE, electron: duo triode; 9 pin miniature.	Balance Modulator	12AT7
V2702	TUBE, electron: sharp cutoff R. F. pentode; 7 pin miniature.	Mid-Frequency Amplifier	6AH6
V2703	Same as V2702.	Metering Tube	
V2704	TUBE, electron.	IF Bal. Med	6AU6
V2705	Same as V2704.		
V2706	Same as V2702.	1st RF Amplifier	
V2707	TUBE, electron: power pentode; wide band amp., 9 pin miniature.	2nd RF Amplifier	6CL6
V2708	TUBE, electron: beam power; large wafer octal base with sleeve, duo triode; 9 pin miniature.	RF Output	6146
V2709	Same as V2702.	HF Amplifier	
W2701	CABLE ASSEMBLY, RF.	IF Input	CA-621-19.50

**FREQUENCY AMPLIFIER CHG-2  
MF-RF CHASSIS**

SYM.	DESCRIPTION	FUNCTION	TMC DWG. OR PART NO.
W2702	CABLE ASSEMBLY, RF.	IF Output	CA-621-21.00
W2703	CABLE ASSEMBLY, RF.	BAL. MOD. Input	CA-622-12.00
W2704	CABLE ASSEMBLY, RF.	HF Input	CA-480-14-35.50
XV2701	SOCKET, electron tube: 9 pin miniature.	Socket for V2701	TS-103-P01
XV2702	SOCKET, electron tube: 7 pin miniature.	Socket for V2702	TS-102-P01
XV2703	Same as XV2702.	Socket for V2703	
XV2704	Same as XV2702.	Socket for V2704	
XV2705	Same as XV2702.	Socket for V2705	
XV2706	Same as XV2702.	Socket for V2706	
XV2707	Same as XV2701.	Socket for V2707	
XV2708	SOCKET, electron tube: octal.	Socket for V2708	TS-101-P01
XV2709	Same as XV2702.	Socket for V2709	

SYM.	DESCRIPTION	APPLICATION	TMC DWG. OR PART NO.
C401	CAPACITOR, electrolytic: 80 uf; 450V	CPP-1, 5	CE51F800R
C402	CAPACITOR, electrolytic: 80 uf; 450V	CPP-1, 5	CE51F800R
C403	CAPACITOR, fixed: paper	CPP-1, 5	CN-110-103-G
C404	CAPACITOR, fixed: paper; 6.0 uf; 660 WVDC (Purchased as a matched set with transformer T401)	CPP-5 only	CP-111
CR401	DIODE, rectifier: silicone	CPP-1, 5	1N1084
CR402	DIODE, rectifier: silicone	CPP-1, 5	1N1084
CR403	DIODE, rectifier: silicone	CPP-1, 5	1N1084
CR404	DIODE, rectifier: silicone	CPP-1, 5	1N1084
F401	FUSE, 2 amp (115V OPERATION)	CPP-1, 5	FU-102-2
F401	FUSE, cartridge: SLO-BLO, 1 amp (230V OPERATION)	CPP-1, 5	FU-102-1
F402	FUSE, 3 amp (115V OPERATION)	CPP-1, 5	FU-102-3
F402	FUSE, cartridge: SLO-BLO, 1.5 amp (230V OPERATION)	CPP-1, 5	FU-102-1.5
F403	FUSE, 0.5 amp (115V OPERATION)	CPP-1, 5	FU-102-.5
I401	LAMP, incandescent	CPP-1, 5	BI-101-47
J401	RECEPTACLE, male: twist lock 3 wire	CPP-1, 5	JJ-175
J402	RECEPTACLE	CPP-1, 5	MS3102A-20-27S
L401	REACTOR, filter	CPP-1, 5	TF-5013
L402	REACTOR, filter	CPP-1, 5	TF-5013
P401	CONNECTOR, plug: female 3 prong	CPP-1, 5	PL-176
P402	CONNECTOR, plug: male 2 prong	CPP-1, 5	PL-171
R401	RESISTOR, fixed: wirewound; 2K, 10W	CPP-1, 5	RW-109-28
R402	RESISTOR, fixed: composition	CPP-1, 5	RC32GF104K
T401	TRANSFORMER, power	CPP-1 only	TF-226
T401	TRANSFORMER, power: regulated (Purchased as a matched set with capacitor C404)	CPP-5 only	TF-230
V401	TUBE, electron	CPP-1, 5	OA2
W401	CABLE, AC (includes P401 and P402)	CPP-1, 5	CA-555-1
XC401	SOCKET, octal	CPP-1, 5	TS-101-P01
XC402	SOCKET, octal	CPP-1, 5	TS-101-P01

## POWER SUPPLY CPP-1, 5

SYM.	DESCRIPTION	APPLICATION	TMC DWG. OR PART NO.
XCR401	HOLDER, rectifier: polarized	CPP-1, 5	CU-128
XCR402	HOLDER, rectifier: polarized	CPP-1, 5	CU-128
XCR403	HOLDER, rectifier: polarized	CPP-1, 5	CU-128
XCR404	HOLDER, rectifier: polarized	CPP-1, 5	CU-128
XF401	FUSE, extractor: post	CPP-1, 5	FH-104-3
XF402	FUSE, extractor: post	CPP-1, 5	FH-104-3
XF403	FUSE, extractor: post	CPP-1, 5	FH-104-3
XI401	SOCKET, lens: miniature; bayonet, red frosted	CPP-1, 5	TS-106-1
XV401	SOCKET & SHIELD, miniature: 7 pin	CPP-1, 5	TS-102-P01



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**SECTION 8**  
**SCHEMATIC DIAGRAMS**



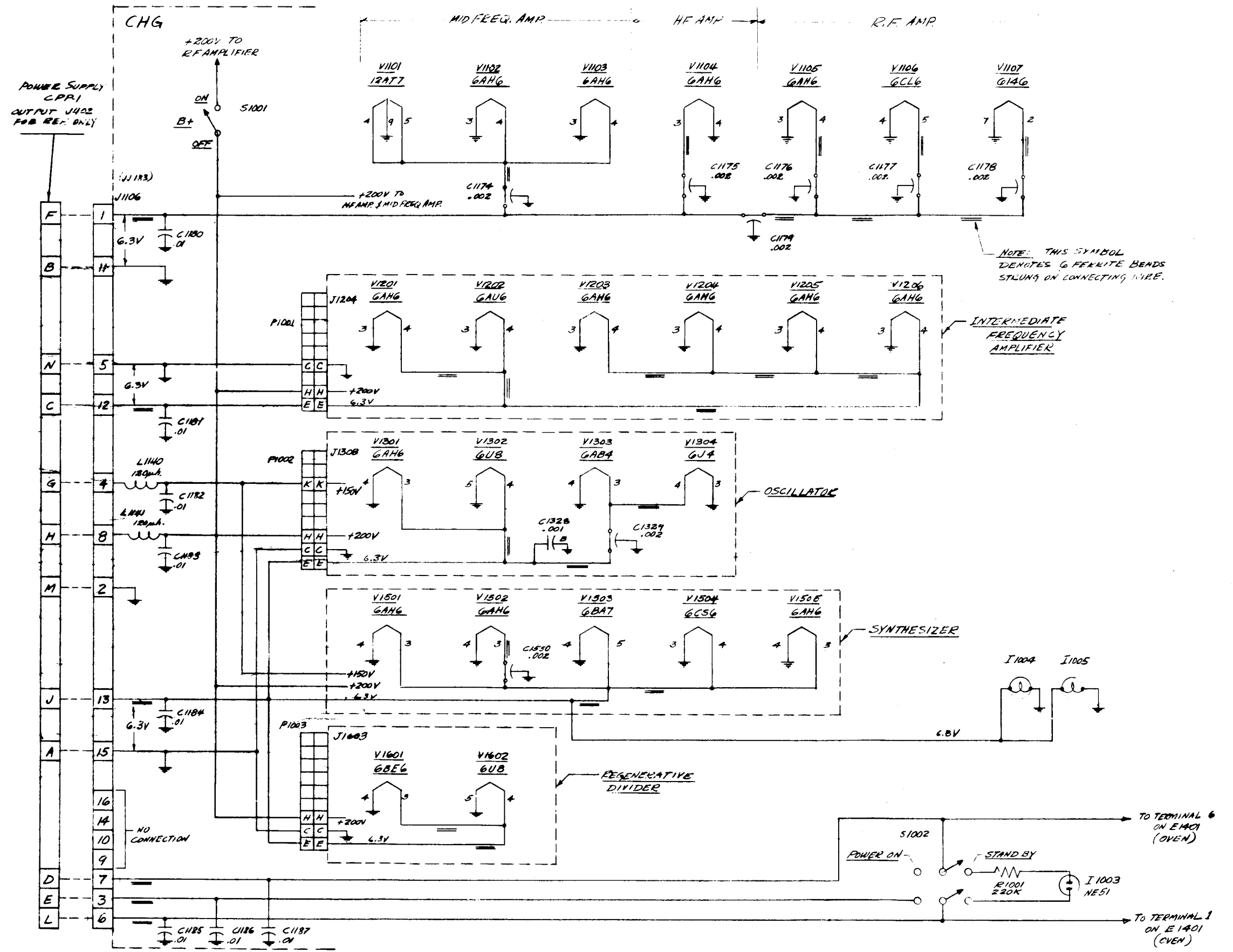


Figure III(A)-8-1a. Schematic Diagram, Frequency Amplifier, CHG-1 (Sheet 2 of 2)



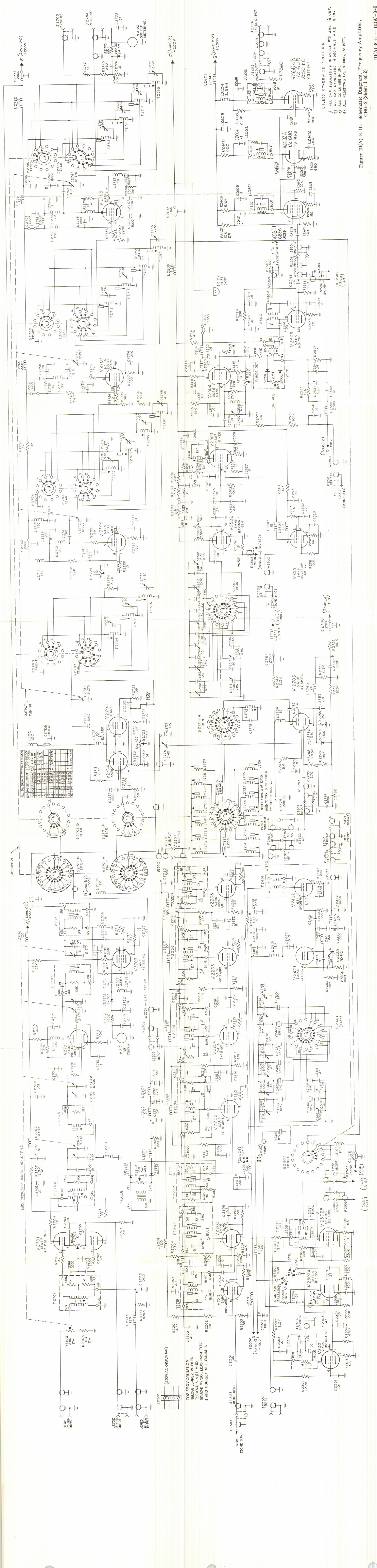


Figure III(A)-8-1b. Schematic Diagram, Frequency Amplifier. CHG-2 (Sheet 1 of 2)

III(A)-8-5 - III(A)-8-6

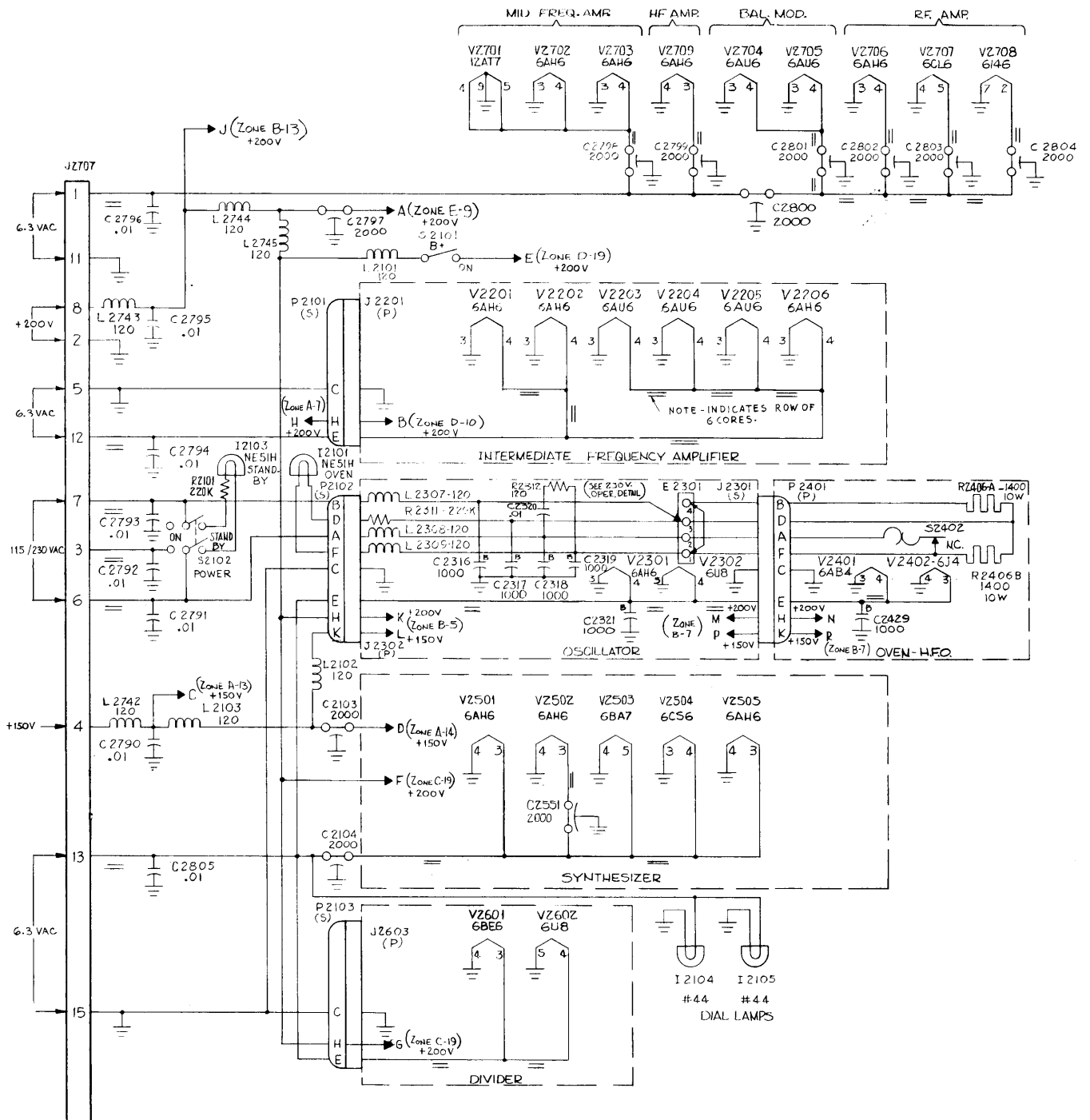


Figure III(A)-8-1b. Schematic Diagram, Frequency Amplifier, CHG-2 (Sheet 2 of 2)







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