VOLUME III

MAINTENANCE MANUAL

for

GPT-40K

TRANSMITTER

THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N.Y. OTTAWA, CANADA

VOLUME III

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THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N.Y. OTTAWA, CANADA

IN 0319 Issue Date: 15 Sept 1964

Addendum #3 to
GPT-40K Maintenance
Manual (IN-319)

MODIFICATION OF

POWER-INPUT CIRCUITS

Power-input circuits of the GPT-40K transmitter have been modified to accept high-voltage or low-voltage, 50 or 60 cps, input power.

When the information given below is noted in text, the GPT-40K Maintenance Manual (IN-319) will apply as written:

1. Because Elapsed Time Meter M7601 located on the relay panel is a 60 cps device, it is only 83-1/3% accurate. In order to calculate the correct elapsed time, multiply the time indicated on meter M7601 by 6/5.

2. Page 1-2. Table 1-1.

   Entris for the high-voltage rectifiers should be changed to read:

   High Voltage Rectifier AX-103
   or
   High Voltage Rectifier HVRC-2

   12-kv High Voltage Rectifier AP-105
   or
   High Voltage Rectifier HVRB-2

3. Page 1-3.

The description given for 40-kw High Voltage Rectifier AP-105 should be changed as follows:

(3) 40-kw High Voltage Rectifier. - The 40-kw high voltage rectifier, slide-mounted below the crowbar drawer, is the rectifier portion of the high voltage power supply for the 40-kw power amplifier tube. Either a gaseous-tube unit (AP-105), or a solid-state unit (HVRB-2) may be supplied. The AP-105 contains six rectifier tubes and their associated filament transformers. The front panel of the AP-105 contains six fuses.

For information concerning the solid-state rectifier, refer to the HVRB-2 instruction manual.

4. Page 1-3. TECHNICAL CHARACTERISTICS.

The entry for "Primary power requirements" should be changed to read:

Primary power requirements (with exciter)	3-phase, 210-240/ 390-480v, 50-60 cps, 200/100 amps per phase.

5. Page 1-3. Tables 1-2 (ELECTRON TUBE COMPLEMENT), 1-3 (DIODE COMPLEMENT), and 1-4 (FUSE COMPLEMENT) should be changed as follows:

a. Table 1-2.
Add asterisk (*) adjacent to V8401-V8406.

b. Table 1-3.
Add:

REFERENCE SYMBOL	TYPE
CR1501, CR1502, CR1503	DD117

c. Table 1-4.
Add asterisks (*) adjacent to F8401-F8406.

d. The following footnote should be added to the bottom of page 1-3:

*Tubes V8401-V8406 and Fuses F8401-F8406 are part of High Voltage Rectifier AP-105. Diode assemblies CR1501-CR1503 are part of High Voltage Rectifier, Model HVRB-2.

6. Page 1-4.
The following items should be added to table 1-5:

EQUIPMENT	MANUAL
10-kw high voltage rectifier	High Voltage Rectifier, Model HVRC-2
40-kw high voltage rectifier	High Voltage Rectifier, Model HVRB-2

7. Page 2-7. Paragraph 2-9 (40-KW HIGH VOLTAGE RECTIFIER)

a. The second sub-paragraph should be changed to read:

"When a gaseous-tube rectifier is used, filament primary power is routed via terminals E8105 and E8106."

b. The first sentence of the third sub-paragraph should be changed to read:

"The high voltage output of the 40-kw high voltage rectifier, present at terminals E8108 E8104, is applied to a choke input filter consisting of inductor L8101 and capacitors C8107 and C8108."

8. Page 2-11/2-12. Figure 2-1.

Remove page 2-11/2-12 of the manual and replace with page 2-11/2-12 provided with this addendum.

9. Page 3-4.

Paragraph 3-9 (40-KW HIGH VOLTAGE RECTIFIER) should be amended to include:

When system troubleshooting (tables 3-2 and 3-3) indicates that a trouble exists in the solid-state rectifier, refer to the information contained in the HVRB-2 manual.

10. Page 3-8.

Figure 3-8 should be changed to include information contained in figure 3-8A of this addendum.

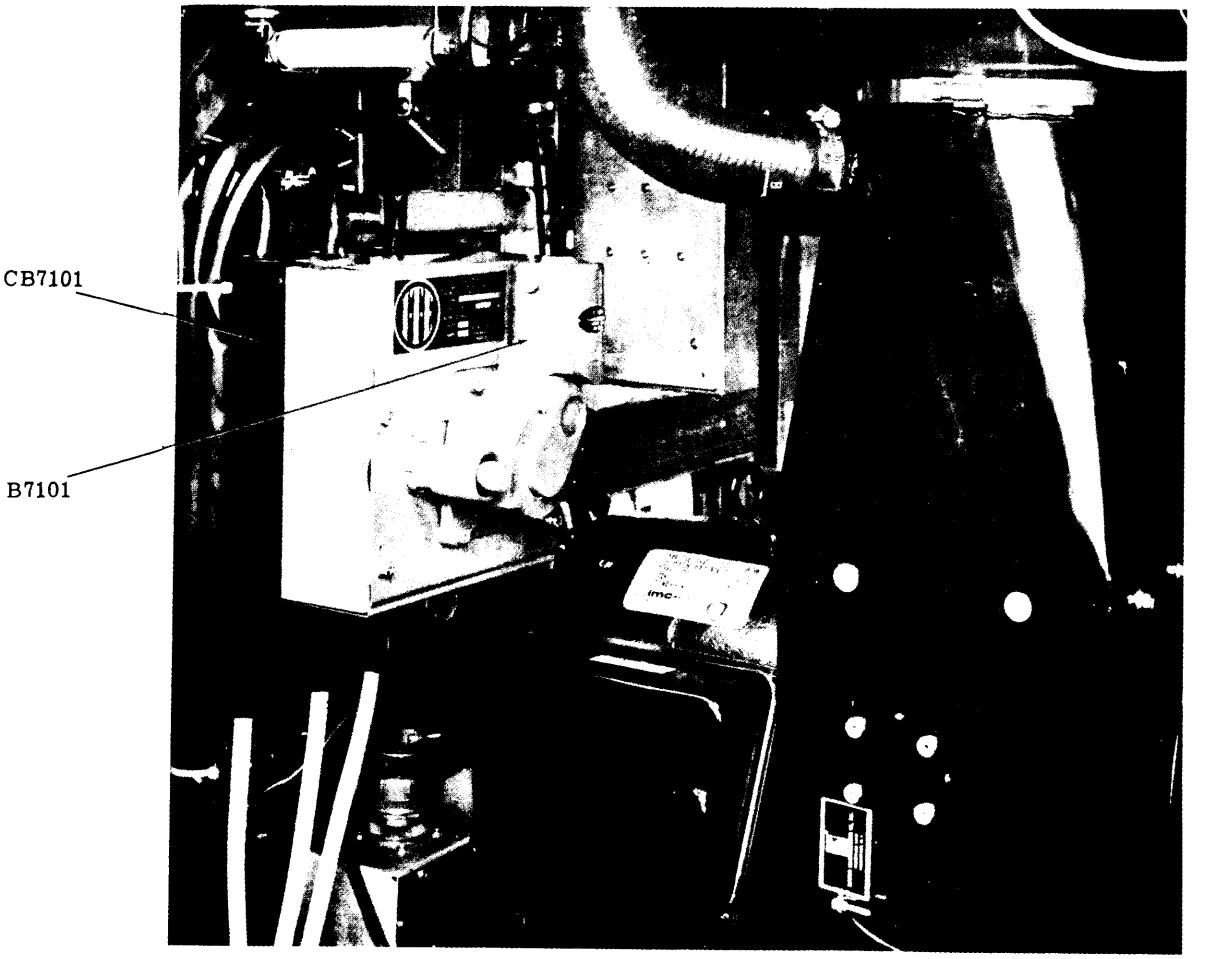


Figure 3-8A

11. Page 3-32. Table 3-11.

The following note should be added to the beginning of table 3-11:

NOTE

For troubleshooting information pertaining to the solid-state rectifier, refer to the HVRB-2 instruction manual.

12. Page 5-39. Parts list for AP-118 Power Supply Assembly.

The reference symbols for B8101 and CB8101 should be changed to B7101 and CB7101 respectively. All reference to B8101 and CB8101 in the remainder of the manual should be changed accordingly.

13. Pages 5-42, 5-43. Change Parts List, Section 5 as follows:

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
T8101	TRANSFORMER, POWER, STEP-UP: dual primary; input- 195, 205, 215, 225, 240 VAC, 50/60 cps, 1 phase; current rating 3.68 amps RMS; secindary winding at 5,200 VAC; working voltage 12,000 VAC; test voltage 25,000 VDC continuous primary shorted to ground; open frame type construction.	TF335
T8107 *	AUTOTRANSFORMER, POWER, FIXED: input- 480, 450, 430, 410, 390 VAC, 50/60 cps, 3 phase; current rated at 40 amps-RMS each phase; windings taped at 200 volts; breakdown test voltage 2,000 volts AC; output- 230 V line to line terminals, 40 amps; open frame case.	TF336

* Add after item T8106.

14. Pages 6-7/6-8, 6-9/6-10, 6-11/6-12, and 6-13/6-14. Figure 6-1 (Sheets 4, 5, 6 and 7).

Remove pages 6-7/6-8, 6-9/6-10, 6-11/6-12, and 6-13/6-14 from manual and replace with corresponding pages provided with this addendum.

15. Page 6-9/6-10. Figure 6-1 (Sheet 5 of 9).

Change high-voltage transformer circuitry of figure 6-1 (sheet 5) to comply with figure 6-1 of this addendum.

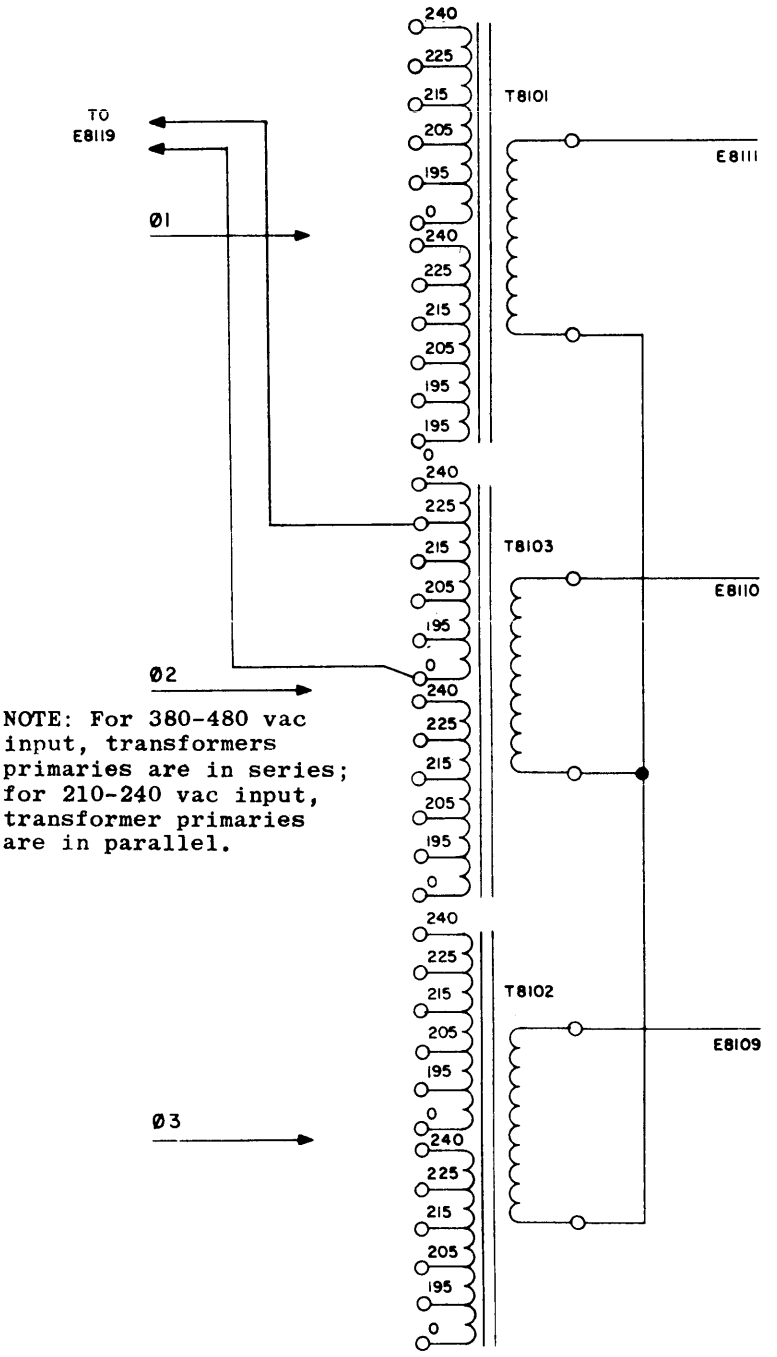


Figure 6-1.

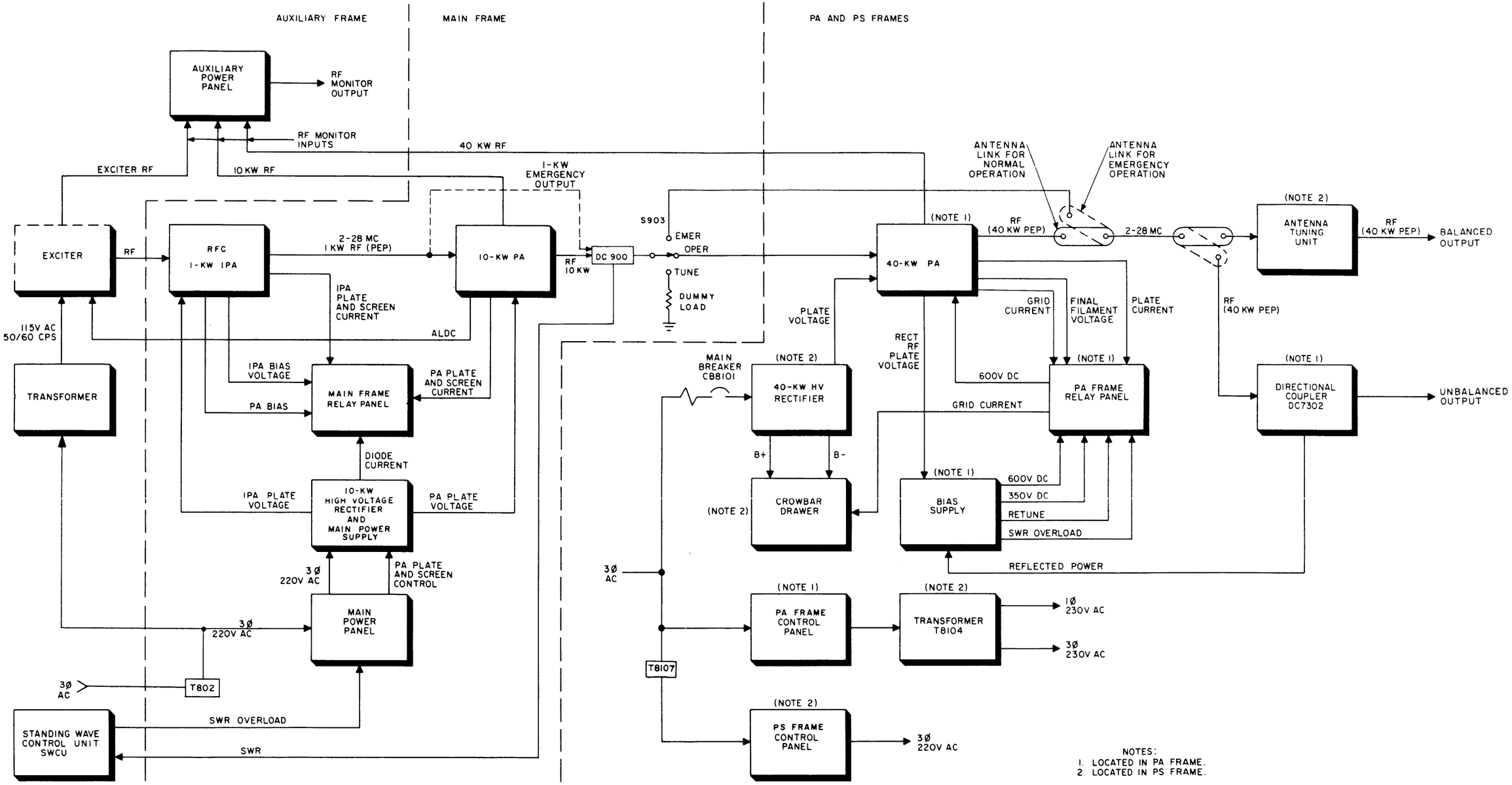


Figure 2-1. GPT-40K Transmitter, Block Diagram

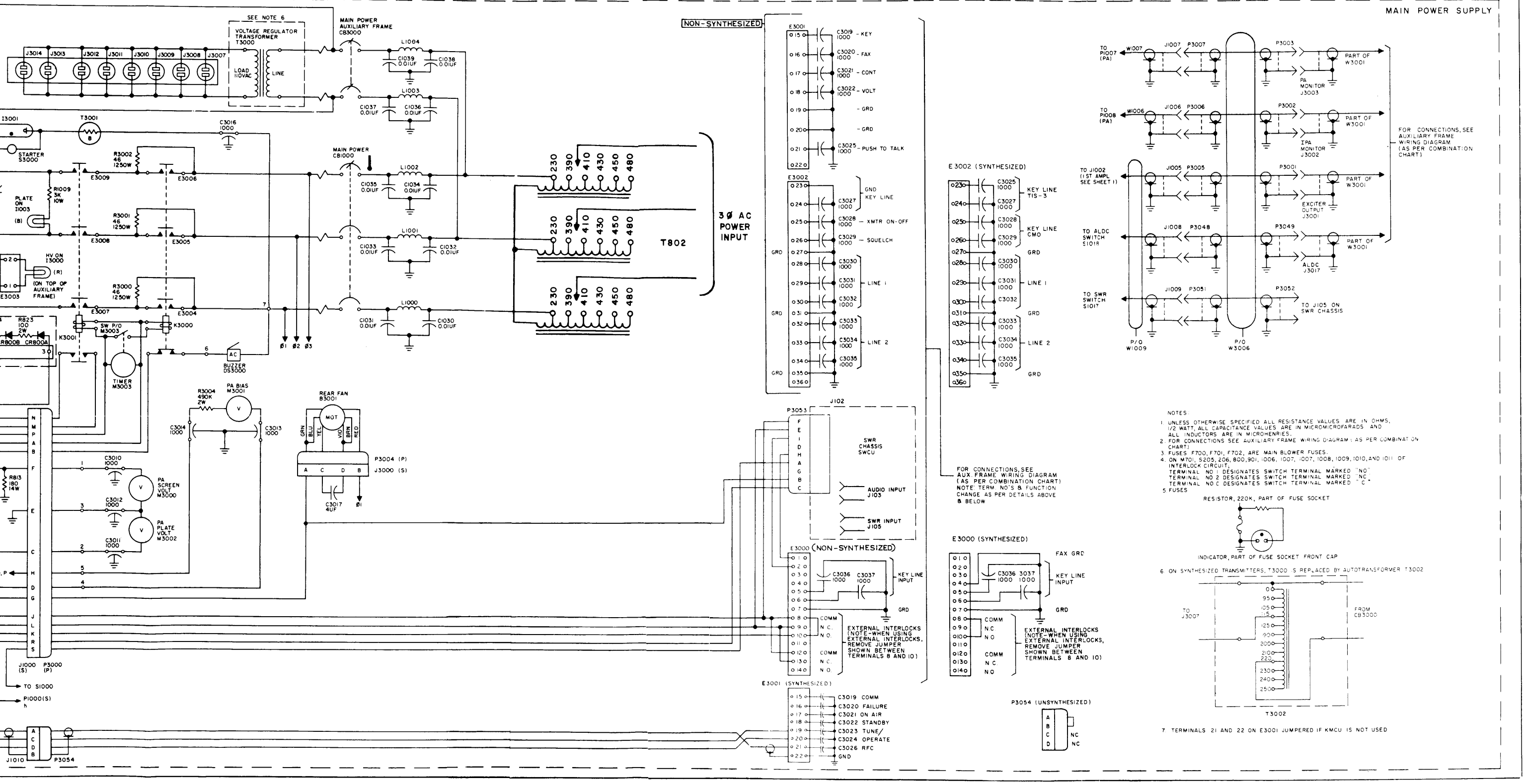
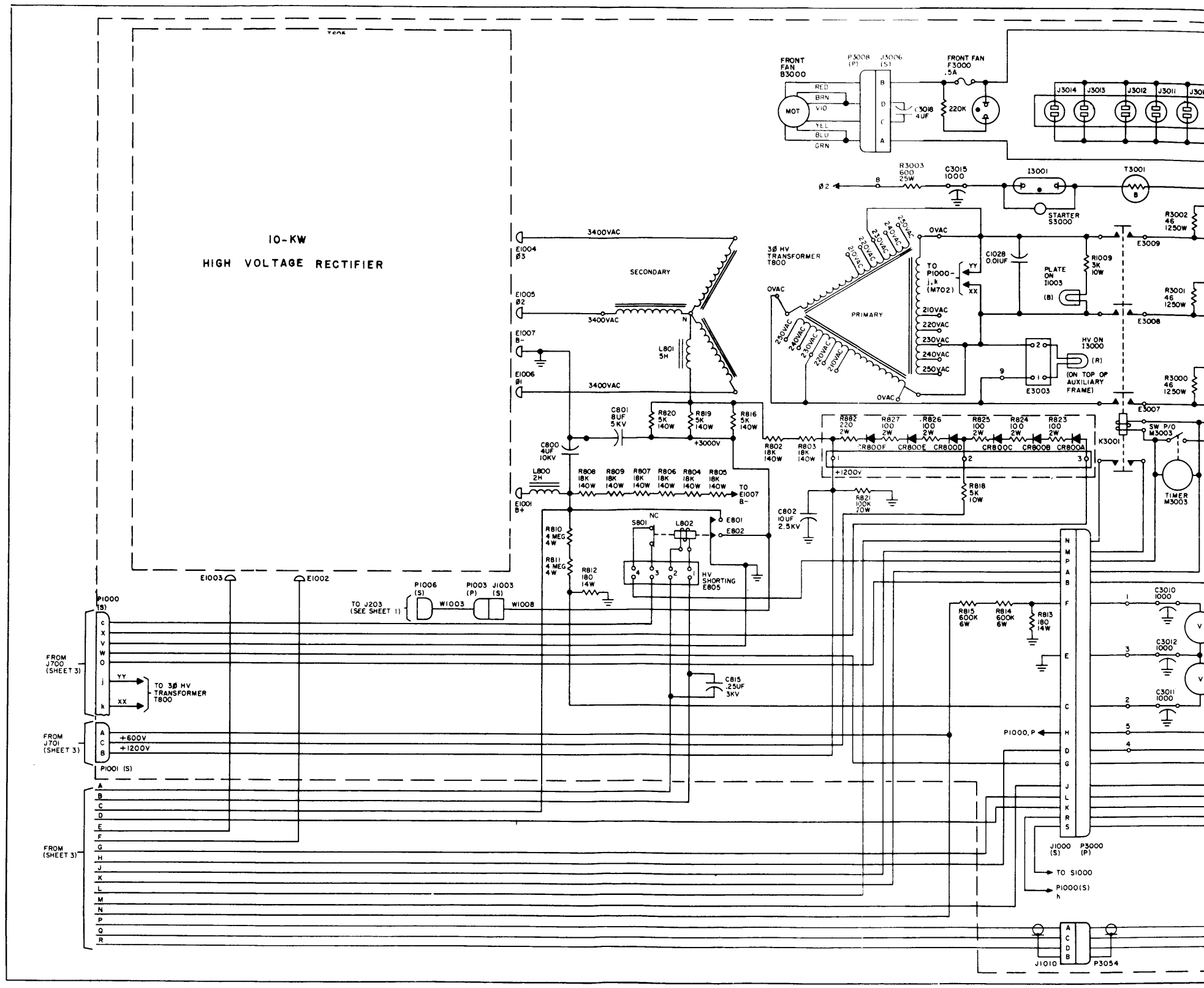


Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 4 of 9)

10-KW

HIGH VOLTAGE RECTIFIER



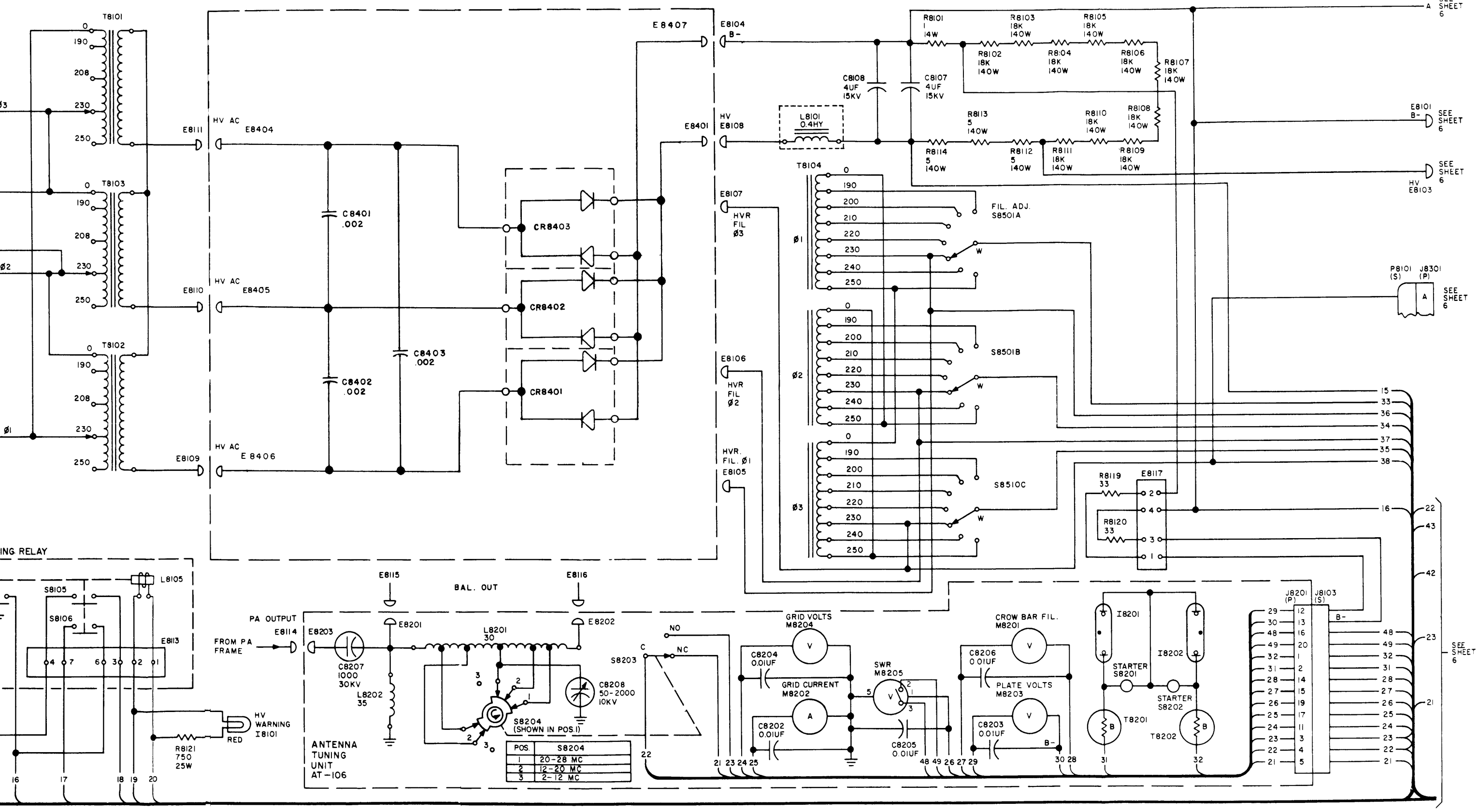


Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 5 of 9)

6-9/6-10

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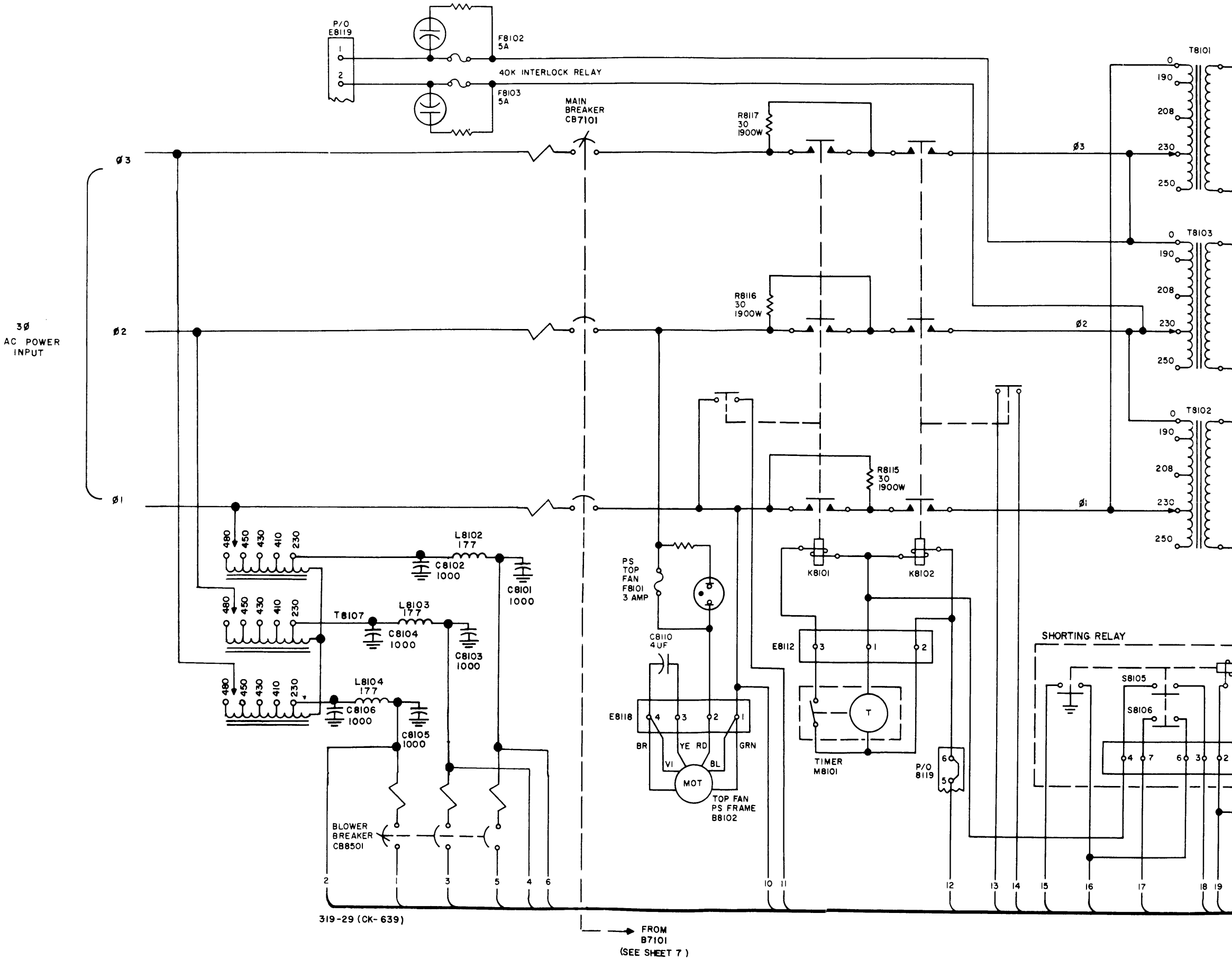
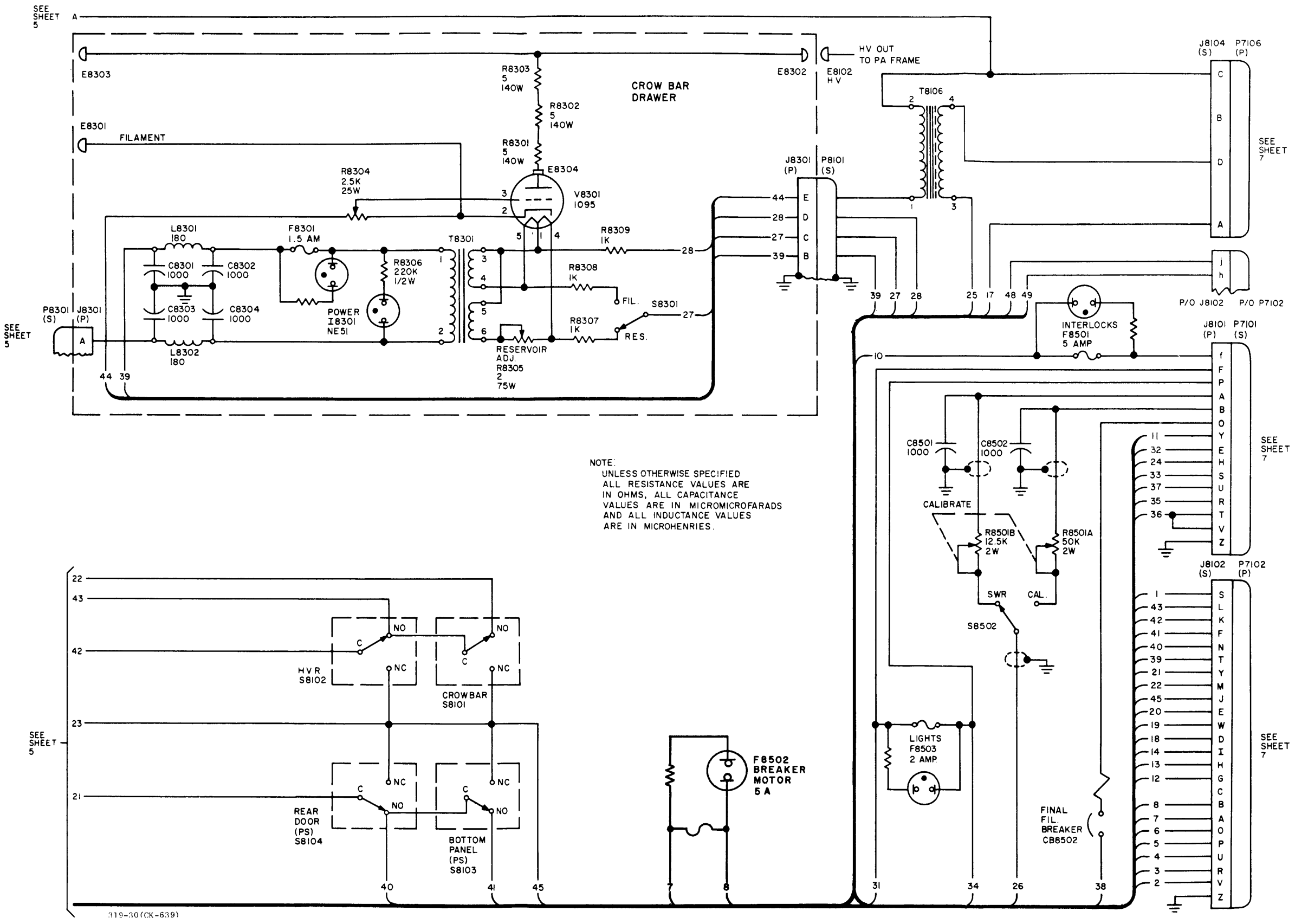

3Ø
AC POWER
INPUT
Ø3
Ø2
Ø1
P/O
E8119
1
2
F8102
5A
F8103
5A
40K INTERLOCK RELAY
MAIN
BREAKER
CB7101
R8117
30
1900W
R8116
30
1900W
R8115
30
1900W
T8101
T8103
T8102
0
190
208
230
250
480
450
430
410
230
L8102
177
C8102
1000
C8101
1000
T8107
L8103
177
C8104
1000
C8103
1000
L8104
177
C8106
1000
C8105
1000
BLOWER
BREAKER
CB8501
PS
TOP
FAN
F8101
3 AMP
C8110
4 UF
E8118
BR
YE
RD
GRN
VI
BL
MOT
TOP FAN
PS FRAME
B8102
K8101
K8102
E8112
T
TIMER
M8101
P/O
8119
SHORTING RELAY
S8105
S8106
319-29 (CK-639)
FROM
B7101
(SEE SHEET 7)



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

Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 6 of 9)

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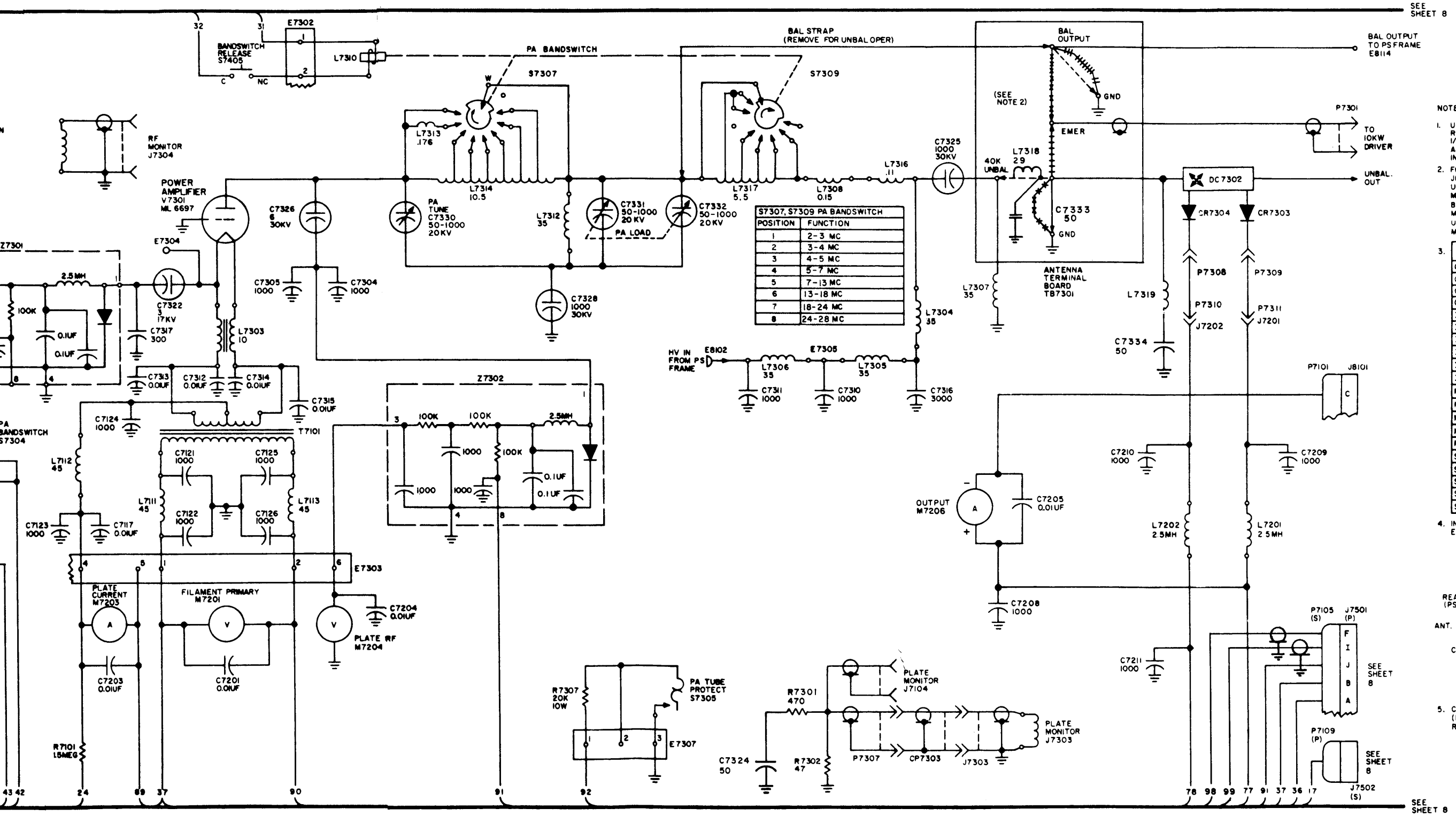
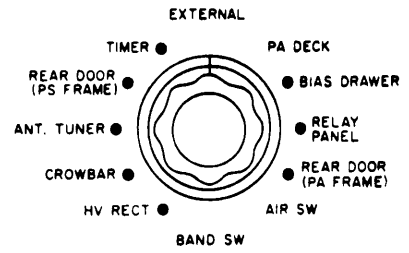


NOTES:

1. UNLESS OTHERWISE SPECIFIED ALL RESISTANCE VALUES ARE IN OHMS, 1/2 WATT, ALL CAPACITANCE VALUES ARE IN MICROMICROFARADS AND ALL INDUCTORS ARE IN MICROHENRIES.
2. FOR BALANCED OUTPUT CONNECT JUMPERS MARKED ——→ FOR UNBALANCED OUTPUT CONNECT JUMPERS MARKED - - - -→ FOR EMERGENCY BALANCED OUTPUT CONNECT JUMPERS MARKED →→→→ FOR EMERGENCY UNBALANCED OUTPUT CONNECT JUMPERS MARKED →→→→→→→→.
3.

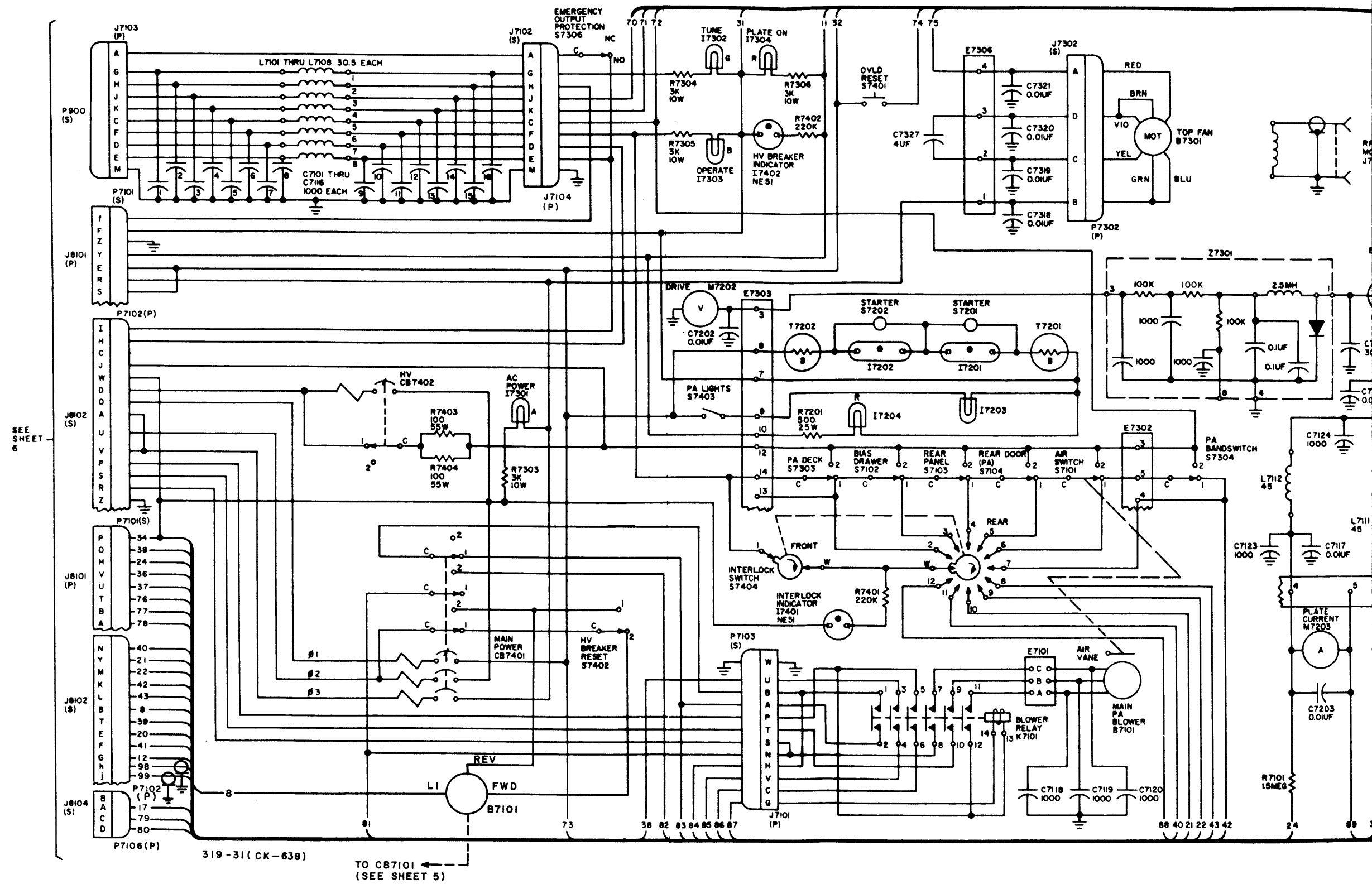
DESIGNATION	PANEL MARKING
C7330	TUNE
C7331, C7332	LOAD
CB7401	MAIN POWER
CB7402	HIGH VOLTAGE
I7301	AC POWER
I7302	TUNE
I7303	OPERATE
I7304	PLATE ON
I7401	INTERLOCK INDICATOR
I7402	HV BREAKER INDICATOR
M7201	FILAMENT PRIMARY
M7202	DRIVE
M7203	PLATE CURRENT
M7204	PLATE RF
M7205	OUTPUT
S7401	OVERLOAD RESET
S7402	HV BREAKER RESET
S7403	PA LIGHT
S7404	INTERLOCK
S7405	BANDSWITCH RELEASE

4. INTERLOCK SWITCH S7404 IS IN EXTERNAL POSITION AS SHOWN BELOW.



5. CONNECTOR DESIGNATIONS CONTAINING (P) OR (S) INDICATES PLUG OR SOCKET RESPECTIVELY.

Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 7 of 9)


J7103 (P)
P900 (S)
L7101 THRU L7108 30.5 EACH
C7101 THRU C7116 1000 EACH
J7102 (S)
J7104 (P)
EMERGENCY OUTPUT PROTECTION S7306
NC
NO
TUNE I7302
PLATE ON I7304
R7304 3K 10W
R7305 3K 10W
R7306 3K 10W
R7402 220K
OPERATE I7303
HV BREAKER INDICATOR I7402 NE51
OVLD RESET S7401
C7327 4UF
E7306
J7302 (S)
C7321 0.01UF
C7320 0.01UF
C7319 0.01UF
C7318 0.01UF
RED
BRN
VIO
YEL
GRN
BLU
MOT
TOP FAN B7301
P7302 (P)
P7101 (S)
J8101 (P)
P7102(P)
J8102 (S)
SEE SHEET 6
HV CB7402
AC POWER I7301
R7403 100 55W
R7404 100 55W
R7303 3K 10W
Z7301
100K
2.5MH
1000
0.1UF
DRIVE M7202
C7202 0.01UF
E7303
STARTER S7202
STARTER S7201
T7202
T7201
I7202
I7201
PA LIGHTS S7403
R7201 500 25W
I7204
I7203
PA DECK S7303
BIAS DRAWER S7102
REAR PANEL S7103
REAR DOOR (PA) S7104
AIR SWITCH S7101
E7302
PA BANDSWITCH S7304
C7124 1000
L7112 45
L7111 45
C7123 1000
C7117 0.01UF
REAR
FRONT
INTERLOCK SWITCH S7404
INTERLOCK INDICATOR I7401 NE51
R7401 220K
P7101(S)
J8101 (P)
J8102 (S)
J8104 (S)
P7102 (P)
P7106(P)
MAIN POWER CB7401
HV BREAKER RESET S7402
ø1
ø2
ø3
REV
FWD
L1
B7101
P7103 (S)
J7101 (P)
E7101
AIR VANE
MAIN PA BLOWER B7101
BLOWER RELAY K7101
C7118 1000
C7119 1000
C7120 1000
PLATE CURRENT M7203
C7203 0.01UF
R7101 1.5MEG
319-31(CK-638)
TO CB7101 (SEE SHEET 5)

112650319

RECORD OF CORRECTIONS MADE

Change No.	Date of Change	Date Entered	Entered By
Addendum #1	(For GPT-40KEF)	Superseded by addendum #3	1/67
Addendum #2	(For GPT-40KEK-5)	Superseded by addendum #3	1/67

CHANGE NO. 1 GPT-40K

INSTRUCTION BOOK CHANGE NOTICE

Date 12/9/64

Manual affected: Maintenance Manual for GPT-40K Transmitter IN -319

Page 1-3, Paragraph 1-4 (Technical Specifications)

Change to read:

Output power	40,000 watts PEP, 20,000 watts average. 3rd order distortion down at least 35 db from either tone of a standard 2-tone test at full PEP.

SHOULD ADDITIONAL COPIES OF THIS CHANGE NOTICE BE REQUIRED, PLEASE CONTACT:

THE TECHNICAL MATERIEL CORP., 700 Fenim re R ad, Mamaroneck, New Y rk

Attn.: Direct r of Eng. Services.

CHANGE NO. 2 GPT-40K

INSTRUCTION BOOK CHANGE NOTICE

Date 8/12/65

Manual affected: GPT-40K Maintenance Manual IN -319
(issue date: 15 September 1964)

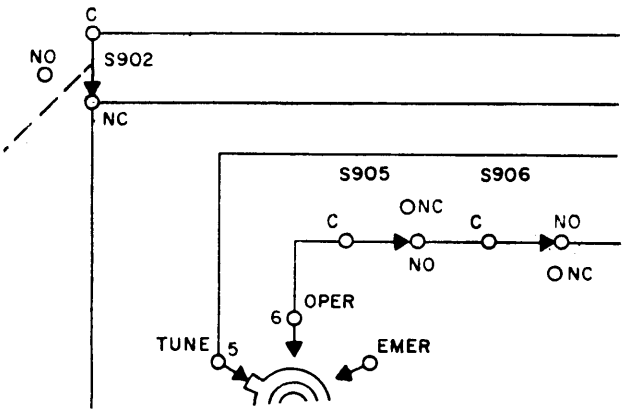
1. Page 5-29. Parts List.

   Change TMC Part number for C7513 from CN108C4243K to CN108F4243K.

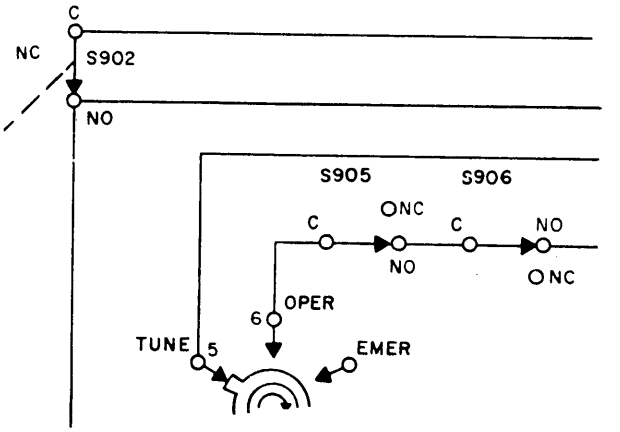
2. Page 2-13/2-14. Figure 2-2.

   Change "Normally open" and "normally closed" notation on Switch S902 as indicated below:

Was



Now



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THE TECHNICAL MATERIEL CORP., 700 Fenimore R ad, Mamaroneck, New York
Attn.: Director of Eng. Services.

EMN 12389
EMN 12860

CHANGE NO. 2 GPT-40K

INSTRUCTION BOOK CHANGE NOTICE

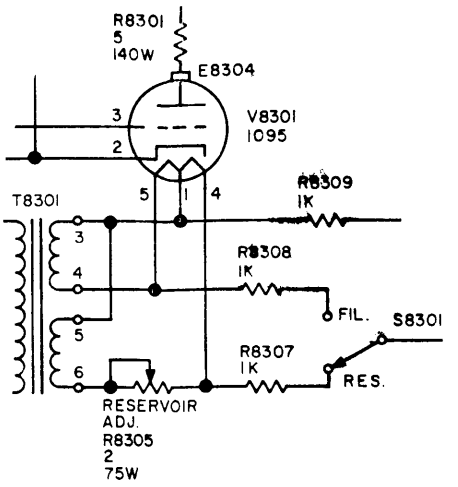
Date Aug. 12, 1965

Manual affected: GPT-40K Maintenance Manual (issue date: 15 Sept. 1964) IN-319

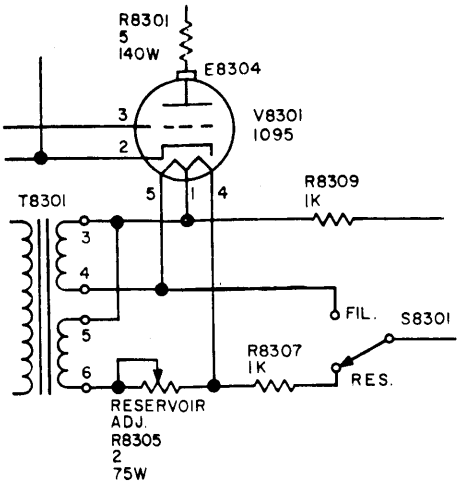
3. Page 2-25/2-26. Figure 2-8
   Page 6-11/6-12. Figure 6-1

   Delete resistor R8308 as indicated below:

Was



Now



4. Page 5-49. Parts List

   Delete resistor R8308 from parts list.

5. Page 5-48. Parts List

   Change TMC part number for R8304 from RA75AXA252AK25 to RA108-252-25

CHANGE NO. 3 GPT-40K

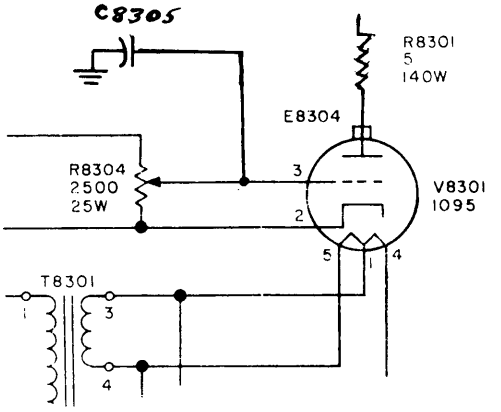
INSTRUCTION BOOK CHANGE NOTICE

Date 8/12/65

Manual affected: GPT-40K Maintenance Manual IN-319
(issue date: 15 September 1964)

Page 2-25/2-26. Figure 2-8
Page 2-33/2-34. Figure 2-12
Page 6-11/6-12. Figure 6-1

Add capacitor C8305 to V8301 circuitry as indicated below:



2. Page 5-48. Parts List

Add C8305 information to parts list:

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C8305	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 1,000 uuf, ±20%; 5,000 WVDC.	CC109-38

SHOULD ADDITIONAL COPIES OF THIS CHANGE NOTICE BE REQUIRED, PLEASE CONTACT: EMN 13594

THE TECHNICAL MATERIEL CORP., 700 Fenim re Road, Mamaroneck, New York

Attn.: Director of Eng. Services.

CHANGE NO. 4 GPT-40K

INSTRUCTION BOOK CHANGE NOTICE

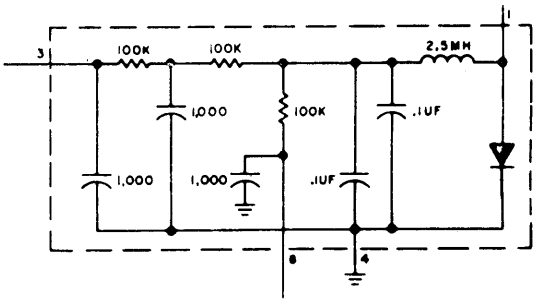
Date 8/12/65

Manual affected: GPT-40K Maintenance Manual IN -319

1. Page 2-15/2-16. Figure 2-3.
   Page 6-13/6-14. Figure 6-1.

Z7301 and Z7302 circuitry should be changed as indicated below:

Was



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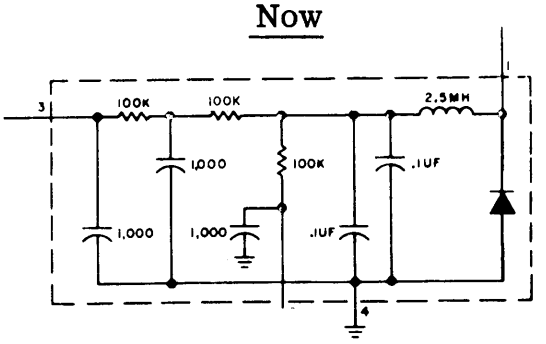
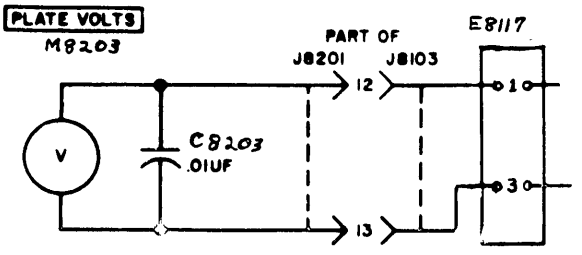


2. Page 2-33/2-34. Figure 2-12
   Page 6-9/6-10. Figure 6-1

Change M8203 circuitry in accordance with following illustrations.

Was



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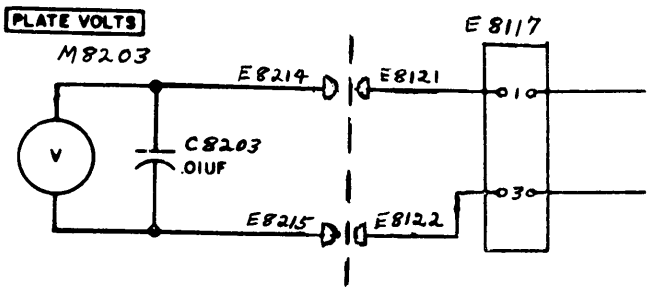

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THE TECHNICAL MATERIEL CORP., 700 Fenim re Road, Mamar neck, New Y rk

Attn.: Director f Eng. Services.

EMN 15802

EMN 16451

CHAN E NO. 4 GPT-40K

INSTRUCTION BOOK CHANGE NOTICE

Date 8/12/65

Manual affected: GPT-40K Maintenance Manual IN -319

3. Page 5-40. Parts List

Add following items to parts list.

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
E8121	CONNECTOR ASSEMBLY, ELECTRICAL	SC165-2
E8122	Same as E8121.	

4. Page 5-45. Parts List

Add following items to parts list.

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
E8214	CONNECTOR ASSEMBLY, ELECTRICAL	A4440
E8215	Same as E8214.	

CHANGE NO. 4 GPT-40K

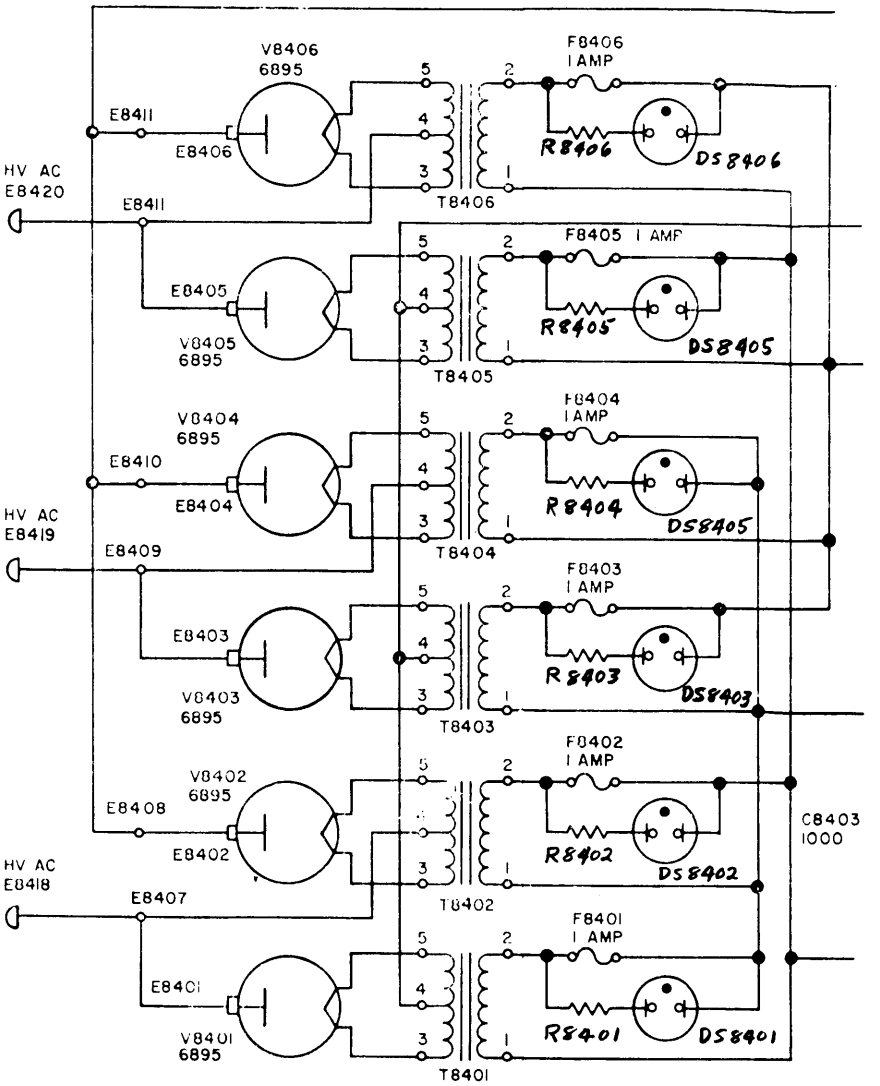
INSTRUCTION BOOK CHANGE NOTICE

Date 8/12/65

Manual affected: GPT-40K Maintenance Manual (issue date 15 September 1964) IN -319

5. Page 6-9/6-10. Figure 6-1

Add reference symbols R8402 through R8406 and DS8401 through DS8406 to High-Voltage rectifier AP105 as indicated below:



SHOULD ADDITIONAL COPIES OF THIS CHANGE NOTICE BE REQUIRED, PLEASE CONTACT:

THE TECHNICAL MATERIEL CORP., 700 Fenim re Road, Mamar neck, New Y rk

Attn.: Director of Eng. Services.

EMN 16451

CHANGE NO. 4 GPT-40K

INSTRUCTION BOOK CHANGE NOTICE

Date 8/12/65

Manual affected: GPT-40K Maintenance Manual IN -319
(issue date: 15 September 1964)

6. Pages 5-50/5-51. Parts List

Add the following items to the parts list.

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
DS8401	Non-replaceable item. Part of XF8401.	
DS8402	Non-replaceable item. Part of XF8402.	
DS8403	Non-replaceable item. Part of XF8403.	
DS8404	Non-replaceable item. Part of XF8404.	
DS8405	Non-replaceable item. Part of XF8405.	
DS8406	Non-replaceable item. Part of XF8406.	

R8401	Non-replaceable item. Part of XF8401.	
R8402	Non-replaceable item. Part of XF8402.	
R8403	Non-replaceable item. Part of XF8403.	
R8404	Non-replaceable item. Part of XF8404.	
R8405	Non-replaceable item. Part of XF8405.	
R8406	Non-replaceable item. Part of XF8406.	

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FOREWORD

This instruction manual covers the theory and maintenance of the power amplifier and power supply frames of the GPT-40K transmitter, as well as those circuits of the auxiliary and main frames that differ from those in the GPT-10K transmitter. System description, operating instructions, installation, and maintenance instructions applicable to the transmitter are covered in the following TMC publications:

ITEM	PUBLICATION
Overall Transmitter Description	Synthesized GPT-40K Transmitter, System Manual
Operating Procedures for Synthesized GPT-40K Transmitter	Operator's Manual for Synthesized 40K Transmitter
Theory and Maintenance of GPT-10K Transmitter	Maintenance Manual for GPT-10K Transmitter
Maintenance of Synthesized Exciter	Technical Manual for Synthesized Exciter
Maintenance of Unsynthesized Exciter	Technical Manual for Unsynthesized Exciter

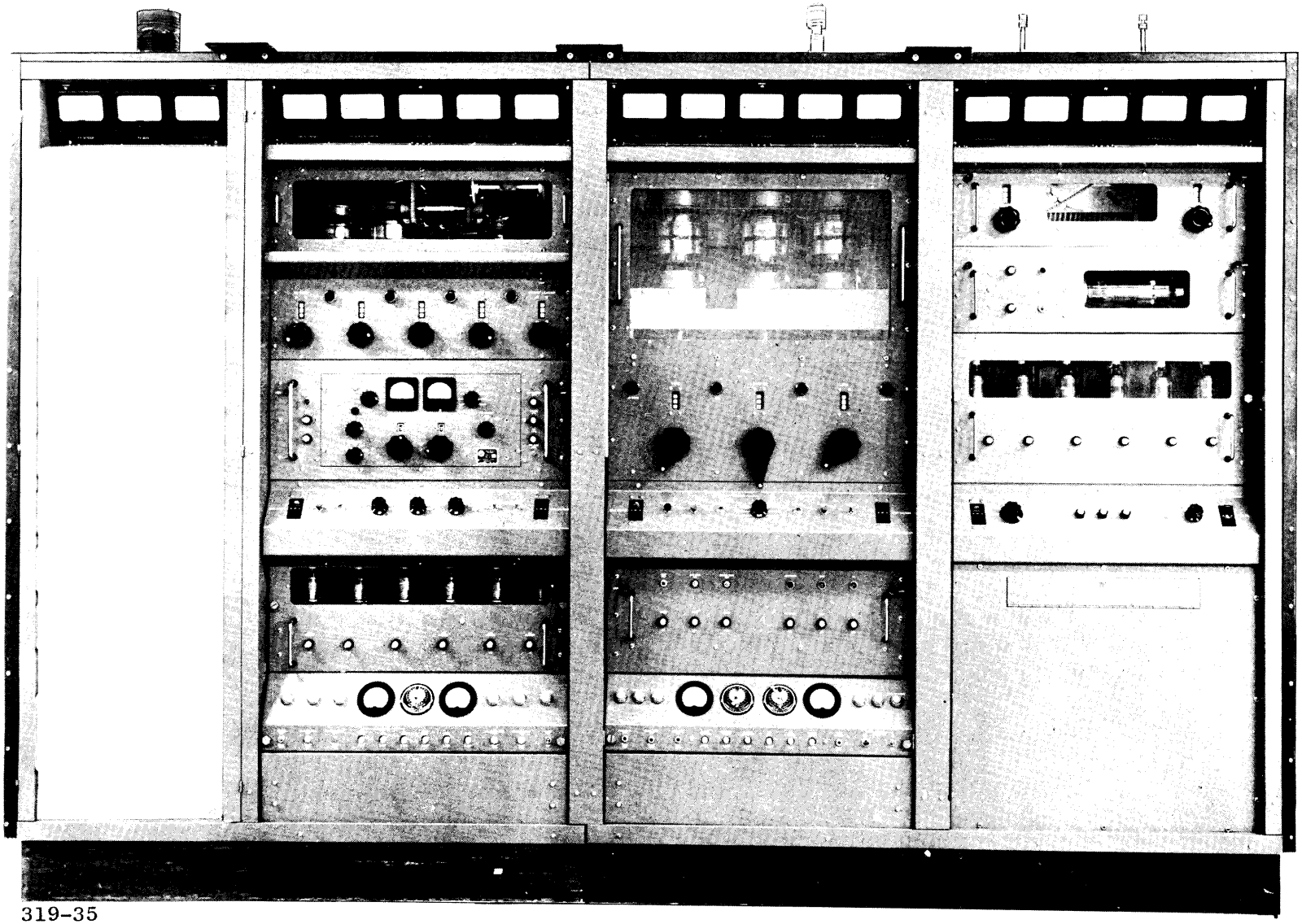

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Figure 1-1. GPT-40K Transmitter, Front View

SECTION 1
GENERAL INFORMATION

1-1. PURPOSE OF EQUIPMENT.

The GPT-40K Transmitter (figure 1-1) is a conservatively-rated general purpose transmitter which delivers 40,000 watts PEP (peak envelope power), or 20,000 watts average power throughout the 2- to 28-mc range. The operating modes of the transmitter are:

(1) SSB (single sideband) with suppressed or any degree of carrier.

(2) DSB (double sideband) with suppressed or any degree of carrier. This mode includes AM (amplitude modulation) operation and AME (AM equivalent).

(3) ISB (independent sideband) (separate intelligence on each sideband) with suppressed or any degree of carrier.

(4) FSK (frequency-shift telegraphy).

(5) FAX (Facsimile).

(6) CW (carrier wave) keying (telegraphy).

1-2. EQUIPMENT SUPPLIED.

Table 1-1 lists all the major components of the transmitter (less the exciter units). Corresponding common nomenclature is also indicated.

1-3. DESCRIPTION OF EQUIPMENT.

a. GENERAL. - As shown in figure 1-1, the transmitter consists of an auxiliary frame, a main frame, a PA (power amplifier) frame, and a PS (power supply) frame. All four frames are bolted together and to two base assemblies, two frames per base. The four frames house all the components of the transmitter and are equipped with protective front doors. Primary power connections are made through the base assembly. Two antenna bowl assemblies, used for balanced output operation, are located on top of the PS frame. A standard 3-1/8 connector, for unbalanced output operation, is located on top of the PA frame.

b. AUXILIARY FRAME. - The auxiliary frame houses the exciter components of the transmitter. This frame is identical to the auxiliary frame used in the GPT-10K transmitter.

c. MAIN FRAME. - The main frame houses a two-stage rf voltage amplifier, the 1-kw IPA, the 10-kw PA and associated power supply and power control circuits. Except for the 10-kw PA (AX-510), the main frame circuits are identical to those in the GPT-10K transmitter.

Power Amplifier Section AX-510 replaces the AX-509 used in the 10K transmitter. The physical location of the two power amplifier sections is identical. The only differences existing between them are:

(1) Repositioning of various sub-assemblies to make frames physically compatible.

(2) Replacement of the antenna tuner (in top of PA section, behind meter panel) in the AX-509 with a dummy load in the AX-510.

(3) Electrical output connections.

d. PA FRAME. - The PA frame houses the 40-kw power amplifier stage of the transmitter. The lower half of the frame is divided into a front and rear section by a partition. The front half houses a filament transformer and removable subassemblies. The rear half houses parts associated with the main power supply and a blower for the power amplifier tube. The upper half of the frame houses the power amplifier tube compartment, associated power amplifier circuit components, and a bandswitch.

(1) PA Frame Meter Panel AM-115. - The PA frame meter panel, located at the top of the PA frame, contains five meters associated with the 40-kw power amplifier. These meters monitor the voltage to the primary of the filament transformer, the rf drive voltage, plate current, rf plate voltage, and output power.

(2) Power Amplifier AX-511. - The 40-kw power amplifier is located below the PA frame meter panel. It contains the 40-kw power amplifier and its associated tuned circuits. A blower motor which provides forced air cooling of the 40-kw power amplifier tube is mounted on the PA frame directly below the tube. The front panel contains a plexiglass window, the power amplifier tuning and loading controls and their associated counter-type dials, and indicator lamps.

(3) PA Control Panel AX-210. - The PA control panel is located below the 40-kw power amplifier. This panel controls the application of main ac power and the PA high voltage, and monitors the interlock circuits associated with the PA and PS frames. Other controls on this panel are associated with the operation of the 40-kw power amplifier and the PA frame relay panel.

TABLE 1-1. MAJOR COMPONENTS

TMC DESIGNATION	COMMON NAME
Auxiliary Frame Assembly AX-507	Auxiliary frame
Auxiliary Meter Panel AX-107	Auxiliary meter panel
Standing Wave Control Unit, Model SWCU-1	Standing wave control unit SWCU
Main Frame Assembly AX-505	Main frame
Main Meter Panel AM-122	Main meter panel
Power Amplifier Section AX-510	10-kw PA
RF Amplifier Drawer AX-104	RF amplifier drawer
RF Amplifier RFC-1	1-kw IPA or RFC
Main Power Panel AX-504	Main power panel
High Voltage Rectifier AX-103	10-kw high voltage rectifier
Relay Panel AR-161	10-kw relay panel
Main Power Supply AX-138	10-kw main power supply
PA Frame AP-116	PA frame
PA Frame Meter Panel AM-115	PA frame meter panel
Power Amplifier AX-511	40-kw PA
PA Control Panel AX-210	PA frame control panel
Bias Supply Drawer AP-117	Bias supply drawer
PA Frame Relay Panel AR-116	PA frame relay panel
PS Frame AP-118	PS frame
Antenna Tuning Unit AT-106	Antenna tuning unit
Crowbar Drawer AX-212	Crowbar drawer
12-kv High Voltage Rectifier AP-105	40-kw high voltage rectifier
PS Control Panel AX-213	PS frame control panel

(4) Bias Supply Drawer AP-117. - The bias supply, mounted below the PA control panel, contains two power supplies and VSWR (voltage standing wave ratio and retune protection circuits. The protection circuits automatically cause associated relays to trip when VSWR becomes excessive or rf signal levels drop excessively. The front panel contains three potentiometers, three lamps, and three fuses.

(5) PA Frame Relay Panel AR-116. - The PA frame relay panel, located at the bottom of the PA frame, contains nine relays and associated parts. The relays protect various circuits in the PA and PS frames. The upper section of the relay panel contains controls and indicators associated with the relays. All relays and terminal boards are contained in the lower section and are easily accessible upon removal of a cover plate.

e. PS FRAME. - The PS frame contains the transmitter high voltage power supply, the power amplifier output network used during balanced antenna operation, and a crowbar drawer. The upper front section of the PS frame contains removable drawer assemblies. The main power supply components occupy the remainder of the frame.

(1) Antenna Tuning Unit AT-106. - The antenna tuning unit contains a balancing network for balanced output operation. A BAND MCS switch and BALANCE

control on the front panel are used during such operation. The front panel also contains five meters which monitor circuit parameters within the 40-kw power amplifier, the crowbar filament voltage, and the VSWR. A manually set pointer and adjustment knob on the SWR (standing wave ratio) permits the transmitter operator to preset the level of VSWR at which the VSWR protective circuits become operative.

(2) Crowbar Drawer AX-212. - The crowbar drawer, mounted below the antenna tuning unit, provides protection against excessive discharge currents in the high voltage supply of the 40-kw PA. This unit contains a thyratron that is visible through a window on the front panel. A switch, lamp, and two fuses are mounted on the front panel.

(3) 40-kw High Voltage Rectifier AP-105. - The 40-kw high voltage rectifier drawer, mounted below the crowbar drawer, is the rectifier portion of the high voltage power supply for the 40-kw power amplifier tube. This unit contains six rectifier tubes and their associated filament transformers. The front panel contains six fuses.

(4) PS Control Panel AX-213. - The PS control panel, mounted below the 40-kw high voltage rectifier, contains controls for adjusting filament voltages in several of the drawers and for turning on filament and blower-motor power. The front panel also contains a calibration control and switch for the SWR meter.

1-4. TECHNICAL CHARACTERISTICS.

The following data outlines the technical characteristics of the transmitter.

Frequency range	2 to 28 mc, band switched
Output power	40,000 watts, 2-tone PEP, 3rd order distortion product down at least 35 db from PEP.
Operating modes	SSB, ISB, DSB, FSK, FAX, CW, AME and AM.
Output impedance	
Balanced	600 ohms
Unbalanced	50 or 70 ohms
Harmonic suppression	Second harmonic down at least 50 db from PEP; third harmonic down at least 65 db from PEP.
Primary power requirements (with exciter)	3-phase, 200 volts, 50/60 cps, 220 amperes per phase.
Safety features	Mechanical and electrical interlocks.
Cooling	Semi-pressurized cabinets that are forced-air cooled.
Operating temperature	Between 0°C (32°F) and 50°C (122°F) for humidity as high as 90%

1-5. ELECTRON TUBE, DIODE, AND FUSE COMPLEMENT.

The electron tubes, diodes, and fuses contained in the PA and PS frames of the transmitter are listed in tables 1-2 through 1-4, respectively.

TABLE 1-2. ELECTRON TUBE COMPLEMENT

REFERENCE SYMBOL	TYPE	FUNCTION
V7301	ML-6697	40-kw PA
V7501	6X4	Rectifier
V7502, V7503	5R4GY	Rectifier
V7504, V7505	0A2	Voltage regulator
V7506	6AU6	Voltage regulator
V7507	6336A	Voltage regulator
V7508, V7509	12AT7	DC amplifier
V8301	1095	Thyratron
V8401-V8406	6895	High voltage rectifier

TABLE 1-3. DIODE COMPLEMENT

REFERENCE SYMBOL	TYPE
CR7303	
CR7304	

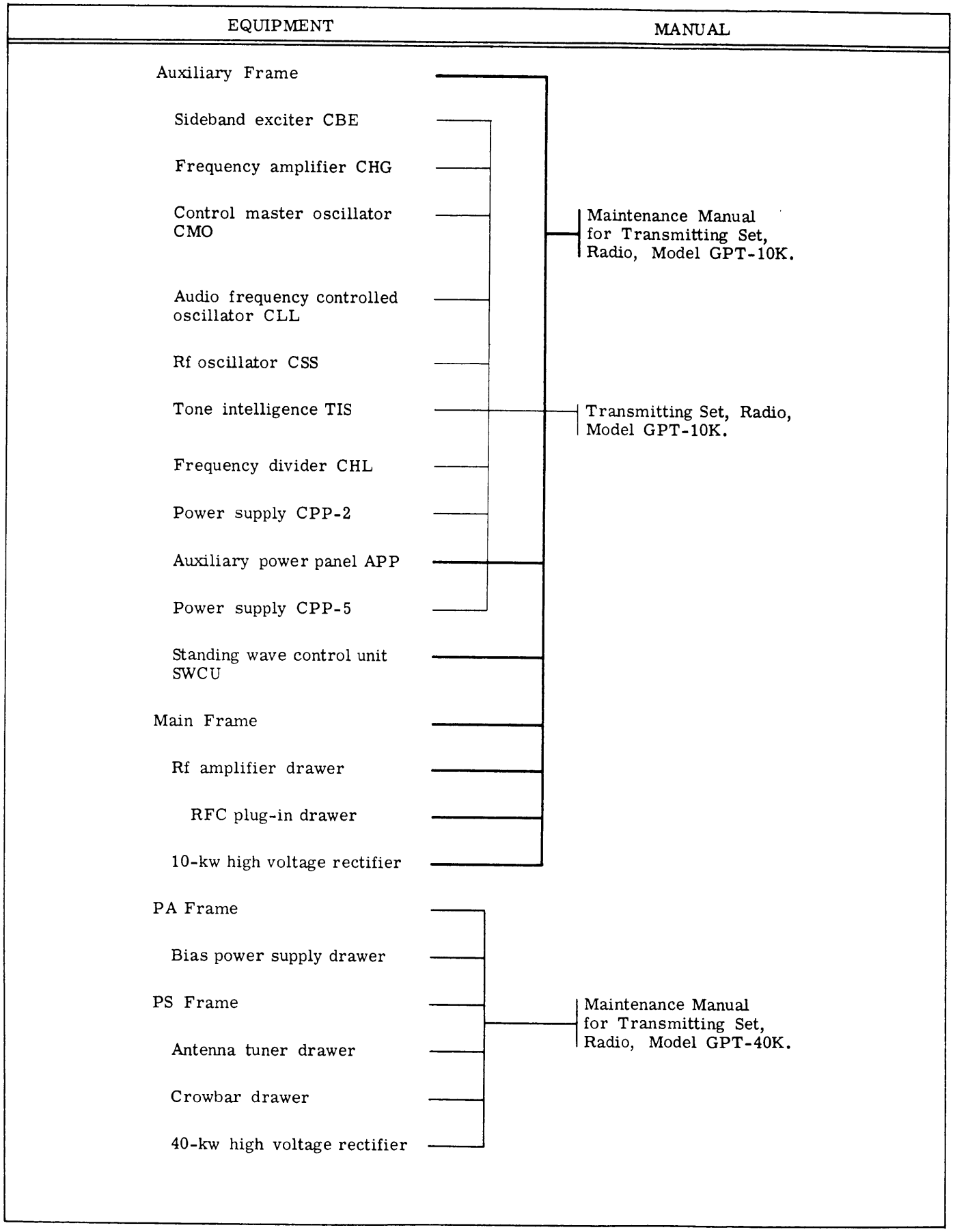
TABLE 1-4. FUSE COMPLEMENT

REFERENCE SYMBOL	TYPE
F7501	AGC-1/8
F7502	MDL-1/2
F7503	MDL-3
F7601	MDL-5
F7602-F7606	MDL-2
F8101	MDL-3
F8401-F8406	MDL-1
F8501-F8502	MDL-5
F8503	MDL-2

1-6. ASSOCIATED MANUALS.

Table 1-5 presents a list of associated equipment manuals. This list provides a convenient reference for readily obtaining information on the GPT-40K transmitter. Additional references are provided in the foreward of this manual.

TABLE 1-5. ASSOCIATED MANUALS



SECTION 2
PRINCIPLES OF OPERATION

2-1. GENERAL.

This section presents the principles of operation of the third and fourth frames (PA and PS frames respectively) of the GPT-40K transmitter. Also, discussed are all circuits in the auxiliary and main frames that differ from those in the GPT-10K transmitter. For the principles of operation of the auxiliary and main frame circuits common to the GPT-10K transmitter, refer to Maintenance Manual for GPT-10K Transmitter.

2-2. OVERALL BLOCK DIAGRAM ANALYSIS. (See figure 2-1.)

An rf signal from the exciter circuits in the auxiliary frame is applied to the input of RF Amplifier RFC-1, the 1-kw IPA (intermediate power amplifier.) The rf input signal must be within the frequency range of 2 to 28 mc and may be modulated or unmodulated. The linear stages of the RFC raise the level of the input signals as high as 1-kw PEP. This signal is applied to the 10-kw PA. The 10-kw output signal is applied to the 40-kw PA. Output switch S903 permits flexibility in transmitter operation. In the TUNE position, a dummy load is connected to the output of the 10-kw PA so that the 10-kw PA may be tuned independently of the 40-kw PA. In the EMER position, the rf output of the 10-kw PA is connected to an antenna link. When the link is strapped for emergency operation, the 10-kw signal is applied to the antenna circuits, completely bypassing the 40-kw PA and permitting transmission at this reduced power level. Another possible emergency mode (shown as a dotted line in figure 2-1) permits the output of the 1-kw IPA to be applied to the antenna link, bypassing both the 10-kw PA and 40-kw PA. In the OPERATE position, OUTPUT LOADING switch connects the rf output of the 10-kw PA to the input of the 40-kw PA. The 40-kw PA may be operated with a balanced or unbalanced output. For balanced operation, the rf signal is connected to antenna tuning unit. For unbalanced operation, the rf signal is connected to directional coupler DC7302.

Rf output samples of the exciter, the 10-kw PA and 40-kw PA are routed to auxiliary power panel in the auxiliary frame where any one signal may be selected for monitoring by means of a coaxial switch and output connector. In addition, an adjustable aldc (automatic load and drive control) signal, developed in the power amplifier section is fed back to the 1-kw IPA and exciter. The aldc signal limits high drive peaks developed during multiple signal transmission; and subsequently, suppresses unwanted transmission by-products. This signal is functionally identical to that of an agc (automatic gain control) signal in a receiver.

Detection of voltage standing waves at the output of the 10-kw PA causes an SWR signal to be applied to the SWCU-1 in the auxiliary frame. When a present level of standing waves is exceeded, an SWR overload signal from the SWCU-1 causes the high voltage to be removed from the transmitter.

The 10-kw high voltage rectifier functions together with the 10-kw main power panel and main power supply to provide the high dc voltages required by the 1-kw IPA and the 10-kw PA stages.

The 10-kw relay panel contains protective circuits that automatically cut off high voltages to the 1-kw IPA and 10-kw PA when preset overload levels are exceeded in these stages. The protective circuits sample the 1-kw IPA, the bias voltage, the 1-kw IPA and 10-kw PA plate and screen currents, and the current in a voltage regulating diode assembly in the main power supply. When any of these currents are excessive, or if a voltage is out of tolerance, the associated protective relay operates and removes power from 10-kw high voltage rectifier. This action automatically removes high voltage from the 40-kw PA in the PA frame, if the DRIVER INTERLOCK switch located on 40-kw relay panel is set at OFF.

High voltage for the 40-kw PA is supplied by 40-kw high voltage rectifier. The B+ and B- outputs of the 40-kw high voltage rectifier are also connected across circuits in the crowbar drawer. The crowbar drawer, a protective device for the 40-kw PA, detects sharp changes in power amplifier grid current. If a sharp rise in grid current occurs (as a result of arcing), the crowbar drawer shorts the output of the 40-kw high voltage rectifier, causing MAIN POWER breaker CB8101 to trip. This action removes power from the 40-kw high voltage rectifier.

The 40-kw PA receives a 600-volt regulated bias voltage from bias supply via PA frame relay panel. The bias supply contains an unregulated +350-volt supply and circuits associated with the standing wave and retune protective circuits. A dc voltage proportional to the 40-kw PA plate rf voltage is supplied to the retune circuit in the bias supply. A dc voltage proportional to standing waves on the unbalanced output line is supplied from directional coupler DC7302 to the SWR meter.

Protective relay circuits similar to those described for the 1-kw IPA and 10-kw PA are used to remove high voltage from the 40-kw PA when a malfunction occurs in an associated circuit. These circuits, contained in PA frame relay panel sample bias (+600 volts), voltage standing waves, retune signals, final filament and crowbar filament voltages, and

plate and grid currents. If one of these currents is excessive or if a voltage is out of tolerance, an associated relay operates and removes power from the 40-kw high voltage rectifier.

Transformer T8104 is an autotransformer that receives 220-volt 3-phase power from PA frame power amplifier control panel and supplies 230 volts ac (single phase) to the primary windings of the filament transformers in the bias supply, crowbar drawer, and the 40-kw PA. The transformer also supplies 3-phase 230 volts ac to the filament transformers in the 40-kw high voltage rectifier. The 3-phase 220 volts ac from the power supply control panel is used for operation of the blowers in the PA frame.

The transmitter also contains interlock circuits that are provided for personnel and equipment safety. Whenever one of these interlocks opens, power is removed from the transmitter. Interlock circuits are provided for drawers in which voltages greater than 500 volts are present. Important cooling air ducts are also interlocked for equipment safety.

2-3. CIRCUIT CHANGES IN AUXILIARY AND MAIN FRAMES.

The auxiliary and main frame circuits of the GPT-40K transmitter are almost identical to those in the GPT-10K transmitter. Circuit differences are described below.

a. DRIVER V900. - In the GPT-10K transmitter, V900 serves as the final power amplifier tube. The 10-kw PEP balanced or unbalanced output is applied to the selected antenna through a suitable network as described in the TMC Maintenance Manual for GPT-10K Transmitter.

In the GPT-40K transmitter, V900 (figure 2-2) operates as a 10-kw driver for the 40-kw PA in the PA frame. Its output is single ended, and is applied to output switch S903. As shown in figure 2-2, the V900 circuit is identical to its GPT-10K counterpart except for the portion of the output circuit following plate coupling capacitor C949. The rf output of driver V900 is coupled to output switch S903 through capacitor C949 and directional coupler DC900. Directional coupler DC900 provides the means for measuring the output power of the transmitter and VSWR of the transmission line on meter M1005. Forward power from DC900 is rectified by diode CR902, filtered by pi-filter elements C1040, L1005, and C1041, and normally applied through spring-loaded contacts of SWR switch S1017 to PA OUTPUT-SWR meter M1005. At this time, the meter provides an indication of transmitter output power in kilowatts PEP. Reflected power from DC900 is rectified by diode CR904, filtered by pi-filter elements C1042, L1006, and C1043, and is normally applied through closed contacts on SWR switch S1017 to an SWR protective circuit. When the switch is depressed, input to the protective circuit is opened and meter M1005 reads SWR.

When switch S903 is set at TUNE, the output of the pi network in the plate circuit of V900 is connected to a dummy load consisting of parallel-connected resistors R911, R912, and R913. This arrangement permits tuning the driver to the transmitter carrier frequency independently of the 40-kw PA. In the EMER position, the rf output is connected to jack J905. When S903 is set at OPER, the output of V900 is connected to terminal E7304 (see figure 2-3), the input to the 40-kw PA in the PA frame.

b. INTERLOCK CIRCUIT. - As shown in figure 2-2, switches S902, S903, and S908 are operated by the OUTPUT LOADING control. These switches are connected into a revised interlock circuit, described in later paragraphs.

c. RF MONITOR. - An rf monitor network in the plate circuit of driver V900 provides a sample of 10-kw rf in exactly the same manner as that in the GPT-10K. In this case, the output at jack J900 (now marked IPA MONITOR rather than PA MONITOR) is cabled to the IPA position of MONITOR switch on auxiliary power panel in the auxiliary frame.

2-4. 40-KW PA AND ANTENNA TUNING UNIT. (See figure 2-3.)

a. GENERAL. - The 40-kw PA V7301, a ML6697 triode operating as a class AB1 grounded grid amplifier, amplifies the output of the 10-kw driver. The input to V7301 is approximately 3200 watts. The output of V7301 is 40,000 watts PEP. The antenna tuning unit provides the output circuit for balanced operation.

b. DETAILED CIRCUIT ANALYSIS. - The rf output of 10-kw driver V900 is applied to the cathode of 40-kw PA V7301 via terminal E7304. RF MONITOR jack J7304 provides the means of monitoring this signal. The signal is coupled from the V7301 input circuit to jack J7304 by an rf pickup coil.

Filament power at 13 volts, 205 amperes, is supplied to V7301 through transformer T7101 and rf choke L7303. Rf choke L7303 is the load impedance for the rf input signal applied to V7301. Capacitors C7312 through C7315 maintain the return ends of L7303 at rf ground. The dc path from the cathode of V7301 to B- is through L7303, the secondary of T7101, an rf filter network, PLATE CURRENT meter M7203, and a relay protective circuit. PLATE OVLD relay K7601, paralleled by resistor R7609 in series with PLATE OVLD ADJ control R7601, and TUBE PROTECT relay K7608 paralleled by TUBE PROTECT ADJ control R7606 constitute the relay protective circuit. Relay K7601 samples the V7301 cathode circuit for excessive current, while relay K7608 operates in conjunction with RETUNE relay K7603 (described in later paragraphs) to protect V7301 from overdissipation. If the cathode current varies above or below operating limits, relay K7601 or K7608 removes the high voltage from the transmitter. Controls R7601 and R7606 set the sensitivity of relays K7601 and K7608, respectively.

The fixed cathode bias on V7301 is +600 volts dc with respect to the grid. The +600-volt dc level from the bias supply is applied to the cathode of V7301 through the normally closed contacts of switch S8106, TUBE PROTECT relay K7608, PLATE OVLD relay K7601, PLATE CURRENT meter M7203,

L7112, the secondary winding of T7101, and L7303. The bias return to the grid (in this case, ground) is through contacts of GRID OVLD relay K7602, GRID OVLD relay K7602 paralleled by resistor R7603 in series with GRID OVLD ADJ control R7602, the primary winding of T8106, and GRID CURRENT meter M8202. Control R7602 sets the sensitivity of relay K7602.

The output plate circuit for V7301 is a pi network consisting of inductor L7314, variable capacitors C7330, C7331, C7332, and switch S7307; and an L network consisting of inductors L7317, L7308, L7316, capacitor C7325, inductor L7307, and switch S7309. Switches S7307 and S7309 successively short out larger inductance as the signal frequency is increased. TUNE capacitor C7330 in the input side of the pi network and ganged LOAD capacitors C7331 and C7332 in the output side of the pi network provide fine tuning and loading, respectively, for the power amplifier output circuit. Inductor L7312 blocks rf, and insures that there is no dc potential across C7330, C7331, and C7332. Capacitor C7328 blocks dc and provides an rf return to ground. The L network is used to match the power amplifier output circuit to the antenna only when unbalanced operation is employed. During balanced output operation, the rf output is strapped directly to terminal E8114 from the output side of the pi network, and the L network is disconnected from the unbalanced output circuit. Terminal E8114 couples the rf signal to antenna tuning unit. When the transmitter is operated with an unbalanced output, the rf signal is strapped from the output side of the L network to the input side of directional coupler DC7302 through harmonic filters L7318 and C7333, and L7319 and C7334. These filters suppress output frequencies above 30 mc.

The output side of DC7302 is connected to the unbalanced OUTPUT jack. Diodes CR7303 and CR7304, connected to DC7302, rectify the forward and reflected rf signals respectively. The resulting positive dc signals are applied to an OUTPUT meter circuit and SWR meter circuit. The input signal for OUTPUT meter M7206 is coupled from CR7303 through rf filter elements C7209, L7201 and C7208. The ground path is completed through CAL-SWR switch S8502. When S8502 is set in the CAL position, M7206 is removed from the circuit. The reflected power signal is coupled from CR7304 to SWR meter M8207 through rf filter elements C7210, L7202, and C8501, CAL control R8501B and CAL-SWR switch S8502. The forward power signal is coupled to M8206 from CR7303 through filter elements C7209, L7201, and C7208, CAL-control, R8501A, and switch S8502. CAL-SWR switch S8502 is a spring-loaded double-pole double-throw switch; normally in the SWR position. SWR meter M8207 is calibrated by holding S8502 in the CAL position and adjusting CAL control R8501 until the pointer on M8207 is aligned with the CAL marker on the meter scale (discussed in paragraph 2-6).

Plate voltage for V7301 is provided by 40-kw high voltage rectifier. Plate voltage is applied through inductors L7306, L7305, L7304, L7316, L7308, L7317, and L7314. Capacitors C7311, C7310, and C7316 provide plate decoupling.

Drive metering network Z7301 rectifies and filters a portion of the rf drive voltage applied to the cathode of power amplifier V7301. The dc output of drive metering network Z7301, proportional to the rf drive applied to V7301, is applied to DRIVE meter M7202.

A sample of the rf output of V7301 is applied through a capacitive voltage divider consisting of capacitors C7326, C7304, and C7305 to plate monitor network Z7302. This network rectifies and filters the rf plate voltage and supplies a proportional dc voltage through terminal 3 to PLATE RF meter M7204. Another rectified output of Z7302 is applied through terminal 8 of Z7302 to the retune circuit in the bias power supply. The retune circuit is described in paragraph 2-6.

PLATE MONITOR jack J7104 provides means for monitoring the rf signal developed at the plate of V7301. This signal is coupled from an rf pickup coil to J7104. Resistor R7302 provides termination for a 50-ohm coaxial cable.

Antenna terminal board TB7301 is provided for connecting the 40-kw PA output. The board may be wired for either balanced or unbalanced output under either normal or emergency operation. During normal balanced operation, connections are made between a terminal on capacitor C7332 and the BAL OUTPUT terminal, and between the DC7302 terminal and the GRD 2 terminal. For unbalanced operation, connections are made between the EMER terminal and the BAL OUTPUT terminal, and between the DC7302 terminal and the GRD 2 terminal. This action patches the output of the 10-kw driver to antenna tuning unit. For emergency operation with an unbalanced output connections are made between the EMER terminal and the DC7302 terminal, and between the BAL OUTPUT terminal and the GRD 1 terminal.

When operating with a balanced output, the rf output of the 40-kw PA is applied to terminal E8203 in the antenna tuning unit. (See figure 2-4.) The signal is coupled through C8207 and developed across inductor L8202. The variable T network, L8201 and C8028, shifts the phase of the rf signal so that the voltage appearing at E8202 is 180 degrees out of phase with that at E8201. BAND MCS switch S8204 tunes the network by shorting portions of L8201. BALANCE capacitor C8208 provides fine control of antenna current in each leg of the antenna. As the capacitor is varied, the impedance of the antenna legs vary in an inverse ratio as the current in one leg rises and, the current in the other decreases. Such changes permit balancing of the rf antenna currents.

2-5. EMERGENCY POWER AMPLIFIER OPERATION.

(See figure 2-5.)

The GPT-40K transmitter can be adapted for 10-kw or 1-kw emergency operation. Figure 2-5 shows the rf signal paths for 1-kw, 10-kw, and 40-kw operation, both for balanced and unbalanced operation.

The tune, operate, or emergency mode is determined by the setting of OUTPUT LOADING switch S903 and the strap connections made at the antenna terminal boards (indicated on figure 2-6 as links 1 and 2). For normal 40-kw operation, OUTPUT LOADING switch S903 is set at OPERATE, routing the output of the 10-kw driver to the 40-kw power amplifier. The 40-kw rf output is then passed through the output circuit to the antenna by connecting the links as indicated on figure 2-5.

For emergency operation, S903 is set at EMER, routing the output of the 10-kw PA to the output circuits, bypassing the 40-kw PA. The strap connections at the two links then feed the 10-kw output to the selected antenna.

When desired, both the 10-kw PA and 40-kw PA stages can be bypassed. For this mode of operation, the connection between the EMER contacts of S903 and emergency output jack J905 is opened, and the output of the 1-kw IPA is routed to J905 via P1009, CP901, (an angle adapter), CP900, and P902. Balanced or unbalanced output operation is determined by the strap connections at the antenna terminal boards.

2-6. BIAS SUPPLY.

a. GENERAL. - The bias supply contains a 600-volt regulated voltage supply used for biasing 40-kw PA tube V7301. It also contains SWR and retune control circuits which protect the power amplifier during periods of excessive SWR or insufficient rf plate voltage, respectively. A separate 350-volt supply in this drawer provides the operating potentials for these control circuits. An associated retune relay in the relay panel also makes use of this 350-volt source.

b. DETAILED CIRCUIT ANALYSIS. - Phase 1 and phase 2 ac power (figure 2-6) is fed to the primary of power transformer T7501. Protective interlock S7501, in series with the phase 2 line, prevents primary power from accidentally being applied to transformer T7501 when the drawer is open (the interlock may be manually closed when the drawer is open for maintenance purposes). AC POWER fuse F7503 provides overload protection. Rf filtering of the primary power lines is provided by pi filters in each ac input phase.

Rectifiers V7502 and V7503 provide full-wave rectification of the ac voltage developed across plate winding 8-10 of transformer T7501. The rectified voltage, filtered by inductor L7503 and capacitor C7506, is developed across resistor R7503, and applied to the plates of dual-triode series regulator V7507. It is controlled by the voltage from voltage regulator V7506. The combined action of V7506 and V7507 provides a regulated +600-volt dc output in the cathode circuit of V7507 that is fed to 40-kw PA tube V7301 through jack J7502 and plug P7109.

BIAS indicator I7502, connected in series with dropping resistor R7515 across the 600-volt output, is lit when the regulated 600-volt portion of the bias supply is functioning normally. Resistor R7531 serves as a bleeder for the regulated 600-volt supply. Rf filtering is provided by capacitors C7511 and C7512 and inductor L7504. Instantaneous load surges in the +600-volt line are bypassed by capacitors C7509 and C7510.

Output voltage variations in the regulated 600-volt dc line are developed across the voltage divider consisting of resistors R7511 and R7512 and BIAS ADJ control R7513. A portion of these voltage variations are tapped from BIAS ADJ control R7513 and applied to the control grid of voltage regulator V7506. The amplified variations are developed across plate resistor R7509 and fed to the control grids of V7507 through grid resistors R7505 and R7506. The change in bias on tube V7507 acts to maintain a constant 600-volt output level. For example, if the output voltage at jack J7502 or ac input voltage tends to rise, the increase in voltage developed across the voltage divider (R7511, R7512, and BIAS ADJ R7513) appears at the control grid of V7506 as a decrease in bias. As the grid of V7506 becomes more positive, the plate of the tube becomes more negative. This negative-going voltage is applied to the grids of tube V7507 causing an increase in voltage drop across the tube. The increased voltage drop across tube V7507 compensates for the increase at jack J7502 by decreasing the output voltage. When the output voltage tends to decrease, the reverse action takes place.

Cathode, screen grid, and suppressor grid voltages for V7506 are tapped off a voltage divider consisting of resistors R7504 and R7507 and gas-type voltage regulators V7504 and V7505. The gas-type voltage regulators are used to stabilize the cathode voltage of V7506 so that only grid voltage variations will effect the plate circuit. Capacitors C7507 and C7508 insure constant grid to cathode bias by eliminating noise. Resistors R7508 and R7510 compensate for differences in internal resistances in each half of tube V7507. BIAS fuse F7502 protects the 600-volt bias supply from overloads. Filament voltage for tubes V7506 and V7507 is provided by secondary winding 14-15 of transformer T7501. AC POWER indicator I7503 lights when primary power is applied to the bias supply.

The retune control circuit uses a dc amplifier to control the operation of the retune relay when the rf plate voltage of the 40-kw PA falls below a preset level. A portion of the detected rf signal from rf plate network Z7302 (figure 2-3) is fed to the grid of retune dc amplifier V7508A through pin J of jack J7501, rf filter network L7505 and C7515, and RETUNE OVLD ADJ control R7520. The level of this grid signal, set by RETUNE OVLD ADJ control R7520, is held relatively constant by capacitor C7513. Triode V7508A operates at a fixed cathode bias of +3 volts. This voltage is tapped off across resistor R7521, part of a voltage divider consisting of resistors R7530 and R7521. A 150-volt dc level for this voltage divider is obtained between voltage regulators V7504 and V7505 of the 600-volt portion of the bias supply. Plate voltage for triode V7508A

is obtained from the separate +350-volt power supply. The +350-volt dc level is also applied across the voltage divider consisting of resistors R7523 and R7524 and potentiometer R7522. Cathode bias for triode V7508B, set by R7522, is obtained from across resistor R7524. During normal operation of the transmitter, the bias level prevents the plate current of V7508B from energizing the overload coil of the retune relay.

If the rf plate voltage of the 40-kw PA decreases, the positive dc level at the grid of tube V7508A also decreases (or becomes more negative). This appears as an increase in plate voltage which is, in turn, coupled to the grid of V7508B through resistor R7518. The positive-going grid causes an increase in plate current in V7508B. If the power amplifier rf plate voltage drops below a predetermined level, the plate current through V7508B rises sufficiently to energize the overload coil of the retune relay.

The standing wave control circuit uses a dc amplifier to control the operation of the SWR relay when the reflected power on the unbalanced antenna line exceeds a preset level. In this case, the SWR protective circuit is activated by a switch contained in SWR meter M8207. Initially, the transmitter operator sets an adjustable pointer on the SWR meter to a value of SWR (2.5:1). When a level of standing waves causes meter needle deflection to reach or pass the adjustable pointer, the switch in the SWR meter closes. This action causes a positive voltage at the junction of voltage divider resistors R7532 and R7533 in the bias supply to be fed through the meter switch to the SWR input, at pin I of J7501. This positive voltage is applied to the cathode of dc amplifier V7509B, causing the plate voltage of V7509B to rise. This rise is coupled to the grid of V7509A through R7519. The same 350-volt power supply used by the retune control circuit provides plate voltage for V7509 and is also applied across the voltage divider consisting of resistors R7527 and R7525 and SWR OVLD ADJ control R7526. The cathode voltage of V7509A is normally set to prevent the plate current of this triode from energizing the overload coil of SWR relay K7604. However, application of the positive-going input at the grid of V7509A (as a result of switch closure at the SWR meter) causes the plate current to rise sufficiently to energize relay K7604.

The power supply that provides 350 volts for tubes V7505 and V7509 and for operation of the SWR and retune relays obtains its ac power from secondary winding 5-7 of transformer T7501. The ac voltage is rectified by full-wave rectifier V7501 and filtered by resistor R7501 and capacitor C7505. LV indicator I7501, connected in series with dropping resistor R7505, lights when the 350-volt power supply is operating normally. LV fuse F7501, in series with the 350-volt return line, protects the power supply for over-loads.

2-7. PA FRAME RELAY PANEL.

a. PROTECTIVE RELAY CIRCUITS. - Nine relays in the PA frame relay panel (figures 2-7 and 6-1 sheet 9) sample five currents and four voltages in the PA and PS frames of the transmitter. Contacts on eight of these relays from part of the series interlock circuit for the PA frame and the PS frame. As shown in figure 6-1, contacts on eight of these relays are series connected. This forms part of the transmitter interlock circuit which is discussed in paragraph 2-10.

The overload windings of PLATE OVLD relay K7601 and TUBE PROTECT relay K7608 are connected in series between the B- line and the cathode circuit of power amplifier V7301 (see figure 2-3). Excess plate current in V7301 operates PLATE OVLD relay K7601 and TUBE PROTECT relay K7608. As a result, PLATE OVLD indicator I7601 lights through the closed indicator contacts of K7601; the series interlock contacts of K7601 open; and the overload winding of K7608 becomes shunted by resistor R7608 to decrease the operating current through the overload windings. In addition, the output of retune dc amplifier V7508 is connected through pin G of J7601, closed contacts of K7608, and through the overload winding of RETUNE relay K7603 to the 350-volt line which enters the PA frame relay panel at pin F of J7601 (see figure 2-6). The plate current of retune dc amplifier V7508 operates the overload coil of RETUNE relay K7603, opening the series interlock contacts and causing RETUNE indicator I7603 to light through closed contacts of K7603. Upon correction of the trouble, operation of OVLD RESET switch S7401 in PA Frame Control Panel applies phase 1 ac power to all reset coils, restoring all relay settings to normal. RETUNE relay K7603 also operates if the contacts of PA TUBE PROTECT thermostat S7305 in 40-kw PA close. The overload winding of PLATE OVLD relay K7601 is shunted by PLATE OVLD ADJ control R7601 in series with resistor R7609, and the overload winding of TUBE PROTECT relay K7608 is shunted by TUBE PROTECT ADJ control R7606. These controls determine the magnitude of the total plate current at which relays K7601 and K7608 will operate.

GRID OVLD relay K7602 and BIAS relay K7605 sense the regulated output voltage of the bias supply. This voltage enters the PA frame relay panel at pin B of J7602. Insufficient output of the bias supply causes the contacts of BIAS relay K7605 to open; subsequently opening the series interlock circuit, removal of high voltage, and illumination of BIAS lamp I7605 through contacts of K7605. An abnormal grid current level operates the overload winding of GRID OVLD relay K7602. As a result, GRID OVLD indicator I7602 lights through closed indicator contacts of K7602 and the series interlock contacts of K7602 open. Upon correction of the trouble, depressing the PA frame control panel OVLD RESET switch S7401 restores the relay settings to normal. The overload winding of GRID OVLD relay K7602 is shunted by GRID OVLD ADJ control R7602 in series with resistor R7603. The setting of GRID OVLD ADJ control R7602 determines the bias supply current that will operate GRID OVLD relay K7602. The overload winding of K7602 is connected in series with transformer T8106 and GRID CURRENT

meter M8202 through contacts 9 and 10 to the output of the bias supply. BIAS RELAY ADJ control R7604 and resistor R7605 are connected in series with the coil of BIAS relay K7605. The setting of BIAS RELAY ADJ control R7604 determines the output voltage of the bias supply that will deenergize relay K7605.

The primary of 40-kw PA filament transformer T7101 is connected in series with the coil of FINAL FILAMENT relay K7607 through pin P of J7601. Similarly, the primary of transformer T8301 in crowbar drawer is connected in series with the winding of CROWBAR relay K7609 through pin U of J7601. Loss of voltage applied to transformer T7101 or an open in the filament circuit of power amplifier V7301 causes relay K7607 to deenergize. When this occurs, the series interlock contacts of K7607 open; FINAL FILAMENT indicator I7607 lights through closed relay contacts, and power is removed from TIME DELAY relay M7602 through open contacts of K7607. Loss of voltage applied to transformer T8301 or an open in the filament circuit of crowbar tube V8301 causes CROWBAR relay K7609 to deenergize. At this time, K7609 opens the series interlock circuit and removes power from TIME DELAY relay M7602. Contacts of CROWBAR relay K7609 are connected in series with the contacts of FINAL FILAMENT relay K7607 that control the application of power to TIME DELAY relay M7602. Therefore, when either or both relays deenergize, TIME DELAY relay M7602 is deenergized, removing high voltage from the transmitter.

The overload winding of SWR relay K7604 is connected in the plate circuit of SWR dc amplifier V7509 through pins E and F of J7601 (see figure 2-6). An excessive SWR voltage on the unbalanced output transmission line actuates the overload winding of SWR relay K7604, lighting SWR indicator I7604 and opening the series interlock circuit. Upon correction of the trouble, operation of OVLD RESET switch S7401 restores the relay contacts to their operating positions.

DRIVE INTERLOCK relay K7606 is energized by transformer T800 in the main frame. If 230-volt power is removed from transformer T800 in the main frame, relay K7606 is deenergized, opening the series interlock circuit and lighting DRIVE INTERLOCK indicator I7606. To energize the main frame, the series interlock circuit of the PA frame and the PS frame must be completed. Since no power is applied to transformer T800 to energize relay K7606 until after the series interlock circuit is closed, DRIVE INTERLOCK switch S7601 is provided to bypass the open series interlock contacts of relay K7606. When DRIVE INTERLOCK switch S7601 is closed, and the main frame becomes operative, 230-volt power is applied to transformer T800, energizing relay K7606, closing its series interlock contacts and opens its indicator contacts. After the series interlock contacts of relay K7606 close, DRIVE INTERLOCK switch S7601 should be opened to give the equipment the full protection of the protective relay system.

b. TIME METER AND TIME DELAY CIRCUITS. - FILAMENT TIME meter M7601 and PLATE TIME meter M7604 indicate the total time that the filament and plate circuits, respectively, of power amplifier V7301 have been activated. This information is important for both operation and maintenance, since it indicates the expended life of the tube. FILAMENT TIME meter M7601 is connected through pin 0 of J7601 to the phase 3 ac output of T8104, so that FILAMENT TIME meter M7601 is energized only when filament power is applied to power amplifier V7301. One side of the PLATE TIME meter circuit is connected through contacts of FINAL FILAMENT relay K7607 and CROWBAR relay K7609 to phase 2 ac power. The other side of the PLATE TIME meter circuit is connected through pin e of J7601 to the switch circuit of high-voltage contactor K8101 which is actuated when high voltage is applied to power amplifier V7301.

The TIME DELAY meter and BLOWER DELAY meter circuits are described in paragraph 2-12.

2-8. CROWBAR DRAWER.

a. GENERAL. - The crowbar drawer functions as a protective device for 40-kw PA V7301 by removing high voltage when arcing within the tube produces grid current surges above a predetermined level. The high voltage is removed by shorting B+ to B- through a heavy-duty thyratron in the crowbar drawer thus causing the main high-voltage circuit breaker CB8101 in the PS frame to open.

b. DETAILED CIRCUIT ANALYSIS. - The 12-kv output of 40-kw high voltage rectifier (figure 2-8) is coupled from E8103 to the plate of thyratron V8301 through E8303 and current-limiting resistors R8301, R8302, and R8303. The B- potential is applied from E8101 to the cathode of the thyratron through E8301. B- is also fed to the grid of the thyratron through the secondary winding (1-2) of transformer T8106 and potentiometer R8304. During normal operation of the transmitter, the thyratron is not conducting.

Power amplifier grid current is fed from the 40-kw PA grid circuit through the primary winding (3-4) of transformer T8106 and GRID CURRENT meter M8202 which monitors the grid current. Transformer T8106 is phased so that PA grid current surges which pass through the primary of T8106 induce positive voltages at terminal 1 of the secondary winding. This positive voltage is applied to the grid of the thyratron causing it to conduct and short out the high voltage. Potentiometer R8304 sets the surge level that will fire the thyratron.

Primary power for filament transformer T8301 is fed from the phase 1 and phase 3 lines. Rf filtering is provided in both ac lines. Fuse F8301 in the phase 1 line protects that line from overloads due to shorts in the thyratron filament and reservoir circuit. POWER indicator I8301 lights when ac power is applied to the primary of transformer T8301.

Secondary winding 3-4 of transformer T8301 provides filament voltage for the thyratron, while the reservoir voltage is obtained from winding 5-6. Either of these voltages may be selected by RESERVOIR-FILAMENT switch S8301 for monitoring by CROWBAR FILAMENT meter M8201. RESERVOIR ADJ control R8305 is used to set the reservoir voltage to the proper level as stamped on the thyratron tube by the manufacturer. This adjustment is made while observing meter M8201 with switch S8301 in the RESERVOIR position.

2-9. 40-KW HIGH VOLTAGE RECTIFIER. (See figure 6-1.)

The 40-kw high voltage rectifier provides the required high voltage for the 40-kw PA. The rectifier input is the three-phase ac output of a delta-wye transformer configuration consisting of transformers T8101, T8102, and T8103. These three-phase output connections are made at terminals E8109 and E8418, E8110 and E8419, and E8111 and E8420, respectively.

Filament voltage for the rectifiers is supplied by transformers T8401 through T8406. Three phase primary voltage for these transformers is supplied through rf filter networks. A fuse (F8401 through F8406) is located in the primary circuit of each of the filament transformers.

The high-voltage output of the three-phase full wave bridge rectifier, developed at terminals E8417 and E8413, is applied to a choke input filter consisting of inductor L8101 and capacitors C8107 and C8108. Connected between the high-voltage and B- terminals of the 12-kv high voltage rectifier (and across the filter capacitors) is a voltage divider consisting of resistors R8101 through R8114. High voltage for the 40-kw PA plate circuit is tapped off between resistors R8111 and R8112. The high-voltage level is monitored by PLATE VOLTS meter M8203, connected across resistor R8101.

2-10. INTERLOCK CIRCUITS.

a. GENERAL. - Basically, two separate interlock switch circuits are included in the transmitter. One interlock circuit services the main frame; the other services the PA frame and PS frame. The interlock switch circuits function together with the protective relay circuits for protection of equipment and personnel. If any of the interlock switches are opened, high voltage is removed from the transmitter.

Door and panel interlock switches are included primarily for personnel safety.

b. MAIN FRAME INTERLOCK CIRCUIT, DETAILED CIRCUIT ANALYSIS. - Ten interlock switches (figure 2-11) forming a series circuit are included in the main frame. Two of these switches, power amplifier air switch S800 and air switch S206, ensure that blower B201 in RF Amplifier RFC-1 and main blower B800 in the main power supply, respectively, are functioning. The other eight interlock switches ensure that band switches, doors, and equipment are in their normal operating positions. For example, the detents on front panel IPA BAND switch S202 and PA BAND switch S900 operate band switches S205 and S901, respectively, and ensure that these band switches are in operating positions and not between positions.

The interlock switch circuits and the protective circuits provide a series circuit that connects phase 2 voltage to one end of high-voltage shorting coil L802. The control path is through switches S205 and S206, external interlock jumper E3000-8 and E3000-10, switches S1006, S800, S1007, S901, S1008, S1009, S1010, and S1011 to the relay panel through pin a of P1000. In the relay panel, the switch on TIME DELAY meter M701 connects this ac voltage to pin d of connector P1000. One end of coil L802 connects to this pin through terminal 1 in terminal block E805. The other end of L802 connects to the phase 1 voltage through terminal 2 of E805. This phase 1 to phase 2 voltage energizes L802.

With L802 energized, switch S801 is closed. The phase 2 voltage at pin d of P1000 is then coupled through series contacts of protective relays K700, K701, K702, K704, K706, K707, and K708 in the relay panel, through closed switch S801, to one end of the coils of contactors K3000 and K3001 and timer M3003. The other end of the coils of contactors K3000 and K3001 and timer M3003 is connected through pin A of J1000 and HIGH VOLTAGE circuit breaker CB1001 to rotor contact 4 on TUNE-OPERATE-EMERG switch S908A.

When S908 is set at TUNE position, the Ø1 circuit is completed to CB1001 through contacts 1 and 4 of S908A and the PA frame and PS frame interlock circuit is simultaneously opened. This action permits high voltage to be applied only to the main frame. When S908 is set in the OPERATE position, the Ø1 voltage at pin E of P900 and J7103 is coupled to CB101 through the following path: inductor L7108, pin E of J7102 and P7104, pin I of P7102 and J8102, a switch operated by high voltage contactor K8102, to pin H of J8102 and P7102. From this pin, the Ø1 voltage is applied through pin D of P7104 and J7102, inductor L7107, pin D of J7103 and P900, and contacts 2 and 4 of S904. When S908 is set in the EMER position, the Ø1 voltage at pin E of P900 and J7103 is coupled to CB1001 through inductor L7108, pin E of J7102 and P7104, emergency output protection switch S7306, to pin A of P7104 and J7102. From this pin, it is coupled through pin A of J7103 and P900, and contacts 3 and 4 of S908A. With S908 in the EMER position, the interlock circuit for the PA frame and PS frame is open, permitting high voltage to be applied only to the main frame.

When the interlock switches and the switch on TIME DELAY meter M701 are in their normal operating positions, INTERLOCK INDICATOR lamp I1004 lights. The phase 1 voltage is applied directly to the lamp, while the phase 2 voltage at pin d of P1000 connects to the lamp through terminals 12 and W of the rear section of INTERLOCK switch S1001 and resistor R1005. When one of the interlock switches is not in its normal operating position, the phase 2 voltage path to contactors K3000

and K3001, coil L802, and INTERLOCK INDICATOR lamp I1004 is open. At this time, the lamp is off and the contactors and coil are deenergized. When high-voltage shorting coil L802 is deenergized, two contacts operated by L802 short the +7,500- and +3,000-volt dc lines in the main power supply to ground. This action discharges the filter capacitors in the +7,500- and +3,000-volt lines, providing a personnel safety feature. In addition, the phase 2 voltage is applied to HIGH VOLTAGE circuit breaker CB1001 through the normally open contact 2 of any open interlock switch and resistors R1000 and R1001, tripping the circuit breaker.

The phase 1 to phase 2 voltage is also applied to circuit breaker CB1001 during the warm-up time provided by meter M701. During this time, the phase 2 voltage is connected to the circuit breaker through contacts C and 2 of M701, the number 2 contacts on the interlock switches, and resistors R1000 and R1001. If circuit breaker CB1001 is set at ON during this warm-up time, this voltage causes the circuit breaker to trip thus preventing premature application of high voltage to the transmitter.

When the transmitter is shut down because of an open interlock switch, INTERLOCK switch S1001 and INTERLOCK INDICATOR lamp I1004 can be used to rapidly localize the trouble to a particular interlock switch circuit. When switch S1001 is rotated clockwise from the NORMAL position, indicator I1004 lights for all positions up to the open circuit and is off for all other positions. For example, assume front panel BAND SW switch is not in a normal operating position (between positions). This causes contacts C and 1 of power amplifier band switch S901 to open and contacts C and 2 to close. With INTERLOCK switch S1001 in the IPA BAND SW position (position 1), the phase 2 voltage is applied to the indicator through switch S205, the front section of S1001 contacts 1 and W and resistor R1005. When switch S1001 is in the IPA AIR SW position, the phase 2 voltage is connected to the indicator through switches S205 and S206, contacts 2 and W of S1001, and resistor R1005. In the EXTERNAL position (position 3), the jumper between terminals 8 and 10 of terminal block E3000 is added to the switches to complete the lamp circuit. Similarly, in the REAR DOOR position (position 4), switch S1006 is added to this circuit, and in the PA AIR SW and PA DECK positions, switches S800 and S1007 are successively added in series with the previously mentioned switches. However, when switch S1001 is turned to the PA BAND SW position (position 7), the indicator lamp does not light because switch S901 interrupts the lamp circuit. The lamp does not light for the succeeding positions of S1001 for the same reason.

Another interlock indicator, DRAWER INTERLOCK indicator lamp I2000, is located on the front panel of RF amplifier drawer. This lamp lights when 1-kw IPA interlock switch S1009 is not in its normal operating position. This lamp is included because switches S1009 and S101 are both added to the series circuit for INTERLOCK INDICATOR lamp I1004 when switch S1001 is turned from the RIGHT SIDE position (position 8) to the HV DECK position (position 9). Thus, if lamp I1004 lights with switch S1001 in the RIGHT SIDE position and extinguishes with S1001 in the HV DECK position, either interlock switch S1009 or S1010 could be open. However, if DRAWER INTERLOCK lamp I2000 is now lit, switch S1009 is open; if lamp I2000 is now off, switch S1010 is open.

Normally open contacts of relay K101 in the SWCU-1 are connected between the phase 2 voltage source at E3000-8 and the number 2 contacts on the interlock switches. When standing waves become excessive, relay K101 is energized. Phase 2 voltage is applied to HIGH VOLTAGE circuit breaker CB1001, through resistors R100 and R1001. The circuit breaker trips, turning off the transmitter.

c. PA FRAME AND PS FRAME INTERLOCK CIRCUIT, DETAILED CIRCUIT ANALYSIS. - Eleven interlock switches (figure 2-9) forming a series circuit are included in the PA frame and PS frame of the transmitter. One of these switches, air switch S7101, ensures that the main power amplifier blower B7102 in the PA frame is operating. The remaining interlock switches ensure that doors, panels, band switches and equipment are in their normal operating positions. In addition, emergency output protection switch S7306, not part of the series interlock switch circuit, is provided for protection of personnel during emergency operation of the transmitter.

The interlock switch circuits and protective circuits constitute series circuit that connects phase 1 to one end of shorting relay L8105 and high-voltage contactor K8102. The Ø1 control path is: phase 1 contacts of CB8101, INTERLOCKS fuse F8501, an rf pi filter consisting of inductor L7102 and capacitors C7102 and C7115, OPERATE contacts of S908B, normally open contacts on switches S905 and S906, an rf pi filter consisting of inductor L7106 and capacitors C7106 and C7111, interlock switches S7303, S7102, S7103, S7104, S7101, S7304, S8102, S8101, S8203, S8104, S8103, the switch on TIME DELAY meter M7602, and SHORTING RELAY fuse F7605, to the coil of shorting relay L8105. The other end of L8105 connects to the phase 2 voltage through MAIN POWER circuit breaker CB7401. This phase 2-to-phase 1 voltage energizes L8105.

The phase 1 voltage is also coupled to one end of high-voltage contactor K8102 through series contacts of protective relays K7601, K7602, K7603, K7604, K7605, K7606, K7607, K7609, and strapped terminals 5 and 6 on E8119. With relay K8105 energized, switch S8105 closes, connecting the other end of K8102 to the phase 2 voltage through contacts of HIGH VOLTAGE circuit breaker CB7402 and contacts of MAIN POWER circuit breaker CB7401.

DRIVER INTERLOCKS switch S7601, connected across the interlock contacts of relay K7606, is provided to complete the interlock circuit when the transmitter is initially energized. Note that relay K7606 is energized by transformer T800 after high-voltage contactor K8102 is energized.

During the warm-up time provided by time delay meter M7602, phase 1-to-phase 2 voltage is applied to circuit breaker CB7402. During this time, the phase 1 voltage is connected to the circuit breaker through contacts C and 2 of M7602, the number 2

contacts of the interlock switches, resistors R7403 and R7404 and contacts C and 1 of the switch operated by CB7402. If the circuit breaker is set at ON during the warm-up time, the voltage applied to the circuit breaker causes it to trip. This feature prevents premature application of high voltage to the transmitter.

Switch S902, operated by the detent of TUNE/OPER/EMER switch S908, prevents high voltage from being applied to the PA frame when S908 is set at TUNE or EMER. If S908 is in either of these positions, S902 is closed and completes the phase 1 voltage path to CB7402 through the C and normally closed contacts of S902, and rf pi filter L7105 and capacitors C7105 and C7112. With the phase 1 voltage thus applied, CB7402 trips.

An additional interlock switch, emergency output protection switch S7306 which is not part of the series interlock circuit, removes the phase 1 voltage from HIGH VOLTAGE circuit breaker CB1001 when S908 is in the EMER position. Switch S7306, actuated when the front panel of the 40-kw PA is removed, prevents personnel from contacting dangerous rf voltage present in the antenna circuits.

When the transmitter shuts down because of the operation of an interlock switch in the PA or PS frame, INTERLOCK switch S7404 and INTERLOCK INDICATOR I7401 can be used to localize the trouble to a particular interlock switch circuit. The procedure is the same as that described for the main frame interlock circuit.

2-11. AUXILIARY FRAME AND MAIN FRAME, AC POWER DISTRIBUTION.

The distribution of ac power in the auxiliary and main frames of the GPT-40K transmitter (figure 2-10) is accomplished in a similar manner to that in the GPT-10K transmitter, except for the insertion of contacts TUNE/OPER/EMER switch S908 (controlled by operation of front-panel OUTPUT LOADING control in the phase 1 line feeding HIGH VOLTAGE circuit breaker CB1001.

When S908A is set at TUNE, the phase 1 voltage is applied to CB1001 through switch contacts 1 and 4. (Another set of contacts on S908 opens the PA frame and PS frame interlock circuit at this time, preventing application of high voltage to these frames.) When S908A is set at OPER, phase 1 voltage is applied to CB1001 through L7108, switch contacts on K8102, L7107, and switch contacts 2 and 4. Since the coil of K8102 is interlocked, this prevents operation of the 10-kw PA unless the PA frame and PS frame interlocks are closed.

When S908A is set at EMER phase 1 voltage is applied to CB1001 through L7108, S7306, and contacts 3 and 4 of S908A. In this position the interlock circuit in the PA frame and PS frame is open, so that power can be applied only to the main frame circuit.

2-12. PA FRAME AND PS FRAME, AC POWER DISTRIBUTION.

Three-phase power (figure 2-11) is supplied to three power input terminals located at the bottom rear of the PA frame. Power is applied directly to main circuit breaker CB8101 and to a line filter consisting of three pi filters. The line filter connects the three phase power to MAIN POWER circuit breaker CB7401 and BLOWER circuit breaker CB8501. Except for the inputs to transformers T8101, T8102, and T8103 and the main power amplifier blower, three-phase voltage is distributed throughout the PA frame and PS frame when MAIN POWER circuit breaker CB7401 is closed.

AC POWER indicator I7301 is connected directly across the phase 2 and phase 3 ac lines. Phase 3 voltage is applied to top fan B7301 through terminal 1 of terminal block E7306. The phase 1 voltage is applied to B7301 through TOP FAN 5 AMP fuse F7601. Capacitor C7327 is the starting capacitor for B7301. The PA frame and PS frame meter fluorescent lights are powered by the phase 2-to-phase 1 voltage. Phase 2 voltage, from terminal 7 of E7303, is also applied to power amplifier light I7203; phase 1 voltage for I7203 is applied through PA LIGHTS switch S7403 and terminal 9 on terminal block E7303.

Band switch release coil L7310 is energized by the phase 1 to phase 2 voltage. Phase 1 voltage is applied to L7310 through BANDSWITCH RELEASE switch S7405 and E7303 terminal 2. Terminal 7 on terminal block E7303 supplies phase 2 voltage to one end of HV BREAKER INDICATOR I7402, PLATE ON lamp I7204, and high-voltage warning lamp I7204. Phase 1 voltage is supplied to the other end of these lamps when contactor K8101 is energized through switch contacts operated by K8101. Phase 1 voltage from pin Y of J8101 and P7101 is also applied to PLATE TIME meter M7604. Phase 2 voltage is applied to M7604 through series contacts of protective relays K7609 and K7607, and TIME DELAY fuse F7604.

The reset coils on protective relays K7601 through K7604 are energized by phase 1 and phase 2 voltages through OVLD RESET switch S7401. TIME DELAY meter M7602 receives phase 1 and phase 2 voltage. Phase 2 voltage is applied to M7602 through series contacts of protective relays K7609 and K7607, and TIME DELAY fuse F7604.

Three-phase ac voltage from MAIN POWER circuit breaker CB7401 is applied to transformer T8104 through FIL ADJ switch S8501. T8104 matches the three-phase voltage to the primaries of transformers T7101, T7501, T8301 and filament transformers in the 12-kv high voltage rectifier. Application of phase 3 voltage from T8104 to T7101 is controlled by FINAL FIL circuit breaker CB8502 and contacts on blower relay K7101. The path for this voltage is through CB8502, contacts 2 on K7101, protective relay K7607, and an rf line filter. Phase 3 voltage is applied to the T8301 primary through an rf line filter. Phase 1 voltage for T8301 is applied through protective relay K7609, an rf line filter, and FILAMENT 1.5 A fuse F8301. The POWER lamp, in series with current-limiting resistor R8306, is connected in parallel with the primary of T8301. When FIL ADJ switch S8501 is in the proper position, FILAMENT PRIMARY meter M7201 indicates 230 volts (red line).

Three-phase voltage is applied to the main power amplifier blower B7101 by BLOWER circuit breaker CB8501 and contacts of relay K7101. Relay K7101 is energized by the phase 1-to-phase 2 voltage. Phase 1 voltage is applied to one end of K7101 from CB8501. Phase 2 voltage is applied to the other end of K7101 from CB8501 through normally closed contacts of BLOWER DELAY meter M7603, closed contacts of switch S3 on CB7401, and BLOWER CONTACTOR fuse F7605.

BLOWER DELAY meter M7603 provides a 5-minute delay in shutting down main pa blower B7101 after MAIN POWER circuit breaker CB7401 is set to off. However, the blower may be immediately shut down by setting CB8501 to OFF. M7603 is energized by the phase 1-to-phase 2 voltage when MAIN POWER circuit breaker CB7401 is set to OFF. With BLOWER DELAY meter M7603 energized, K7101 is held energized by the switch operated by M7603 until the present time delay has expired.

Three-phase voltage from main breaker CB8101 is applied to transformers T8101, T8102, and T8103, through switch contacts on K8101 and K8102. The transformers supply high voltage to the tubes in the 40-kw high voltage rectifier. CB8101 is operated by breaker motor B8101 connected to the phase 2 and phase 3 lines. Phase 3 voltage is applied to terminal L1 of B8101 through BREAKER MOTOR fuse F8502. Phase 2 voltage is applied to terminal F of B8101 through switch S1 on CB7401. Closing CB8101 immediately applies power to top fan B8102 connected across the phase 1 and phase 2 lines in the power supply frame. PS TOP FAN fuse F8101 protects the power source from short circuits in the fan motor. Capacitor C8109 is a starting capacitor for the fan motor. When CB8101 is tripped by an overload, it may reset by depressing HV BREAKER RESET switch S7402.

When CB8101 closes, power cannot be supplied to transformers T8101, T8102, and T9103 until shorting relay L8105, and high-voltage contactors K8101 and K8102 are energized. L8105 is energized by the switch contacts operated by TIME DELAY meter M7602, described in connection with the interlock circuit. With L8105 energized, switch S8105 closes, providing a path for phase 2 voltage to K8102 and K8101. The phase 2 voltage is applied by closing HIGH VOLTAGE circuit breaker CB7402. A high-voltage warning light I8101, in series with a dropping resistor, is connected across L8105. Phase 1 voltage is applied to K8101 and K8102 through the interlock circuit. The phase 1 and phase 2 voltages immediately energize K8102, and its contacts close, applying reduced voltages to transformers T8101, T8102, and T8103 through resistors R8115, R8116, and R8117. After a present time delay, a switch on timer M8101 closes. Contactor K8101 is then energized, applying full voltage to the transformers.

2-13. MAIN FRAME DC POWER DISTRIBUTION.

The dc power distribution in the main frame of the GPT-40K transmitter is identical to that in the GPT-10K transmitter.

2-14. PA FRAME AND PS FRAME, DC POWER DISTRIBUTION.

The 40-kw high voltage rectifier supplies plate voltage (figure 2-12) for the power amplifier tube V7301. A regulated bias voltage of +600 volts for V7301 is supplied by the bias supply. In addition, the bias supply contains an unregulated +350-volt supply for operation of the retune and standing wave dc amplifiers that are part of the relay protective circuit.

The high-voltage output of the 40-kw high voltage rectifier is filtered by choke L8101 and capacitors C8108 and C8107. The filtered dc voltage is applied across a voltage divider consisting of resistors R8101 through R8114. The high B+ voltage at the junction of resistors R8112 and R8111 is applied to the plate of V7301 through inductors L7306, L7305, L7304, L7316, L7308, L7317 and L7314. The high B- voltage, from E8104, is connected to the cathode of V7301 through protective relays K7608 and K7601, PLATE CURRENT meter M7203, inductor L7112 secondary of transformer T7101, and choke L7303.

The high-voltage output is also connected, across V8301 in the crowbar drawer for protective purposes, to terminals E8103 and E8101. The operation of the crowbar drawer is described in paragraph 2-8.

The V7301 plate voltage is measured by PLATE VOLTS meter M8203 connected across resistor R8101. The +600-volt regulated bias voltage from the bias supply is applied to the V7301 cathode from J7502 through switch S8106, protective relays K7609 and K7601, PLATE CURRENT meter M7203, choke L7112, secondary winding of T7101, and choke L7303. The -600 volts is routed from the bias power supply (pin D of J7501) through contacts of protective relay K7602, the coil of K7602, the primary winding of T8106, GRID CURRENT meter M8202, and ground to the grid of V7301. Protective bias relay K7605 is connected across the 600-volt bias output and is energized when this voltage is present.

GRID VOLTS meter M8204 measures 600-volt grid to cathode voltage of V7301, effectively the output of the bias supply. Meter M8204 is connected between ground and the line supplying the +600 volts to the cathode of V7301.

The 350-volt dc supply in the bias supply provided the plate voltage for retune dc amplifier V7508 and swr dc amplifier V7509 (described in paragraph 2-6).

A personnel safety circuit is included in the 40-kw high voltage rectifier circuit. When MAIN POWER circuit breaker CB7401 is set at OFF, shorting relay L8105 is deenergized and a short circuit is placed between the 12-kv B and B- and to ground through contacts operated by L8105. This action discharges the high-voltage capacitors. This action also shorts the 600 volts on the B- line to ground. Opening S8106 prevents the 600 volt output of the bias supply from being shorted to ground.

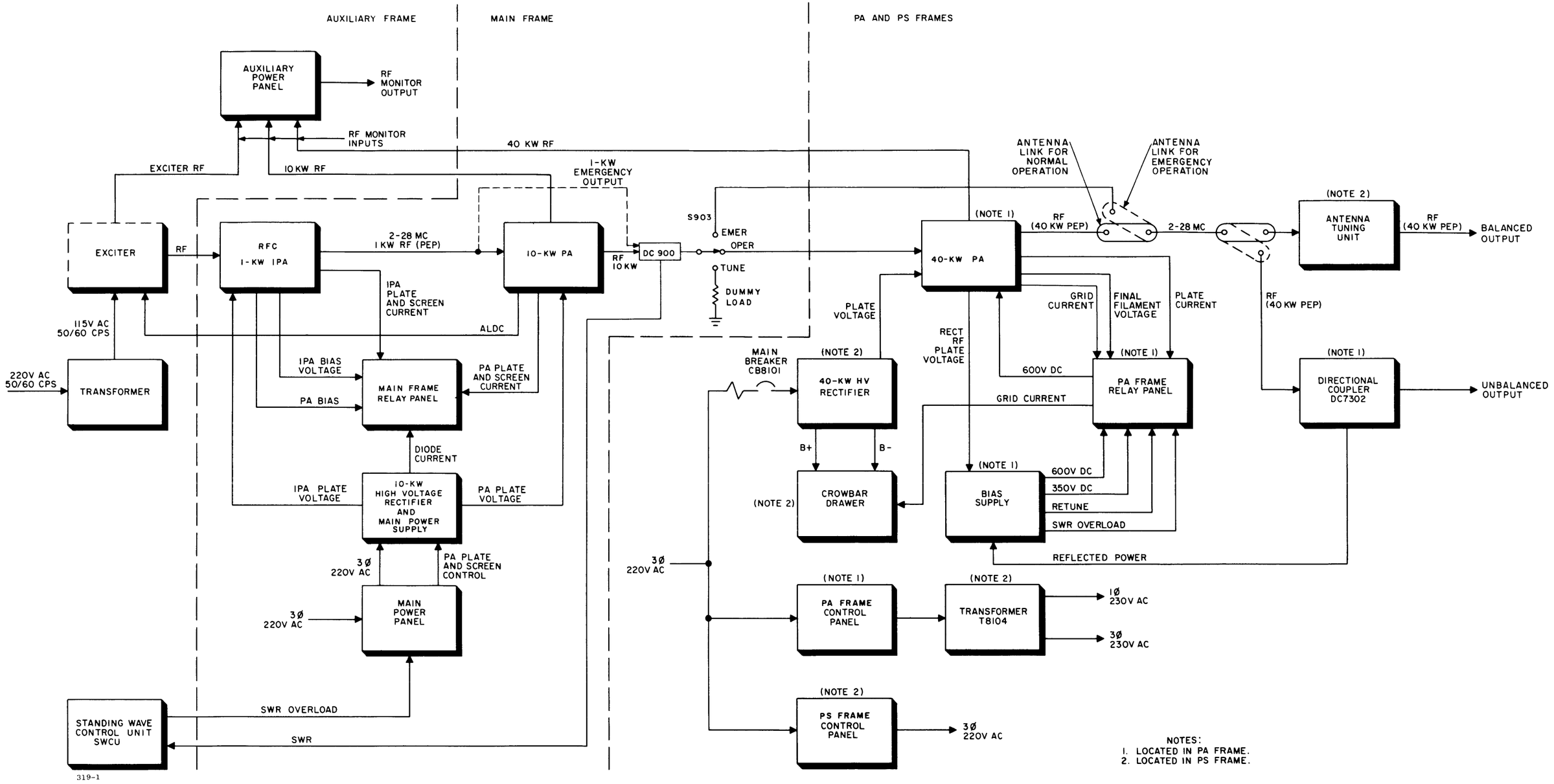
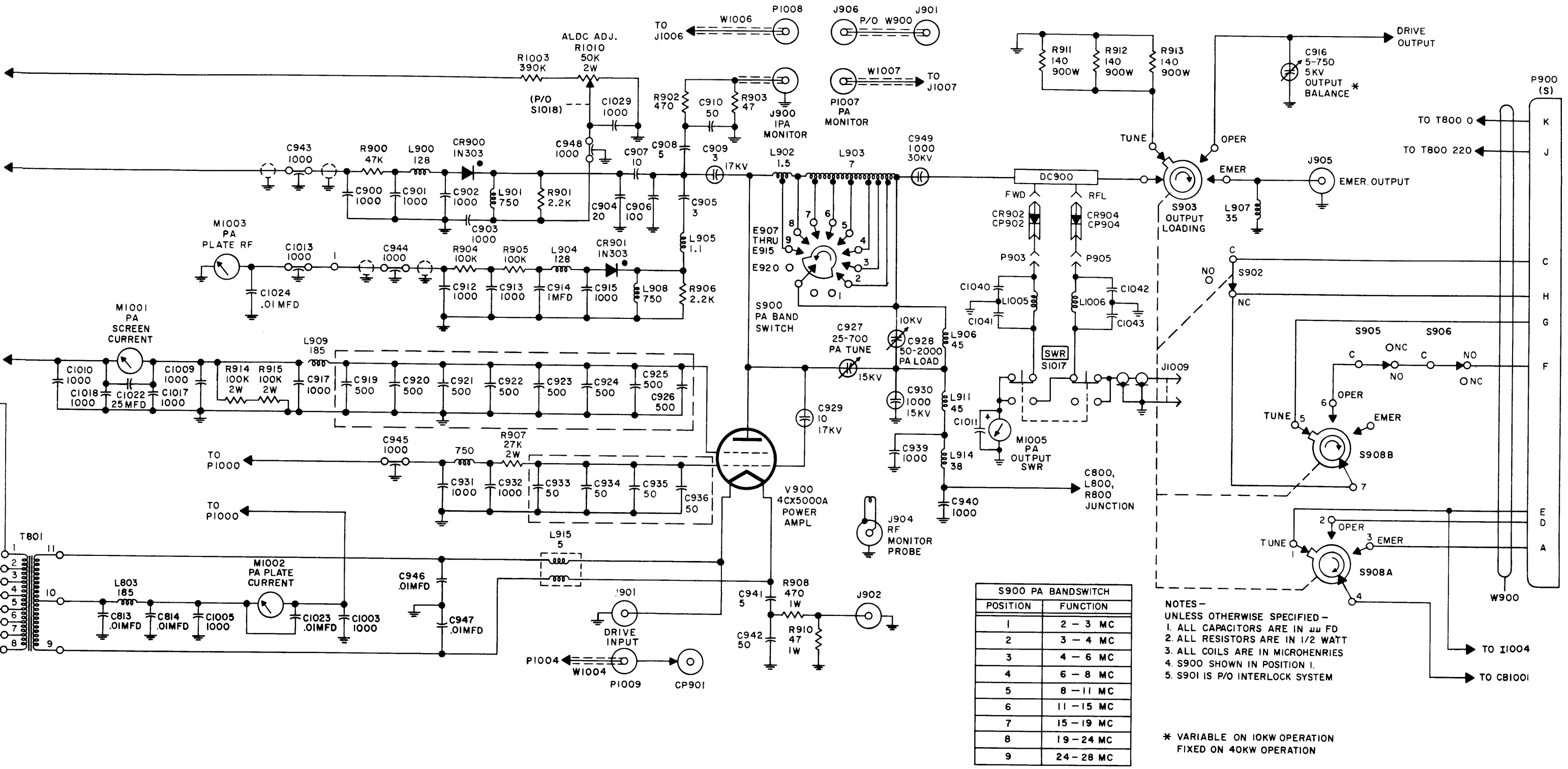


Figure 2-1. GPT-40K Transmitter, Block Diagram



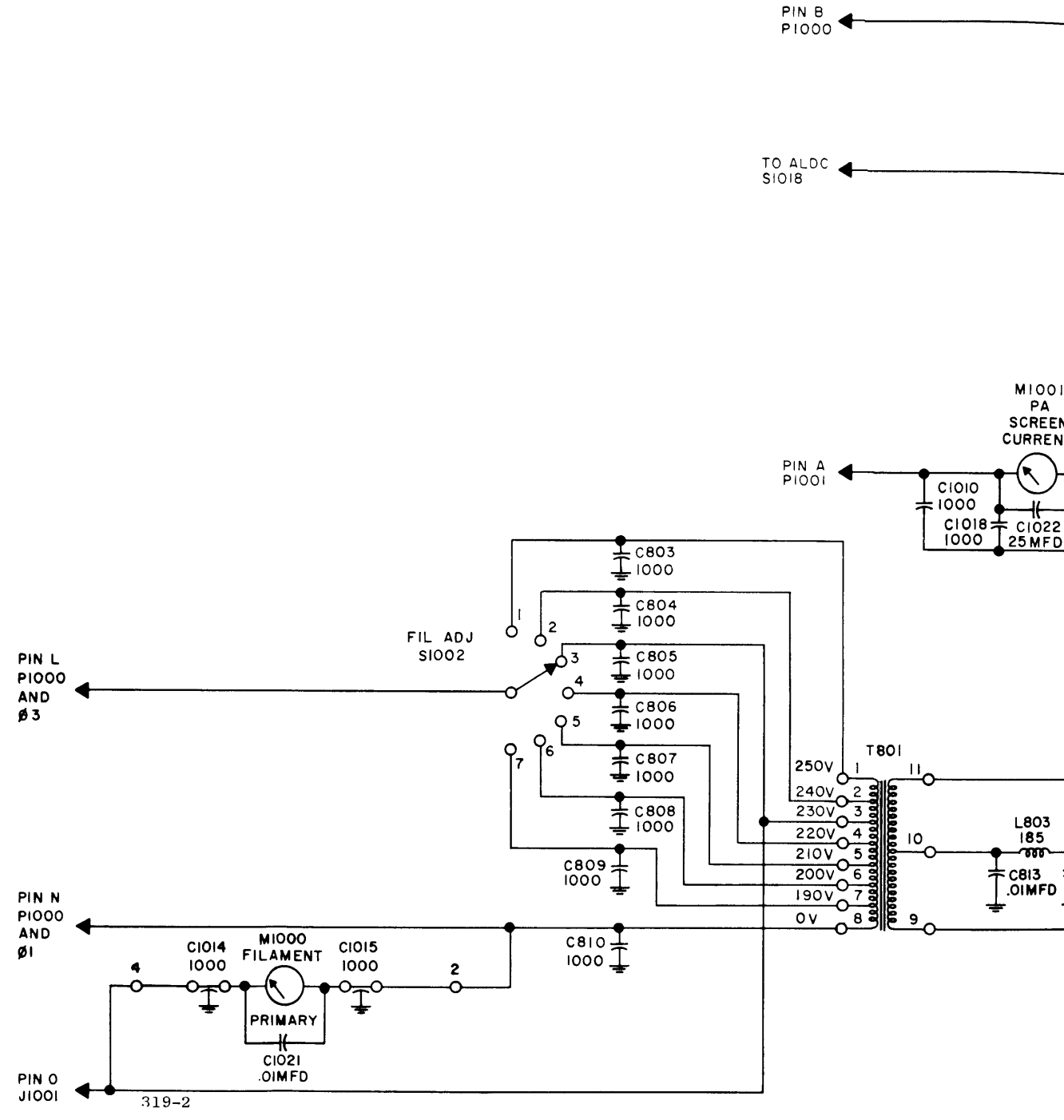
S900 PA BANDSWITCH	
POSITION	FUNCTION
1	2 – 3 MC
2	3 – 4 MC
3	4 – 6 MC
4	6 – 8 MC
5	8 – 11 MC
6	11 – 15 MC
7	15 – 19 MC
8	19 – 24 MC
9	24 – 28 MC

NOTES –
UNLESS OTHERWISE SPECIFIED –
1. ALL CAPACITORS ARE IN μμ FD
2. ALL RESISTORS ARE IN 1/2 WATT
3. ALL COILS ARE IN MICROHENRIES
4. S900 SHOWN IN POSITION 1.
5. S901 IS P/O INTERLOCK SYSTEM

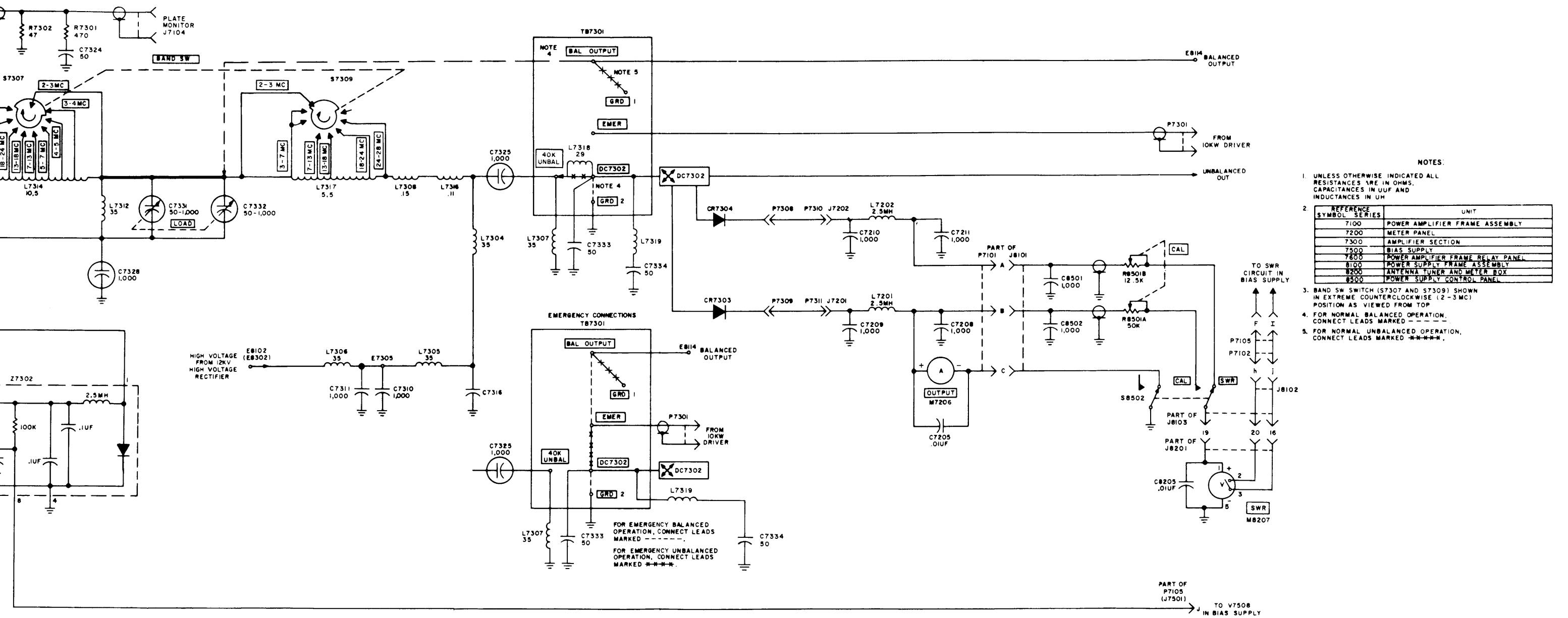
* VARIABLE ON 10KW OPERATION
FIXED ON 40KW OPERATION

Figure 2-2. 10-kw Driver V900, Simplified Schematic Diagram

009640319


PIN B
P1000
TO ALDC
S1018
M1001
PA
SCREEN
CURREN
PIN A
P1001
C1010
1000
C1018
1000
C1022
25MFD
C803
1000
C804
1000
C805
1000
C806
1000
C807
1000
C808
1000
C809
1000
C810
1000
FIL ADJ
S1002
PIN L
P1000
AND
Ø3
T801
250V
240V
230V
220V
210V
200V
190V
0V
L803
185
C813
.01MFD
PIN N
P1000
AND
Ø1
C1014
1000
M1000
FILAMENT
C1015
1000
PRIMARY
C1021
.01MFD
PIN O
J1001

319-2



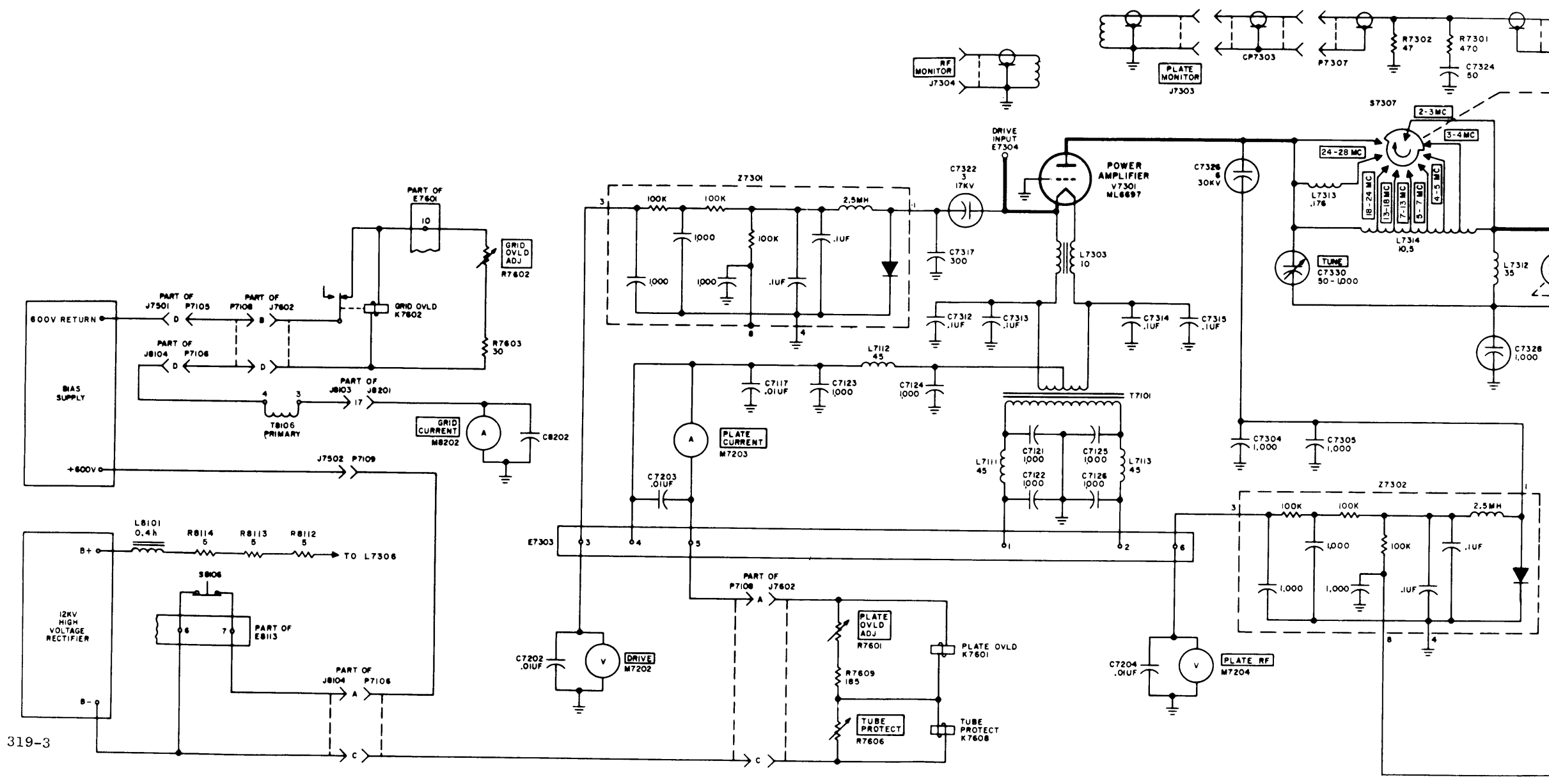
NOTES:

1. UNLESS OTHERWISE INDICATED ALL RESISTANCES ARE IN OHMS, CAPACITANCES IN UUF AND INDUCTANCES IN UH
2.

REFERENCE SYMBOL SERIES	UNIT
7100	POWER AMPLIFIER FRAME ASSEMBLY
7200	METER PANEL
7300	AMPLIFIER SECTION
7500	BIAS SUPPLY
7600	POWER AMPLIFIER FRAME RELAY PANEL
8100	POWER SUPPLY FRAME ASSEMBLY
8200	ANTENNA TUNER AND METER BOX
8500	POWER SUPPLY CONTROL PANEL

3. BAND SW SWITCH (S7307 AND S7309) SHOWN IN EXTREME COUNTERCLOCKWISE (2-3 MC) POSITION AS VIEWED FROM TOP
4. FOR NORMAL BALANCED OPERATION, CONNECT LEADS MARKED - - - - -
5. FOR NORMAL UNBALANCED OPERATION, CONNECT LEADS MARKED - - - -.

Figure 2-3. 40-kw Power Amplifier V7301, Simplified Schematic Diagram


PART OF E7601
10
GRID OVLD ADJ
R7602
PART OF J7501 P7105
PART OF P7108 J7602
GRID OVLD K7602
600V RETURN
BIAS SUPPLY
PART OF J8104 P7106
R7603 30
PART OF J8103 J8201
T8106 PRIMARY
GRID CURRENT M8202
C8202
+600V
J7502 P7109
L8101 0.4 h
R8114 5
R8113 5
R8112 5
TO L7306
B+
B-
12KV HIGH VOLTAGE RECTIFIER
S8106
PART OF E8113
PART OF J8104 P7106
RF MONITOR J7304
PLATE MONITOR J7303
CP7303
P7307
R7302 47
R7301 470
C7324 50
S7307
2-3MC
3-4MC
24-28 MC
18-24 MC
13-18 MC
7-13 MC
4-7 MC
2-4 MC
L7313 .176
L7314 10.5
TUNE C7330 50-1000
L7312 35
C7328 1,000
C7326 6 30KV
DRIVE INPUT E7304
POWER AMPLIFIER V7301 ML6697
Z7301
100K
1000
2.5MH
.1UF
C7322 3 17KV
C7317 300
L7303 10
C7312 .1UF
C7313 .1UF
C7314 .1UF
C7315 .1UF
L7112 45
C7117 .01UF
C7123 1000
C7124 1000
T7101
PLATE CURRENT M7203
C7203 .01UF
L7111 45
L7113 45
C7121 1000
C7122 1000
C7125 1000
C7126 1000
C7304 1,000
C7305 1,000
Z7302
E7303
C7202 .01UF
DRIVE M7202
PART OF P7108 J7602
PLATE OVLD ADJ R7601
R7609 185
TUBE PROTECT R7606
PLATE OVLD K7601
TUBE PROTECT K7608
C7204 .01UF
PLATE RF M7204

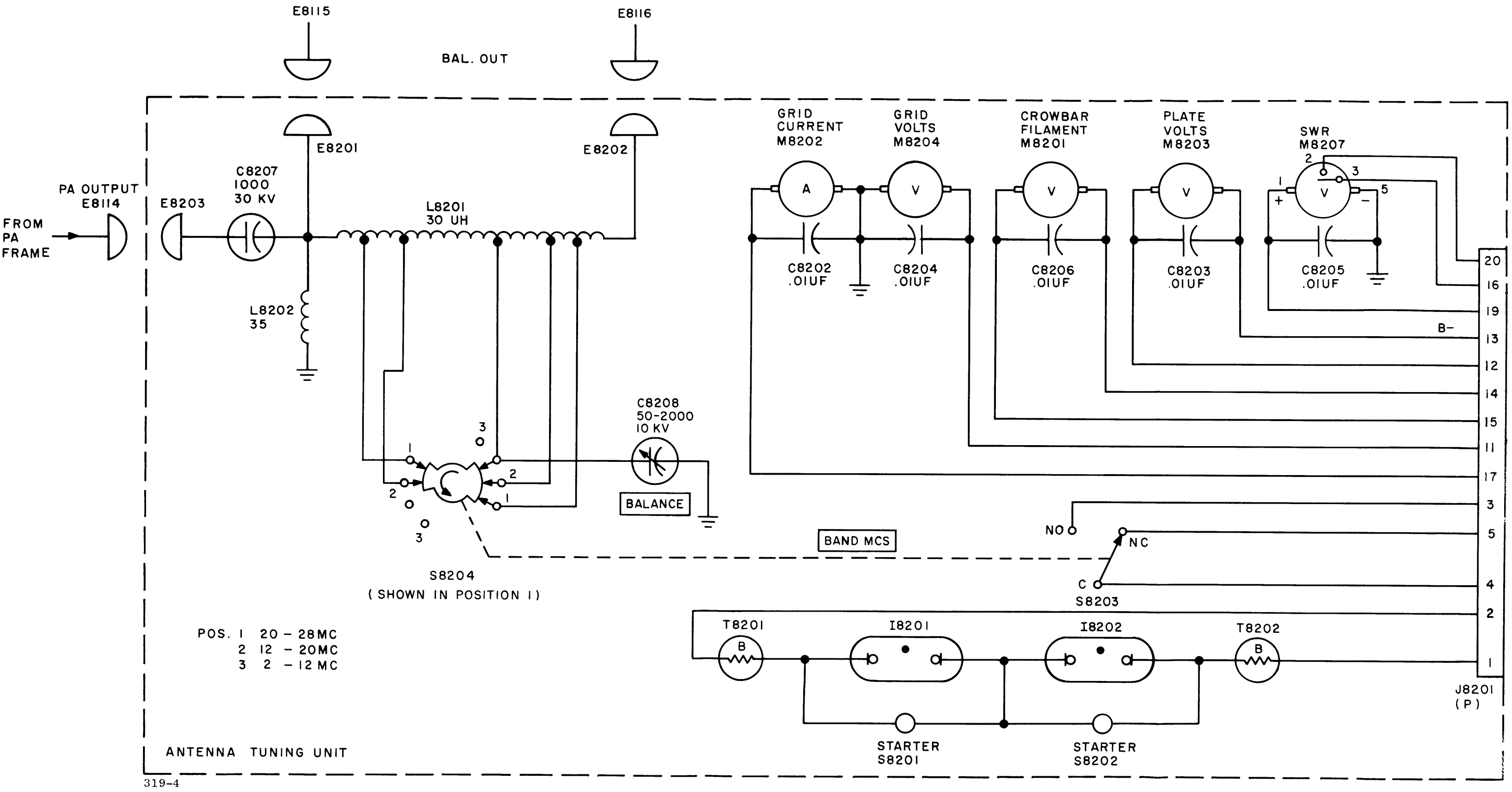


Figure 2-4. Antenna Tuning Unit, Schematic Diagram

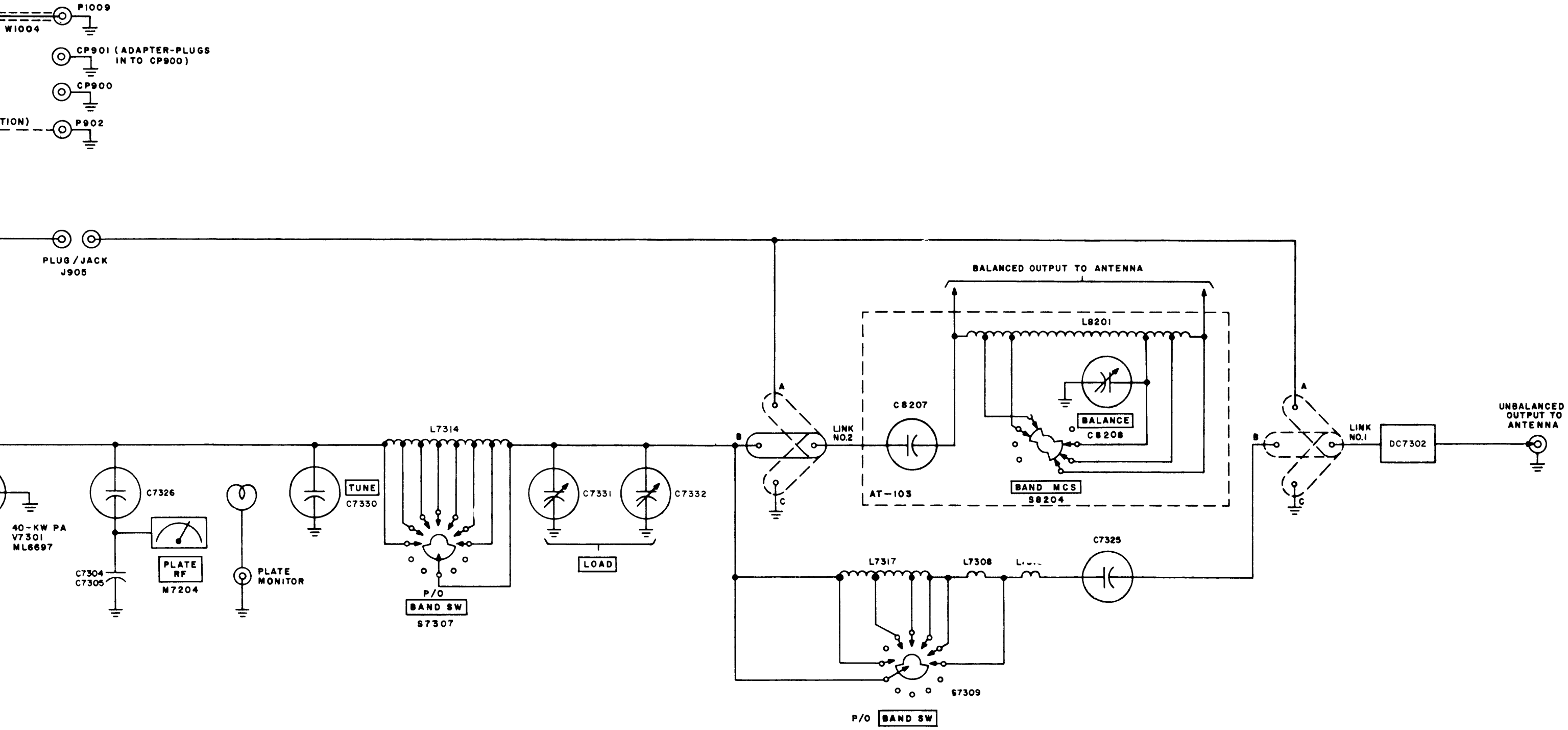
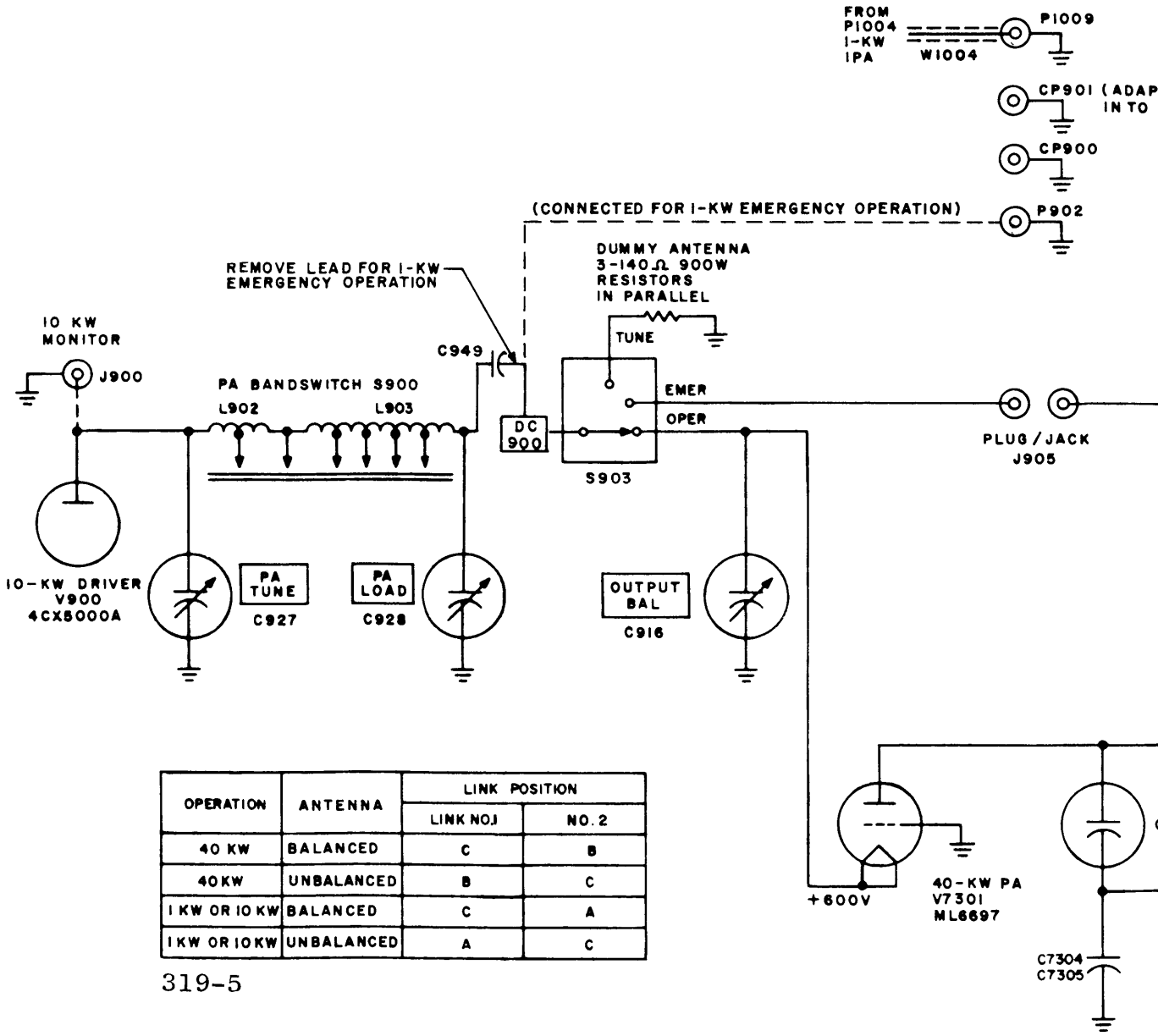


Figure 2-5. Circuit Wiring for 1-kw, 10-kw, and 40-kw Outputs, Simplified Schematic Diagram

2-19/2-20



OPERATION	ANTENNA	LINK POSITION	
		LINK NO.1	NO. 2
40 KW	BALANCED	C	B
40 KW	UNBALANCED	B	C
1 KW OR 10 KW	BALANCED	C	A
1 KW OR 10 KW	UNBALANCED	A	C

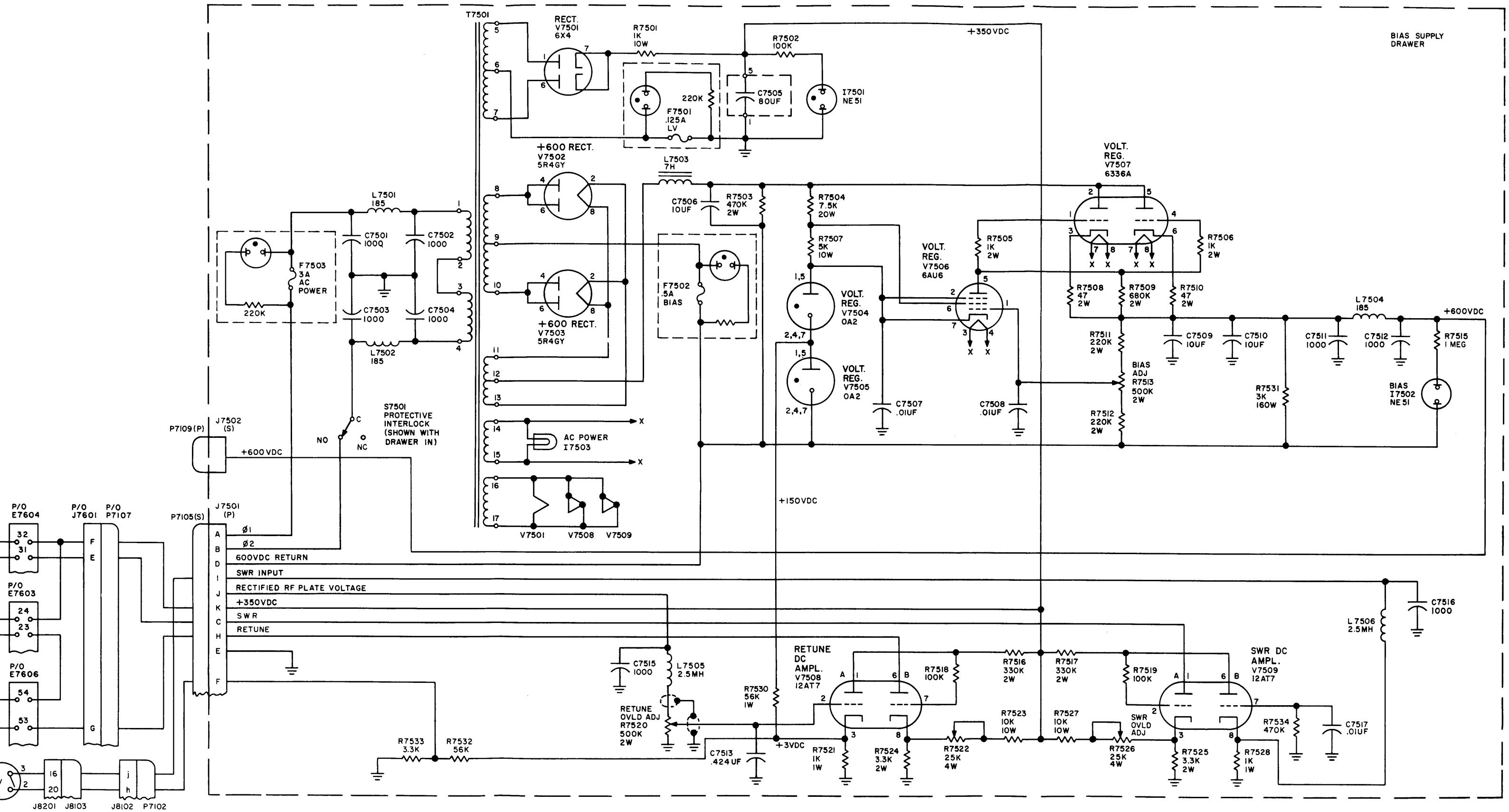
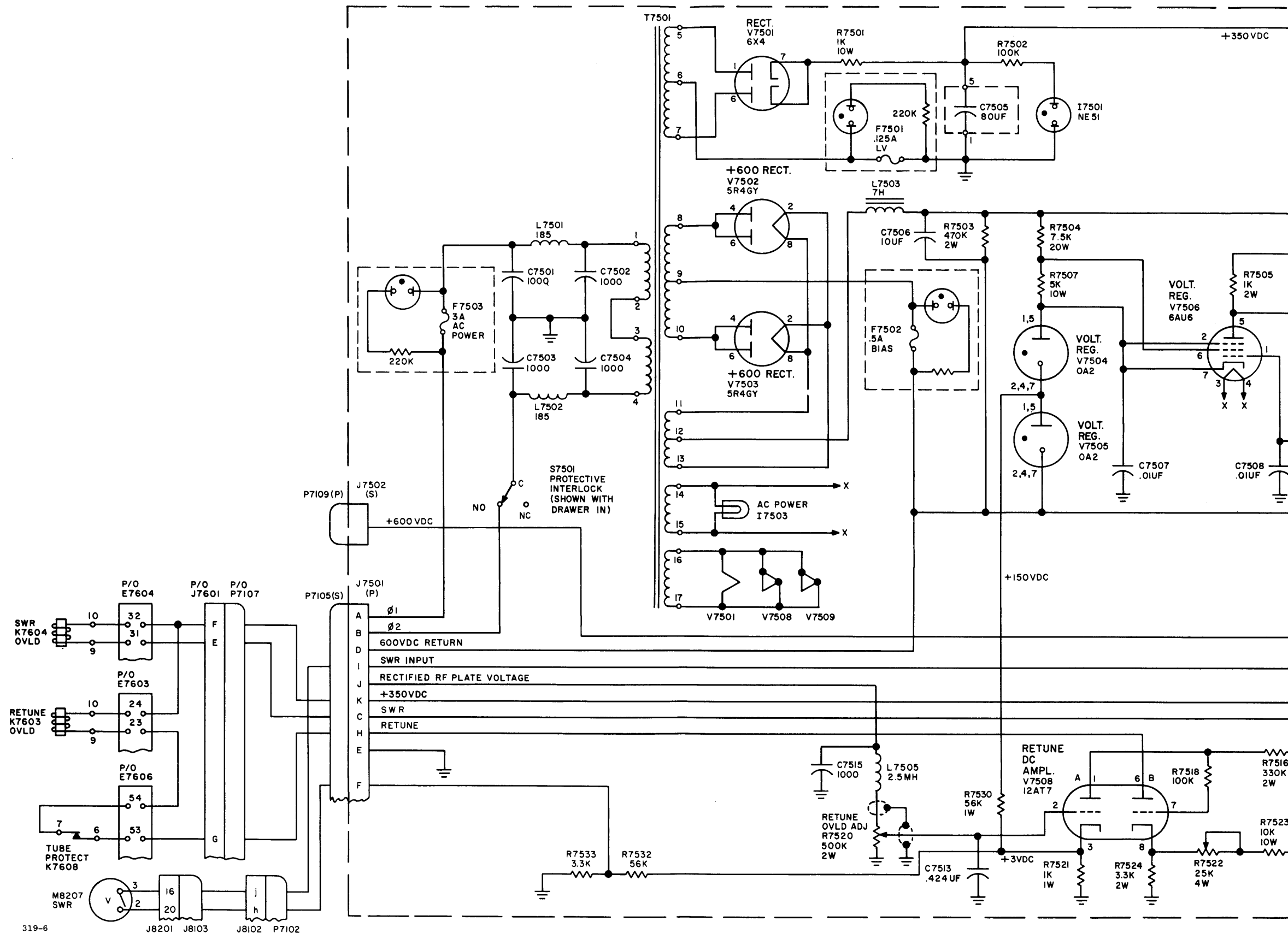


Figure 2-6. Bias Supply Drawer, Schematic Diagram



319-6

009640319

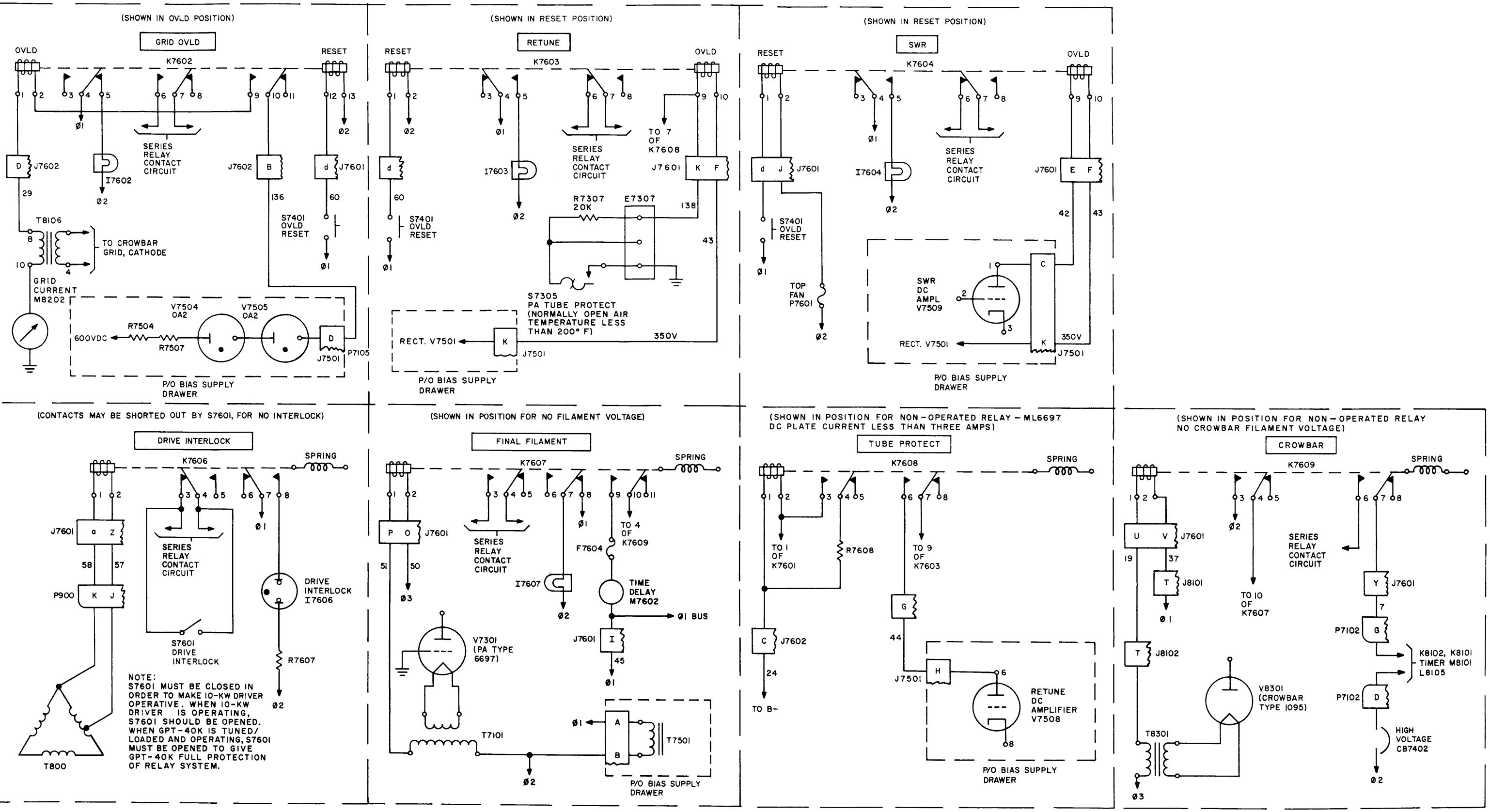
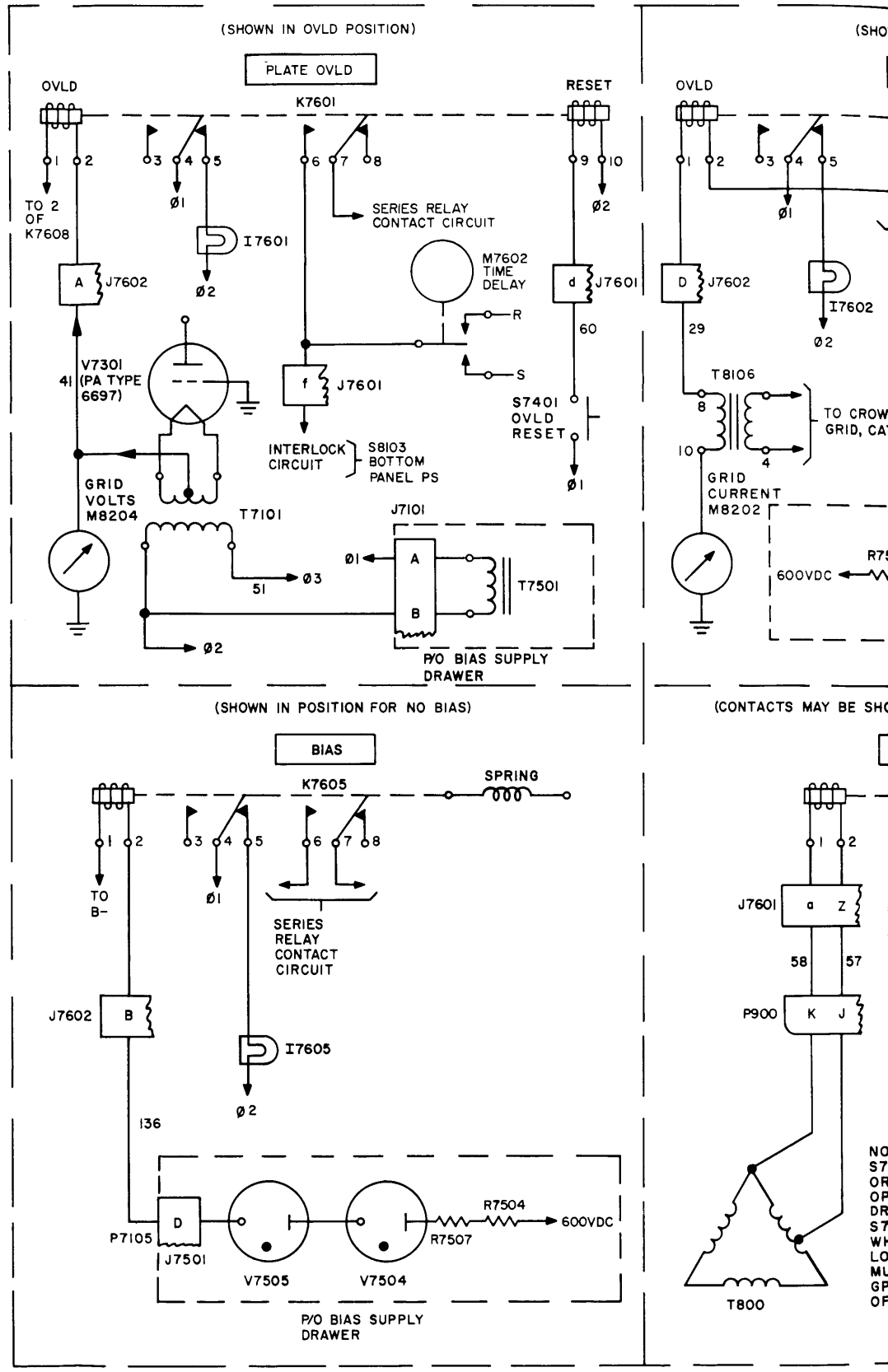


Figure 2-7. PA Frame Relay Panel Protective Relay Circuits, Simplified Schematic Diagram


(SHOWN IN OVLD POSITION)
PLATE OVLD
OVLD
K7601
RESET
TO 2 OF K7608
Ø1
I7601
Ø2
SERIES RELAY CONTACT CIRCUIT
M7602 TIME DELAY
J7602
J7601
R
S
60
V7301 (PA TYPE 6697)
41
J7601
S7401 OVLD RESET
INTERLOCK CIRCUIT
S8103 BOTTOM PANEL PS
GRID VOLTS M8204
T7101
J7101
51
Ø3
T7501
P/O BIAS SUPPLY DRAWER
(SHOWN IN POSITION FOR NO BIAS)
BIAS
K7605
SPRING
TO B-
SERIES RELAY CONTACT CIRCUIT
I7605
136
P7105
J7501
V7505
V7504
R7504
R7507
600VDC
P/O BIAS SUPPLY DRAWER
(SHO
OVLD
I7602
29
T8106
TO CROW
GRID, CA
GRID CURRENT M8202
600VDC
(CONTACTS MAY BE SH
J7601
58
57
P900
T800
NO
S7
OR
OP
DR
S7
WH
LO
MU
GP
OF

319-7

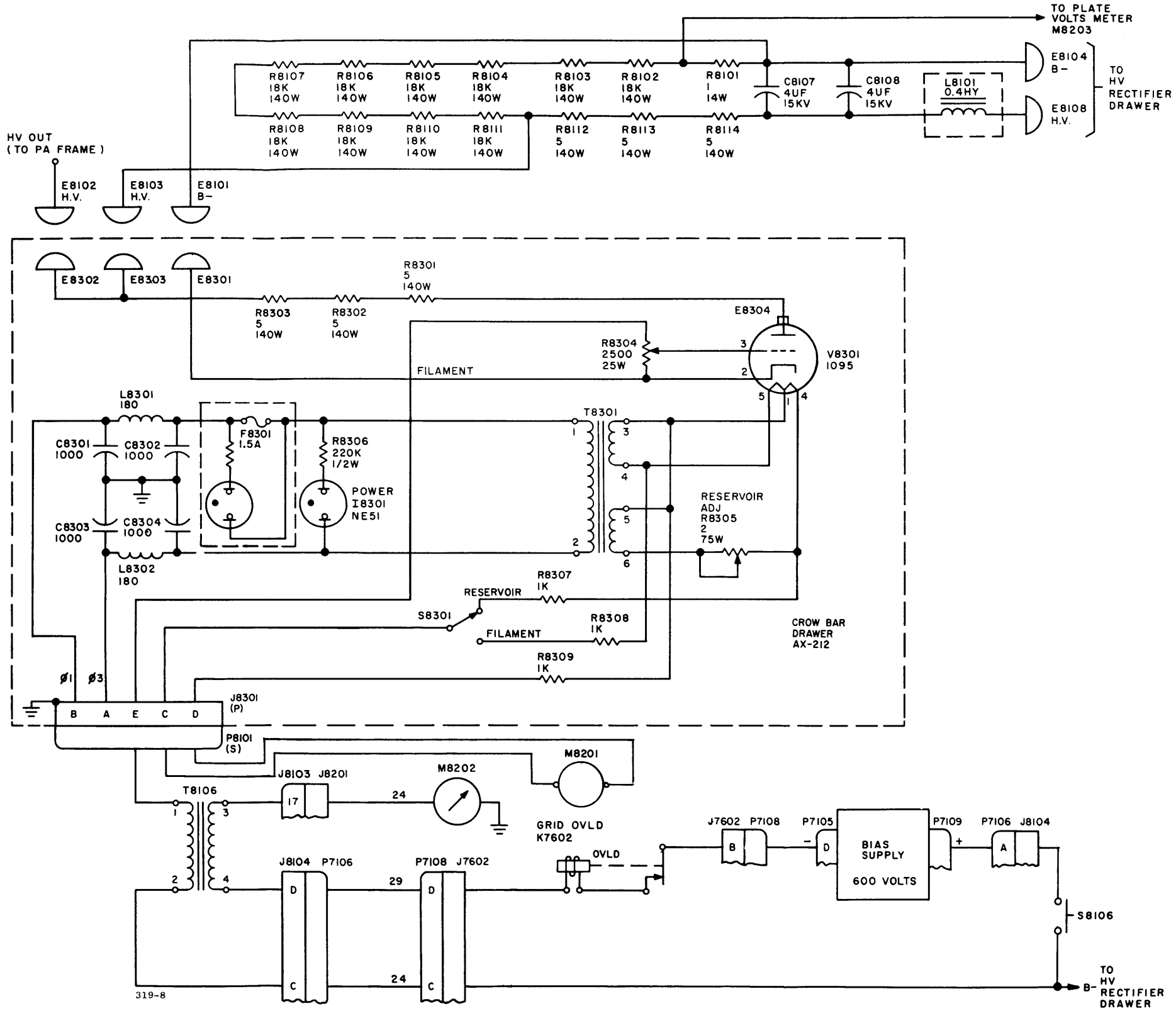
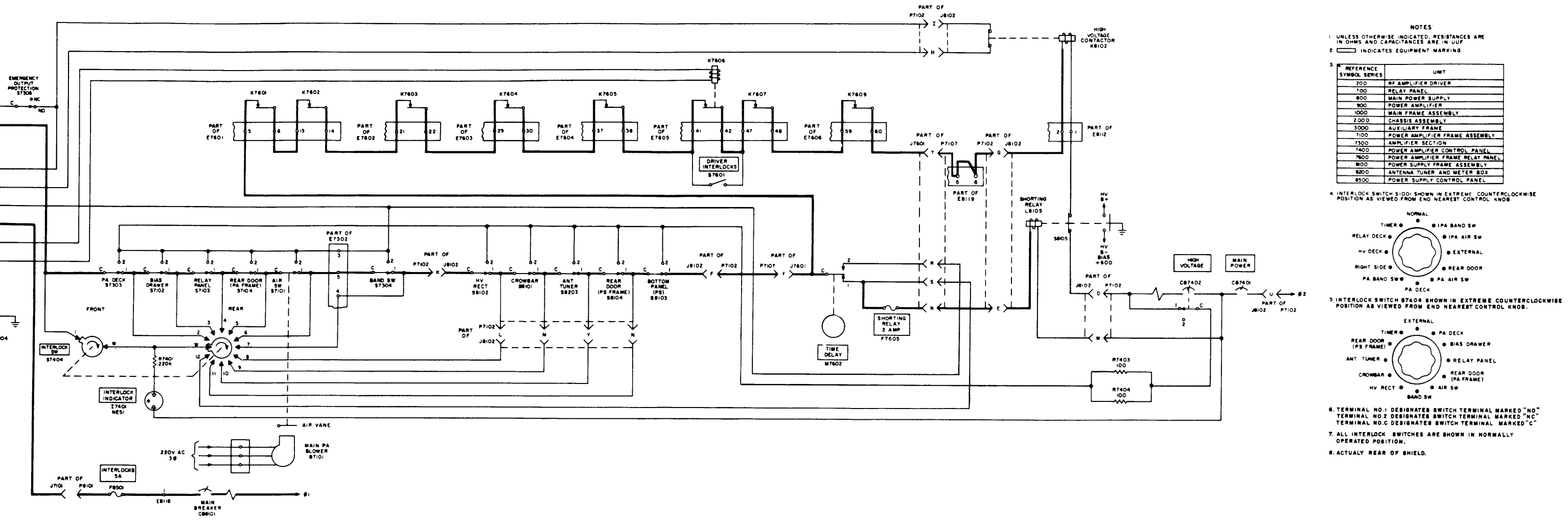


Figure 2-8. Crowbar Drawer, Schematic Diagram



NOTES:

1. UNLESS OTHERWISE INDICATED, RESISTANCES ARE IN OHMS AND CAPACITANCES ARE IN UUF.
2. ▭ INDICATES EQUIPMENT MARKING.
3.

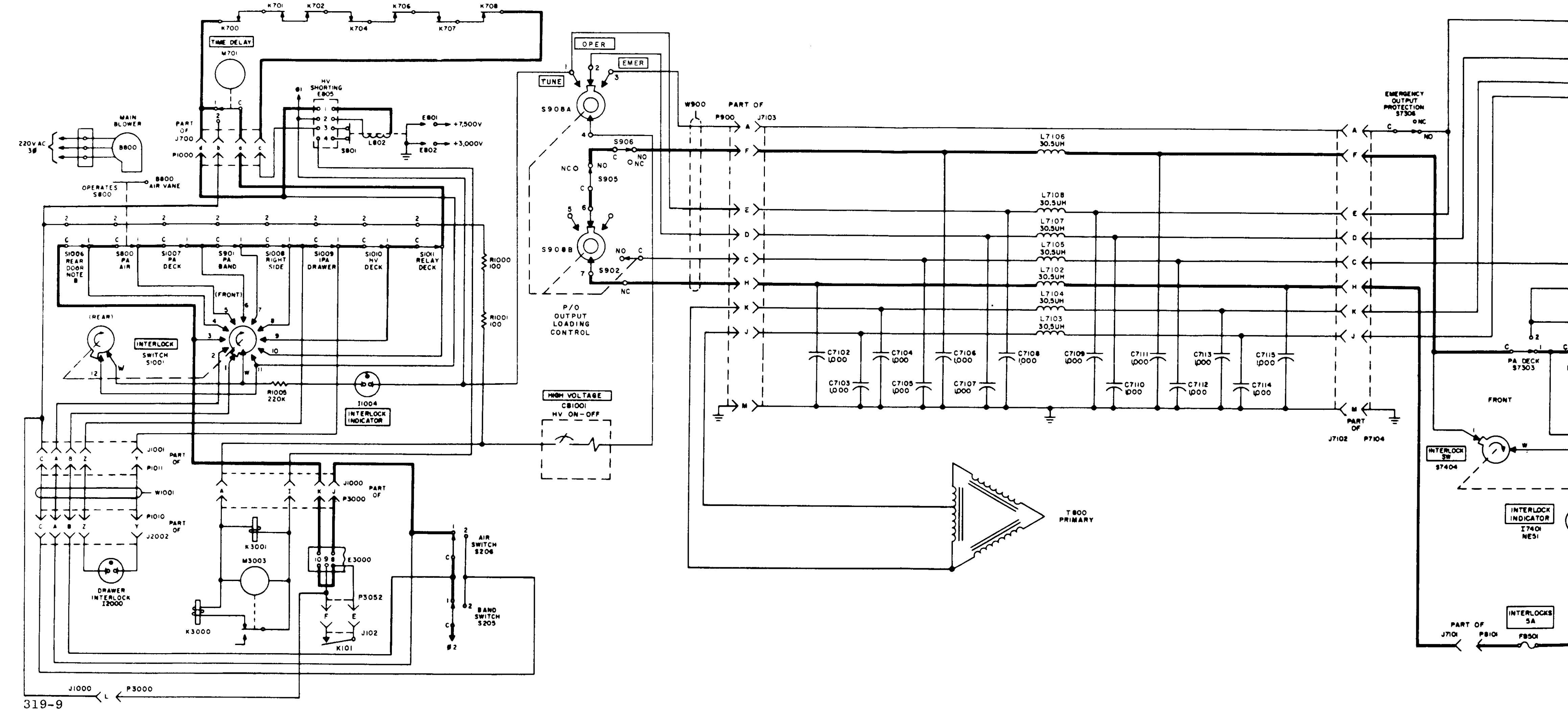
REFERENCE SYMBOL SERIES	UNIT
200	RF AMPLIFIER DRIVER
700	RELAY PANEL
800	MAIN POWER SUPPLY
900	POWER AMPLIFIER
1000	MAIN FRAME ASSEMBLY
2000	CHASSIS ASSEMBLY
3000	AUXILIARY FRAME
7100	POWER AMPLIFIER FRAME ASSEMBLY
7300	AMPLIFIER SECTION
7400	POWER AMPLIFIER CONTROL PANEL
7600	POWER AMPLIFIER FRAME RELAY PANEL
800	POWER SUPPLY FRAME ASSEMBLY
8200	ANTENNA TUNER AND METER BOX
8500	POWER SUPPLY CONTROL PANEL

4. INTERLOCK SWITCH S1001 SHOWN IN EXTREME COUNTERCLOCKWISE POSITION AS VIEWED FROM END NEAREST CONTROL KNOB.

5. INTERLOCK SWITCH S7404 SHOWN IN EXTREME COUNTERCLOCKWISE POSITION AS VIEWED FROM END NEAREST CONTROL KNOB.

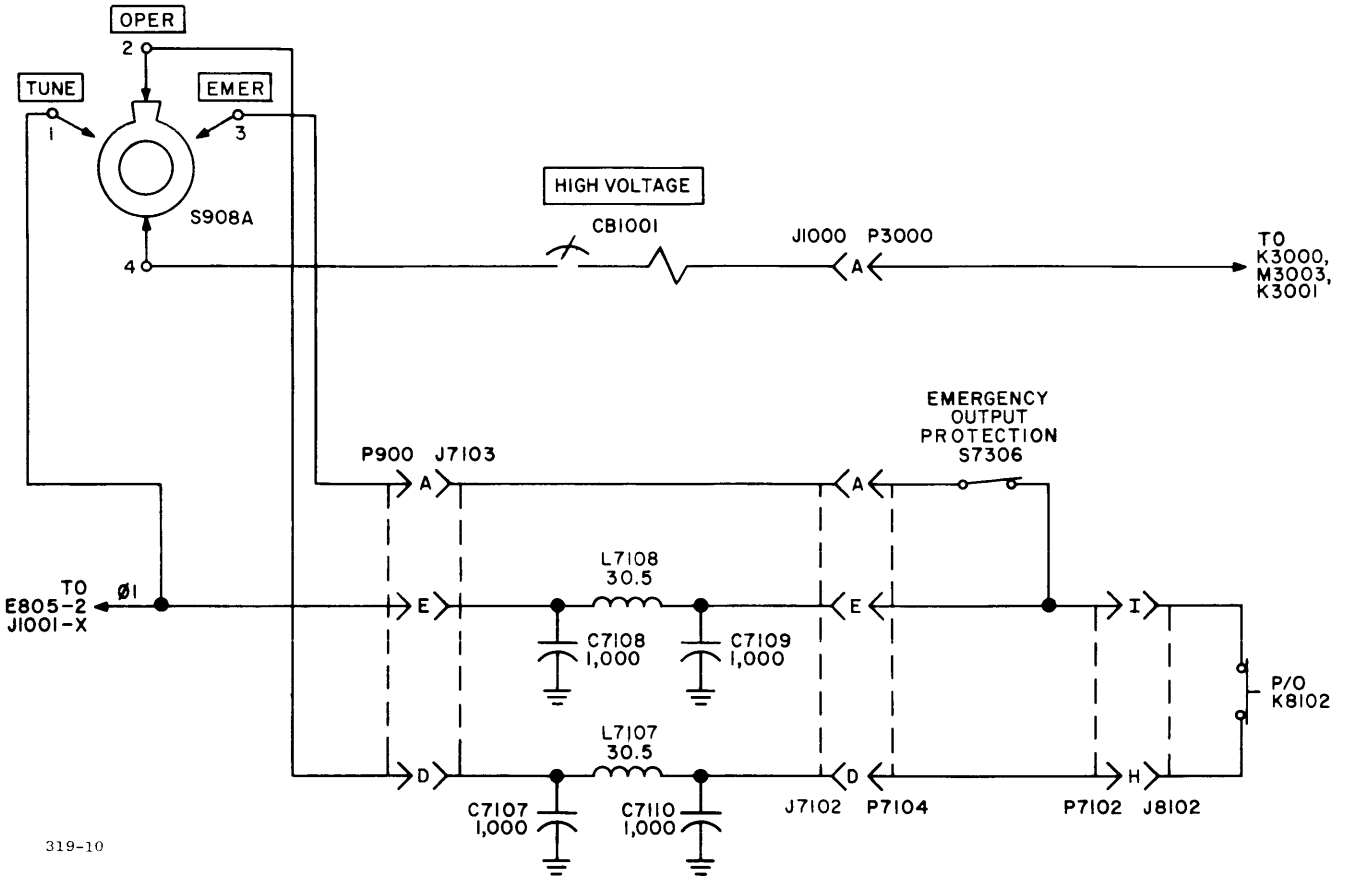
6. TERMINAL NO.1 DESIGNATES SWITCH TERMINAL MARKED "NO"
TERMINAL NO.2 DESIGNATES SWITCH TERMINAL MARKED "NC"
TERMINAL NO.C DESIGNATES SWITCH TERMINAL MARKED "C"
7. ALL INTERLOCK SWITCHES ARE SHOWN IN NORMALLY OPERATED POSITION.
8. ACTUALY REAR OF SHIELD.

Figure 2-9. Interlock Circuits, Simplified Schematic Diagram



TIME DELAY
MAIN BLOWER
220VAC 3Ø
OPERATES S800
B800 AIR VANE
HV SHORTING E805
+7,500V
+3,000V
INTERLOCK SWITCH S1001
INTERLOCK INDICATOR
DRAWER INTERLOCK I2000
AIR SWITCH S206
BAND SWITCH S205
OPER
EMER
TUNE
P/O OUTPUT LOADING CONTROL
HIGH VOLTAGE
CB1001
HV ON-OFF
T800 PRIMARY
EMERGENCY OUTPUT PROTECTION S7306
PA DECK S7303
FRONT
INTERLOCK INDICATOR
INTERLOCKS 5A

319-9



NOTE
UNLESS OTHERWISE SPECIFIED, INDUCTANCES ARE IN UH AND CAPACITANCES ARE IN UUF.

Figure 2-10. Connection of TUNE/OPER/EMER switch S908 in Main Frame AC power Distribution Circuits

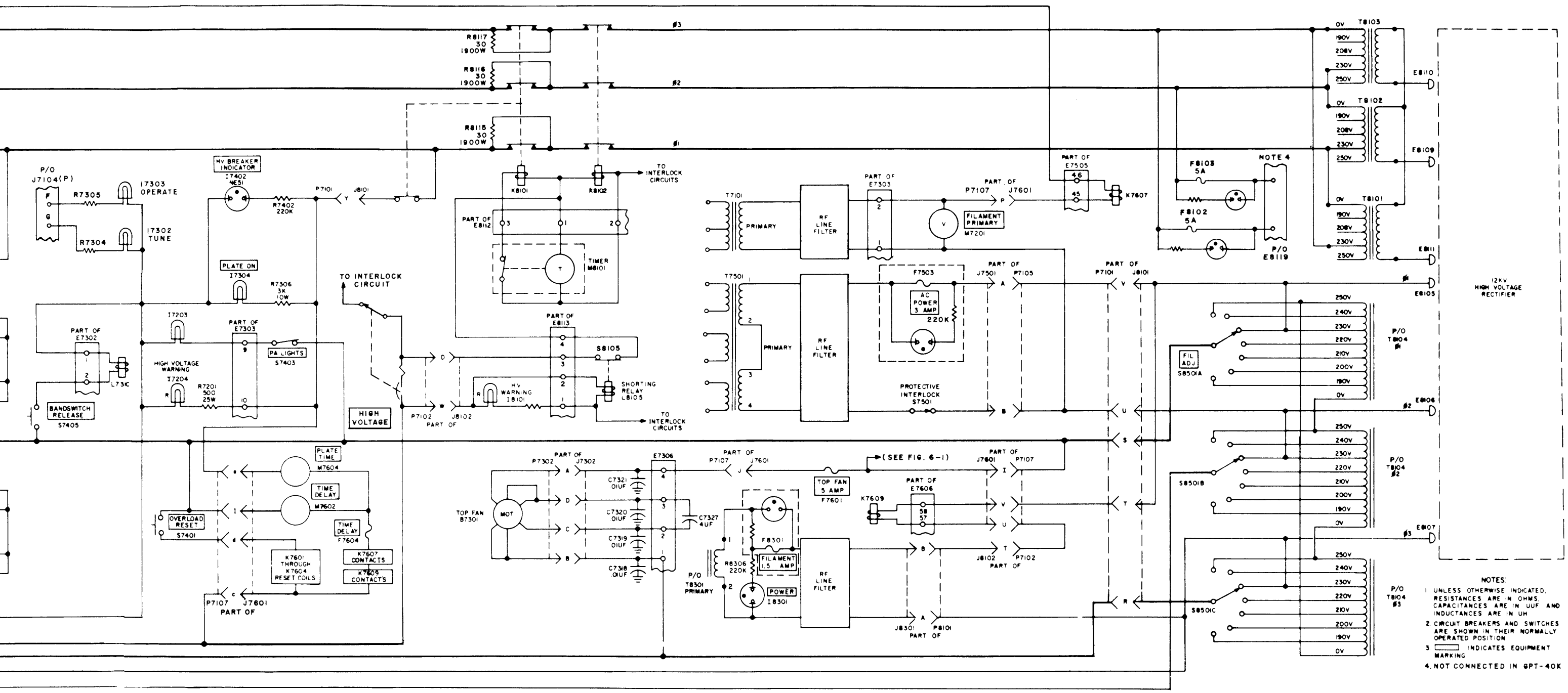
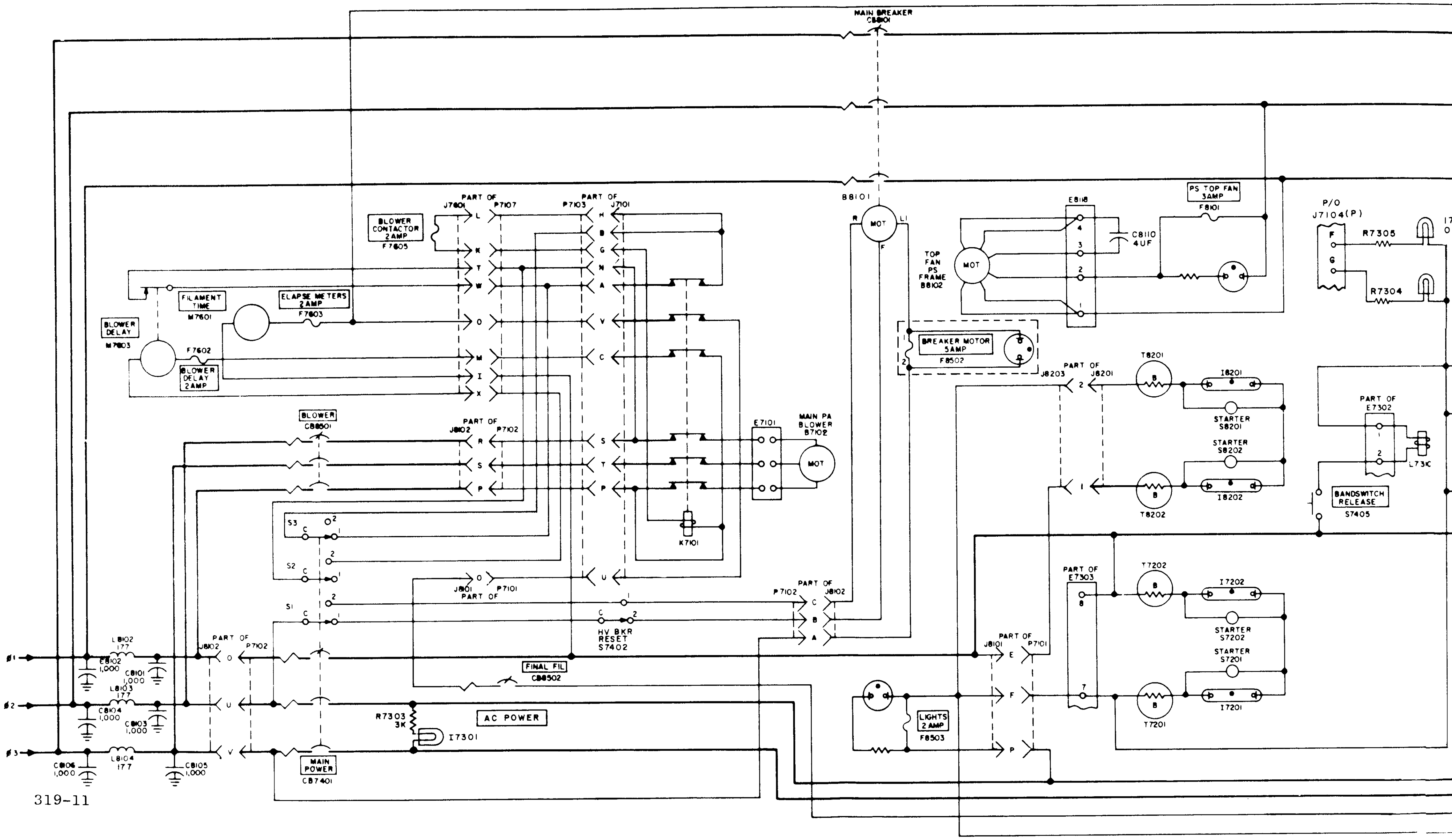


Figure 2-11. PA Frame and PS Frame, AC Power Distribution



MAIN BREAKER CB8101
B8101
MOT
TOP FAN PS FRAME B8102
E8118
C8110 4UF
PS TOP FAN 3AMP F8101
P/O J7104(P)
R7305
R7304
BREAKER MOTOR 5AMP F8502
J8203
PART OF J8201
T8201
I8201
STARTER S8201
STARTER S8202
I8202
T8202
PART OF E7302
L73C
BANDSWITCH RELEASE S7405
PART OF E7303
T7202
I7202
STARTER S7202
STARTER S7201
I7201
T7201
J8101
PART OF P7101
LIGHTS 2AMP F8503
BLOWER CONTACTOR 2AMP F7605
PART OF J7601
P7107
PART OF P7103
J7101
FILAMENT TIME M7601
ELAPSE METERS 2AMP F7603
BLOWER DELAY M7603
F7602
BLOWER DELAY 2AMP
BLOWER CB8501
PART OF J8102
P7102
E7101
MAIN PA BLOWER B7102
K7101
S3
S2
S1
J8101 PART OF
P7101
HV BKR RESET S7402
P7102
PART OF J8102
FINAL FIL CB8502
L8102 177
C8102 1,000
C8101 1,000
L8103 177
C8104 1,000
C8103 1,000
C8106 1,000
L8104 177
C8105 1,000
R7303 3K
I7301
AC POWER
MAIN POWER CB7401

319-11

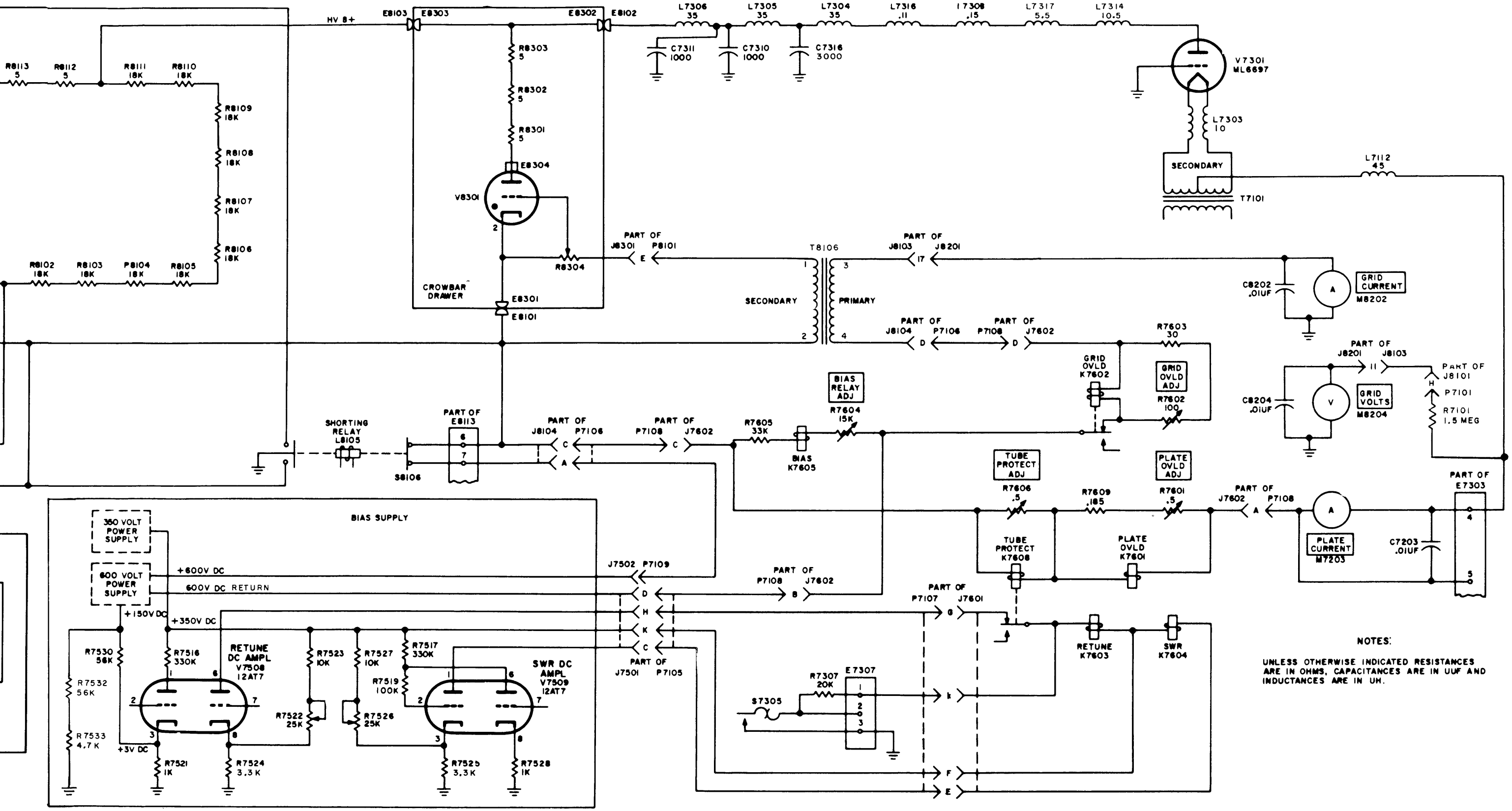
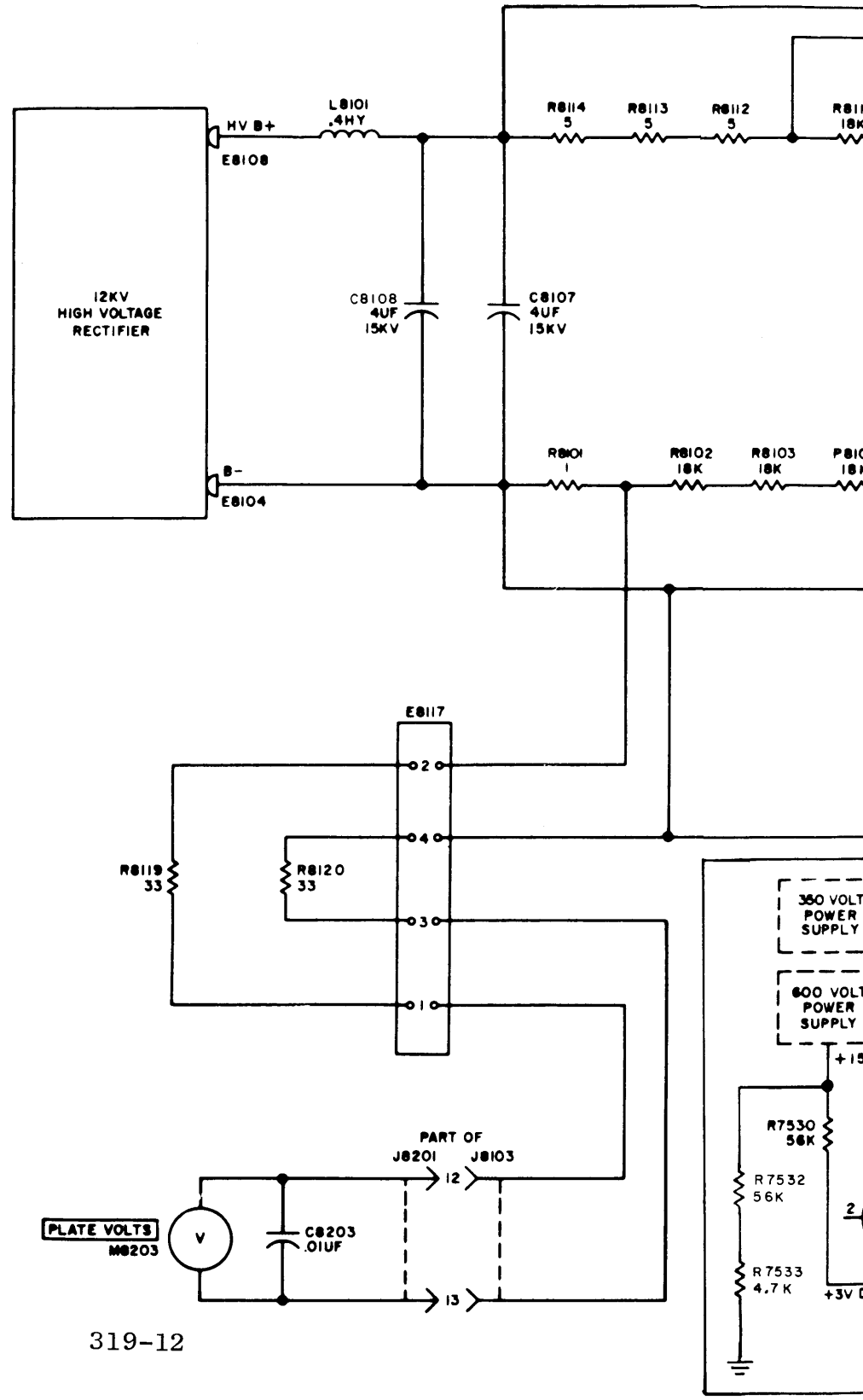


Figure 2-12. PA Frame and PS Frame, DC Power Distribution


12KV
HIGH VOLTAGE
RECTIFIER
HV B+
E8108
B-
E8104
L8101
.4HY
C8108
4UF
15KV
C8107
4UF
15KV
R8114
5
R8113
5
R8112
5
R8101
1
R8102
18K
R8103
18K
E8117
2
4
3
1
R8119
33
R8120
33
PART OF
J8201
J8103
12
13
PLATE VOLTS
M8203
V
C8203
.01UF
350 VOLT
POWER
SUPPLY
600 VOLT
POWER
SUPPLY
+15
R7530
56K
R7532
56K
R7533
4.7K
+3V D

SECTION 3
TROUBLESHOOTING

3-1. INTRODUCTION.

This section contains detailed troubleshooting techniques and reference data that should be used to quickly locate malfunctions in the transmitter. A preliminary inspection procedure, table 3-1 is included as a visual aid to determine obvious conditions which may have caused equipment breakdown. This is followed by an equipment performance check, table 3-2, and a system troubleshooting chart, table 3-3. An overall short circuit test procedure is included in table 3-4. The combined data of tables 3-1 through 3-4 will permit sectionalization of troubles to specific drawers in the transmitter and in many instances, to specific stages and parts.

NOTE

It is assumed in this section that the trouble symptoms listed are produced by malfunctions rather than by improper operating procedures. Thus, if an overload lamp lights, it is assumed that the operator cannot clear the trouble by normal operating procedures such as reducing the drive, retuning, and reloading. Also, the results of defective front-panel indicator lamps and meters, and the remedial measures concerned are obvious and are not covered in this section.

3-2. EQUIPMENT PERFORMANCE CHECK.

Table 3-2 is a procedure that systematically checks equipment performance in terms of operating procedures. Perform each step in the order given.

NOTE

Numbers in parentheses identify locations of operating controls and indicators. Refer to the operator's manual for front panel location diagrams. Normal, proper, or correct meter indications are those given in the GPT-40K tuning chart and table 3-5.

3-3. SYSTEM TROUBLESHOOTING.

Table 3-3 provides additional troubleshooting data based on specific transmitter trouble symptoms. When a trouble has been sectionalized to a specific unit or circuit, refer to the applicable paragraph in this section which applies to that unit for additional troubleshooting data.

Normal, proper, or correct meter indications are those given in the GPT-40K tuning chart and table 3-5.

3-4. SHORT CIRCUIT TEST.

Table 3-4 provides the means to quickly check the PA frame and PS frame for the presence of short circuits. Perform this test when a short circuit is suspected in the frame circuits. Prepare for this test as follows:

a. Set all circuit breakers at OFF. Disconnect all 3Ø power inputs from GPT-40K.

b. Disconnect the following plugs from their mating jacks:

P7102 from J8102

P7101 from J8101

P7106 from J8104

P7103 from J7101

P7107 from J7601

P7108 from J7602

P7105 from J7501

P7109 from J7502

c. Pull crowbar drawer out to limit of its slides. Disconnect P8101 from J8301. Leave crowbar drawer out while taking resistance measurements.

d. Pull antenna tuner out to limit of its slides. This action automatically disconnects J8201 from J8103. Leave antenna tuner out while taking resistance measurements.

3-5. 40-KW PA.

Troubleshooting procedures for the 40-kw PA are included in tables 3-2 and 3-3. Use the meters on the PA frame and PS frame meter panels to indicate voltage and current measurements. Compare readings with those shown in table 3-5. If voltage readings are abnormal, take resistance measurements to isolate the open or short circuits. Use the overall schematic diagram in section 6, in conjunction with the parts location diagrams, figure 3-1 and 3-2, to circuit trace the 40-kw PA.

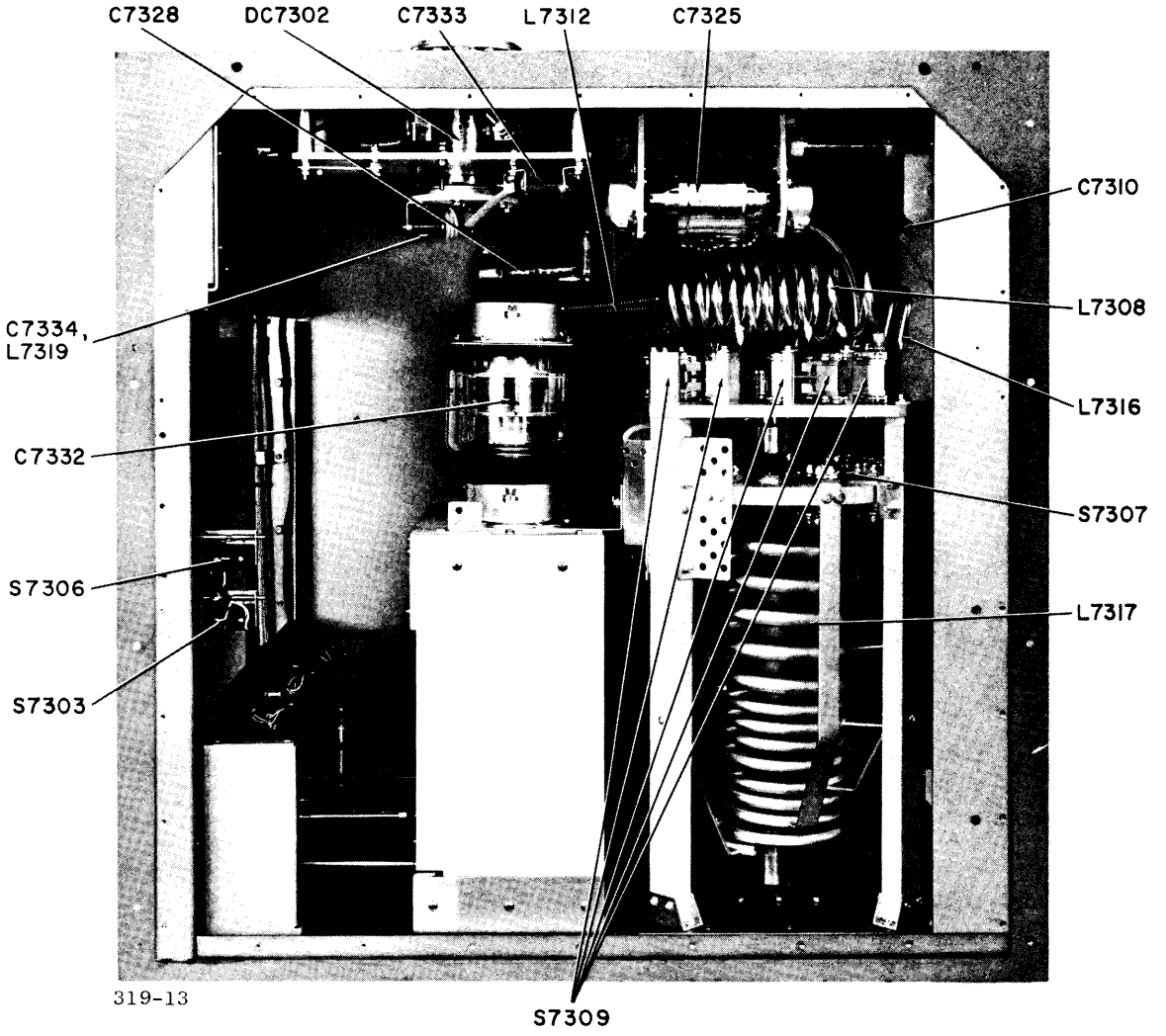


Figure 3-1. 40-KW PA, Right Side View

WARNING

Voltages as high as 12,000 volts are present in the transmitter. Before making resistance measurements, make sure the HIGH VOLTAGE and MAIN POWER circuit breakers on main frame and PA frame of the transmitter are set at OFF. Use the shorting rod provided to discharge all filter capacitors in the main frame and PS frame to ground. When taking voltage readings, make sure hands are dry, use test prods insulated for at least 25,000 volts, and take care to keep free hand and body away from electrical ground and clear of equipment.

3-6. BIAS SUPPLY.

When system troubleshooting (tables 3-2 and 3-3) indicates that a trouble exists in the bias supply, use table 3-6 in conjunction with the voltage and resistance data in table 3-7 to isolate the trouble to a specific stage or part in this unit. Make all checks with the bias supply installed and connected in the PA frame. When trouble has been isolated to a stage, use the overall schematic diagram in section 6, in conjunction with the parts location diagram, figure 3-3, to locate the defective part.

3-7. PA FRAME RELAY PANEL.

Troubleshooting procedures for the PA frame relay panel are included in tables 3-2 and 3-3. When trouble has been sectionalized to a particular circuit in the relay panel, use the resistance data of table 3-8 in conjunction with the overall schematic diagram (figure 6-1) to isolate the trouble to a part. Parts location is shown in figure 3-4.

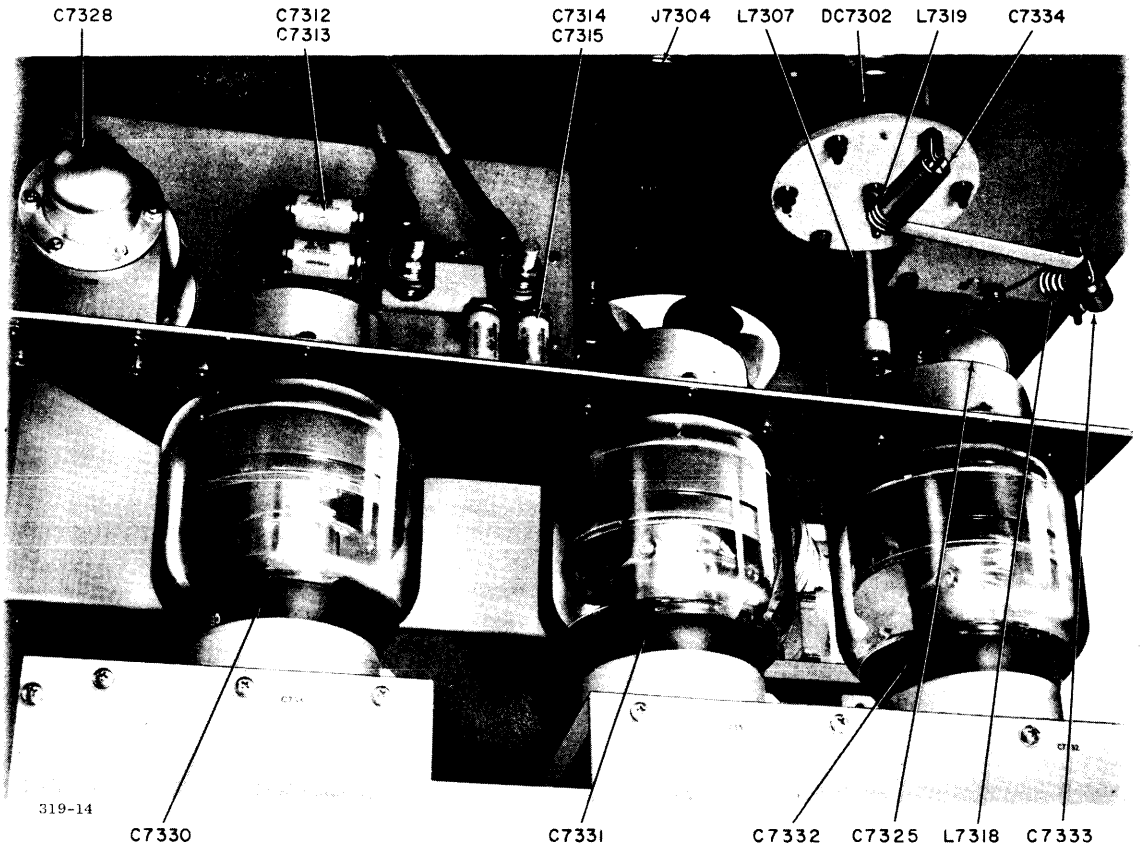


Figure 3-2. 40-KW PA, Front View

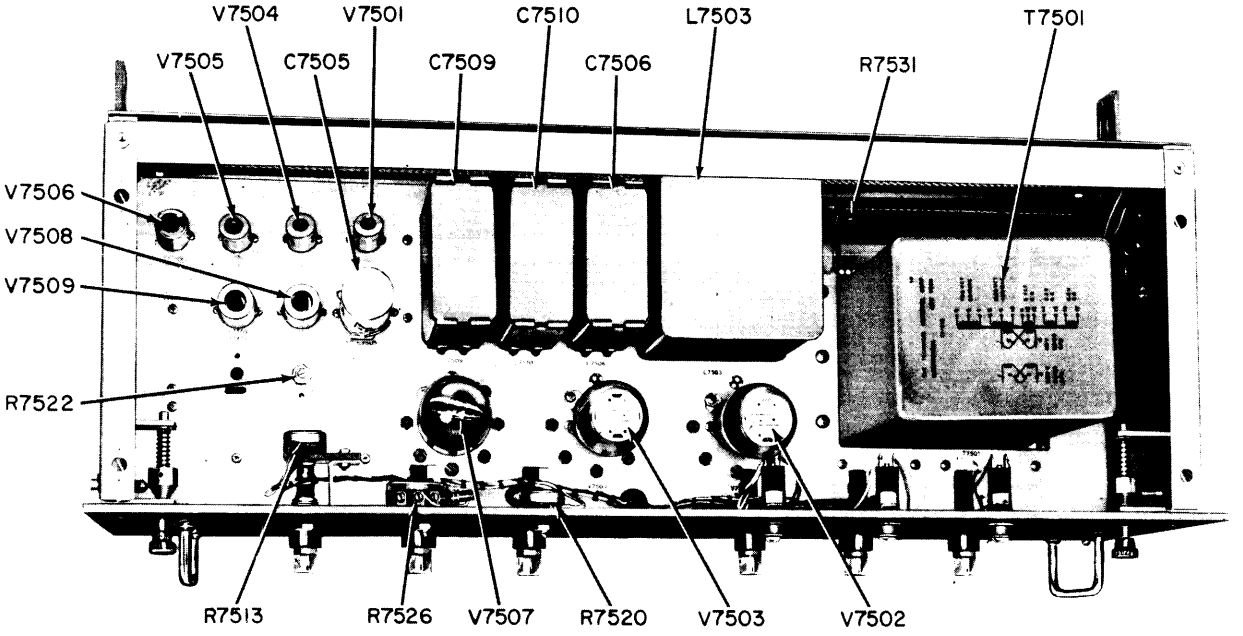


Figure 3-3. Bias Supply, Top View

3-8. CROWBAR DRAWER.

When system troubleshooting (tables 3-2 and 3-3) indicates that a trouble exists in the crowbar drawer, use table 3-9 to isolate the trouble to a specific stage or part in this unit. Make all checks with two phases of a 230-volt ac source connected across pins A and B of jack J8301 and with a vtvm connected between pins C and D of J8301. Set up the vtvm for measurement of approximately 6 volts ac. When trouble has been isolated to a specific area, refer to the overall schematic diagram in section 6, and to the parts location diagram, figure 3-5, to locate the defective part. Transformer and coil resistances are listed in table 3-10.

3-9. 40-KW HIGH VOLTAGE RECTIFIER.

When system troubleshooting (table 3-2 and 3-3) indicates that a trouble exists in the 40-kw high voltage rectifier, use table 3-11 to isolate the trouble to a specific stage or part. Make all checks with a 230-volt three-phase power source connected to terminal E8114, E8115, and E8116. (These checks localize troubles in the filament circuits only; high-voltage circuits are covered in the system troubleshooting tables.) When trouble has been isolated to a specific area, refer to the overall schematic diagram in section 6 and to the parts location diagram, figure 3-6, to locate the defective part. Transformer and coil resistances are listed in table 3-12.

3-10. PA FRAME AND PA CONTROL PANEL.

Troubleshooting procedures for the PA frame and PA control panel are covered in the system troubleshooting tables (3-2 and 3-3). When trouble has been sectionalized to a particular area of the PA frame, use the overall schematic diagram in section 6 and the parts location diagrams, figures 3-7, 3-8, and 3-9, to locate the defective part. The dc resistance of the transformers and coils in the PA frame are listed in table 3-13. For wire information on the PA frame, refer to table 3-14.

3-11. PS FRAME, PS CONTROL PANEL, AND ANTENNA TUNING UNIT.

Troubleshooting procedures for the PS frame, PS frame control panel and antenna tuning unit are covered in the system troubleshooting tables (3-2 and 3-3). When trouble has been sectionalized to a particular area of the PS frame, use the overall schematic diagram in section 6 and the parts location diagrams, figures 3-10 through 3-12, to locate the defective part. The dc resistances of the transformers and coils in the PS frame are listed in table 3-15. For wire routing information on the PS frame, refer to table 3-16.

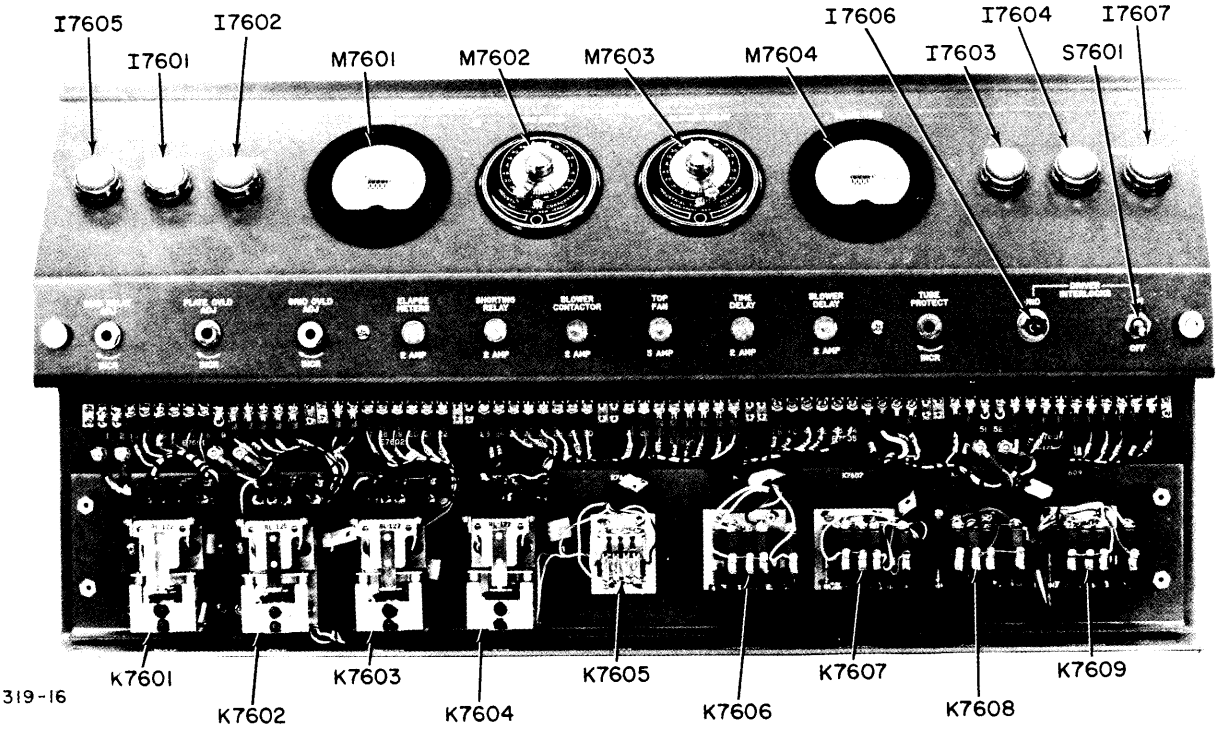


Figure 3-4. PA Frame Relay Panel, Front View

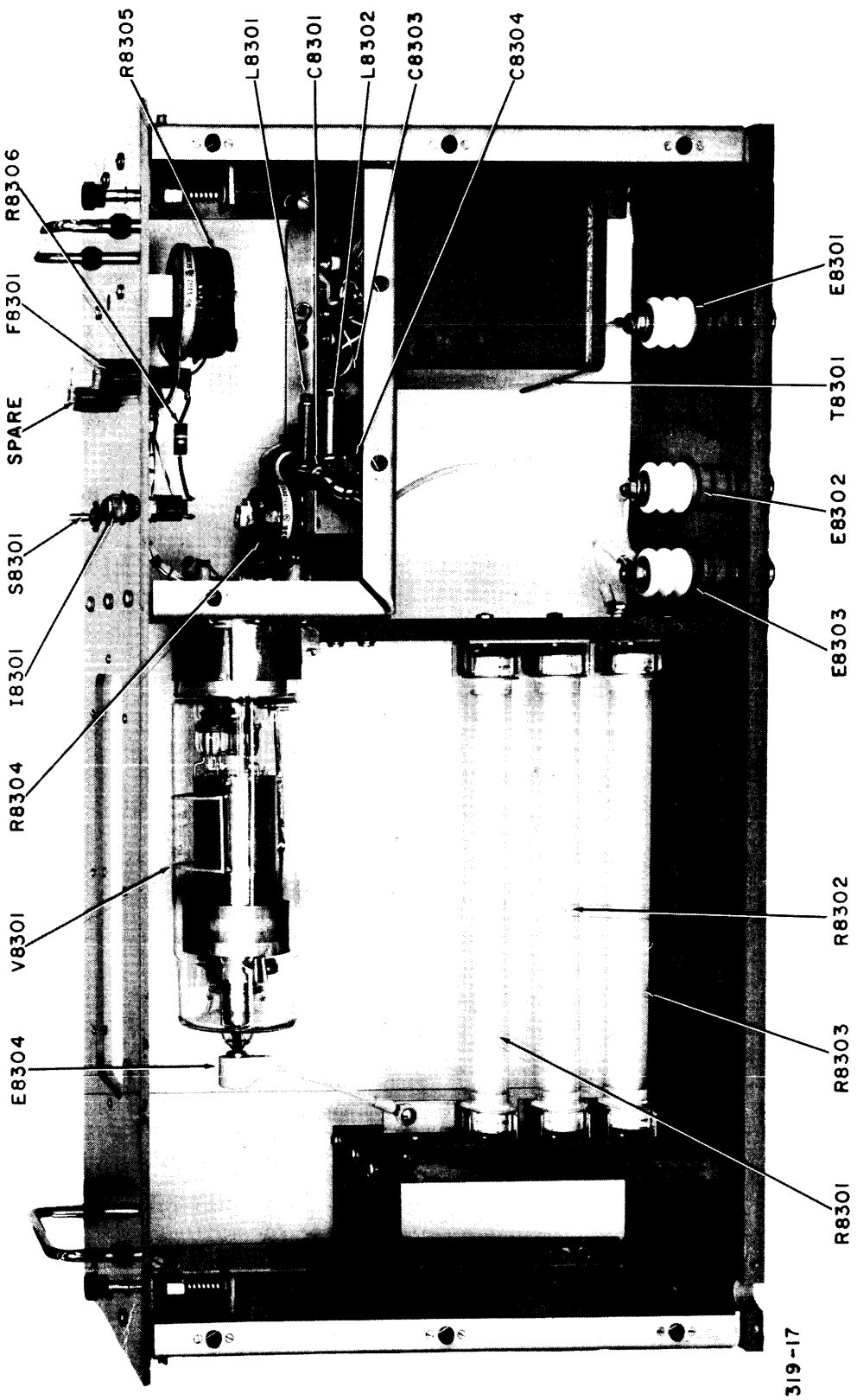


Figure 3-5. Crowbar Drawer, Top View

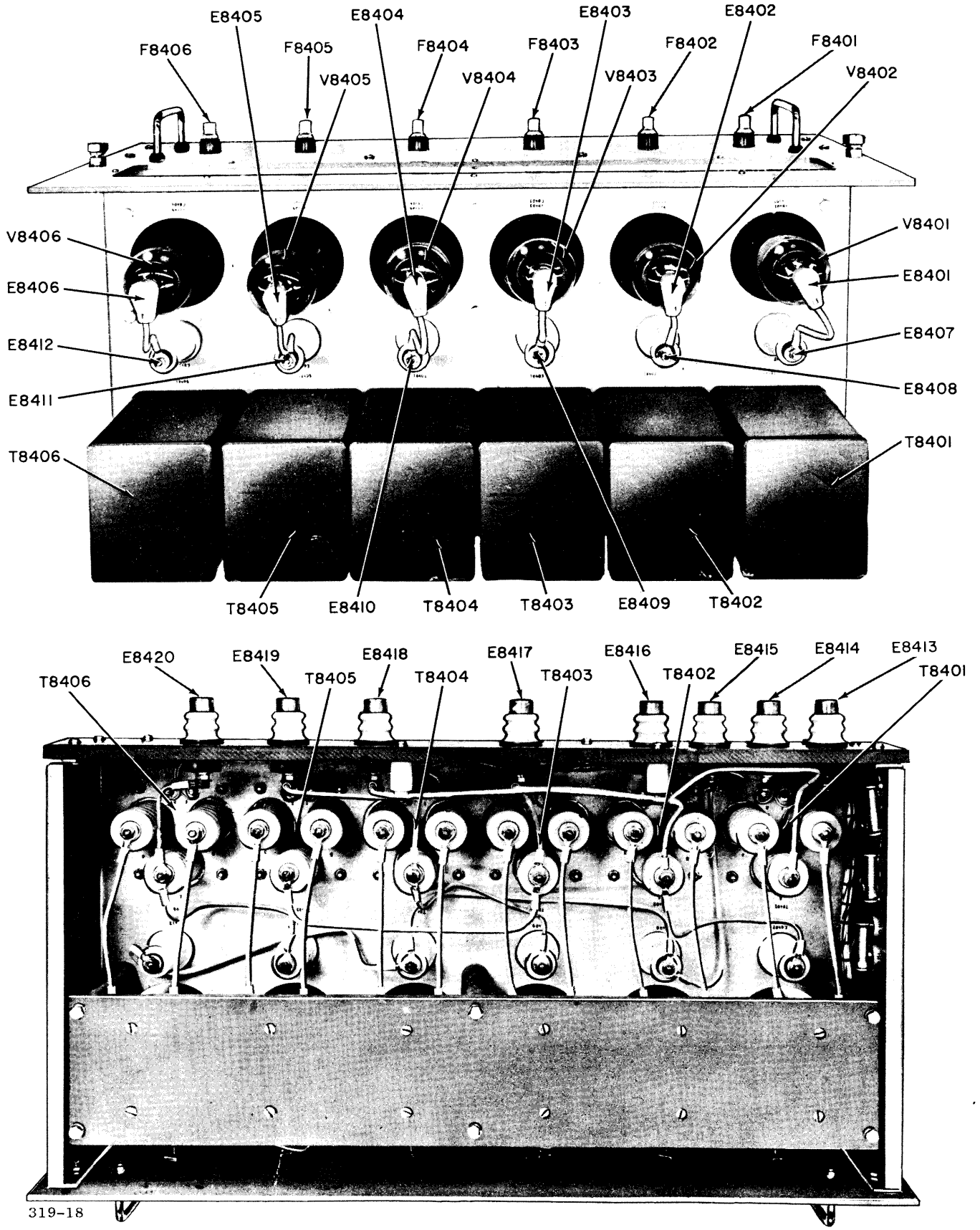


Figure 3-6. 40-KW High Voltage Rectifier, Top and Bottom View

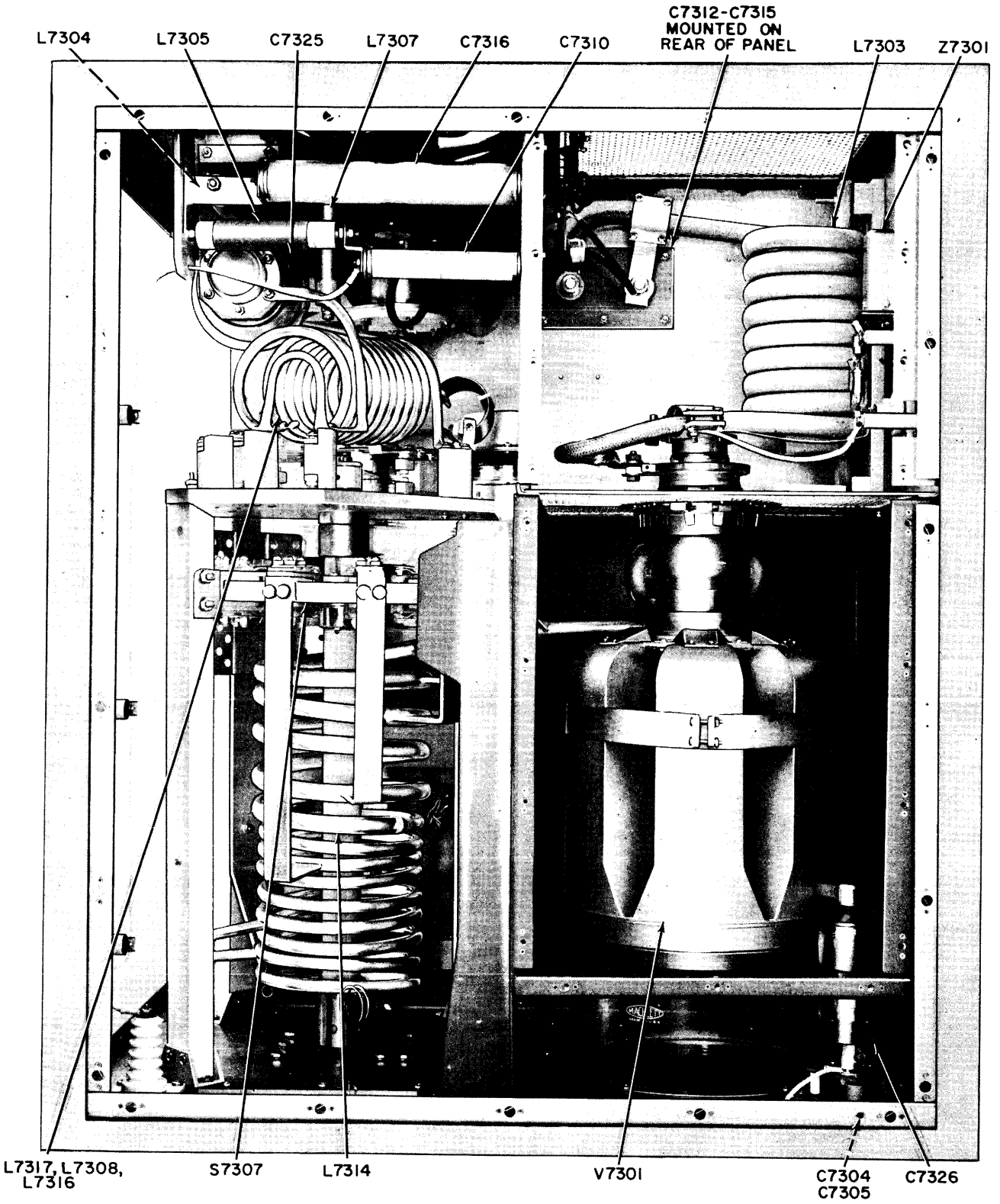


Figure 3-7. PA Frame, Rear View, Top

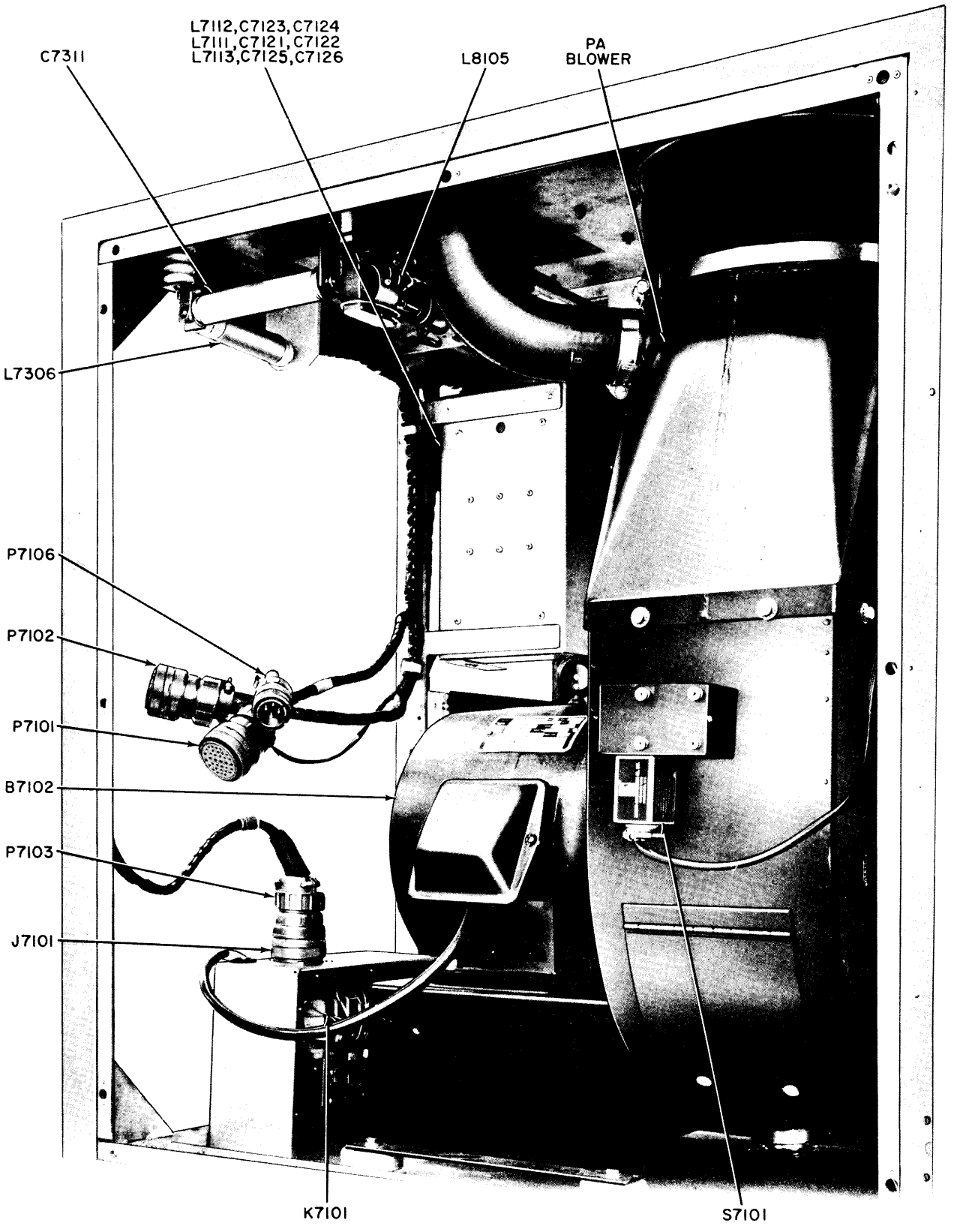


Figure 3-8. PA Frame, Rear View, Bottom

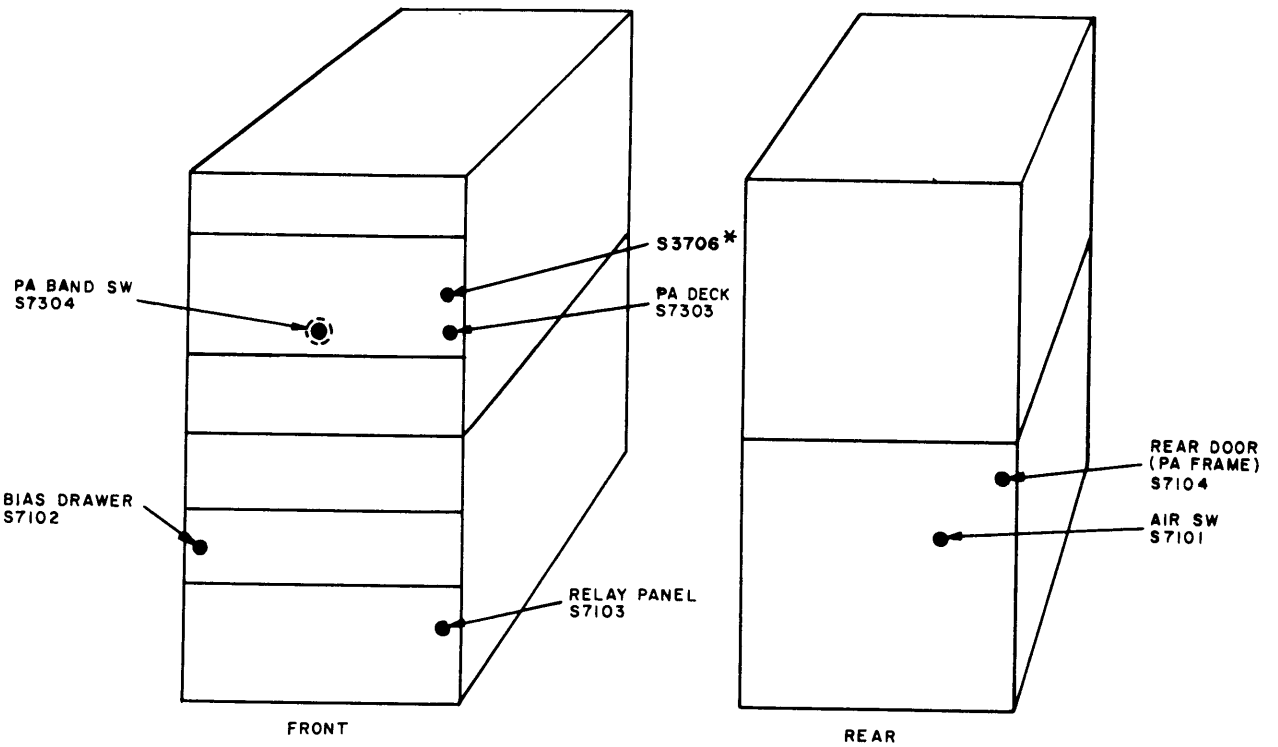


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Figure 3-9. PA Frame, Location of Interlock Switches

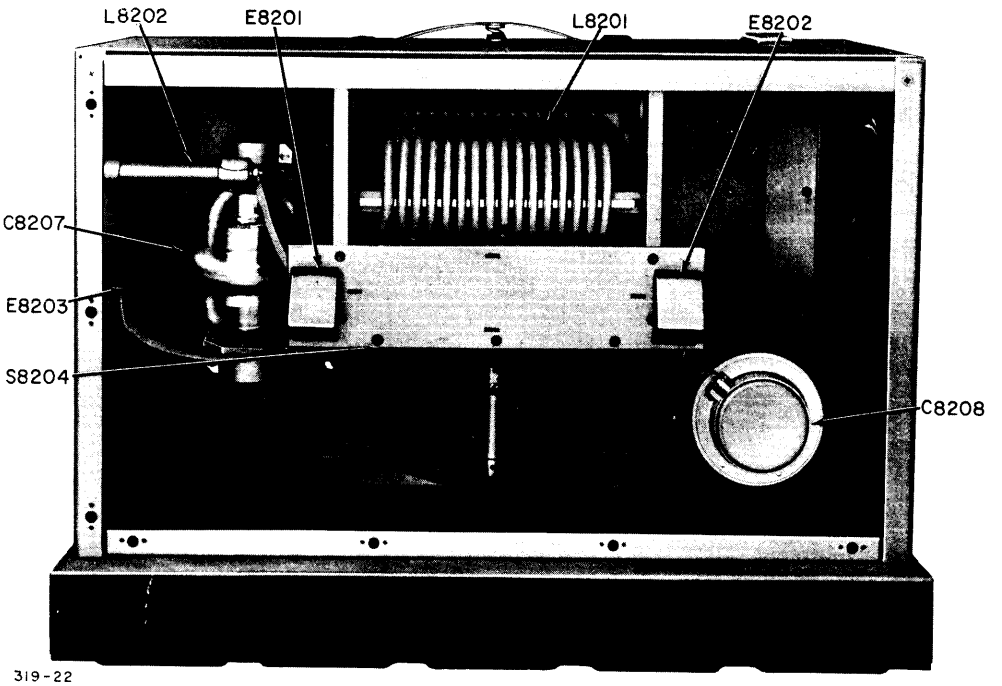
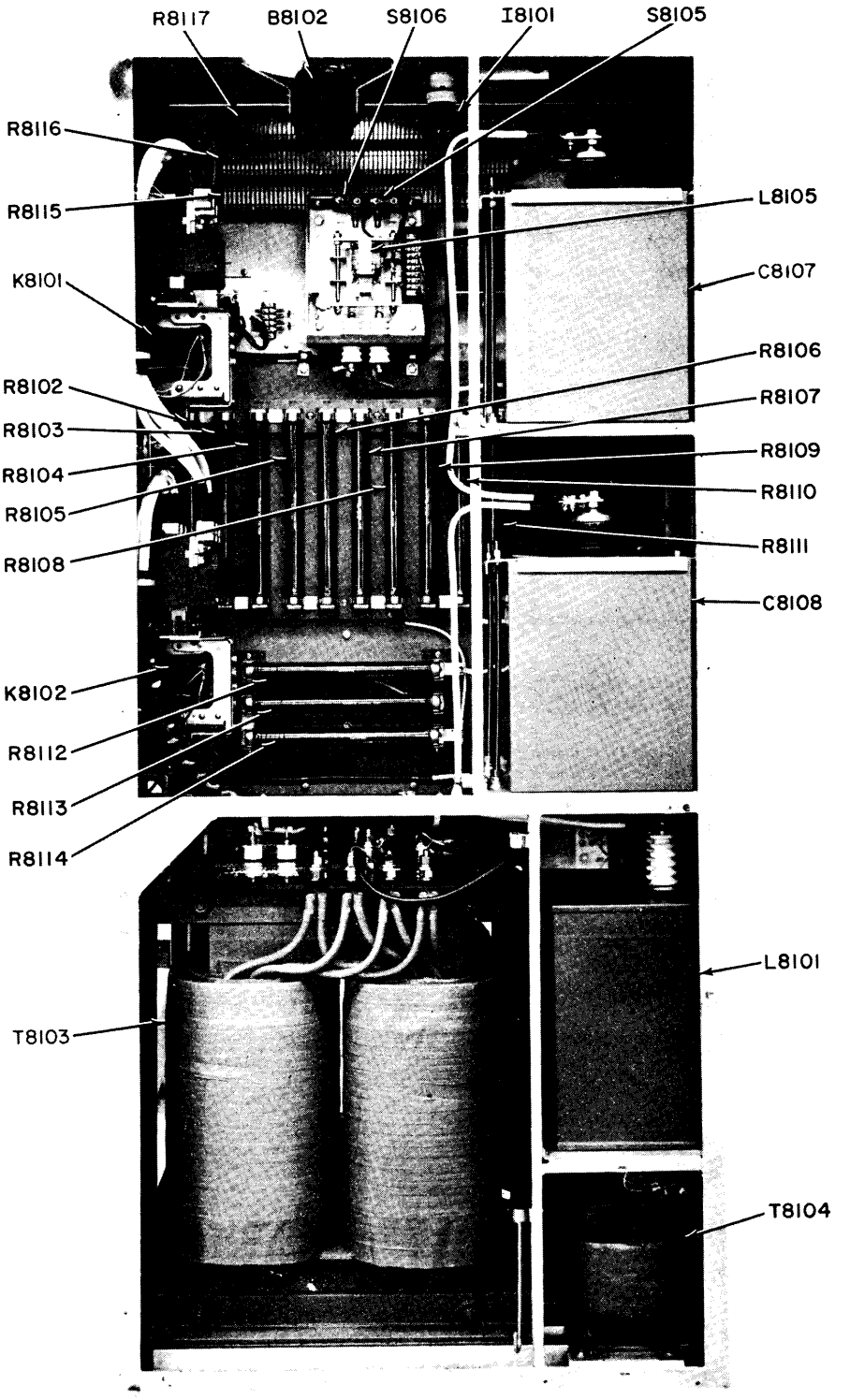


Figure 3-10. Antenna Tuning Unit, Top View



319-23

Figure 3-11. PS Frame, Rear View

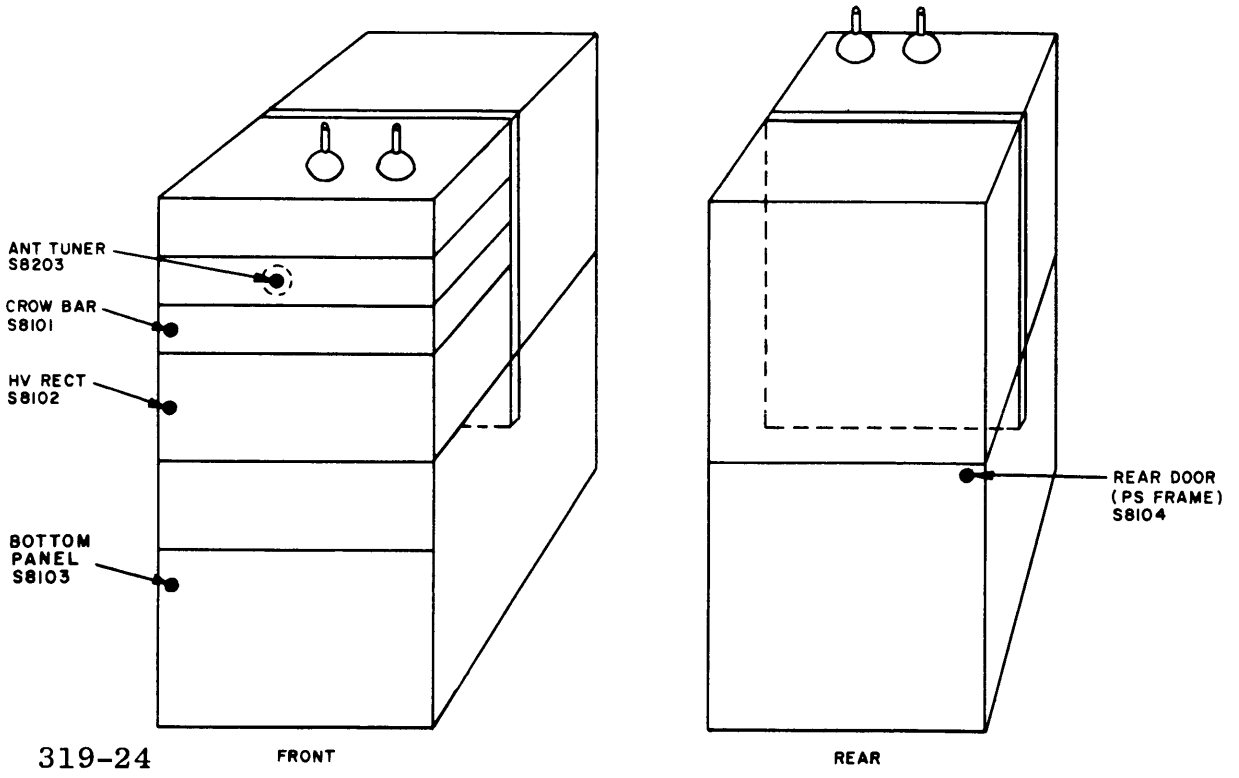


Figure 3-12. PS Frame, Location of Interlock Switches

TABLE 3-1. PRELIMINARY INSPECTION PROCEDURE

WHAT TO INSPECT	DEFECTS TO LOOK FOR	REMEDY
All electrical connections at rear of PA and PS frames.	Open connections, dirt, frayed cables.	Tighten, replace or clean as necessary.
Antenna connections	Loose connections, dirt, frayed cables.	Tighten, replace or clean as necessary.
Knobs, screws, connectors	Loose or missing hardware.	Tighten or replace.
Wiring	Loose or frayed wires.	Resolder or rewire.
Resistors	Cracks, chipping, blistering, discoloration, and other signs of overheating.	Replace as necessary.
Capacitors	Leaks, bulges, discoloration.	Replace as necessary.
Tubes	Poor seating.	Secure firmly in place.
Meters	Bent needle, cracked case, broken glass.	Replace as necessary.

TABLE 3-2. EQUIPMENT PERFORMANCE CHECK

STEP	OPERATION	NORMAL INDICATION	PROBABLE CAUSE OF ABNORMAL INDICATION
1	Connect antenna or dummy load to transmitter and check that all doors, covers, and components are secured.		
2	Set AUXILIARY FRAME MAIN POWER circuit breaker at ON.	Auxiliary frame blower motor (located in top front of auxiliary frame) starts. Power lamps on individual exciter units light when associated switches are turned on.	If exciter units are powered, but blower unit fails to operate, FRONT FAN fuse F3000 is open or blower defective. If none of exciter units are powered, voltage regulator transformer T3000 (unsynthesized transmitter) defective. If an individual exciter unit cannot be powered, it is defective. (Refer to appropriate exciter unit manual for maintenance data.)
3	Remove P3001 from J3001 and terminate J3001 with a 70-ohm 1 watt load. Tune up exciter units at some carrier frequency within the 2- to 28-mc range. Connect rf VTVM across 70 ohm load.	Normal rf output (up to 1 watt PEP) obtained at EXCITER OUTPUT connector J3001 in auxiliary frame. 1 watt PEP is approximately 6.0 vrf (RMS) across the 70 ohm load.	Defective unit in exciter. Refer to technical manuals for exciter units for maintenance data on unsynthesized or synthesized exciter.
	NOTE At conclusion of step 3, set rf output of exciter at minimum, remove 70-ohm load, and reconnect P3001 to J3001.		
4	Set all tuning controls on transmitter at positions specified in transmitter tuning chart, then set switches as follows: PA SCREEN (140) OFF TUNE-OPERATE (139) TUNE HIGH VOLTAGE (141) OFF ALDC (137) OFF INTERLOCK (135) NORMAL OUTPUT LOADING (119) TUNE		
5	Set TIME DELAY control (143) at 5 minutes, then set MAIN POWER circuit breaker (132) at ON.	Main frame blower motor B800 operates. TUNE lamp (107) lights PA BIAS lamp (145) lights. After a few seconds, it goes off. PA BIAS meter (2) reads 300 volts. FILAMENT PRIMARY meter (101) reads 230 volts ac.	Open MAIN BLOWER fuse on relay panel or defective blower unit. Open resistor R1007. Defective circuit in rf amplifier Power Supply. Incorrect setting of PA BIAS ADJ control (145). Incorrect setting of FIL ADJ switch (136).

TABLE 3-2. EQUIPMENT PERFORMANCE CHECK (CONT)

STEP	OPERATION	NORMAL INDICATION	PROBABLE CAUSE OF ABNORMAL INDICATION
5 (cont)		All tube filaments in high voltage rectifier light.	Defective rectifier tube. Open H. V. FILAMENT fuse on high voltage rectifier.
		After 5 minutes, INTERLOCK INDICATOR lamp (134) lights.	Open interlock circuit.
6	Set TIME DELAY control (232) at 5 minutes, then set the MAIN POWER circuit breaker (219) at ON.	AC POWER lamp (206) and TUNE lamp (207) on PA frame light.	Resistors R7303 and R7304, respectively, defective.
		Top fan in PA frame starts.	Open TOP FAN fuse F7601.
		AC POWER lamp (225) on bias supply drawer lights.	Open AC POWER fuse F7503.
		After a short delay (about 5 seconds), LV lamp (227) on bias supply drawer lights.	Open LV fuse F7501.
		After a short delay (about 5 seconds), BIAS lamp (226) lights.	Open BIAS fuse F7502.
		POWER lamp (251) on crow-bar drawer lights.	Open FILAMENT fuse F8301.
		Filaments of 40-kw high voltage rectifier tubes glow.	Defective rectifier tube or open H. V. FILAMENT fuse (F8401 through F8406).
7	Set BLOWER circuit breaker (253) at ON position.	Main blower in PA frame starts.	Open BLOWER CONTACTOR fuse F7606.
8	Set FINAL FIL circuit breaker (257) at ON.	FILAMENT TIME meter (231) registers elapsed time.	Open ELAPSE METERS fuse F7603.
		FILAMENT PRIMARY meter (201) indicates 230 volts.	Incorrect setting of FIL ADJ selector switch (254).
9	Set MULTIMETER switch (122) at DC IPA BIAS.	MULTIMETER (120) reads 100 volts.	Incorrect setting of IPA BIAS ADJ control on rf amplifier drawer.
10	Set MULTIMETER switch (122) at RF 1ST AMPL EP position. Turn OUTPUT control on exciter clockwise slightly, then tune 1ST AMPL TUNING control (123) for peak on MULTIMETER (120).	A peak obtained.	Defective amplifier V201 in RF Amplifier RFC; defective rectifier V2000 in rf amplifier drawer.
11	Set MULTIMETER switch (122) at RF IPA EG position and tune IPA GRID TUNING control (123) for peak on MULTIMETER (120).	A peak obtained.	Defective amplifier V202 in RFC.
		NOTE	
	At conclusion of step 11, return rf drive to minimum.		

TABLE 3-2. EQUIPMENT PERFORMANCE CHECK (CONT)

STEP	OPERATION	NORMAL INDICATION	PROBABLE CAUSE OF ABNORMAL INDICATION
12	Depress OVERLOAD RESET pushbutton (133), then set HIGH VOLTAGE circuit breaker (141) at ON position.	Red indicator lamp on roof of auxiliary frame and PLATE ON lamp (109) glow dimly.	Defective contactor K3001 in auxiliary frame, open TIMER fuse F704.
		All 10-kw high voltage rectifier tubes glow dull purple.	Defective rectifier tube.
		After 5 seconds, above lamps glow brightly and high voltage rectifier tubes glow bright purple.	Defective contactor K3000 or defective timer M3003.
		PA PLATE meter (3) indicate plate voltage (7.5 kvdc).	Defective main power supply.
13	Set MULTIMETER switch (122) to DC IPA ESG position.	MULTIMETER (120) reads 200 volts dc.	Defective switch on contactor K3001.
14	Increase drive slightly, then adjust IPA TUNING control (128) for dip (null) on IPA PLATE CURRENT meter (121).	A dip (null) obtained.	Defective amplifier V203 in RFC.
		NOTE	
	At conclusion of step 14, return rf drive to minimum.		
15	Set PA SCREEN switch (140) at ON.	PA SCREEN meter (1) indicates PA screen voltage (1150 vdc).	Defective relay K703 or K705 in relay panel.
16	Turn exciter OUTPUT clockwise slightly until some increase is noted on PA PLATE CURRENT meter (102), then tune PA TUNE control (115) for dip on PA PLATE CURRENT meter (102).	A dip obtained.	Defect in power amplifier V900.
17	Reduce exciter OUTPUT to minimum, then set TUNE-OPERATE switch (139) at OPERATE position.	PA PLATE CURRENT meter (103) reads approximately 500 ma.	Defect in power amplifier V900.
		OPERATE lamp (108) lights and TUNE lamp (107) goes out.	Open resistor R1008.
		IPA PLATE CURRENT meter (121) reads approximately 200 ma.	Defective amplifier V203 in RFC.
18	Increase exciter OUTPUT, then tune and load 1-kw IPA and 10-kw PA until PA PLATE current meter (103) reads approximately 1.5 amperes and PA PLATE RF meter (104) reads 2 to 5 kv rf.	Proper indications are obtained on meters.	Improper tuning and/or loading or defect in PA circuit.

TABLE 3-2. EQUIPMENT PERFORMANCE CHECK (CONT)

STEP	OPERATION	NORMAL INDICATION	PROBABLE CAUSE OF ABNORMAL INDICATION
19	Reduce exciter OUTPUT to minimum, then set HIGH VOLTAGE circuit breaker (141) at OFF position.		
20	Set OUTPUT LOADING control (119) at OPER.	TUNE lamp (207) goes out and OPERATE lamp (208) lights.	Open contact on TUNE/OPER/EMER switch S908.
21	Set DRIVER INTERLOCKS switch (243) at ON, then depress OVERLOAD RESET switch (214) and HV BREAKER RESET switch (217).	None of the lamps on PA frame relay panel light.	Defective OVERLOAD RESET switch (214).
22	Rotate INTERLOCK switch (221) through each of its positions.	INTERLOCK INDICATOR lamp (215) lights at each position of switch. (Lamp lights at TIMER position of switch after preset time delay interval expires.)	Open or defective interlock switch.
23	Set HIGH VOLTAGE circuit breaker (220) at ON position.	PLATE ON lamp (209), red indicator lamp on roof of PA frame, and HV BREAKER INDICATOR lamp (216) light dimly. Tubes in 40-kw high voltage rectifier glow dull purple.	Defective HIGH VOLTAGE circuit breaker, defective switch S8105, or defective contactor K8102. Open resistor R8115, R8116, or R8117.
		PLATE TIME meter (234) registers elapsed time.	Defective meter.
		After 5 seconds, indicators above light brightly and rectifier tubes glow bright purple.	Defective timer M8101 or contactor K8101.
24	Set HIGH VOLTAGE circuit breaker (141) on main frame at ON.	Same as step 12.	Same as step 12.
25	When DRIVER INTERLOCKS lamp goes out, set DRIVER INTERLOCKS switch (242) at OFF.		
26	Tune and load 40-kw PA until full PEP is obtained.	40-kw PEP rf output obtained, in accordance with type of antenna connected to transmitter.	Improper tuning and/or loading or defect in 40-kw PA circuit.

TABLE 3-3. SYSTEM TROUBLESHOOTING

ITEM	INDICATION	PROBABLE TROUBLE	PROCEDURE
1	AUXILIARY FRAME MAIN POWER circuit breaker trips continually	Short circuit in 110-volt ac circuit of auxiliary frame.	Disconnect all exciter unit power plugs from ac power strip in auxiliary frame. If circuit breaker continues to trip, check voltage regulator transformer T3000 (non-synthesized exciter) or auto-transformer T3002 (synthesized exciter). If trouble disappears when any one power plug is disconnected, associated exciter unit is defective. Refer to technical manual for that unit.
2	FRONT FAN fuse F3000 (at rear of auxiliary frame) opens continuously.	Blower motor B3000 defective.	Check B3000 and associated wiring.
3	Front fan in auxiliary frame does not operate but all exciter units are on.	Blower motor B3000 defective.	Check B3000 and associated wiring.
4	None of exciter units can be powered. Front fan does not operate.	Defect in auxiliary frame power input circuit.	Check circuit breaker CB3000 and associated wiring.
5	MAIN POWER circuit breaker (132) trips continually.	Short circuit in 220-volt ac input circuit.	Disconnect P1000 from J700 and P1010 from J2002. If circuit breaker still trips, check for overload in ac input circuit and main power supply. If circuit breaker can now be set at ON without tripping, connect P1010 to J2002. If the circuit breaker trips with P1010 connected to J2002, check the RFC and rf amplifier drawer for shorts. If the circuit breaker remains on, check for a short in the relay panel.
6	With MAIN POWER circuit breaker (132) set at ON and HIGH VOLTAGE circuit breaker (141) set at OFF, all lamps on main frame are off and FILAMENT TIME meter (142) does not record elapsed time. Blower motor B800 does not run.	220-volt ac input circuit defective.	Check circuit breaker CB1000 and associated wiring.
7	The fluorescent lamp in the main frame does not light but FILAMENT TIME meter (142) on relay panel records elapsed time.	Fluorescent lamp circuit in main frame defective.	Check lamps I1005 and I1006 and associated starters and ballasts.
8	MAIN BLOWER fuse on main frame relay panel opens continuously.	Blower motor B800 defective.	Check for short circuit in blower motor B800 and associated wiring.
9	Blower motor in main frame does not operate, but FILAMENT TIME meter (142) on relay panel records elapsed time.	Blower motor B800 defective.	Check for open circuit in blower motor B800 and associated wiring.

TABLE 3-3. SYSTEM TROUBLESHOOTING (CONT)

ITEM	INDICATION	PROBABLE TROUBLE	PROCEDURE
10	REAR FAN fuse on main frame relay panel opens continually.	Blower motor B3001 defective.	Check for short circuit in B3001 and associated wiring.
11	TIMER fuse on main frame relay panel opens continually.	TIME DELAY meter M701 defective.	Check for short circuit in TIME DELAY meter and associated wiring.
12	PA FIL fuse on main frame relay panel opens continually.	Filament transformer T801 defective.	Check for short circuit in T801.
		Short in filament circuit of power amplifier V900.	Check for short circuit in V900.
		FILAMENT TIME meter M700 defective.	Check for short circuit in FILAMENT TIME meter M700 and associated wiring.
13	FILAMENT TIME meter (142) does not record elapsed time but FILAMENT PRIMARY meter (101) indicates 230 volts (red line).	FILAMENT TIME meter M700 defective.	Check M700 and associated wiring.
14	TIME DELAY meter (143) does not operate but FILAMENT TIME meter (142) records elapsed time.	TIME DELAY meter M701 defective.	Check M701 and associated wiring.
15	On rf amplifier drawer, B+ fuse, IPA BIAS fuse, IPA BLOWER fuse, IPA FIL fuse, or LV fuse opens continually.	Power supply in rf amplifier drawer defective.	Refer to maintenance manual for GPT-10K.
		RF Amplifier RFC defective.	Refer to maintenance manual for GPT-10K.
16	Blower motor B201 in RFC does not operate.	B201 defective.	Check B201 and associated wiring.
17	PA BIAS lamp (145) remains on after MAIN POWER circuit breaker (132) is turned on.	Bias rectifier circuit in rf amplifier drawer defective.	Refer to maintenance manual for GPT-10K.
18	PA BIAS lamp (145) is on and incorrect reading appears on PA BIAS meter (2)	Bias rectifier circuit in rf amplifier drawer defective.	Refer to maintenance manual for GPT-10K.
19	PA BIAS lamp (145) is on but a correct indication is obtained on PA BIAS meter (2).	Main frame relay panel defective.	Check PA BIAS relay K700, R700 and associated wiring.
20	An incorrect indication is obtained on PA BIAS meter (2) but PA BIAS lamp (145) is off.	Main frame relay panel defective.	Check PA BIAS ADJ control R703, R702, and associated wiring.
21	On RFC, incorrect indication obtained on MULTIMETER (120) when MULTIMETER switch (122) set to IPA BIAS.	RFC or rf amplifier drawer defective.	Refer to maintenance manual for GPT-10K.

TABLE 3-3. SYSTEM TROUBLESHOOTING (CONT)

ITEM	INDICATION	PROBABLE TROUBLE	PROCEDURE
22	Transmitter remains on although VSWR is excessive.	SWCU defective.	Refer to maintenance manual for GPT-10K.
23	An incorrect indication obtained on FILAMENT PRIMARY meter (101) and filaments of V600 through V605 do not glow, but FILAMENT TIME meter (142) records elapsed time.	FIL ADJ switch (136) defective.	Check S1002 and associated wiring.
		Transformer T801 defective.	Check transformer T801.
24	On 10-kw high voltage rectifier, an HV FILAMENT fuse opens continually.	10-kw high voltage rectifier defective.	Check the rectifier tube, transformer, and wiring associated with the open fuse.
25	A tube filament in the 10-kw high voltage rectifier does not glow.	10-kw high voltage rectifier defective.	Check the tube and its associated fuse and transformer.
26	With INTERLOCK switch (135) set at NORMAL, INTERLOCK INDICATOR lamp (134) does not light although the time delay provided by TIME DELAY meter (143) has expired.	A panel or component improperly positioned.	Check that all panels and components are firmly secured in position.
		Defective interlock switch circuit.	Rotate INTERLOCK switch clockwise from the NORMAL position. The INTERLOCK INDICATOR lamp will go out when the switch is turned to the position corresponding to the open interlock. If this occurs, check switches as follows:

INTERLOCK Switch Position	Check Interlock Switch (figs. 3-8 and 3-11)
IPA BAND SW	S205 (operated by S202 in RFC)
IPA AIR SW	S206 (operated by blower B201 in RFC)
EXTERNAL	Jumper between terminals 8 and 10, E3000
REAR DOOR	S1006
PA AIR SW	S800 (operated by main blower B800)
PA DECK	S1007
PA BAND SW	S901 (operated by S900)
RIGHT SIDE	S1008
HV DECK	If DRAWER INTERLOCK lamp is lit, check RFC drawer switch S1009. If lamp is off, check hv deck interlock switch S1010
RELAY DECK	S1011
TIMER	Switch on TIME DELAY meter M701

TABLE 3-3. SYSTEM TROUBLESHOOTING (CONT)

ITEM	INDICATION	PROBABLE TROUBLE	PROCEDURE
27	HIGH VOLTAGE circuit breaker (141) trips continually. (OUTPUT LOADING switch (119) is set to TUNE.)	An interlock switch open.	Refer to item 26 above.
		Contactor K3000 or K3001, or timer M3003 defective.	Check for a short circuit in K3000, K3001, or M3003.
28	With HIGH VOLTAGE circuit breaker (141) set at ON, the high voltage lamp on the roof of the auxiliary frame and PLATE ON lamp (109) do not light, but the six lamps on the relay panel are all off.	DIODE PROTECT relay K704 has detected an overload.	On the main frame relay panel, measure ac voltage between terminals 29 and 30 of E702. If no voltage, relay K704 did not detect an overload. If 230 volts ac is measured, check relay K704, R701, CR800A through CR800F, and associated wiring.
		High voltage shorting coil L802 defective.	Check L802 and associated wiring.
		AC power input circuit defective.	Check contactors K3000 and K3001, and timer M3003.
29	PA PLATE OVLD lamp (146) lights, but a correct indication appears on PA BIAS meter (2).	PA PLATE OVLD ADJ R705 incorrectly set or defective. PA PLATE OVLD relay K701 or associated wiring defective.	Adjust PA PLATE OVLD ADJ control R705. Check relay K701, potentiometer R705, and R704.
		Power amplifier defective.	Check 10-kw power amplifier V900.
		Rf amplifier RFC defective.	Check for shorted or leaky capacitors C253 and C275.
30	PA SCREEN OVLD lamp (147) lights.	PA SCREEN OVLD ADJ R707 incorrectly set or defective. PA SCREEN OVLD relay K702 or associated wiring defective.	Adjust PA SCREEN OVLD ADJ control R707. Check relay K702, PA SCREEN OVLD ADJ control R707, and R706.
		Power amplifier defective.	Check power amplifier V900.
31	IPA SCREEN OVLD lamp (148) lights.	IPA SCREEN OVLD ADJ R709 incorrectly adjusted or defective. IPA SCREEN OVLD relay K706 or associated wiring defective.	Adjust IPA SCREEN OVLD ADJ control R709. Check relay K706, IPA SCREEN OVLD ADJ control R709, and R708.
		RFC defective.	Check V203 and check for short in screen circuit of V203.
32	IPA PLATE OVLD lamp (149) lights.	IPA PLATE OVLD ADJ R711 incorrectly adjusted or defective. IPA PLATE OVLD relay K707 or associated wiring defective.	Adjust IPA PLATE OVLD ADJ control R711. Check relay K707, IPA PLATE OVLD ADJ control R711, and R710.
		RFC defective.	Check amplifier V203

TABLE 3-3. SYSTEM TROUBLESHOOTING (CONT)

ITEM	INDICATION	PROBABLE TROUBLE	PROCEDURE
33	SWR OVLD lamp (150) lights.	SWCU-1 incorrectly adjusted or defective.	Adjust SWR OVLD ADJ control R104 on SWCU. Check relay K102 and amplifier V101 in SWCU.
34	PLATE ON lamp (109) and high voltage lamp on roof of auxiliary frame are lit, but high voltage rectifier tubes do not glow purple.	10-kw main power supply defective.	Check transformer T800 circuits in 10K main power supply.
35	PLATE ON lamp (109) is on, but PLATE TIME meter (144) does not record elapsed time.	Meter defective.	Check meter M702.
36	A correct reading appears on PA SCREEN meter (1), but incorrect reading appears on PA PLATE meter (3).	10-kw main power supply defective.	Check resistors R810, R811, and R812.
37	A correct reading appears on PA PLATE meter (3), but improper readings are obtained on PA SCREEN meter (2) and on PA SCREEN CURRENT meter (102).	Relay K703 defective.	Check relay K703.
		Main power supply defective.	Check the 1150 and 550 volt circuit in the main power supply.
		PA SCREEN switch (140) defective.	Check switch S1005.
38	PA SCREEN CURRENT meter (102) reads normally, but PA SCREEN meter (1) produces abnormal reading.	Main power supply defective.	Check resistors R813, R814, and R815.
39	A correct indication is obtained on PA SCREEN meter (1), but reading on PA SCREEN CURRENT meter (102) is abnormal.	10-kw power amplifier defective.	Check screen circuit of V900.
40	PA SCREEN meter (1) indicates 1150 volts when TUNE-OPERATE switch (139) is in the TUNE position. The TUNE lamp (107) is on.	Relay K705 defective.	Check relay K705.
41	Correct readings are obtained on PA PLATE CURRENT and PA OUTPUT meter (103 and 105), but reading on PA PLATE RF meter (104) is abnormal.	Meter rectifier circuit defective.	Check the meter rectifier circuit associated with the PA PLATE RF meter.
42	With ALDC switch (137) set at ON, output power of transmitter does not decrease as ALDC control is rotated clockwise.	ALDC circuit in main frame and auxiliary frame defective.	Check ALDC rectifier circuit elements.
		ALDC switch (137) defective.	Check ALDC switch and associated wiring.

TABLE 3-3. SYSTEM TROUBLESHOOTING (CONT)

ITEM	INDICATION	PROBABLE TROUBLE	PROCEDURE
43	MAIN POWER circuit breaker (219) trips continually.	Short circuit in 220-volt ac input line.	Disconnect P7101 from J8101 and P7107 from J7601. Set MAIN POWER circuit breaker (219) at ON. If the circuit breaker trips, check for a short circuit in PA frame. If the circuit breaker remains on, connect P7107 to J7601. Set circuit breaker at ON. If the circuit breaker trips with P7107 and J7601 connected, check for short-circuited wiring in the PA frame relay panel. If the circuit breaker remains on, check for short-circuited wiring in the PS frame.
44	BLOWER circuit breaker (253) trips continually.	Blower motor B7102 defective.	Disconnect P7103 from J7101. Set BLOWER circuit breaker (253) at ON. If the circuit breaker remains on, blower motor B7102 defective. Check B7102 and its associated circuit. If the circuit breaker trips, check for a short in PA frame wiring.
45	Blower motor B7102 does not operate but FILAMENT TIME meter (231) registers elapsed time.	Blower motor B7102 defective.	Check for an open circuit in blower motor B7102 and its associated wiring.
46	Main PA blower B7102 stops operating. (MAIN POWER circuit breaker (219) is set at OFF while BLOWER circuit breaker (253) is left ON.)	BLOWER DELAY meter M7603 improperly set or defective.	Set M7603 for a 5-minute delay. If necessary, check M7603 and its associated circuit.
		Open BLOWER DELAY fuse F7602.	Check for a short circuit in the M7603 meter circuit.
47	FINAL FIL circuit breaker (257) trips continually.	Short circuit in 40-kw power amplifier V7301 filament circuit.	Check for short circuit in V7301 filament circuit.
48	FINAL FIL circuit breaker (257) is at ON, but V7301 filament does not light, FILAMENT TIME meter (231) does not register elapsed time, FILAMENT PRIMARY meter (201) does not indicate, and blower motor B7102 does not operate.	Blower contactor K7101 defective.	Check contactor K7101 and its associated circuit.
		BLOWER CONTACTOR fuse open.	Check K7101 and its associated circuit for a short.
49	With MAIN POWER circuit breaker (219) set at ON and HIGH VOLTAGE circuit breaker (220) set at OFF, all lamps on the PA frame and PS frames are off and FILAMENT PRIMARY meter (201) does not indicate.	220-volt ac input circuit defective.	Check for open circuit breaker CB7401 and associated wiring.
50	Fluorescent lamps on PA and PS frames do not light.	Open LIGHTS fuse F8503.	Check for short circuit in fluorescent lamp circuit.

TABLE 3-3. SYSTEM TROUBLESHOOTING (CONT)

ITEM	INDICATION	PROBABLE TROUBLE	PROCEDURE
51	TOP FAN fuse F7601 on PA frame relay panel opens continually.	Blower motor B7301 defective.	Check for short circuit in blower motor B7301.
52	BLOWER DELAY fuse F7602 on PA frame relay panel opens continually.	BLOWER DELAY meter M7603 (233) defective.	Check for short circuit in meter M7603.
53	TIME DELAY fuse F7604 on PA frame relay panel opens continually.	TIME DELAY meter M7602 (232) or PLATE TIME meter M7604 (234) defective.	Check for short circuit in meters M7602 and M7604.
54	BLOWER CONTACTOR fuse F7606 on PA frame relay panel opens continually.	Blower contactor K7101 defective.	Check for short circuit in blower contactor K7101.
55	SHORTING RELAY fuse F7605 on PA frame relay panel opens continually.	Shorting relay L8105 defective.	Check for short circuit in shorting relay L8105.
56	ELAPSE METERS fuse F7603 on PA frame relay panel opens continually.	FILAMENT TIME meter M7601 (231) defective.	Check for short circuit in meter M7601.
57	Top fan motor in PS frame does not operate but tube filaments in 40-kw high voltage rectifier glow.	Fan motor B8102 defective.	Check for open circuit in fan motor B8102.
		Open top fan fuse F8101.	Check for short circuit in fan motor B8102.
58	With OUTPUT LOADING control (119) set at TUNE, TUNE lamp (207) does not light.	OUTPUT LOADING switch S908 defective.	Check OUTPUT LOADING switch S908.
59	FILAMENT TIME meter (231) on PA frame relay does not record elapsed time but FILAMENT PRIMARY meter (201) indicates 230 volts (red line).	FILAMENT TIME meter M7601 defective.	Check M7601.
60	PLATE TIME meter (234) on PA frame relay panel does not record elapsed time but PLATE ON lamp (209) lights.	PLATE TIME meter M7604 defective.	Check M7604.
61	BIAS lamp (226) on bias supply does not light, BIAS lamp (228) on PA frame relay panel lights, and LV lamp (227) lights.	600-volt power supply circuit in bias supply defective.	Refer to table 3-6.
62	LV lamp on bias supply does not light but BIAS lamp lights.	350-volt power supply circuit in bias supply defective.	Refer to table 3-6.
63	BIAS lamp (228) on PA frame relay panel is on.	600-volt power supply in bias supply defective.	Refer to table 3-6.

TABLE 3-3. SYSTEM TROUBLESHOOTING (CONT)

ITEM	INDICATION	PROBABLE TROUBLE	PROCEDURE
64	BIAS lamp (228) on PA frame relay panel is lit, but correct indication is obtained on GRID VOLTS meter (245).	PA frame relay panel defective.	Check BIAS relay K7605, BIAS RELAY ADJ control R7604, resistor R7605, and associated wiring.
65	FINAL FILAMENT lamp (237) on PA frame relay panel lit, FILAMENT PRIMARY meter (201) does not indicate correctly and AC POWER lamp (225) on bias supply lit.	PA frame relay panel defective. Transformer T7101 defective.	Check FINAL FILAMENT relay K7607 and associated circuit. Check transformer T7101 and associated wiring.
66	FILAMENT PRIMARY meter (201) indicates incorrectly, CROWBAR FILAMENT meter (247) indicates incorrectly, and AC POWER lamp (225) on bias supply is out.	FIL ADJ switch (254) defective. Transformer T8104 defective.	Check FIL ADJ switch S8501 and associated wiring. Check transformer T8104.
67	Correct indication obtained on FILAMENT PRIMARY meter (201) but incorrect reading obtained on CROWBAR FILAMENT meter (247).	Crowbar drawer defective.	Refer to table 3-9.
68	FILAMENT fuse F8301 on crowbar drawer opens continually.	Crowbar drawer defective.	Refer to table 3-9.
69	On 40-kw high voltage rectifier, one of H. V. FILAMENT fuses opens continually.	40-kw high voltage rectifier defective.	Refer to table 3-11.
70	INTERLOCK INDICATOR lamp (215) does not light in every position of INTERLOCK switch (221). (OUTPUT LOADING switch (119) set at OPERATE.)	Door or equipment improperly positioned. Defective interlock switch circuit.	Check that all doors and equipment are properly positioned. Rotate INTERLOCK switch clockwise. INTERLOCK INDICATOR lamp (215) lights wherever an interlock switch is closed and goes out if an interlock switch is open. If INTERLOCK INDICATOR lamp goes out in any position of INTERLOCK switch, check appropriate interlock switches as follows: INTERLOCK Switch Position — Switch or Circuit to be Checked PA DECK — S7307 BIAS DRAWER — S7102 RELAY PANEL — S7103 REAR DOOR (PA FRAME) — S7104 AIR SW — S7101 BAND SW — S7304

TABLE 3-3. SYSTEM TROUBLESHOOTING (CONT)

ITEM	INDICATION	PROBABLE TROUBLE	PROCEDURE
70 (cont)			INTERLOCK Switch Position / Switch or Circuit to be Checked HV RECT — S3102 CROWBAR — S8101 ANT. TUNER — S8203 REAR DOOR (PS FRAME) — S8104 TIMER — TIME DELAY meter M7602 and PS bottom panel S8103 EXTERNAL — OUTPUT LOADING switch S908 external interlock switches S905 and S906.
71	HIGH VOLTAGE circuit breaker (220) trips continually.	Interlock switch open.	Refer to item 70 above.
		NOTE If S908, S905, or S906 is open, HIGH VOLTAGE circuit breaker will not trip.	
		Contactor K8101 or K8102 defective.	Check for short circuit in contactor K8101 or K8102.
72	PLATE OVLD lamp (229) on PA frame relay panel lights.	PA frame relay panel misaligned or defective.	Adjust PLATE OVLD ADJ potentiometer R7601. Check relay K7601, potentiometer R7601, and resistor R7609.
		40-kw PA defective.	Check 40-kw PA stage.
73	BIAS lamp (228) on PA frame relay panel lights.	PA frame relay panel misaligned or defective.	Adjust BIAS RELAY ADJ potentiometer R7604. Check relay K7605, potentiometer R7604, and resistor R7605.
		Bias supply defective.	Refer to table 3-6.
74	RETUNE lamp (235) lights.	40-kw PA improperly tuned.	Retune transmitter.
		RETUNE OVLD ADJ potentiometer R7520 misadjusted.	Refer to Section IV.
		Thermostatically operated 40-kw PA tube protect switch S7305 defective.	Check S7305 and associated wiring.
		Retune amplifier V7508 in bias supply defective.	Check amplifier V7508.
75	SWR lamp (236) on PA frame relay panel lights.	SWR OVLD ADJ potentiometer R7529 misadjusted.	Adjust potentiometer R7529.

TABLE 3-3. SYSTEM TROUBLESHOOTING (CONT)

ITEM	INDICATION	PROBABLE TROUBLE	PROCEDURE
75 (cont)		SWR amplifier V7509 in bias supply defective.	Refer to maintenance manual for GPT-10K.
		Switch in SWR meter defective.	Check SWR meter.
76	FINAL FILAMENT lamp (237) on PA frame relay panel lights.	Transformer T7101 defective.	Check T7101 primary for open circuit.
77	With RESERVOIR-FILAMENT switch (252) on crowbar drawer in RESERVOIR position, CROWBAR FILAMENT meter (247) does not indicate voltage stamped on base of V8301.	Crowbar drawer misaligned or defective.	Check transformer T8301, RESERVOIR ADJ potentiometer R8305, and associated wiring.
78	With RESERVOIR-FILAMENT switch (252) in FILAMENT position, CROWBAR FILAMENT meter (247) does not indicate correctly.	Crowbar drawer defective.	Refer to table 3-9.
79	All tubes in the 40-kw high voltage rectifier do not glow purple, but PLATE ON lamp (209) is on.	40-kw high voltage rectifier defective.	Refer to table 3-11.
80	When HIGH VOLTAGE circuit breaker (220) is set to ON, all the tubes in the 40-kw high voltage rectifier glow a dull purple but do not glow brightly after a time delay.	Defective timer or relay.	Check timer M8101 and relay K8101.
81	PLATE TIME meter (234) does not record elapsed time, but PLATE ON lamp (209) is ON.	Defective meter.	Check meter M7604.
82	Incorrect reading obtained on DRIVE meter (202) but correct readings obtained on PLATE CURRENT and PLATE RF meters (203 and 204).	Rf detector network Z7301 defective.	Check Z7301.
83	During unbalanced operation, incorrect indication is obtained on OUTPUT meter (205), and correct indications obtained on PLATE CURRENT and PLATE RF meters.	Directional coupler circuit defective.	Check diode CR7303 and rf filter elements associated with directional coupler DC7302.

TABLE 3-3. SYSTEM TROUBLESHOOTING (CONT)

ITEM	INDICATION	PROBABLE TROUBLE	PROCEDURE
84	During balanced operation, equal indications cannot be obtained on meters connected to balanced antenna output terminals.	Antenna Tuning Unit is defective.	Check BALANCE capacitor C8208, coil L8201, and switch S8204.
		Antenna or transmission line is defective.	Check antenna and transmission line for loose connections, open circuit, and short-circuited wires.
85	When HIGH VOLTAGE circuit breaker (220) is set at ON, 1-kw high voltage rectifier tubes do not glow, but HIGH VOLTAGE circuit breaker (220) does not trip.	OUTPUT LOADING switch S908 in TUNE or EMER position. Door or window improperly positioned on main frame.	Ensure that OUTPUT LOADING switch is in OPER position. Ensure that PA DECK window and REAR DOOR are properly positioned on main frame.

TABLE 3-4. SHORT CIRCUIT TEST

POINT OF MEASUREMENT	NORMAL INDICATION	ISOLATING PROCEDURE
From ground to:		
1. Pin E of P7101.	Infinite resistance.	Finite resistance indicates short circuit in PA frame phase 1 input line. Check for short circuit in phase 1 input line to ground.
2. Pin P of P7101.	Infinite resistance.	Finite resistance indicates short circuit in PA frame phase 2 input line. Check for short circuit in phase 2 input wiring to ground.
3. Pin R of P7101.	Infinite resistance.	Finite resistance indicates short circuit in PA frame phase 3 input line. Check blower motor B7301 for short circuit. Check for leaky bypass capacitor C7318.
4. Either primary winding terminal of T7101.	Infinite resistance.	Finite resistance indicates short circuit in primary circuit of transformer T7101. Check for leaky or shorted bypass capacitor C7121, C7122, C7125, or C7126. Check for short circuit in primary winding of T7101. Check for short circuit between input wiring to T7101 and ground.
5. Pin O of P7102.	Infinite resistance.	Finite resistance indicates short circuit in PA frame phase 1 line. Check Pin O of P7102, CB7401, and wiring connecting these components for short circuit to ground.
6. Pin U of P7102.	Infinite resistance.	Finite resistance indicates short circuit in PA frame phase 2 line. Check pins U and B of P7102, CB7401, S7402 and wiring connecting these components for short circuit to ground.

TABLE 3-4. SHORT CIRCUIT TEST (CONT)

POINT OF MEASUREMENT	NORMAL INDICATION	ISOLATING PROCEDURE
7. Pin V of P7102.	Infinite resistance.	Finite resistance indicates short circuit in PA frame phase 3 line. Check pin V of P7102, CB7401, and wiring connecting these components for short circuit to ground.
8. Plate of V7301.	Infinite resistance.	Finite resistance indicates short circuit in plate circuit. Check for shorted or leaky bypass capacitors C7310, C7311, and C7316, and for short-circuited wiring in plate circuit.
9. V7301 filament.	Infinite resistance.	Finite resistance indicates short circuit in filament circuit. Check for shorted or leaky bypass capacitors C7312 through C7315, C7117, C7123, and C7124, and for short-circuited secondary winding of T7101. Check for short circuit in wiring in the PLATE CURRENT meter (M7203) circuit.
	WARNING	
	Make sure three-phase power is disconnected from power input terminals on PA frame before making following measurements.	
10. Pin O of J8102.	Infinite resistance.	Finite resistance indicates short circuit in phase 1 wiring. Check for shorted or leaky bypass capacitors C8101 and C8102 in phase 1 input line. Check for short-circuited wiring from phase 1 wiring to ground.
11. Pin U of J8102.	Infinite resistance.	Finite resistance indicates short circuit in phase 2 wiring. Check for shorted or leaky bypass capacitors C8103 and C8104 in phase 2 input line. Check for short-circuited wiring from phase 2 wiring to ground.
12. Pin V of J8102.	Infinite resistance.	Finite resistance indicates short circuit in phase 3 wiring. Check for shorted or leaky bypass capacitors C8105 and C8106 in phase 3 input line. Check for short-circuited wiring from phase 3 line to ground.

TABLE 3-4. SHORT CIRCUIT TEST (CONT)

POINT OF MEASUREMENT	NORMAL INDICATION	ISOLATING PROCEDURE
13. Either terminal of resistor R8115.	Infinite resistance	Finite resistance indicates short circuit in phase 1 input wiring to high-voltage transformers T8101 and T8102. Check for shorted blower motor B8102. Check for short-circuited wiring from phase 1 line to ground.
14. Either terminal of resistor R8116.	Infinite resistance.	Finite resistance indicates short circuit in phase 2 input wiring to high-voltage transformers T8102 and T8103. Check for a short circuit between the wiring from the phase 2 line and fuse F8101 and ground. Check for short-circuited wiring from phase 2 input line to ground.
15. Either terminal of resistor R8117.	Infinite resistance.	Finite resistance indicates short circuit in phase 3 input wiring to high-voltage transformers T8101 and T8103. Check for short-circuited wiring from phase 3 line to ground.
	NOTE	
Hold open the shorting contacts on shorting relay L8105 for the following measurement.		
From E8108 to E8104.	Approximately 180, 000 ohms.	If resistance is low, check for shorted or leaky capacitor C8107 or C8108 and for short circuit in 12-kv B+ and B- lines.

TABLE 3-5. POWER AMPLIFIER V7301, VOLTAGE AND RESISTANCE MEASUREMENTS

TUBE ELEMENT	VOLTAGE	RESISTANCE (TO GROUND)
Plate	+12, 000*	∞**
Grid	0 (to ground)	0
Filament	13V AC (measured across filament)	0
Filament	+600V DC (to ground)	∞

*Measured to either side of filament
**Measured with shorting relay L8105 held open.

TABLE 3-6. BIAS SUPPLY TROUBLESHOOTING

ITEM	INDICATION	PROBABLE TROUBLE	PROCEDURE
1	AC POWER indicator I7503, BIAS indicator I7502, and LV indicator I7501 do not light when primary power is applied to the bias supply.	AC POWER fuse F7503 open as result of overload.	If blown fuse indicator is lit, check bias supply for shorted circuit.
		Protective interlock switch S7501 defective.	Check continuity of S7501.
		Transformer T7501 defective.	Check T7501 for open winding.
2	AC POWER indicator I7503 and BIAS indicator I7502 do not light when primary power is applied to the bias supply; LV indicator I7501 lights.	Open secondary winding 14-15 on transformer T7501.	Check continuity of winding 14-15.
3	No 600-volt output (BIAS indicator I7502 does not light); AC POWER indicator I7503 and LV indicator I7501 light normally.	Rectifier or filter circuit defective.	If BIAS blown fuse indication is lit, check for short in 600-volt power supply before replacing fuse F7502.
			If fuse F7502 is good, check rectifiers V7502 and V7503; check secondary windings 8-10 and 11-13 of T7501; check continuity of filter choke L7503 and resistor R7503; check for leaky filter capacitor C7506.
		Voltage regulator defective.	Check voltage regulators V7504 through V7507. If tubes are good, take V and R readings at tube sockets to isolate the trouble.
		Inductor L7504 open.	Check continuity of L7504 and replace if defective.
4	Incorrect output voltage measured at jack J7502; reading at pin 2 of tube V7507 is within normal limits.	BIAS ADJ control R7513 not set properly.	Adjust R7513 for +600-volt output between J7502 (+) and pin D of P7105 (-).
			If adjustment of R7513 has no effect on the output voltage, take V and R readings to isolate trouble.
			If adjusting R7513 varies the output but not sufficiently to obtain a +600-volt output, check for open load resistor R7531.
5	Poor regulation (changes in load or in ac voltage input produce changes in voltage at jack J7502).	Tube V7504, V7505, V7506, or V7507 defective.	Check tubes.
6	No 350-volt output measured between pins K and E of jack J7501 (LV indicator does not light); AC POWER indicator I7503 and BIAS indicator I7502 light normally.	Fuse F7501 open.	Check for short in 350-volt circuits before replacing fuse.
		Rectifier V7501 is defective.	Check V7501.
		Resistor R7501 open.	Check continuity of R7501.
		Transformer T7501 defective.	Check windings 5-7 and 16-17 of T7501.

TABLE 3-7. BIAS SUPPLY, VOLTAGE AND RESISTANCE MEASUREMENTS

NOTE

1. Remove all cable connections to bias supply before making measurements.
2. Resistance measurement for pin 2 of W7508 is taken as R7520 (RETUNE OVLD ADJ) is rotated through its entire range.
3. N. C. = NO CONNECTION: ∞ = INFINITY

TUBE	PIN NUMBER	RESISTANCE (IN OHMS TO GROUND)
V7501	1	200
	2	N. C.
	3	∞
	4	∞
	5	N. C.
	6	200
	7	10, 000
V7502	1	N. C.
	2	∞
	3	N. C.
	4	∞
	5	N. C.
	6	∞
	7	N. C.
	8	∞
V7503	1	N. C.
	2	∞
	3	N. C.
	4	∞
	5	N. C.
	6	∞
	7	N. C.
	8	∞
V7504	1	∞
	2	31, 000
	3	N. C.
	4	N. C.
	5	∞
	6	N. C.
	7	N. C.
V7505	1	31, 000
	2	N. C.
	3	N. C.
	4	N. C.
	5	N. C.
V7505 (cont)	6	N. C.
	7	∞
V7506	1	∞
	2	∞
	3	∞
	4	∞
	5	∞
	6	∞
	7	∞
V7507	1	∞
	2	∞
	3	∞
	4	∞
	5	∞
	6	∞
	7	∞
	8	∞
V7508	1	380, 000
	2	4. 7 - 480, 000
	3	1, 000
	4	∞
	5	∞
	6	∞
	7	480, 000
	8	3, 300
	9	∞
V7509	1	∞
	2	500, 000
	3	3, 300
	4	∞
	5	∞
	6	380, 000
	7	490, 000
	8	1, 000
	9	∞

TABLE 3-8. RELAY COIL RESISTANCES

RELAY	TERMINALS	RESISTANCE (OHMS)
K7601	E7607-E7608 (Ovld winding) E7601: 7-8	Less than 1 1, 100
K7602	E7609-E7610 (Ovld winding) E7602: 15-16	170 1, 100
K7603	E7602: 17-18 E7603: 23-24	1, 000 10, 000
K7604	E7603: 25-26 E7604: 31-32	1, 000 10, 000
K7605	E7604: 33-34	11, 000
K7606	E7605: 39-40	1, 800
K7607	E7605: 45-46	Less than 1
K7608	E7611-E7612	Less than 1
K7609	E7606: 57-58	2.4

TABLE 3-9. CROWBAR DRAWER TROUBLESHOOTING

ITEM	INDICATION	PROBABLE TROUBLE	PROCEDURE
1	No reading on vtvm with switch S8301 in either the FILAMENT or RESERVOIR position; POWER indicator I8301 is not lit.	No primary power applied to transformer T8301.	Check fuse F8301. If fuse is open, check for shorts in crowbar drawer before replacing fuse. If fuse is good, check continuity of inductors L8301 and L8302.
2	No reading on vtvm with switch S9301 in either the FILAMENT or RESERVOIR position; filament of tube V8301 does not light; POWER indicator I8301 lights normally.	Transformer T8301 defective.	Check resistance of T8301 windings.
3	No reading on vtvm with switch S8301 in the FILAMENT position, normal reading in the RESERVOIR position.	Filament circuit of V8301 defective.	Check winding 3-4 of T8301. If open, replace T8301. If filament of V8301 is lit, check R8308 and FILAMENT contact of S8301.
4	No reading on vtvm with switch S8301 in the RESERVOIR position; normal reading in the FILAMENT position.	Reservoir circuit of V8301 defective.	Check winding 5-6 of T8301. Check continuity of RESERVOIR ADJ control R8305. Disconnect the meter from pins C and D of J8301 and connect it across pins 1 and 4 of the V8301 tube socket. If the reading is normal, check R8307 and the RESERVOIR contact of S8301. **NOTE** Reconnect the meter to pins C and D of J8301.
5	Incorrect reading on vtvm with switch S8301 in RESERVOIR position.	RESERVOIR ADJ control R8305 not set properly.	Adjust R8305 for vtvm voltage reading stamped on thyratron V8301.
6	No reading on vtvm with switch S8301 in either the FILAMENT or RESERVOIR position, but filament appears lit in thyratron V8301.	Meter circuit in crowbar drawer defective.	Disconnect the meter from pins C and D of J8301 and connect it across pins 1 and 4 and then 1 and 5 of the V8301 tube socket. If the readings are normal, check the continuity of switch S8301 and resistor R8309.

TABLE 3-10. CROWBAR DRAWER, TRANSFORMER AND COIL RESISTANCES

TRANSFORMER OR COIL	TERMINALS	RESISTANCE (OHMS)
T8301	1-2	4
	3-4	Less than 1
	5-6	Less than 1
L8301		Less than 1
L8302		Less than 1

TABLE 3-11. 40-KW HIGH-VOLTAGE RECTIFIER TROUBLESHOOTING

ITEM	INDICATION	PROBABLE TROUBLE	PROCEDURE
1	Filaments of tubes V8401, V8402, V8405, and V8406 do not light (no filament voltage measured with meter connected between terminals 3 and 5 of transformers T8401, T8402, T8405, and T8406); tubes V8403 and V8404 light normally.	Phase 1 filament voltage input circuit defective.	Check continuity of L8403 and replace if defective. Check connections at E8414.
2	Filaments of tubes V8401 through V8404 do not light (no filament voltage measured with meter connected between terminals 3 and 5 of transformers T8401 through T8404); tubes V8405 and V8406 light normally.	Phase 2 filament voltage input circuit defective.	Check continuity of L8402 and replace if defective. Check connections at E8415.
3	Filaments of tubes V8403 through V8406 do not light (no filament voltage measured with meter connected between terminals 3 and 5 of transformers T8303 through T8406); tubes V8401 and V8402 light normally.	Phase 3 filament voltage input circuit defective.	Check continuity of L8401 and replace if defective. Check connections at E8416.
4	Filament of tube V8401 does not light; all other tubes light normally.	Fuse F8401 open.	Check F8401. If open, check T8401 and filament circuit wiring for shorts before replacing.
		Tube V8401 defective.	Check continuity of V8401 filament. If defective, replace V8401.
		Transformer T8401 defective.	Check resistance of windings in T8401 and replace if defective.

NOTE

The indication, probable troubles and procedures in step 4 apply to each tube and its associated components.

TABLE 3-12. 40-KW HIGH-VOLTAGE RECTIFIER, TRANSFORMER AND COIL RESISTANCES

TRANSFORMER OR COIL	TERMINALS	RESISTANCE (OHMS)
T8401 thru T8406	1-2	5
	3-4	Less than 1
	4-5	Less than 1
L8401 thru L8403	-	0

TABLE 3-13. PA FRAME, TRANSFORMER AND COIL RESISTANCES

TRANSFORMER OR COIL	TERMINALS	RESISTANCE (OHMS)
T7101	Primary (1-2) Secondary (3-4-5)	Less than 1
L7101 thru L7108		Less than 1
L7111		Less than 1
L7112		Less than 1
L7113		Less than 1
L7201		Less than 1
L7202		Less than 1
K7101		150

TABLE 3-14. PA FRAME WIRE RUNNING LIST

FROM	TO	COLOR
P7102-A	Main Power Breaker Ø 3H	Grey
P7102-B	HV Breaker Reset Sw, NC	Wh/Violet
P7102-C	HV Breaker Reset Sw, NO	Wh/Blue
P7102-D	HV Breaker	Yellow
P7102-E	P7107-N	Wh/Blue
P7102-F	P7107-f	Orange
P7102-G	P7107-Y	Green
P7102-H	P7104-D	Wh/Green
P7102-I	J7104-E	Wh/Yellow
P7102-J	PA Deck Interlock NC	Wh/Brown
P7102-K	Band switch Int. NO	Wh/Red
P7102-L	Interlock Sw, HVR Position	Wh/Yellow
P7102-M	Interlock Sw, Crowbar Pos.	Wh/Orange
P7102-O	Interlock Sw, Rear Dr Pos. (PS)	Wh/Blue

TABLE 3-14. PA FRAME WIRE RUNNING LIST (CONT)

FROM	TO	COLOR
P7102-O	Main Power Breaker Ø 1H	White
P7102-P	P7103-P	Wh/Black
P7102-R	P7103-S	Wh/Violet
P7102-S	P7103-T	Wh/Grey
P7102-T	P7107-U	Brown
P7102-U	Main Power Breaker	Violet
P7102-V	Main Power Breaker	Grey
P7102-W	HV Breaker	Violet
P7102-Y	Interlock Sw - Ant. Tuner Pos.	Red
P7102-h	P7105-F	
P7102-j	P7105-I	
P7106-C	P7108-C	Tan
P7106-A	P7109	Wh/Red
P7101-A	SWR Circuit	Wh/Shielded
P7101-B	SWR Circuit	Red/Shielded
P7101-D	P7108-D	Green
P7101-E	PA Light Switch	White
P7101-F	Tune Light	Wh/Violet
P7101-H	R7101	Wh/Orange
P7101-O	P7103-U	Wh/Grey
P7101-P	Main Power Breaker Ø 2C	Violet
P7101-R	Main Power Breaker Ø 3C	Grey
P7101-S	Main Power Breaker Ø 1C	White
P7101-T	P7107-V	Wh/Black
P7101-U	Xfmr Filter Box	Wh/Violet
P7101-V	P7105-A	Wh/Black
P7101-Y	Term 10, Meter Box Red Light	Yellow
P7107-A	Term 5, Meter Box P1. Curr. Neg	Brown
P7107-G	P7105-H	Wh/Red
P7107-F	P7105-K	Pink
P7107-E	P7105-H	Wh/Blue
P7107-I	Main Power Breaker Ø 1C	White

TABLE 3-14. PA FRAME WIRE RUNNING LIST (CONT)

FROM	TO	COLOR
P7107-J	Main Power Breaker Ø 2C	Violet
P7107-K	P7103-G	Yellow
P7107-L	P7103-H	Red
P7107-M	P7103-C	Orange
P7107-O	P7103-V	Violet
P7107-P	Xfmr Filter Box	Violet
P7107-R	Band Switch, Interlock NC	Wh/Brown
P7107-S	Interlock Sw, Timer Pos.	Green
P7107-T	Main Power Breaker; Aux Sw 2 Com.	Wh/Yellow
P7107-W	Main Power Breaker; Aux Sw 3, NO	Wh/Orange
P7107-X	Main Power Breaker; Aux Sw 2, NC	Wh/Red
P7107-Z	J7104-J	Wh/Black
P7107-a	J7104-K	Blue
P7107-C	J7302-A	Wh/Violet
P7107-d	Ovld Reset Sw.	Wh/Black
P7107-e	Plate On Light Resistor	Yellow
P7103-A	Main Power Breaker; Aux Sw 3, NO	Wh/Orange
P7103-B	Main Power Breaker; Aux Sw 3, Com.	Wh/Green
P7103-N	Main Power Breaker; Aux Sw 2, Com.	Wh/Yellow
P7104-C	Band Switch Interlock NC	Wh/Brown
P7104-F	Operate Light Resistor	Wh/Green Tag
P7104-G	Tune Light Resistor	Green
P7104-H	P7101-f	White
P7105-B	Xfmr Filter Box	Wh/Violet
P7105-E	Ground	Black
P7105-J	Plate Meter, Pin 8	Green
Plate Meter, Pin 3	Meter Box Strip, Term. 6	Blue
Meter Box Strip Term 1 (Fil Pri)	Xfmr Filter Box	Wh/Violet
Meter Box Strip Term 2 (Fil Pri)	Xfmr Filter Box	Violet
Meter Box Strip Term 11 (Secondary)	Ground	Black

TABLE 3-14. PA FRAME WIRE RUNNING LIST (CONT)

FROM	TO	COLOR
Meter Box Strip Term 3 (Drive Meter +)	Z7301-3	Yellow
Plate On Light Res.	Meter Box Strip Term 10	Yellow
Meter Box Strip Term 10	HV Bkr Ind. Light Resistor	Yellow
Main Power Bkr 01C	Meter Box Strip Term 8	White
Meter Box Strip Term 8	Ovld Reset Switch	White
Ovld Reset Switch	PA Light Switch	White
Meter Box Strip Term 9	PA Light Switch	Wh/Black
Tune Light	Plate On Light	Wh/Violet
Plate On Light	Operate Light	Wh/Violet
Operate Light	Meter Box Strip Term 7	Wh/Violet
Meter Box Strip Term 7	HV Bkr Ind. Light	Wh/Violet
AC Power Light	Main Power Bkr Ø 3C	Grey
Main Power Breaker Ø 2C	AC Power Light Resistor	Violet
Main Power Breaker Ø 2H	Main Power Breaker Aux. Sw 1 Com.	Violet
Main Power Breaker Aux Sw L NO	HV Breaker Reset Switch	Red
Main Power Breaker Ø 1C	Band Switch Rel. Sw	White
HV Breaker	Interlock Indic.	Violet
Main Power Ø 2C	Interlock Indic.	Violet
Plate on Light	Band Switch Release Solenoid	Wh/Violet
Band Switch Release Solenoid	Band Switch Release Sw NC	Red
Band Switch Interlock NC	Air Switch Interlock Sw	Wh/Brown
Resistor	Rear Door Int. NC	Wh/Brown
Rear Door Inter. NC	Relay Panel Inter. NC	Wh/Brown
Relay Panel Inter. NC	Bias Drawer Inter. NC	Wh/Brown
Bias Drawer Inter. NC	PA Deck Interlock NC	Wh/Brown
Aux Sw (HV Breaker) Resistor	HV Breaker Aux Switch C	Red
HV Breaker Aux Switch	HV Breaker	Yellow
Interlock Switch Bias Position	Bias Interlock Sw NO	Pink
Bias Interlock Sw NO	Relay Interlock Sw Com.	Wh/Red

TABLE 3-14. PA FRAME WIRE RUNNING LIST (CONT)

FROM	TO	COLOR
Interlock Sw Relay Position	Relay Interlock Sw NO	Yellow
Relay Interlock NO	Rear Door (PA) Com.	Yellow
Rear Door (PA) NO	Interlock Sw Rear Door Position	Blue
Rear Door (PA) NO	Air Switch Com.	Blue
Interlock Switch Air Switch Position	Air Switch NO	Orange
Airswitch NO	Band Switch Com.	Orange
Interlock Switch Band Switch Position	Band Switch NO	Wh/Red
Interlock Switch PA Deck Position	PA Deck Interlock NO	Violet
PA Deck Interlock NO	Bias Interlock Com.	Violet
PA Deck Int. Com.	Interlock Switch External Position	Wh/Green
Fan Cap.	J7302-C	Red
Fan Cap.	J7302-D	Wh/Red
J7302-B	Main Power Breaker Ø 3C	
Ext. Filter Box	Plate Meter Circuit Pin 5	Coax. /Blk.
P7103-W	Ground	Black
P7104-M	Ground	Black
P7107-b	Ground	Black
P7101-Z	Ground Interconnect Box	Black
P7102-Z	Ground	Black
SWR Circuit	P7105-I	White
HV Breaker Aux Sw Resistor W/100-101	HV Breaker Aux Sw Resistor	Wh/Brown
HV Breaker Aux Sw Resistor	HV Breaker Aux Sw Resistor W/105	Red
AC Power Light	AC Power Light Resistor	White
Tune Light	Tune Light Resistor	White
Operate Light	Operate Light Resistor	White
Plate On Light	Plate On Light Resistor	White
Main Power Breaker Aux Sw 1 NC	HV Breaker Reset Sw NO	Wh/Blue
P7105-D	P7108-B	Red
Meter Circuit	Probe	Black
P7107, Pink	Therm. E7307	Red
P7104-A	PA Int. C	Yellow
P7104-E	PA Int. NO	Wh/Yellow

TABLE 3-15. PS FRAME, TRANSFORMER AND COIL RESISTANCES

TRANSFORMER OR COIL	TERMINALS	RESISTANCE (OHMS)
K8101		7.5
K8102		7.5
L8101		1.4
L8102		Less than 1
L8103		Less than 1
L8104		Less than 1
L8105		78.2
L8201		0
L8202		Less than 1
T8101	0-190	Less than 1
	0-208	Less than 1
	0-230	Less than 1
	0-250	Less than 1
T8102		Same as T8101
T8103		Same as T8101
T8104-Ø1	0-190	Less than 1
	0-200	Less than 1
	0-210	Less than 1
	0-220	Less than 1
	0-230	Less than 1
	0-240	Less than 1
	0-250	Less than 1
T8104-Ø2		Same as T8104-Ø1
T8104-Ø3		Same as T8104-Ø1
T8105	1-3	20.5
	2-4	23.6
	5-6	330.0
	6-7	350.0
	5-7	680.0
	8-9	Less than 1
	9-10	Less than 1
	8-10	Less than 1

TABLE 3-16. PS FRAME WIRE RUNNING LIST

FROM	TO	COLOR
Pin A	Breaker Motor Fuse	Grey
Breaker Motor Fuse	L1 of Breaker Motor	Grey
J8102-B	Forward, Breaker Motor	Wh/Violet
J8102-C	Reverse, Breaker Motor	Wh/Blue
J8102-D	Micro Sw Shorting Relay	Yellow
J8102-E	Shorting Relay Coil	Wh/Blue
J8102-F	Bottom Panel Int. NO	Orange
J8102-G	HV Contactor Coil	Green
J8102-H	HV Cont Aux Sw	Wh/Green
J8102-I	HV Cont Aux Sw	Wh/Yellow
J8102-J	HVR Interlock, NC (HV Prot.)	Wh/Brown
J8102-K	HVR Interlock, C (Inter Start)	Wh/Red
J8102-L	HVR Interlock, NO (Indic)	Wh/Yellow
J8102-M	Crowbar Inter. NO	Wh/Orange
J8102-N	Rear Door Inter. NO	Wh/Blue
J8102-O	Filter Box, Ø 1 (AC Ln)	White
J8102-P	Blower On-Off, Ø 1	Wh/Black
J8102-R	Blower On-Off, Ø 2	Wh/Violet
J8102-S	Blower On-Off, Ø 3	Wh/Grey
J8102-T	Crowbar, Pin B	Brown
J8102-U	Filter Box, Ø 2 (AC In)	Violet
J8102-V	Filter Box, Ø 3 (AC In)	Grey
J8102-W	Shorting Relay Coil	Orange
J8102-Y	Ant Tuner, Pin 5 Micro Sw NO (Indic)	Red
J8104-C	B- of HVR and C. B.	Tan
J8104-A	Short Relay Micro Sw +600 V	Wh/Red
J8101-A	SWR Pot	Wh/Shielded
J8101-B	SWR Pot	Red/Shielded
J8104-D	Ant. Tuner, Pin 17 Grid Current Meter	Green
J8101-E	Ant. Tuner, Pin 1 Ø 1 to Meter Lights	White
J8101-F	Light Fuse, Ø 2	Wh/Violet

TABLE 3-16. PS FRAME WIRE RUNNING LIST (CONT)

FROM	TO	COLOR
J8101-H	Ant. Tuner, Pin 11 Grid Volt Meter	Orange
J8101-O	Final Fil. Breaker	Wh/Grey
J8101-P	Fil. Adj. Sw - Ø 2 Wiper 230 V	Violet
J8101-R	Fil. Adj. Sw - Ø 3 Wiper 230 V	Grey
J8101-S	Fil. Adj. Sw - Ø 1 Wiper 230 V	White
J8101-T	Auto XFMR, Ø 1 230 V	Wh/Black
J8101-U	Auto XFMR, Ø 2 230 V	Wh/Violet
J8101-V	Auto XFMR, Ø 1 230 V	Wh/Black
J8101-Y	Resistor, Contactor Aux. Switch	Yellow
SWR, Cal. Switch	Ant. Tuner Pin 19	Green
Light Fuse, Ø 2	Fil. Adj. Sw - Ø 2 Wiper 230 V	Violet
Final Fil. Breaker	Auto XFMR - Ø 3 230 V	Grey
Final Fil. Breaker	Crowbar, Pin A	Grey
HVR, Ø 1 Fil.	Auto XFMR, - Ø 1 230 V	Wh/Black
HVR, Ø 2 Fil.	Auto XFMR, - Ø 2 230 V	Wh/Violet
HVR, Ø 3 Fil.	Auto XFMR, - Ø 3 230 V	Wh/Grey
HVR and Crowbar B Return	Ant. Tuner Term. Strip	Tan
HVR Inter. NO	Crowbar Inter. C	Wh/Yellow
Crowbar Inter. NO	Ant. Tuner, Pin 4 C	Wh/Orange
Ant. Tuner, Pin 5 NO	Rear Door Inter. G	Red
Rear Door Inter. NO	Bottom Panel Inter. C	Wh/Blue
Fil. Adj. Sw Ø 1 Wiper	Interlock Fuse	White
HVR Inter. NC	Crowbar Inter. NC	Wh/Brown
Crowbar Inter. NC	Rear Door Inter. NC	Wh/Brown
Rear Door Inter. NC	Bottom Panel Inter. NC	Wh/Brown
Bottom Panel Inter. NC	Ant. Tuner, Pin 3 NC	Wh/Brown
1 Ohm 14W Resistor Board	Ant. Tuner, Strip Plate Volt Meter	Wh/Red
Ant. Tuner, Pin 15 AV	Crowbar, Pin C Filament	Blue
Light Fuse	Ant. Tuner, Pin 2	Wh/Violet
Crowbar, Pin D Filament	Ant. Tuner, Pin 14 AC Volts	Pink
Crowbar, Pin E	XFMR Term 4	Wh/Brown

TABLE 3-16. PS FRAME WIRE RUNNING LIST (CONT)

FROM	TO	COLOR
HV Cont. Coil	Timer Switch	Green
Res. Short Cont. Coil	Timer Switch	Orange
Res. Short Cont. Coil	HV Cont. Coil	Blue
Res. Short Cont. Coil	Short Relay Micro Sw	Blue
Res. Short Cont. Aux Switch	Res. Short Cont. Ø 1 Line Term	White
Blower On-Off Ø 1	Filter Box, Ø 1	White
Blower On-Off Ø 2	Filter Box, Ø 2	Violet
Blower On-Off Ø 3	Filter Box, Ø 3	Grey
Tap Sw Ø 1, 230 V	Auto XFMR, Ø 1, 230 V	White
Tap Sw Ø 2, 230 V	Auto XFMR, Ø 2, 230 V	Violet
Tap Sw Ø 3, 230 V	Auto XFMR, Ø 3, 230 V	Grey
Tap Sw Ø 1, 190 V	Auto XFMR, Ø 1, 190 V	Red
Tap Sw Ø 2, 190 V	Auto XFMR, Ø 2, 190 V	Red
Tap Sw Ø 3, 190 V	Auto XFMR, Ø 3, 190 V	Red
Tap Sw Ø 1, 200 V	Auto XFMR, Ø 1, 200 V	Blue
Tap Sw Ø 2, 200 V	Auto XFMR, Ø 2, 200 V	Blue
Tap Sw Ø 3, 200 V	Auto XFMR, Ø 3, 200 V	Blue
Tap Sw Ø 1, 210 V	Auto XFMR, Ø 1, 210 V	Yellow
Tap Sw Ø 2, 210 V	Auto XFMR, Ø 2, 210 V	Yellow
Tap Sw Ø 3, 210 V	Auto XFMR, Ø 3, 210 V	Yellow
Tap Sw Ø 1, 220 V	Auto XFMR, Ø 1, 220 V	Orange
Tap Sw Ø 2, 220 V	Auto XFMR, Ø 2, 220 V	Orange
Tap Sw Ø 3, 220 V	Auto XFMR, Ø 3, 220 V	Orange
Tap Sw Ø 1, 240 V	Auto XFMR, Ø 1, 240 V	Green
Tap Sw Ø 2, 240 V	Auto XFMR, Ø 2, 240 V	Green
Tap Sw Ø 3, 240 V	Auto XFMR, Ø 3, 240 V	Green
Tap Sw Ø 1, 250 V	Auto XFMR, Ø 1, 250 V	Brown
Tap Sw Ø 2, 250 V	Auto XFMR, Ø 2, 250 V	Brown
Tap Sw Ø 3, 250 V	Auto XFMR, Ø 3, 250 V	Brown
J8101-Z	Ground	Black
J8102-Z	Ground	Black

TABLE 3-16. PS FRAME WIRE RUNNING LIST (CONT)

FROM	TO	COLOR
Ø 1 0	Ø 2 250 (Auto XFMR)	Brown
Ø 2 0	Ø 3 250 (Auto XFMR)	Brown
Ø 3 0	Ø 1 250 (Auto XFMR)	Brown
Timer	Cont. Coil	Blue
Int. Fuse	F of J8101	Wh/Black
Shorting Relay Pin 5 Ant. Tuner, Pin 12 Ant. Tuner, Pin 13	B- Term Strip 1 Term Strip 3	Tan
Sh. Rel. B	XFMR Term 1	Tan
XFMR Term 10	Tuner Unit Pin 10	Wh/Brown
Sh. Relay, Term 1	HV Light Resistor	Wh/Blue
Sh. Relay, Term 2	HV Light	Orange
Ø 1 Contactor	Fan Strip, Term 1	White
Ø 2 Contactor	Fan Fuse	Violet
Fan Strip Term 2	Fuse	Wh/Violet
Fan Strip Term 3	Cap	White
Fan Strip term 4	Cap	White

SECTION 4
MAINTENANCE

4-1. GENERAL.

Maintenance is divided into three categories: operator's maintenance, preventive maintenance, and corrective maintenance. The operator's maintenance, performed by the operator as he works with the equipment, is confined to visual inspection, cleaning, and fuse replacement. Operator's maintenance for the GPT-40K transmitter is included in the operator's manual for GPT-40K. Preventive and corrective maintenance procedures for the PA and PS frames are given in this section.

4-2. PREVENTIVE MAINTENANCE.

Preventive maintenance is maintenance that detects and corrects trouble-producing conditions before they become serious enough to affect equipment operation. Common causes of trouble are dirt and grime, contact erosion, improper contact pressure, lack of proper lubrication, improper relay adjustment, dirty air filters, overheating unstable power supplies, vacuum tubes with poor emission, and loose parts (due to vibration). Recommended schedules for preventive maintenance are presented below.

a. ONCE EACH SHIFT DURING AN "ON THE AIR" PERIOD. - Check the operator's performance record for irregularities and possible sources of future trouble. Make minor adjustments of tuning controls to verify proper tuning. Observe all electrical quantities measurable with built-in meters and compare observations with established standards (tuning chart and table 3-5) for irregularities. Observe indicator lights and rectifier tubes for abnormal color and signs of internal flashing.

b. DAILY DURING AN "OFF THE AIR" PERIOD. - Visually and manually inspect all parts in the transmitter for overheating and damage. Inspect all sliding or moving coil contacts. Feel blower and fan motors for overheating and observe rotating parts for wear. Note deposits of dust and dirt. Inspect condition of relay contacts. Check operation of all door interlocks.

c. MONTHLY DURING "OFF THE AIR" PERIOD. - Recondition rotary and switch contacts as necessary. Use crocus cloth and trichlorethylene or ethylene-dichloride for cleaning. Inspect and clean the transmitter. Check the condition of air filters. Replace or clean dirty filters. Inspect the equipment for loose solder connections or screws, especially in those areas in which appreciable vibration occurs. Gear trains showing signs of becoming dry should be lubricated with a drop or two of any high quality, light machine lubricant. Check the condition of all tubes.

4-3. CORRECTIVE MAINTENANCE.

The corrective maintenance procedures are essentially factory alignment procedures modified for use in the field. Alignment procedures are presented in the following paragraphs.

4-4. ALIGNMENT OF RELAYS IN PA FRAME RELAY PANEL.

Perform the following procedures with the PA frame relay panel installed in the PA frame and the transmitter operating into a dummy load or antenna.

a. ALIGNMENT OF TUBE PROTECT RELAY K7608.

NOTE

During this alignment only, mechanically prevent the overload contacts of RETUNE relay K7603 from closing.

(1) Adjust BIAS ADJ control R7513 (222) on the bias supply drawer for a reading of 3 amperes on PLATE CURRENT meter (203) on the PA frame meter panel.

CAUTION

Do not maintain PA plate current at 3 amperes for more than 2 minutes.

(2) Adjust TUBE PROTECT control R7606 (241) so that TUBE PROTECT relay K7608 is energized at 3 amperes.

(3) Readjust BIAS ADJ control R7513 for a reading of 1.8 amperes on the PLATE CURRENT meter.

b. ALIGNMENT OF GRID OVLD RELAY K7602, PLATE OVLD RELAY K7601, RETURN RELAY K7603, BIAS RELAY K7605, AND SWR RELAY K7604.

(1) Set RETUNE OVLD ADJ control R7520 (224) and SWR OVLD ADJ control R7529 (223) on bias supply drawer to their maximum clockwise positions.

(2) Set PLATE OVLD ADJ control R7601 (239), GRID OVLD ADJ control R7602 (240), and BIAS RELAY ADJ control R7604 (238) to their maximum counterclockwise positions.

(3) Tune the transmitter to 11 mc.

(4) Adjust exciter output for a 200-ma reading on GRID CURRENT meter (244) on the antenna tuning unit.

(5) Adjust GRID OVLD ADJ control R7602 (240) so that GRID OVLD relay K7602 is energized at 200 ma as indicated on GRID CURRENT meter (244).

(6) Reduce exciter output to zero, then depress OVERLOAD RESET switch S7401 (214) on the PA control panel.

(7) Increase exciter output until a reading of 6 amperes is obtained on PLATE CURRENT meter (203).

CAUTION

Do not maintain 6-ampere reading on PLATE CURRENT meter for more than 1 minute.

(8) Adjust PLATE OVLD ADJ control R7601 (239) so that PLATE OVLD relay K7601 is energized at 6 amperes as indicated on PLATE CURRENT meter.

(9) Reduce exciter output to zero, then depress OVERLOAD RESET switch S7401 (214).

(10) Increase exciter output until PLATE CURRENT meter (203) reads 3 amperes. Rotate LOAD control (212) on 40-kw PA until PLATE CURRENT meter reading increases to 4 amperes.

(11) Adjust exciter output until a reading of 22.0 kilovolts is obtained on PLATE RF meter (204).

(12) Turn RETUNE OVLD ADJ control R7520 (244) on bias supply drawer clockwise until RETUNE relay K7603 is energized, then turn control back slightly.

(13) Reduce exciter output to zero. Depress overload reset switch S7401 (214). Slowly increase exciter output. RETUNE relay K7603 should be energized when PLATE CURRENT meter (203) indicates 3.0 amperes with less than 2.0 kilovolts indicated on PLATE RF meter (204). If RETUNE relay is not energized when these meter readings are reached, turn RETUNE OVLD slowly clockwise until RETUNE relay is energized. Repeat step (13) until RETUNE relay is energized any time PLATE CURRENT meter (203) indicates 3.0 amperes with less than 2.0 kilovolts indicated on PLATE RF meter (204).

(14) Return LOAD control (212) on 40-kw PA to its proper setting as shown in the tuning chart, then depress OVERLOAD RESET switch S7401 (214).

(15) Slowly turn BIAS RELAY ADJ control R7604 (238) clockwise until BIAS relay K7605 is deenergized.

(16) Turn BIAS RELAY ADJ control R7605 (238) slightly counterclockwise and depress OVERLOAD RESET switch S7401. Repeat this step until BIAS relay remains energized.

(17) Connect a jumper between terminals 2 and 3 of SWR meter M8207. Adjust SWR OVLD ADJ control R7526 (223) until SWR relay K7604 becomes energized. Remove jumper from meter.

4-5. FAN MOTOR BEARING REPLACEMENT.

(See figure 4-1.)

The following procedure is presented to facilitate replacement of motor bearings on the fans used in the PA and PS frames. To replace motor bearings, proceed as follows:

a. Loosen two setscrews (91-12-1) on fan hub. Slide fan (68-25-7) off shaft.

b. Remove four nuts (94-2-1), four washers (92-5), and four thru bolts (91-10-17) from motor.

c. Remove front end cap (3102B-101) and rotor assembly (4102B168-1) from motor housing.

d. Remove front end cap (3102B-101) from rotor assembly (4102B168-1).

NOTE

If any shim washers should adhere to front bearing, be sure to put them back into end cap. All shim washers and loading springs (83-10) must be positioned in their original order when reassembling motor.

e. Press off old bearings from shaft (one at a time), by supporting bearings and applying pressure to shaft at center. Take care not to damage shaft. Discard old bearings.

f. Press new bearings (47-3-31) on shaft by applying pressure to inner race only, keeping bearings square with shaft.

CAUTION

DO NOT APPLY PRESSURE TO OUTER RACE OF BEARINGS.

g. Replace rotor assembly (4102B168-1) in front end cap (3102B101). Place rotor assembly with front end cap in motor housing. Secure front end cap to motor housing using four thru bolts (91-10-17), four nuts (94-2-1) and four washers (92-5).

h. Slide fan (68-25-7) on shaft. The two setscrews (91-12-1) should line up with flats on shaft to prevent raising burr on shaft which would interfere with future disassembly. Tighten setscrews and stake with Glyptol.

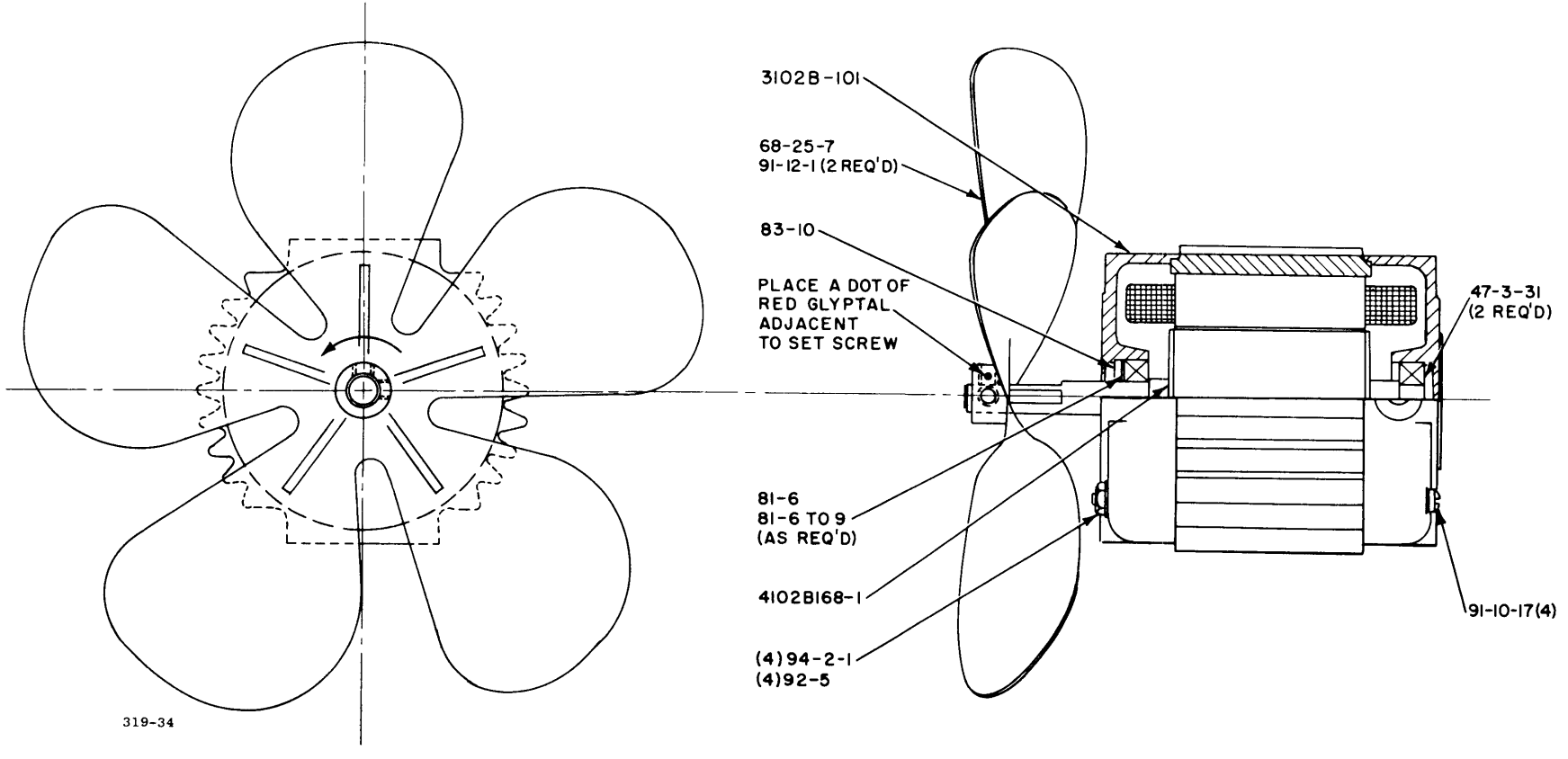


Figure 4-1. PA and PS Frame Fan

SECTION 5
PARTS LIST

INTRODUCTION. Reference designations have been assigned to identify all maintenance parts of the equipment. These designations appear on wiring schematics and are marked on the equipment adjacent to the part. The following table lists all maintenance parts and their corresponding designations. The TMC part number is the number by which the part may be ordered.

CONTENTS

MAIN(10K) FRAME

PA(40K) FRAME

POWER SUPPLY FRAME

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
A901	NOT USED		
A902	NOT USED		
A903	POWER AMPLIFIER BANDSWITCH ASSY.	PA Tuning	AS-119
C900	CAPACITOR, FIXED, MICA DI-ELECTRIC: button, 1000 uuf, ±5%, 300 wvdc.	ALDC Bypass	CB21PD102J
C901 thru C903	Same as C900	ALDC Bypass	
C904	CAPACITOR, FIXED, MICA DI-ELECTRIC: 20 uuf, ±2%, 500 wvdc.	ALDC Filter	CM20C200G
C905	CAPACITOR, FIXED, CERAMIC DI-ELECTRIC: 3 uuf, ±.25 uuf, 500 wvdc.	PA Plate RF Meter Coupling	CC21SL030C
C906	CAPACITOR, FIXED, MICA DI-ELECTRIC: 100 uuf, ±5%, 500 wvdc, char. C.	ALDC Filter	CM20C101J
C907	CAPACITOR, FIXED, CERAMIC DI-ELECTRIC: 10 uuf, ±.5 uuf, 500 wvdc.	ALDC Coupling	CC21SL100D
C908	CAPACITOR, FIXED, MICA DI-ELECTRIC: 5 uuf, ±20%, 500 wvdc.	PA Monitor Coupling	CM20C050M
C909	CAPACITOR, FIXED, VACUUM: 3 uuf, 17,000 volts peak; 7 amp current rating; 1-1/16" dia. x 3-1/4" lg.	PA Monitor Coupling	CO-102-3
C910	CAPACITOR, FIXED, MICA DI-ELECTRIC: 50 uuf, ±5%, 300 wvdc.	Volt. Divider	CM15C500J
C911	NOT USED.		
C912	Same as C900.	M1003 Bypass	
C913	Same as C900.	M1003 Bypass	
C914	CAPACITOR, FIXED, PLASTIC DI-ELECTRIC: mylar; .1 uf, ±5%, 700 wvdc.	M1003 Bypass	CN108C1003J

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C915	Same as C900.	M1003 Bypass	
C916	CAPACITOR ASSEMBLY, VARIABLE, VACUUM: 5-750 uuf, 5000 volts peak; clockwise rotation decreases capacity; 3-1/4" dia. x 7-3/4" lg. o/a, with bevel gear.	Output Balance	AM-103
C917	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 1000 uuf, ±20%, 5000 wvdc; 6-32 tapped studs each end; 13/16" dia. x 7/8" lg. o/a.	PA Screen Bypass	CC-109-38
C918	NOT USED		
C919	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 500 uuf, ±20%, 5000 wvdc, 6-32 tapped studs each end, 13/16" dia. x 7/8" lg. o/a. Part of XV900.	PA Screen Bypass	CC-109-36
C920 thru C926	Same as C919. Part of XV900.	PA Screen Bypass	
C927	CAPACITOR ASSEMBLY, VARIABLE, VACUUM: 25-700 uuf, 15,000 volts peak; clockwise rotation decreases capacity; 3-3/4" dia. x 16-1/2" lg. o/a, with bevel gear.	PA Tuning	AM-113
C928	CAPACITOR ASSEMBLY, VARIABLE, VACUUM: 50-2000 uuf, 10,000 volts peak; clockwise rotation decreases capacity; 5-1/8" dia. x 16-1/2" lg. o/a, with bevel gear.	PA Load	AM-114
C929	CAPACITOR, FIXED, VACUUM: 10 uuf, 17,000 volts peak; 1-1/16" dia. x 3-1/8" lg. o/a.	PA Inverse Feedback	CO-104-2
C930	CAPACITOR, FIXED, VACUUM: 1000 uuf, 15,000 wvdc.	PA Plate DC Blocking	CO-101-1000-15C
C931	CAPACITOR, FIXED, MICA DIELECTRIC: 1000 uuf, ±10%, 500 wvdc.	Grid Bypass	CM20C102K
C932	Same as C931.	Grid Bypass	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C933	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 50 uuf, ±10%, 7500 wvdc, 6-32 tapped studs each end, 13/16" dia. x 7/8" lg. o/a. Part of XV900.	Grid Bypass	CC-109-19
C934 thru C936	Same as C933, Part of XV900.	Grid Bypass	
C937	NOT USED		
C938	NOT USED		
C939	CAPACITOR, FIXED, PLASTIC DIELECTRIC: trylar; 1000 uuf, ±10%, 14,000 wvdc.	PA Plate Bypass	CX102K102T
C940	Same as C939.	PA Plate Bypass	
C941	CAPACITOR, FIXED, MICA DIELECTRIC: 5 uuf, ±20%, 300 wvdc.	IPA Monitor Volt. Divider	CM15C050M
C942	CAPACITOR, FIXED, MICA DIELECTRIC: 50 uuf, ±5%, 500 wvdc.	IPA Monitor Volt. Divider	CM20B500J
C943	CAPACITOR, FIXED, CERAMIC DIELECTRIC: feed-thru; 1000 uuf, ±20%, 500 wvdc.	Feed-thru Bypass ALDC	CK70AW102M
C944	Same as C943.	RF Bypass M1003	
C945	Same as C943.	PA Grid Bias Bypass	
C946	CAPACITOR, FIXED, PLASTIC DIELECTRIC: trylar; 10,000 uuf, ±10%, 4000 wvdc.	PA Filament Bypass	CX102J103M
C947	Same as C946.	PA Filament Bypass	
C948	Same as C943.	ALDC Bypass	
C949	CAPACITOR, FIXED, VACUUM: 1000 uuf, ±10%; 25,000 peak RF voltage.	DC Blocking	CO-106-1000-30C
CP900	ADAPTER, connector	Adapter for P902	UG-1019/U
CP901	NOT USED		
CR900	SEMICONDUCTOR DEVICE, DIODE: germanium.	ALDC Rectifier	1N303

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
CR901	Same as CR900.	PA Plate, RF Rectifier	
CR902	NOT USED		
CR903	NOT USED		
CR904	DETECTING ELEMENT, DIRECTIONAL COUPLER: frequency range, 2-30 Mc, 1 Kw full scale; calibrated to be within ±5% at 500 watts.	RF Detectors	DD-109-2
CR905	DETECTING ELEMENT, DIRECTIONAL COUPLER: frequency range, 2-30 Mc; 10 Kw full scale; calibrated to be within ±5% at 5 Kw.	RF Detectors	DD-109-1
DC900	COUPLER, DIRECTIONAL: 50 ohms impedance; forward power 10 Kw frequency.	Directional Watt Meter	DC-104
E900 thru E906	NOT USED		
E907	CONTACT ASSEMBLY, short.	p/o RF Bandswitch	AX-129
E908 thru E911	Same as E907.	p/o RF Bandswitch	
E912	CONTACT ASSEMBLY, long.	p/o RF Bandswitch	AX-128
E913 thru E915	Same as E907	p/o RF Bandswitch	
E916	Same as E912.	p/o RF Output Switch	
E917 thru E919	Same as E907.	p/o RF Output Switch	
E920	ROTOR PLATE: brass, rhodium plate; 1-1/4" x 4-1/2" o/a.	PA Bandswitch Rotor Contact	AX-158
J900	CONNECTOR, RECEPTACLE, ELECTRICAL: 1 female contact; 52 ohms, BNC type.	IPA Monitor	UG-625/U
J901	CONNECTOR, RECEPTACLE, ELECTRICAL: female; teflon insulated; mtg. dim. four 1/8" holes on 29/32"mtg. centers.	Driver Input	UG-560/U

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
J902	Same as J900	Monitor	
J903	NOT USED		
J904	PROBE, WAVEGUIDE: radio frequency.	RF Monitor	AJ-100
J905	CONNECTOR, RECEPTACLE, ELECTRICAL: R.F.; coaxial, QDL.	Emergency Output	JJ-137
J906	CONNECTOR, RECEPTACLE, ELECTRICAL: R.F.; coaxial.	PA Monitor	JJ-172
L900	COIL, RADIO FREQUENCY: 128 uhy, ±10%.	ALDC Choke	CL-177
L901	COIL, RADIO FREQUENCY: 750 uhy; ±20%, 100 ma max. current approx. 17 ohms DC resistance.	ALDC Choke	CL-100-5
L902	COIL, RADIO FREQUENCY: L-1.5 uh; at 2.5 mc.	PA Pi Network	CL-170
L903	FINAL COIL: not a replaceable item, part of A903.	PA Pi Network	
L904	Same as L900	M1003 Choke	
L905	COIL, RADIO FREQUENCY: 1.1 uhy at 7.9 mc; 3/16" dia. x 5/8" lg. body.	M1003 Choke	CL-139
L906	COIL, RADIO FREQUENCY: fixed; plate decoupling, L - 45 uhy, F - 2.5 mc test frequency.	PA Plate Choke	CL-154
L907	COIL, RADIO FREQUENCY: 35 uhy; 2.5 mc.	Static Choke	CL-166
L908	Same as L901.	M1003 Choke	
L909	COIL, RADIO FREQUENCY: fixed; 185 uhy, ±10%.	PA Screen Choke	CL-178
L910	Same as L901.	PA Grid Choke	
L911	Same as L906.	PA Plate Choke	
L912	NOT USED		
L913	NOT USED		
L914	COIL, RADIO FREQUENCY: fixed; 38 uhy, ±5%.	PA Plate Choke	CL-179

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
L915	COIL, RADIO FREQUENCY: 5 uhy ea. coil; inside coil completely insulated from outside coil; 3-1/4" o.d. x 6 1/2" lg.	PA Filament Choke	CL-160
MP900	COUNTER: rotating; 3 wheel; 0 to 9 each wheel.	Tune Indicator	CY-105
MP901	Same as MP900.	Load Indicator	
MP902	Same as MP900.	Output Balance Indicator	
MP903	COUNTER: rotating; 3 wheel, tune, operate, emergency.	Output Loading Indicator	AC-108
MP904	COUNTER: bandswitch; rotating; 3 wheel, 2 to 28 mc, plain bearing type non-reset; black figures, white wheels, rotation is clockwise; 9 positions.	Bandswitch Indicator	AC-124
P900	CONNECTOR, PLUG, ELECTRICAL: female, pin type.	IPA to PA Interconnect	MS3106B20-27S
P901	CONNECTOR, PLUG, ELECTRICAL: R.F.; dielectric-teflon, used with RG-174 coaxial wire.	PA Monitor	PL-169
P902	CONNECTOR, PLUG, ELECTRICAL: coaxial; HN type; 50 ohms, 5000 volts peak. Part of W901.	p/o W901	PL-222
P903	CONNECTOR, PLUG, ELECTRICAL: R.F.; female, angle type.	p/o W902	PL-192
P904	Same as P903.	p/o W902	
R900	RESISTOR, FIXED, COMPOSITION: 47,000 ohms, ±10%, 1/2 watt.	ALDC Decoupling	RC20GF473K
R901	RESISTOR, FIXED, COMPOSITION: 2200 ohms, ±10%, 1/2 watt.	ALDC Divider	RG20GF222K
R902	RESISTOR, FIXED, COMPOSITION: 470 ohms, ±10%, 1/2 watt.	PA Monitor Volt. Divider	RC20GF471K
R903	RESISTOR, FIXED, COMPOSITION: 47 ohms, ±10%, 1/2 watt.	PA Monitor Volt. Divider	RC20GF470K

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
R904	RESISTOR, FIXED, COMPOSITION: 100,000 ohms, ±10%, 1/2 watt.	M1003 Decoupling	RC20GF104K
R905	Same as R904.	M1003 Decoupling	
R906	Same as R901.	M1003 Voltage Divider	
R907	RESISTOR, FIXED, COMPOSITION: 27,000 ohms, ±10%, 2 watts.	PA Grid Bias	RC42GF273K
R908	RESISTOR, FIXED, COMPOSITION: 470 ohms, ±10%, 1 watt.	IPA Monitor Volt. Divider	RC32GF471K
R909	NOT USED		
R910	RESISTOR, FIXED, COMPOSITION: 47 ohms, ±10%; 1 watt.	IPA Monitor Volt. Divider	RC32GF470K
R911	RESISTOR, FIXED, FILM: 140 ohms, ±10%, 900 watts.	Load Resistor	RR-117-140
R912	Same as R911.	Load Resistor	
R913	Same as R911.	Load Resistor	
R914	RESISTOR, FIXED, COMPOSITION: 100,000 ohms, ±10%, 2 watts.	PA Screen	RC42GF104K
R915	Same as R914.	PA Screen	
S900	Not a replaceable item, part of A903.	PA Bandswitch	
S901	SWITCH, PUSH-PULL: micro; 10 amps at 125/250 VAC, 1/2 amp at 125 VDC.	PA Bandswitch Interlock	SW-189
S902	SWITCH, PUSH-PULL: momentary contact; normally closed; SPST, 15 amp at 125, 250 or 460 VAC, 1/2 amp at 125 VDC, 1/4 amp at 250 VDC.	PA Output Interlock	SW-169
S903	SWITCH ASSEMBLY, rotary; 3 position single pole; ceramic insulation. Consists of E916 thru E919.	10K RF Output Switch	AS-117
S904	NOT USED		

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
S905	SWITCH, INTERLOCK, total travel app. 0.321"; 15 amp, 120, 250 VAC; 2 amps resistive at 250 VDC.	Front Interlock	SW-230
S906	Same as S905.	Rear Interlock	
S907	NOT USED		
S908A,B	SWITCH, ROTARY: 2 section, 4 position; non-shorting contacts; 1 amp 28 VDC or 5 amps 110 VAC.	Tune/Operate/Emergency Switch	WS-131
V900	ELECTRON TUBE: power amplifier, ceramic tetrode.	Power Amplifier	4CX5000A
W900	CABLE ASSEMBLY, POWER, ELECTRICAL, BRANCHED: consists of various lengths and colors of MWC and RG-174/U cables; connectors, symbol nos. P900, P901 and J906.	Power Interconnect	CA-532
W901	CABLE ASSEMBLY, RADIO FREQUENCY: consists of 42" of RG-165/U cable and connector, symbol no. P902, at one end; 2 terminal lugs at other end.	Emergency Aux. Service Cable	CA-582-1
W902	WIRING HARNESS, BRANCHED: consists of 2 connectors, symbol nos. P903 and P904; 60" MWC cable; 80" length RG-58/U cable.	Wattmeter Cables	CA-829
XV900	SOCKET, ELECTRON TUBE: consists of socket and capacitors C919 thru C926 and C933 thru C936.	Socket for V900	AX-130

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
B7101	NOT USED		
B7102	BLOWER, CENTRIFUGAL: CCW rotation up blast; 5.0 hp, 220 VAC, 50/60 cycles, 3 phase; 2930 rpm at 50 cycles, 3520 rpm at 60 cycles.	Main PA Blower	BL-110
C7101	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 1000 uuf, ±20%, 5000 wvdc.	Bypass, External Filter	CC-109-38
C7102 thru C7116	Same as C7101.	Bypass, External Filter	
C7117	CAPACITOR, FIXED, PLASTIC DIELECTRIC: trylar; .01 uf, ±5%, 4000 wvdc.	Bypass, PA Fil. Filter	CX102J103M
C7118 thru C7120	Same as C7101.	Bypass, Main Blower	
C7121 thru C7126	Same as C7101.	Bypass, PA Fil. Filter	
C7127 thru C7129	NOT USED		
E7101	TERMINAL BOARD, BARRIER TYPE: 3 terminals.	Main Blower Strip	TM-118-3
J7101	CONNECTOR, RECEPTACLE, ELECTRICAL: male; pin type, 35 contacts.	Blower Contactor Receptacle	MS3102A32-7P
J7102	CONNECTOR, RECEPTACLE, ELECTRICAL: female; socket type, 14 contacts.	External Filter Receptacle	MS3102A20-27S
J7103	CONNECTOR, RECEPTACLE, ELECTRICAL: male, pin type, 14 contacts.	External Filter Receptacle	MS3102A20-27P
J7104	CONNECTOR, RECEPTACLE, ELECTRICAL: 1 round female contact; straight type; series BNC to BNC.	Plate Monitor Connector	JJ-172
K7101	RELAY, ARMATURE: 6 pole normally open; continuous rating 10 amps AC; coil 208-220 volts, 50/60 cps.	Main Blower Relay	RL-132

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
L7101	COIL, RADIO FREQUENCY: fixed; 30.5 uh; resistance, .025 ohms; frequency, 2.5 mc.	External Filter Coil	CL-222
L7102 thru L7108	Same as L7101.	External Filter Coil	
L7109	NOT USED		
L7110	NOT USED		
L7111	COIL, RADIO FREQUENCY: fixed; 45 uh, resistance, .018 ohms; frequency, 2.5 mc.	PA Filament Filter Coil	AC-111
L7112	Same as L7111.	PA Filament Filter Coil	
L7113	Same as L7111.	PA Filament Filter Coil	
P7101	CONNECTOR, PLUG, ELECTRICAL: female; socket type, 35 contacts.	PA to PS Interconnect	MS3106B32-7S
P7102	CONNECTOR, PLUG, ELECTRICAL: male; pin type, 35 contacts.	PA to PS Interconnect	MS3106B32-7P
P7103	Same as P7101.	Blower Contactor Plug	
P7104	CONNECTOR, PLUG, ELECTRICAL: male; pin type, 14 contacts.	External Filter Plug	MS3106B20-27P
P7105	CONNECTOR, PLUG, ELECTRICAL: female; socket type, 14 contacts.	Bias Supply Plug	MS3106B20-27S
P7106	CONNECTOR, PLUG, ELECTRICAL: male; pin type, 4 contacts.	PA to PS Interconnect	MS3106B22-10P
P7107	Same as P7101.	Relay Panel Plug	
P7108	CONNECTOR, PLUG, ELECTRICAL: female; socket type, 4 contacts.	Relay Panel Plug	MS3106B22-10S
P7109	CONNECTOR, PLUG, ELECTRICAL: male; pin type, 1 contact.	Bias Supply B- Plug	MS3106B18-16P
R7101	RESISTOR, FIXED, COMPOSITION: 1 megohm, $\pm$5%, 1/2 watt.	Grid Voltmeter Dropping	RC20GF105J
S7101	SWITCH, AIRFLOW: air pressure regulated.	Main Blower Air Switch	SW-243-2

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
S7102	SWITCH, INTERLOCK: push to operate; total travel approx. 0.312"; 15 amp, 120, 250 VAC; 2 amps resistive at 250 VDC.	Bias Drawer Interlock	SW-230
S7103	Same as S7102.	Relay Panel Interlock	
S7104	Same as S7102.	Rear Door (PA) Interlock	
T7101	TRANSFORMER, POWER, STEP-DOWN: primary winding 230V, 50/60 cycle; secondary winding 13 VAC at 225 amps CT; test voltage 2000 V; rectangular steel case.	PA Filament	TF-215

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C7201	CAPACITOR, fixed: mica; .01 mfd, ± 10%, 500 wvdc.	Filament Primary Meter Bypass	CM35B103K
C7202	Same as C7201.	Drive Meter Bypass	
C7203	Same as C7201.	Plate Current Meter Bypass	
C7204	Same as C7201.	Plate RF Meter Bypass	
C7205	Same as C7201.	Output Meter Bypass	
C7206	NOT USED		
C7207	NOT USED		
C7208	CAPACITOR, fixed; mica; 1000 mmfd, ± 10%; 500 wvdc.	SWR Bypass	CM20B102K
C7209 thru C7211	Same as C7208.	SWR Bypass	
I7201	LAMP, fluorescent: standard cool, 1/2" dia. x 11-1/4" lg.	Meter Illuminating	BI-107
I7202	Same as I7201	Meter Illuminating	
I7203	LAMP, incandescent: frosted; 230/250 V, 25 watts; standard screw base; 4" x 1-7/8" o/a.	PA Deck Illuminating	BI-106-2
I7204	LAMP, incandescent: red; 110/115 V, 25 watts; standard screw base; 4" x 1-7/8" o/a.	HV ON Light	BI-106-3
J7201	CONNECTOR, receptacle: coaxial.	SWR Connector	UG-625/U
J7202	Same as J7201.	SWR Connector	
L7201	COIL, R.F.: fixed; 2.5 millihenries, 100 ma, molded case.	SWR Filter	CL-140-1
L7202	Same as L7201.	SWR Filter	
M7201	METER, filament primary: AC voltmeter, 0-300 volts, red marker at 230 V; 4-1/2" square case.	Filament Primary	MR-118

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
M7202	METER, kilovolts, R.F.: 0-1 kilovolts; 4-1/2" rectangular case.	Drive	MR-135
M7203	METER, amperes: 0-10 amps; 4-1/2" rectangular case.	Plate Current	MR-129
M7204	METER, kilovolts, R.F.: 0-10 kilovolts, RF scale, 200 microamp DC movement, 4-1/2" square case.	Plate, R.F.	MR-120
M7205	NOT USED		
M7206	METER, kilowatts, R.F.: 0-60 Kw; 200 microamp DC movement.	Unbalanced Output	MR-147
R7201	RESISTOR, fixed: wirewound; 500 ohms, 25 watts.	HV ON Light Volt. Dropping Res.	RW-111-17
S7201	STARTER, fluorescent lamp; 8 watts; 13/16" dia. x 1-1/2" lg.	Lamp Starter	PO-170
S7202	Same as S7201.	Lamp Starter	
T7201	BALLAST, fluorescent lamp; 8 watts, 118 volts, 0.17 amps, 60 cps.	Lamp Ballast	PO-169
T7202	Same as T7201.	Lamp Ballast	
XI7201A	SOCKET, fluorescent lamp: 75 watts, 250 volts.	Lamp Socket	TS-141
XI7201B	Same as XI7201A.	Lamp Socket	
XI7202A	Same as XI7201A.	Lamp Socket	
XI7202B	Same as XI7201A.	Lamp Socket	
XI7203	SOCKET, bulb head mounting: ceramic; for standard base incandescent lamp; rated for 660 wattts, 250 volts.	PA Deck Light Socket	TS-143
XI7204	Same as XI7203.	HV ON Light Socket	
XS7201	SOCKET, starter: fluorescent; 60 watts, 250 volts.	Starter Socket	TS-140
XS7202	Same as XS7201.	Starter Socket	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
A7301 thru A7305	NOT USED		
A7306	GEAR BOX ASSEMBLY, BANDSWITCH: consists of: A. Symbol E7302, TERMINAL BOARD, TMC No. TM-120-5 B. Symbol L7310, SOLENOID, TMC No. SZ-100 C. Symbol MP7302, GEAR, WORM, TMC No. GR-151-3 D. Symbol MP7303, GEAR, WORM WHEEL, TMC No. GR-151-1 E. Symbol S7304, SWITCH, TMC No. SW-189 F. Various bearings, plates, hubs, shafts, leads and hardware.	Drive and Detent, Bandswitch	A-2024
A7307	BANDSWITCH AND COIL ASSEMBLY: consists of: A. Symbol A7308, SWITCH SECTION & COIL ASSEMBLY, "L" SECTION, TMC No. AX-459 B. Symbol A7306, GEAR BOX ASSEMBLY, TMC No. A-2024 C. Symbol E7308, INSULATOR, STANDOFF, TMC No. A-1992-2 D. Symbol E7309, 7310, INSULATOR, STANDOFF, TMC No. A-1992-1 E. Symbol L7313, COIL, RF, 24 to 28 MC, TMC No. CL-276 F. Symbol L7314, COIL, RF, 2 to 24 MC, TMC No. CL-277 G. Symbol MP7301, SHAFT, MAIN, TMC No. PX-538 H. Symbol S7307, SWITCH SECTION, ROTARY, "Pi" SECTION, TMC No. AX-266 J. Various plates, brackets, baffles and hardware.	Main Bandswitch	AS-125
A7308	SWITCH SECTION AND COIL ASSEMBLY; "L" SECTION: consists of: A. Symbol L7308, COIL, RF, 24 to 28 MC, TMC No. CL-223 B. Symbol L7317, COIL, RF, 2 to 24 MC, TMC No. CL-324	Switch & Coil, "L" Section	AX-459

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
A7308 (cont)	C. Symbol L7316, COIL, RF, TMC No. CL-278 D. Symbol S7309, SWITCH SECTION, ROTARY, TMC No. AX-458 E. Various hardware This Assembly also supplied with TMC Part No. AS-125, symbol A7307.		
B7301	FAN, AXIAL: 3400 rpm, CW; 115-230 VAC.	Top Fan	BL-108
C7301 thru C7303	NOT USED		
C7304	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 1000 uuf; ±20%; 5000 vdcw.	Bypass, Plate Meter Circuit	CC-109-38
C7305	Same as C7304.	Bypass, Plate Meter Circuit	
C7306 thru C7309	NOT USED		
C7310	CAPACITOR, FIXED, PLASTIC DIELECTRIC: trylar; 1000 uuf; ±10%; 18,000 vdcw.	Bypass, PA Plate	CX102K102S
C7311	Same as C7310.	Bypass, PA Plate	
C7312	CAPACITOR, FIXED, PLASTIC DIELECTRIC: trylar; .01 uf; ±5%; 4000 vdcw.	Bypass, PA Filament	CX102J103M
C7313 thru C7315	Same as C7312.	Bypass, PA Filament	
C7316	CAPACITOR, FIXED, PLASTIC DIELECTRIC: 3000 uuf; 25,000 vdcw.	Bypass, PA Plate	CX-108-1
C7317	CAPACITOR, FIXED, MICA DIELECTRIC: 100 uuf; ±10%; char. B., 500 vdcw.	Bypass, Drive Meter Circuit	CM20B101K
C7318	CAPACITOR, FIXED, MICA DIELECTRIC: .01 uf; ±10%; char. B., 300 vdcw.	Top Fan Bypass	CM35B103K

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C7319	Same as C7318.	Top Fan Bypass	
C7320	Same as C7318.	Top Fan Bypass	
C7321	NOT USED		
C7322	CAPACITOR, FIXED, VACUUM: 3 uuf; 17,000 volts peak; 7 amp current rating; 1-1/6" dia. x 3-1/4" lg.	Coupling, Drive Meter Circuit	CO-102-3
C7323	Same as C7318.	Top Fan Bypass	
C7324	CAPACITOR, FIXED, MICA DIELECTRIC: 50 uuf; ±10%; char. B., 500 vdcw.	Plate Monitor	CM15B500K
C7325	CAPACITOR, FIXED, VACUUM: 1000 uuf; 30 Kv; 125 amps rms.	DC Blocking	CO-106-1000-30C
C7326	CAPACITOR, FIXED, VACUUM: 6 uuf; 30 Kv; 60 amps rms.	Coupling, Plate Meter Circuit	CO-107-6-30C
C7327	CAPACITOR, FIXED, PAPER DIELECTRIC: 4 uf; ±10%; char. F.; 600 vdcw; oil filled and impregnated, hermetically sealed cylindrical metal case.	Top Fan Capacitor	CP41B1FF405K
C7328	Same as C7325.	Bypass	
C7329	NOT USED		
C7330	CAPACITOR, VARIABLE, VACUUM: 50-1000 uuf, 125 amp rms, 20 Kv, glass case.	PA Tune	CB-160
C7331	Same as C7330.	PA Load	
C7332	Same as C7330.	PA Load	
C7333	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 50 uuf; ±10%; 15,000 vdcw.	p/o Harmonic Filter	CC-109-24
C7334	Same as C7333.	p/o Harmonic Filter	
CP7301	NOT USED		
CP7302	NOT USED		

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
CP7303	ADAPTER, connector.	J7303 to P7307 Adapter	UG-273/U
CR7301	NOT USED		
CR7302	NOT USED		
CR7303	DETECTING ELEMENT, DIRECTIONAL COUPLER: frequency range, 2-30 mc. Also supplied with DC-101, Symbol No. DC7302.	SWR Forward	DD-103
CR7304	Same as CR7303.	SWR Reverse	
DC7301	NOT USED		
DC7302	COUPLER, DIRECTIONAL: 60,000 watts; 2-30 mc; supplied with 2 diodes, Symbol No. CR7303, CR7304.	SWR System	DC-101
E7301	NOT USED		
E7302	TERMINAL BOARD: barrier type; 5 terminal. Also supplied with TMC Part No. A-2024, Symbol No. A7306.	Bandswitch Release Strip	TM-102-5
E7303	TERMINAL BOARD: barrier type; 14 terminals.	Meter Box Strip	TM-102-14
E7304	FEED-THRU: insulated.	Drive Input	NS-107
E7305	INSULATOR, CERAMIC: glazed; feed-thru type.	PA Deck Feed-Thru	AX-228
E7306	TERMINAL BOARD: barrier type; 4 terminals.	Top Fan Strip	TM-102-4
E7307	TERMINAL BOARD: barrier type; plastic; 3 terminals.	PA Tube Thermostat Strip	TM-102-3
E7308	INSULATOR, STANDOFF: rectangular; material, supra-mica 500; over-all dim., 1" x 1-1/2" x 21" lg. excluding 1/4-20 thd x 1-3/8" lg. rod protruding from end, 5 mounting holes. Also supplied with TMC No. AS-125, Symbol A7307.	Support, Bandswitch	A-1992-2

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
E7309	INSULATOR, STANDOFF: rectangular; material, supra-mica 500; over-all dim., 1" x 1-1/2" x 21" lg. excluding 1/4-20 thd x 1-3/8" lg. rod protruding from end, 6 mounting holes. Also supplied with TMC No. AS-125, Symbol A7307.	Support, Bandswitch	A-1992-1
E7310	Same as E7309. Also supplied with TMC No. AS-125, Symbol A7307.	Support, Bandswitch	
E7311	CONTACT, ELECTRICAL: wiper; brass and copper components, silver plated; over-all dim., 1-3/8" x 4-1/8" x 8-1/8"; hardware, brass, nickel plated. This Assembly aslo supplied with TMC No. AX-266, Symbol S7307.	"Pi" Section Wiper Contact	AX-268
E7312	CONTACT, ELECTRICAL: button type; brass and copper components, silver plated; over-all dim., 1" x 2-1/2" x 2-7/8"; hardware, brass, nickel plated. This Assembly also supplied with TMC No. AX-266, Symbol S7307.	"Pi" Section Contact	AX-267
E7313 thru E7319	Same as E7312. Also supplied with TMC No. AX-266, Symbol S7307.	"Pi" Section Contact	
E7320	ROTOR, ELECTRICAL SWITCH: "Pi" Section; brass, rhodium plate; over-all dim., 1-1/2" x 6" x 7" approx.; 112 deg. span. Also supplied with TMC No. AX-266, Symbol S7307.	"Pi" Section Rotor	RO-102
E7321	INSULATOR, DISC TYPE: "Pi" Section; material, supra-mica 500; over-all dim., 3/4" x 12" o.d. x 8 3/4" i.d. with 11 groupings of four 1/8" dia. mtg. holes. Also supplied with TMC No. AX-266, Symbol S7307.	"Pi" Section Wafer	WS-107

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
E7322	CONTACT, ELECTRICAL: button type; brass, copper, and aluminum components, silver plated; over-all dim., 1" x 2-1/4" x 2-9/16"; hardware, brass, nickel plated. This Assembly also supplied with TMC No. AX-458, Symbol S7309.	L Section Contact	AX-339
E7323 thru E7326	Same as E7322. Also supplied with TMC No. AX-458, Symbol S7309.	L Section Contact	
E7327	ROTOR, ELECTRICAL SWITCH: "L" Section; brass, silver plated; over-all dim., 7/8" x 4-5/8" x 6" approx.; 102 deg. span. Also supplied with TMC No. AX-458, Symbol S7309.	L Section Rotor	RO-103
E7328	INSULATOR, PLATE TYPE: "L" Section; material, supra-mica 500; over-all dim., 1/2" x 12" x 12" with 6" x 6" corner notch and various size holes. Also supplied with TMC No. AX-458, Symbol S7309.	L Section Wafer	WS-132
E7329	NOT USED		
E7330	CORE: fixed type; ferramic, type Q2; 5/8" dia. x 7" lg.	Filament Coil Core	CI-112-Q2-7L
E7331	Same as E7330.	Filament Coil Core	
E7332	Same as E7330.	Filament Coil Core	
E7333	Same as E7322	L Section Contact	
E7334	POST, ELECTRICAL-MECHANICAL EQUIPMENT: 10-32 threaded internally; aluminum, silver plate finish; 2-1/4" lg. x 1/2" dia.; round type.	Spacer	TE1032AP74R
E7335	Same as E7334.	Spacer	
I7301	LAMP, INCANDESCENT: 230 V, 10 watts; screw base.	AC Power	BI-105-1

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
I7302	Same as I7301.	Tune	
I7303	Same as I7301.	Operate	
I7304	Same as I7301.	Plate On	
J7301	NOT USED		
J7302	CONNECTOR, RECEPTACLE, ELECTRICAL: female; 4 contacts.	Top Fan	MS3102A14S-2S
J7303	PROBE, WAVEGUIDE: radio frequency.	Plate Monitor	AJ-101
J7304	PROBE, WAVEGUIDE: radio frequency.	R.F. Monitor	AJ-100
L7301	NOT USED		
L7302	NOT USED		
L7303	COIL, RADIO FREQUENCY: fixed; 6 uhy; 225 amps max; teflon insulated.	PA Filament	CL-220
L7304	COIL, RADIO FREQUENCY: fixed; 35 uhy, Q=180 at 2.5 mc.	Decoupling	CL-166
L7305	Same as L7304.	Decoupling	
L7306	Same as L7304.	Decoupling	
L7307	Same as L7304.	Thermocouple	
L7308	COIL, RADIO FREQUENCY: fixed; .15 uhy; copper, silver plated; Also supplied with TMC No. AX-459, Symbol A7308.	"L" Section Tank Coil 24-28 Mc	CL-223
L7309	NOT USED		
L7310	SOLENOID, RELAY: with plunger; 230 V, 60 cps, 0.2 amps; continuous duty cycle. Also supplied with TMC No. A-2024, Symbol A7306.	Bandswitch Release System	SZ-100
L7311	NOT USED		

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
L7312	COIL, RADIO FREQUENCY: fixed 33uh nom inductance; air wound.	Decoupling	CL-271
L7313	COIL, RADIO FREQUENCY: fixed; .175 uh, copper, silver plated. Also supplied with TMC No. AS-125, Symbol A7307.	24-28 Mc Tank Coil	CL-276
L7314	COIL, RADIO FREQUENCY: fixed; 10.5 uhy, current rating, 300 amps; tapped; copper, silver plated; dim., including taps, 13-1/4" dia. x 16-3/4" lg. Also supplied with TMC No. AS-125, Symbol A7307.	Pi Section Main Tank Coil, 2-24 Mc	CL-277
L7315	NOT USED		
L7316	COIL, RADIO FREQUENCY: fixed; .11 uhy; copper, silver plated; over-all dim., 1" x 5" x 6-1/4". Also supplied with TMC No. AX-459, Symbol A7308.	L Section Tank Coil	CL-278
L7317	COIL, RADIO FREQUENCY: fixed; 5.5 uhy; 11 turns, tapped; copper, silver plated; dim., excluding taps, 4-1/4" dia. x 10" lg. Also supplied with TMC No. AX-459, Symbol A7308.	L Section Tank Coil, 2-24 Mc	CL-324
L7318	COIL, RADIO FREQUENCY: .82 uh, ±10% at 25 mc.	p/o Harmonic Filter	CL-326
L7319	COIL, RADIO FREQUENCY: .67 uh, ±10% at 25 mc.	p/o Harmonic Filter	CL-325
MP7301	SHAFT, STRAIGHT: insulated material, G-7 Silicone Glass; 1-1/2" mon o.d. x 19-7/8" lg.; keywayed at both ends. Also supplied with TMC No. AS-125, Symbol A7307.	Main Shaft, Bandswitch	PX-538
MP7302	GEAR, WORM: pitch dia., .625"; pitch, 16; threads, double, righthand; pressure angle, 14-1/2 deg.; face, 1"; .3125" sq. center hole; material oil hardened steel. Also supplied with TMC No. A-2024, Symbol A7306.	Drive Gear, Bandswitch	GR-151-3

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
MP7303	GEAR, WORM WHEEL: pitch dia., 3.750"; pitch, 16; threads, double, right hand; pressure angle, 14-1/2 deg.; face, 5/16" no. of teeth, 60; hub, 1-1/2" dia. x 7/16"; .753" dia. key-wayed center hole; material, oil hardened steel. Also supplied with TMC No. A-2024, Symbol A7306.	Drive Gear, Bandswitch	GR-151-1
MP7304	NOT USED		
MP7305	COUNTER, ROTATING, FIXED MOUNTING: 3 wheel, non-reset; 0 to 9 each wheel.	PA Tune Capacitor Counter	CY-105
MP7306	Same as MP7305.	PA Load Capacitor Counter	
MP7307	COUNTER, ROTATING, FIXED MOUNTING: 3 wheel, non-reset; 1st position, 2-3 mc; 2nd position, 3-4 mc; 3rd position, 4-5 mc; 4th position, 5-7 mc; 5th position, 7-13 mc; 6th position, 13-18 mc; 7th position, 18-24 mc; 8th position, 24-28 mc. Black figures on white background.	Bandswitch Frequency Counter	AC-175
P7301	CONNECTOR, PLUG, ELECTRICAL: QDL; male; single connector; for RG-18/U, RG-35/U or RG-164/U cable. Also supplied with TMC No. CA-561, Symbol W7301.	Emergency Output Connector	PL-136
P7302	CONNECTOR, PLUG, ELECTRICAL: male; 4 contacts.	Top Fan Plug	MS3106B14S-2P
P7303 thru P7306	NOT USED		
P7307	CONNECTOR, PLUG, ELECTRICAL: RF; coaxial.	Plate Monitor	PL-169
P7308	CONNECTOR, PLUG, ELECTRICAL: angle type. Also supplied with TMC No. CA-577-2, Symbol W7303.	SWR Reflected Power	PL-192

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
P7309	Same as P7308. Also supplied with TMC No. CA-577-1, Symbol W7302.	SWR Forward Power	
P7310	CONNECTOR, PLUG, ELECTRICAL: coaxial, male. Also supplied with TMC No. CA-577-2, Symbol W7303.	SWR Reflected Power	UG-88/U
P7311	Same as P7310. Also supplied with TMC No. CA-577-1 Symbol W7302.	SWR Forward Power	
R7301	RESISTOR, FIXED, COMPOSITION: 470 ohms; ±5%, 1/2 watt.	Volt. Divider Plate Monitor	RC20GF471J
R7302	RESISTOR, FIXED, COMPOSITION: 47 ohms; ±5%, 1/2 watt.	Volt. Divider Plate Monitor	RC20GF470J
R7303	RESISTOR, FIXED, WIREWOUND: 3000 ohms; ±5%; 10 watts.	AC Power Light Dropping Res.	RW-109-30
R7304	Same as R7303.	Tube Light Dropping Res.	
R7305	Same as R7303.	Operate Light Dropping Res.	
R7306	Same as R7303.	Plate On Light Dropping Res.	
R7307	RESISTOR, FIXED, WIREWOUND: 20,000 ohms; ±5%, 10 watts.	Thermostat Dropping	RW-109-37
S7301	NOT USED		
S7302	NOT USED		
S7303	SWITCH, INTERLOCK: push to operate; total travel approx. 0.312"; 15 amp, 120, 250 VAC; 2 amps resistive at 250 VDC.	PA Deck Interlock	SW-230
S7304	SWITCH, MICRO: push; 10 amps at 125/250 VAC; 1/2 amp at 125 VDC. Also supplied with TMC No. A-2024, Symbol A7306.	PA Bandswitch	SW-189
S7305	SWITCH, THERMOSTATIC: SPST; closes at 200° ±6° F; opens at 185° ±6° F.	PA Tube Protect	SS-104

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
S7306	Same as S7303.	Emergency Output Protection	
S7307	SWITCH SECTION, ROTARY: "Pi" Section; 1 moving contact, 9 fixed contacts; consists of: A. Symbol E7311, Contact, Electrical, TMC No. AX-268. B. Symbols E7312 thru E7319, Contact, Electrical, TMC No. AX-267. C. Symbol E7320, Rotor, TMC No. RO-102. D. Symbol E7321, Insulator, Disc, TMC No. WS-107. E. Various hardware.	Pi Section Bandswitch	AX-266
S7308	NOT USED		
S7309	SWITCH SECTION, ROTARY: "L" Section; 1 moving contact, 6 fixed contacts; consists of: A. Symbol E7322 thru E7326, Contact, Electrical, TMC No. AX-339. B. Symbol E7327, Rotor, TMC No. RO-103. C. Symbol E7328, Insulator, Disc, TMC No. WS-132. D. Symbol E7334, E7335, Post, Electrical-Mechanical, common contact, TMC No. TE1032AP74R. E. Various hubs, plates and hardware.	L Section Bandswitch	AX-458
V7301	ELECTRON TUBE: triode.	Power Amplifier	ML-6697
W7301	CABLE ASSEMBLY, RADIO FREQUENCY: consists of MIL type RG-17/U coaxial cable, 1 each connector, TMC No. PL-136, Symbol P7301; 29-7/8" lg. over-all including connector.	10 KW Emergency Output	CA-561
W7302	CABLE ASSEMBLY, RADIO FREQUENCY: consists of MIL type RG-58/U coaxial cable, 1 connector, TMC No. PL-192, Symbol P7309, 1 connector, TMC No. UG-88/U, Symbol	Forward Power Interconnect	CA-480-112-8.50

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
W7302 (cont)	P7311; 8-1/2" lg. over-all.		
W7303	CABLE ASSEMBLY, RADIO FREQUENCY: consists of MIL type RG-58/U coaxial cable, 1 connector, TMC No. PL-192, Symbol P7308, 1 connector, TMC No. UG-88/U, Symbol P7310; 13-1/2" lg. over-all.	Reflected Power Interconnect	CA-480-112-13.50
XI7301	LIGHT, INDICATOR: w/frosted amber lens; screw type socket.	AC Power	TS-136-3FS
XI7302	LIGHT, INDICATOR: w/frosted green lens; screw type socket.	Tune	TS-136-2FS
XI7303	LIGHT, INDICATOR: w/frosted blue lens; screw type socket.	Operate	TS-136-4FS
XI7304	LIGHT, INDICATOR: w/frosted red lens; screw type socket.	Plate ON Drive	TS-136-1FS
XZ7301	SOCKET, ELECTRON TUBE: octal.	Drive Network Socket	TS101P01
XZ7302	Same as XZ7301.	Plate Monitor Network Socket	
Z7301	NETWORK, DETECTOR: R.F.; range - 2 to 28 mc; meters to 30 KV RF; converting RF to DC for metering circuit. (Non-repairable item)	Drive Metering Network	AX-219
Z7302	Same as Z7301.	Plate Monitor Network	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
CB7401	CIRCUIT BREAKER, triple pole, single throw; 230 VAC, 50 amps; series trip, 3 auxiliary switches mounted on rear.	Main Power ON-OFF	SW-266
CB7402	CIRCUIT BREAKER, single pole, single throw; 230 VAC, 2 amps, series trip, auxiliary SPDT switch mounted on rear.	High Voltage ON-OFF	SW-268
I7401	LAMP, neon, miniature; 105/125 V, 1/25 watt; T-3-1/4 clear bulb, bayonet base.	Interlock Indicator	BI-100-51
I7402	Same as I7401.	HV Breaker Indicator	
R7401	RESISTOR, fixed: composition; 220,000 ohms, $\pm$10%, 1/2 watt.	Interlock Indic. Dropping Resistor	RC20GF224K
R7402	Same as R7401.	HV Breaker Indic. Dropping Res.	
R7403	RESISTOR, fixed: wire wound; 100 ohms, 55 watts.	HV Protect	RW-115-101-55
R7404	Same as R7403.	HV Protect	
S7401	SWITCH, push button: momentary contact; SPST; 1 amp at 250 V, 3 amps at 125V, normally open, red button.	Ovld. Reset Switch	SW-168-SPST-2-NO-BR
S7402	SWITCH, push button: momentary contact; SPDT, heavy duty, 6 amps at 250 V, 12 amps at 125 V.	HV Breaker Reset	SW-272-R
S7403	SWITCH, toggle: SPST; 6 amps; 125 VAC; 28^{o} angle of throw, solder lug terminals.	PA Lights ON-OFF	ST-12A
S7404	SWITCH, rotary: 1 section; 12 positions, 30^{o} angle of throw.	Interlock Indicator Switch	SW-250
S7405	SWITCH, push button: momentary contact; SPST; 1 amp at 250 V, 3 amps at 125 V, normally open, black button.	Bandswitch Release	SW-168-SPST-2-NO-BB

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
XI7401	LIGHT, indicator: w/clear white lens; for miniature bayonet base, T-3-1/4 bulb.	I7401 Socket	TS-106-2
XI7402	Same as XI7401.	I7402 Socket	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C7501	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 1000 uufd, ±20%; 5000 wvdc.	AC Input Filter	CC-109-38
C7502 thru C7504	Same as C7501	AC Input Filter	
C7505	CAPACITOR, FIXED, ELECTROLYTIC: polarized, 80 mfd, 450 wvdc.	Filter Cap., 350 V.	CE51C800R
C7506	CAPACITOR, FIXED, PAPER DIELECTRIC: 10 uf; ±10%, 1000 volts, char. F.	Filter Cap 600 V.	CP70B1FG106K
C7507	NOT USED		
C7508	CAPACITOR, FIXED, MICA DIELECTRIC: 10,000 uuf, ±10%; 500 wvdc.	RF Bypass, V7506	CM-100-6
C7509	Same as C7506.	600 V Filter Cap.	
C7510	Same as C7506.	600 V Filter Cap.	
C7511	Same as C7501.	600 V Filter Cap.	
C7512	Same as C7501.	600 V Filter Cap.	
C7513	CAPACITOR, FIXED, PLASTIC DIELECTRIC: mylar; .424 uf, 200 wvdc.	Grid Bypass, V7508	CN108C4243K
C7514	NOT USED		
C7515	CAPACITOR, FIXED, MICA DIELECTRIC: 1000 uufd, ±10%; char. B; 500 wvdc.	Retune Bypass	CM20B102K
C7516	Same as C7515.	SWR Ovld. Bypass	
C7517	Same as C7508.	Bypass	
F7501	FUSE CARTRIDGE: 1/8 amp.	Low Voltage Fuse	FU-102-.125
F7502	FUSE CARTRIDGE: 1/2 amp.	Bias Fuse	FU-102-.500
F7503	FUSE CARTRIDGE: time lag; 3 amps.	AC Power	FU-102-3
I7501	LAMP, GLOW: neon; miniature; 110 volts, 1/25 watt; T-3-1/4 clear bulb; bayonet base.	Low Voltage	BI-100-51

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
I7502	Same as I7501.	Bias	
I7503	LAMP, INCANDESCENT: 6-8 V; 250 ma; T-3-1/4 clear bulb; bayonet base.	AC Power	BI-101-44
J7501	CONNECTOR, RECEPTACLE, ELECTRICAL: male, 14 contacts.	Voltage Input & Output	MS3102A20-27P
J7502	CONNECTOR, RECEPTACLE, ELECTRICAL: female, 1 contact.	B- Connector	MS3102A18-16S
L7501	COIL, RADIO FREQUENCY: fixed; 185 uhy, ±15 uhy; Q=50 or greater.	AC Input Filter	CL-178
L7502	Same as L7501.	AC Input Filter	
L7503	REACTOR: filter; 7 hy at 400 ma. In accordance with MIL-T-27A and Amend., Type TF1RX04YY.	Filter Choke	TF-5015
L7504	Same as L7501.	Filter Choke	
L7505	COIL, RADIO FREQUENCY: fixed; 2.5 millihenries.	Retune Filter	CL-140-1
L7506	Same as L7505.	SWR Filter	
R7501	RESISTOR, FIXED, WIREWOUND: 1000 ohms, ±5%, 10 watts.	Volt. Dropping, V7501	RW-109-24
R7502	RESISTOR, FIXED, COMPOSITION: 470,000 ohms, ±10%, 1/2 watt.	I7501 Volt. Dropping	RC20GF474K
R7503	RESISTOR, FIXED, COMPOSITION: 47 ohms, ±10%, 2 watts.	Volt. Dropping	RC42GF470K
R7504	RESISTOR, FIXED, WIREWOUND: 7500 ohms, ±10%, 20 watts.	Volt. Dropping	RW-110-32
R7505	RESISTOR, FIXED, COMPOSITION: 1000 ohms, ±10%, 2 watts.	V7506 Plate Dropping	RC42GF102K
R7506	Same as R7505.	Plate Dropping	
R7507	RESISTOR, FIXED, WIREWOUND: 5000 ohms, 10 watts 1-3/4 length.	Volt. Divider	RW-109-32

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
R7508	Same as R7503.	Cathode Bias Resistor	
R7509	RESISTOR, FIXED, COMPOSITION: 680,000 ohms, ±10%, 2 watts.	Volt. Divider	RC42GF684K
R7510	Same as R7503.	Volt. Divider	
R7511	RESISTOR, FIXED, COMPOSITION: 220,000 ohms, ±10%, 2 watts.	Volt. Divider	RC42GF224K
R7512	Same as R7511.	Volt. Divider	
R7513	RESISTOR, VARIABLE, COMPOSITION: 500,000 ohms, ±20%, 2 watts, with locking bushing.	Bias Adj.	RV4ATXA504B
R7514	NOT USED		
R7515	RESISTOR, FIXED, COMPOSITION: 1 megohm, ±10%, 1/2 watt.	Volt. Dropping	RC20GF105K
R7516	RESISTOR, FIXED, COMPOSITION: 330,000 ohms, ±10%, 2 watts.	V7508 Plate Dropping	RC42GF334K
R7517	Same as R7516.	V7509 Plate Dropping	
R7518	RESISTOR, FIXED, COMPOSITION: 100K ohms, ±10%, 1/2 watt.	Plate Load	RC20GF104K
R7519	Same as R7518.	Plate Load	
R7520	Same as R7513.	Retune Ovld. Adj. V7508	
R7521	RESISTOR, FIXED, COMPOSITION: 1000 ohms, ±10%, 1 watt.	Cathode Res., V7508	RC32GF102K
R7522	RESISTOR, VARIABLE, WIREWOUND: 25,000 ohms, ±10%, 4 watts, linear taper.	Cathode Volt. Adj., V7508	RA106ASXA253A
R7523	RESISTOR, FIXED, WIREWOUND: 10,000 ohms, ±5%, 10 watts.	Cathode Volt. Dropping, V7508	RW-109-34
R7524	RESISTOR, FIXED, COMPOSITION: 3300 ohms, ±10%, 2 watts.	Cathode Volt. Dropping, V7508	RC42GF332K
R7525	Same as R7524.	Cathode Volt. Dropping, V7509	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
R7526	Same as R7522.	Cathode Volt. Adj., V7509	
R7527	Same as R7523.	Cathode Volt. Dropping, V7509	
R7528	Same as R7521.	Cathode Res., V7509	
R7529	NOT USED		
R7530	RESISTOR, FIXED, COMPOSITION: 56,000 ohms, ±5%, 1 watt.	Cathode Bias Res., V7508	RC32GF563J
R7531	RESISTOR, FIXED, WIREWOUND: 3000 ohms, ±5%, 160 watts, 230 ma.	Volt. Bleeder	RW-117-21
R7532	Same as R7530.	Volt. Dropping	
R7533	RESISTOR, FIXED, COMPOSITION: 4700 ohms, ±10%, 1 watt.	Volt. Dropping	RC32GF472K
R7534	RESISTOR, FIXED, COMPOSITION: 470,000 ohms, ±10%, 1 watt.	Grid Return	RC32GF474K
S7501	SWITCH, PUSH-PULL: interlock; total travel approx. 0.312"; 15 amp, 120, 250 VAC; 2 amps resistive at 250 VDC.	Protective Interlock	SW-230
T7501	TRANSFORMER, POWER, STEP-UP AND STEP-DOWN: primary 1-4 230 VAC; secondary - terminals 5-7 700 V at 50 ma CT; terminals 8-10 1500 V at 400 ma CT; terminals 11-13 5 V at 6 amps CT; terminals 14-15 6.3 V at 6 amps; terminals 16-17 6.3 V at 2 amps. In accordance with MIL-T-27A and Amend., Type TF1RX02YY,	AC Input Transformer	TF-216
V7501	ELECTRON TUBE: full wave rectifier, 7 pin miniature.	Rectifier, +350 V	6X4
V7502	ELECTRON TUBE: full wave rectifier, octal base.	Rectifier, +600 V	5R4GY
V7503	Same as V7502.	Rectifier, +600 V	
V7504	ELECTRON TUBE: voltage regulator; 7 pin miniature.	Volt. Reg.	OA2

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
V7505	Same as V7504.	Volt. Reg.	
V7506	ELECTRON TUBE: sharp cutoff RF pentode; 7 pin miniature.	Volt. Reg. +600 V	6AU6
V7507	ELECTRON TUBE: twin power triode.	Volt. Reg. +600 V	6336A
V7508	ELECTRON TUBE: duo triode; 9 pin miniature.	Retune DC Amplifier	12AT7
V7509	Same as V7508.	SWR DC Amplifier	
XC7501 thru XC7504	NOT USED		
XC7505	SOCKET, ELECTRON TUBE: octal, high crown.	Capacitor Socket, C7505	TS101P01
XF7501	FUSEHOLDER: fuse with 220 K resistor and indicator.	Fuse Socket F7501	FH-104-3
XF7502	Same as XF7501.	Fuse Socket F7502	
XF7503	Same as XF7501.	Fuse Socket F7503	
XI7501	LIGHT, INDICATOR: w/clear white lens, for miniature bayonet base, T-3-1/4 bulb.	Lamp Socket, I7501	TS-106-2
XI7502	Same as XI7501.	Lamp Socket, I7502	
XI7503	LIGHT, INDICATOR: w/red frosted lens; for miniature bayonet base, T-3-1/4 bulb.	Lamp Socket, I7503	TS-106-1
XV7501	SOCKET, ELECTRON TUBE: 7 pin miniature.	Tube Socket V7501	TS102P01
XV7502	Same as XC7505.	Tube Socket V7502	
XV7503	Same as XC7505.	Tube Socket V7503	
XV7504	Same as XV7501.	Tube Socket V7504	
XV7505	Same as XV7501.	Tube Socket V7505	
XV7506	Same as XV7501.	Tube Socket V7506	
XV7507	Same as XC7505.	Tube Socket V7507	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
XV7508	SOCKET, ELECTRON TUBE: 9 pin miniature.	Tube Socket V7508	TS103P01
XV7509	Same as XV7508.	Tube Socket V7509	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
E7601	BOARD, terminal: barrier type; 14 6-32 x 1/4" binding head machine screws.	Relay Terminal Strip	TM-100-14
E7602	BOARD, terminal: barrier type; 8 6-32 x 1/4" binding head machine screws.	Relay Terminal Strip	TM-100-8
E7603	Same as E7602.	Relay Terminal Strip	
E7604	Same as E7602.	Relay Terminal Strip	
E7605	BOARD, terminal: barrier type; 10 6-32 x 1/4" binding head machine screws.	Relay Terminal Strip	TM-100-10
E7606	Same as E7601.	Relay Terminal Strip	
F7601	FUSE, cartridge type: time delay, 5 amps.	Top Fan Fuse	FU-102-5
F7602	FUSE, cartridge type: time delay, 2 amps.	Blower Delay Fuse	FU-102-2
F7603	Same as F7602.	Elapse Meters Fuse	
F7604	Same as F7602.	Time Delay Fuse	
F7605	Same as F7602.	Shorting Relay Fuse	
F7606	Same as F7602.	Blower Contactor Fuse	
I7601	LAMP, neon: double candlebra; 110 volts, 1/4 watt; T-4-1/2 clear bulb; bayonet base.	Plate Overload	BI-103-2
I7602	Same as I7601.	Grid Overload	
I7603	Same as I7601.	Retune	
I7604	Same as I7601.	SWR	
I7605	Same as I7601.	Bias	
I7606	LAMP, neon: miniature; 110 volts, 1/25 watt; T-3-1/4 clear bulb; bayonet base.	Drive Interlock	BI-100-51
I7607	Same as I7601.	Final Filament	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
J7601	CONNECTOR, receptacle: male; 35 contacts.	Power In & Out	MS3102A32-7P
J7602	CONNECTOR, receptacle: male; 4 contacts.	Power In & Out	MS3102A22-10P
K7601	RELAY ASSEMBLY consists of armature relay with cabling. Contacts - silver cadmium rated at 25 amps, 125 VAC resistive: latch relay - 1100 ohms, ±10%; unlatch relay 0-93 ohms, ±10%; latch operate 220 V, 60 cps AC or less.	Plate Overload	AR-117
K7602	RELAY ASSEMBLY, consists of armature relay with cabling. Coil - latch 1100 ohms, ±10%; trip - 170 ohms, ±10%; 4 PDT; contacts - silver rated at 20 amps non-inductive load: latch operate 220 V, 60 cps AC or less.	Grid Overload	AR-119
K7603	RELAY ASSEMBLY, consists of armature relay with cabling. Coil - latch 1000 ohms, ±10%; trip - 10,000 ohms, ±10%; 4 PDT; contacts - silver rated at 20 amps non-inductive load: latch operate 220 V, 60 cps AC or less.	Retune	AR-122
K7604	Description same as K7603.	SWR	AR-121
K7605	RELAY ASSEMBLY, consists of armature relay with cabling. Coil - 11,000 ohms, ±10%, four form pile up: contacts - silver cadmium rated at 10 amps 125 VAC resistive; operate .010 amps, non-operate .009 amps.	Bias	AR-120
K7606	RELAY ASSEMBLY, consists of armature relay with cabling. Contacts - silver cadmium rated at 25 amps; coil - 1800 ohms, ±10%, operate 220 V, 50/60 cps.	Driver Interlock	AR-118
K7607	RELAY ASSEMBLY, consists of armature relay with cabling. Contacts - silver plated cadmium;	Final Filament	AR-125

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
K7607 (cont)	rated at 25 amps; coil - .01 ohms, ±10%; operate at 3 VAC at 10 amps.		
K7608	RELAY ASSEMBLY, consists of armature relay with cabling. Contacts - silver plated cadmium; rated at 25 amps; coil - .93 ohms, ±10%; operate at 1 amp DC. Consists of R7608.	Tube Protect	AR-124
K7609	RELAY ASSEMBLY, consists of armature relay with cabling. Contacts - silver plated cadmium; rated at 25 amps; coil - 2.4 ohms, ±10%; operate at 10 VAC, 0.5 amps.	Crow Bar	AR-123
M7601	METER, elapsed time: 120 volts, 50/60 cycles; standard ASA/MIL 3-1/2" (MR-36) mounting.	Filament Time	MR-125-2
M7602	TIMER, time delay: 3" dia. panel, mounting bakelite case; contacts rated at 10 amps; time cycle 5 min.; dial division - 5 seconds.	Time Delay	TI-101-4
M7603	Same as M7602.	Blower Delay	
M7604	Same as M7601.	Plate Time	
R7601	RESISTOR, variable: wire wound; .5 ohms, ±10%, 25 watts.	Plate Ovld. Adj.	RA75ASAOR5AK25
R7602	RESISTOR, variable: wire wound; 100 ohms, ±10%; 25 watts.	Grid Ovld. Adj.	RA75ASA101AK25
R7603	RESISTOR, fixed: wire wound, 30 ohms, ±5%, 10 watts.	Grid Ovld. Volt. Dropping	RW-109-46
R7604	RESISTOR, adjustable: wire wound; 15,000 ohms; ±10%; 3 watts.	Bias Relay Adj.	RA100ASSA153A
R7605	RESISTOR, fixed: wire wound; 35,000 ohms, ±5%, 10 watts.	Bias Relay Volt. Dropping	RW-109-40
R7606	Same as R7601.	Tube Protect Adj.	
R7607	RESISTOR, fixed: composition; 220,000 ohms, +10%; 1/2 watt.	Drive Interlock Indic. Volt. Dropping	RC20GF224K

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
R7608	RESISTOR, fixed: wire wound; .166 ohms, ±5%. (R7608 is p/o K7608.)	Tube Protect Relay Coil Shunt	AR-128
R7609	RESISTOR, fixed: wire wound; .185 ohms, ±5%.	K7601 Current Limiting	AR-130
S7601	SWITCH, toggle: SPST; 6 amps; 125 VAC; 28° angle of throw; solder lug terminals.	Driver Interlock	ST-12A
XI7601	HOLDER, lamp: bayonet base; 105/125 volts, with white frosted lens.	Plate Overload	TS-137-7FB4
XI7602	Same as XI7601.	Grid Overload.	
XI7603	Same as XI7601.	Retune	
XI7604	Same as XI7601.	SWR	
XI7605	Same as XI7601.	Bias	
XI7606	LIGHT, indicator: w/clear white lens; for miniature base T-3-1/4 bulb.	Driver Interlock	TS-106-2
XI7607	Same as XI7601.	Final Filament	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
B8101	GEARCASE-MOTOR: 240 VAC at 5 amps. For use with, but not part of, SW-271, Symbol CB8101.	Main Power Breaker Motor	MO-110
B8102	FAN, AXIAL: 3400 rpm, CW; 115/230 VAC.	Top Fan, PS Frame	BL-108
C8101	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 1000 uufd, ±20%, 5000 wvdc.	AC Filter	CC-109-38
C8102 thru C8106	Same as C8101.	AC Filter	
C8107	CAPACITOR, FIXED, PAPER DIELECTRIC: oil filled, 4 ufd, 15,000 wvdc.	AC Filter	CP-107
C8108	Same as C8107.	AC Filter	
C8109	NOT USED		
C8110	CAPACITOR, FIXED, PAPER DIELECTRIC: 4 uf, ±10%; 600 wvdc hermetically sealed cylindrical metal case.	Fan Capacitor	CP41B1FF405K
CB8101	CIRCUIT BREAKER: magnetic trip; 3 pole; 600 VAC, 225 amp; used with, but not part of, MO-110, Symbol B8101.	Main Power Breaker	SW-271
E8101	CONTACT: spring loaded, nickel plated beryllium copper; 2-1/4" x 1-1/4" x 1" o/a.	B-, Crowbar	AX-153
E8102	Same as E8101.	HV, Crowbar	
E8103	Same as E8101.	HV, Crowbar	
E8104	Same as E8101.	B-, HVR	
E8105 thru E8107	Same as E8101.	HVR Filament	
E8108	Same as E8101.	HVR High Voltage	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
E8109 thru E8111	Same as E8101.	HVR HV AC	
E8112	TERMINAL BOARD: barrier type, 4 terminals.	Timer Terminal Strip	TM-102-4
E8113	TERMINAL BOARD: barrier type, 8 terminals.	Shorting Relay Terminal Strip	TM-102-8
E8114	CONTACT, ELECTRICAL: spring wiper type; beryllium copper, nickel plated.	PA Output Contact	AX-221
E8115	CONTACT ASSY., balanced output, brass, rhodium plated contact; brass, gold plated threaded rod.	Balanced Output Contacts	AX-223
E8116	Same as E8115.	Balanced Output Contacts	
E8117	Same as E8112.	Meter Cal. Res. Bd.	
E8118	Same as E8112.	Top Fan Term. Bd.	
E8119	TERMINAL BOARD: barrier type, 6 terminals.	External 200K Interlock	TM-100-6
E8120	Same as E8101.		
F8101	FUSE, CARTRIDGE: time-lag; 3 amp.	Top Fan Fuse	FU-102-3
F8102	FUSE, CARTRIDGE: 5 amp.	Ext. Interlock Relay Fuse	FU-102-5
F8103	Same as F8102.	Ext. Interlock Relay Fuse	
I8101	LAMP, INCANDESCENT: red; 110/115 V, 25 watts; standard screw base; 4" x 1-7/8" o/a.	HV Warning	BI-106-3
J8101	CONNECTOR, RECEPTACLE, ELECTRICAL: male; 35 contacts.	Interconnect Receptacle PA Frame	MS3102A32-7P
J8102	CONNECTOR, RECEPTACLE, ELECTRICAL: female; 35 contacts.	Interconnect Receptacle PA Frame	MS3102A32-7S
J8103	CONNECTOR, RECEPTACLE, ELECTRICAL: female; rectangular; 17 contacts.	Interconnect Receptacle Tuner Unit	JJ-181

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
J8104	CONNECTOR, RECEPTACLE, ELECTRICAL: female; 4 contacts.	Interconnect Receptacle PA Frame	MS3102A22-10S
K8101	RELAY, CONTACTOR: 208-220 VAC, 50/60 cycle, 3 phase; 8 hour rating; 150 amp open; silver alloy contacts.	Surge Resistor Contactor	RL-138
K8102	Same as K8101.	Main Power Contactor	
L8101	REACTOR, FILTER: 0.4 hy at 4.5 amps.DC. In accordance with MIL-T-27A and Amend., Type TF1RO4YY.	AC Filter Choke	TF-5016
L8102	COIL, RADIO FREQUENCY: line filter; L - Nom. 177 uh (175-179); Q greater than 10; F - 2 Mc.	AC Filter	CL-155
L8103	Same as L8102.	AC Filter	
L8104	Same as L8102.	AC Filter	
L8105	SOLENOID, RELAY: with plunger; 230 V, 60 cps, 0.2 amps; continuous duty cycle.	Shorting Relay Actuator	SZ-100
M8101	TIME DELAY: 20 seconds; quick make, quick break, 250 V, 5 amp switches.	Contactor Delay	TI-100
P8101	CONNECTOR, PLUG, ELECTRICAL: female; pin type, 5 contacts.	Crowbar Plug	MS3106B22-12S
R8101	RESISTOR, FIXED, WIREWOUND: 1.0 ohms, 14 watts.	Bleeder/Divider Resistor	RW119G1RO
R8102	RESISTOR, FIXED, WIREWOUND: 18,000 ohms, 140 watts, char. F.	Bleeder/Divider Resistor	RW118F183
R8103 thru R8111	Same as R8102.	Bleeder/Divider Resistor	
R8112	RESISTOR, FIXED, WIREWOUND: 140 watts, 5.0 ohms, char. F.	Bleeder/Divider Resistor	RW118F5RO
R8113	Same as R8112.	Bleeder/Divider Resistor	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
R8114	Same as R8112.	Bleeder/Divider Resistor	
R8115	RESISTOR, FIXED, FINSTRIP: 8 ohms, 1900 watts; 21" lg. x 2" wide x 1-3/8" high o/a.	Surge Protect	RR-127-3
R8116	Same as R8115.	Surge Protect	
R8117	Same as R8115.	Surge Protect	
R8118	NOT USED		
R8119	RESISTOR, FIXED, COMPOSITION: 33 ohms, ±10%, 1/2 watt.	Plate Meter Volt. Dropping	RC20GF330K
R8120	Same as R8119.	Plate Meter Volt. Dropping	
R8121	RESISTOR, FIXED, WIREWOUND: 750 ohms, 25 watts.	HV Warning Lamp Volt. Dropping	RW-111-18
S8101	SWITCH, INTERLOCK: push to operate; total travel approx. 0.312"; 15 amp, 120, 250 VAC; 2 amps resistive at 250 VDC.	Crowbar Interlock	SW-230
S8102	Same as S8101.	HVR Interlock	
S8103	Same as S8101.	Bottom Panel Interlock	
S8104	Same as S8101.	Rear Door Interlock	
S8105	SWITCH, PUSH-PULL: momentary contact; normally closed; SPST; 15 amp at 125, 250 or 460 VAC, 1/2 amp at 125 VDC, 1/4 amp at 250 VDC.	HV Interlock	SW-169
S8106	Same as S8105.	Bias Voltage ON-OFF	
T8101	TRANSFORMER, POWER, STEP-UP: primary winding 250 VAC tapped at 190 V, 208 V and 230 V; 50/60 cycle, 3 phase; secondary winding 5200 VDC at 3.67 amps; MIL-T-27 and Amend.	Main Power Transformer	TF-211
T8102	Same as T8101.	Main Power Transformer	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
T8103	Same as T8101	Main Power Transformer	
T8104	TRANSFORMER, POWER, FIXED AUTO-TRANSFORMER: tapped at 190, 200, 210, 220, 230, 240, 250 volts; 3 phase; 25 amps each phase; 50/60 cycle; insulated for 15,000 volts; MIL-T-27 and Amend., Type TF3RX01ZZ.	Filament Adj. Autotransformer	TF-212
T8105	NOT USED.		
T8106	TRANSFORMER, VARIABLE, POWER: primary 6.3 volts at 3 amps; secondary 200 volts AC, 50/60 cps; insulated for 10,000 volts AC; hermetically sealed rectangular steel case.	Trigger Transformer	TF-256
XF8101	FUSEHOLDER: bayonet base; 100/250 volts, neon lamp, clear knob, black plastic body, 13/16" x 2-13/16" o/a.	F8101 Holder	FH-104-3
XF8102	Same as XF8101.	F8102 Holder	
XF8103	Same as XF8101.	F8103 Holder	
X18101	SOCKET: bulkhead mounting; ceramic; for standard base incandescent lamp; rated for 660 watts, 250 volts.	I8101 Socket	TS-143

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
A8201	ROTOR, ELECTRICAL SWITCH: consists of 1 basic rotor, brass, silver plated and 5 contacts, TMC part no. AX-234, symbol nos. E8204 thru E8208.	S8201 Rotor	AR-127
A8202	COIL, CONTACT, and INSULATOR ASSEMBLY; consists of 1 coil, TMC p/n CL-221, symbol no. L8201; 1 contact assembly, TMC p/n AX-258, symbol no. A8203; 2 side-plates, silicone glass; 2 spring contacts, TMC p/n AX-221, symbol nos. E8201, E8202; various mtg. and retaining hardware, brass, nickel plated.	Bandswitch Coil	AC-112
A8203	CONTACT ASSEMBLY: bandswitch; consists of 1 mtg. plate, supra-mica; 4 button contacts, TMC p/n AX-233, symbol nos. E8209 thru E8212; 1 button contact with strap, TMC p/n AX-257, symbol no. E8213 This Assembly also supplied with Assembly, TMC p/n AC-112, symbol no. A8202.	Bandswitch Wafer	AX-258
C8201	NOT USED		
C8202	CAPACITOR, FIXED MICA DI-ELECTRIC: .01 uf, ±10%, 300 wvdc, char. B.	Grid Current Meter Bypass	CM35B103K
C8203	Same as C8202.	Plate Volt. Meter Bypass	
C8204	Same as C8202.	Grid Volt. Meter Bypass	
C8205	Same as C8202.	SWR Meter Bypass	
C8206	Same as C8202.	Crowbar Fil. Meter Bypass	
C8207	CAPACITOR, FIXED, VACUUM: 1000 uuf, 30 Kv, 125 amps RMS.	Coupling Cap.	CO-106-1000-30C
C8208	CAPACITOR, VARIABLE VACUUM: 50 to 2000 uuf, 10,000 volts peak, 45 amps RMS; with ex-tension shaft, pinned and key-wayed.	Balance Adj.	AM-116

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
E8201	CONTACT, ELECTRICAL: spring wiper type; beryllium copper, nickel plated. Also supplied with Assembly, TMC p/n AC-112, symbol no. A8202.	Balanced Output Contact	AX-221
E8202	Same as E8201.	Balanced Output Contact	
E8203	CONTACT, ELECTRICAL: button type; brass, rhodium plated; hardware, brass, nickel plated.	PA Output Contact	AX-222
E8204	CONTACT ELECTRICAL: leaf and shoe type; beryllium copper and brass, rhodium plated. Also supplied with Rotor, TMC p/n AR-127, symbol no. A8201.	Rotor Contact	AX-234
E8205 thru E8208	Same as E8204.	Rotor Contact	
E8209	CONTACT, ELECTRICAL: button type; brass, rhodium plated; hardware, brass, nickel plated. Also supplied with Contact Assembly, TMC p/n AX-258, symbol no. A8203.	Switch Contact	AX-233
E8210 thru E8212	Same as E8209.	Switch Contact	
E8213	CONTACT, ELECTRICAL: button type, with strap; brass, rhodium plated; hardware, brass, nickel plated. Also supplied with Contact Assembly, TMC p/n AX-258, symbol no. A8203.	Switch Contact	AX-257
I8201	LAMP, FLUORESCENT: standard cool; 1/2" dia. x 11-1/4" lg.	Meter Illuminating Light	BI-107
I8202	Same as I8201.	Meter Illuminating Light	
J8201	CONNECTOR, RECEPTACLE, ELECTRICAL: male; rectangular; 17 pin contacts.	Power Input Connector	JJ-180

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
L8201	COIL, RADIO FREQUENCY: fixed; 30 uhy total, tapped. Also supplied with Assembly, TMC p/n AC-112, symbol no. A8202.	Coil Section of A8202	CL-221
L8202	COIL, RADIO FREQUENCY: fixed; 35 uhy, 2.5 mc.	Static Choke	CL-166
M8201	VOLTMETER: AC; rectifier type; 0-12 volts AC, approx. 1000 ohms resistance; rectangular case 4.2 x 4.66.	Crowbar Filament Meter	MR-131
M8202	AMMETER: milliamps; 300-0-300; approx. 1 ohm resistance; rectangular case, 4.2 x 4.66.	Grid Current Meter	MR-130
M8203	VOLTMETER: DC; 0-20 kilovolts; approx. resistance 46 ohms, rectangular case 4.2 x 4.66.	Plate Volts Meter	MR-133
M8204	VOLTMETER: DC; negative 0-1000 volts, approx. resistance 46 ohms; rectangular case 4.2 x 4.66.	Grid Volts Meter	MR-134
M8205	NOT USED		
M8206	NOT USED		
M8207	VOLTMETER: SWR; movement 0-100 microamps DC, 1800 ohm resistance; standard commercial rectangular steel case.	SWR Relay Meter	MR-165
MP8201	COUNTER, ROTATING, FIXED MOUNTING: 3 wheel; non-reset type; 0 to 9 each wheel.	Bal. Capacitor Counter	CY-105
MP8202	NOT USED		
MP8203	COUNTER, ROTATING, FIXED MOUNTING: 3 wheel; non-reset type; 1st position, 2-12 mc; 2nd position, blank; 3rd position, 12-20 mc; 4th position, 20-28 mc.	Bandswitch Counter	AC-139
S8201	STARTER, FLUORESCENT LAMP: 8 watts; 13/16" dia. x 1-1/2" lg.	Lamp Starter	PO-170

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
S8202	Same as S8201.	Lamp Starter	
S8203	SWITCH, MICRO, PUSH-PULL: 10 amps at 125/250 VAC; 1/2 amp at 125 VDC.	Bandswitch Interlock	SW-189
S8204	SWITCH, ROTARY: band. Not a replaceable item. Rotor - Symbol No. A8201 Wafer - Symbol No. A8203	Bandswitch	c/o A8201 and A8203
T8201	BALLAST, FLUORESCENT LAMP: 8 watts; 118 volts, 0.17 amps, 60 cps.	Lamp Ballast	PO-169
T8202	Same as T8201.	Lamp Ballast	
XI8201 A, B	SOCKET, FLUORESCENT LAMP: 75 watts; 250 volts.	Lamp Socket	TS-141
XI8202 A, B	Same as XI8201.	Lamp Socket	
XS8201	SOCKET, STARTER, FLUORESCENT: 60 watts, 250 volts.	Starter Socket	TS-140
XS8202	Same as XS8201.	Starter Socket	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C8301	CAPACITOR, fixed; ceramic; 1000 uufd, ±20%, 5000 wvdc.	Filter Bypass	CC-109-38
C8302 thru C8304	Same as C8301.	Filter Bypass	
C8305	NOT USED.		
E8301	FEED-THRU, high voltage: ceramic insulated; nickel plated brass.	B- Contact	AX-220
E8302	Same as E8301.	HV Contact	
E8303	Same as E8301.	HV Contact	
E8304	CLIP, electrical: white ceramic; phosphor bronze spring clip to fit a 9/16" dia. tube cap.	V8301 Plate Cap.	HB-102-1
F8301	FUSE, cartridge type: 1.5 amps.	Filament Fuse	FU-102-1.5
I8301	LAMP, neon; miniature; 105/125 V, 1/25 watt, T-3-1/4 clear bulb, bayonet base.	Power Light	BI-100-51
J8301	CONNECTOR, receptacle, male: 5 pins, three #16, A, C, D; two #8, B & E; voltage rating 3500 V.	AC Input Connector	MS3102A22-12P
L8301	COIL, R.F.: fixed; 180 uhy, ±10 uhy, Q = 50.	AC Filter Coil	CL-178
L8302	Same as L8301.	AC Filter Coil	
R8301	RESISTOR, fixed: wirewound; glass case; 5 ohms, 140 watts, char. F.	Plate Dropping	RW118F5R0
R8302	Same as R8301.	Plate Dropping	
R8303	Same as R8301.	Plate Dropping	
R8304	RESISTOR, variable: wirewound; 2500 ohms, ±10%, 25 watts.	Grid Leak Resistor	RA75AXA252AK25
R8305	RHEOSTAT, sliding contact type: 2 ohms, 75 watts, 6.120 maximum amps; 28 steps; slotted shaft.	Reservoir Adj.	RP-101-3-S

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
R8306	RESISTOR, fixed: composition; 220,000 ohms, ±10%, 1/2 watt.	Power Light Dropping	RC20GF224K
R8307	RESISTOR, fixed: composition; 1000 ohms, ±10%, 1/2 watt.	Mtr. Volt. Drop.	RC20GF102K
R8308	Same as R8307.	Mtr. Volt. Drop.	
R8309	Same as R8307.	Mtr. Volt. Drop.	
S8301	SWITCH, toggle: DPDT; 3 amp, 250 V, (one pole unused).	Reservoir - Filament Switch	ST-22N
T8301	TRANSFORMER, power distributing: step-down; terminals 1-2 primary 220 VAC; terminals 3-4 secondary 6.3 V at 25 amps; terminals 5-6 secondary 5.5 V at 7.0 amps. In accordance with MIL-T-27A, Type TF1RX01YY.	Filament Transformer	TF-214
V8301	TUBE, electron: crowbar; hydrogen thyratron.	HV Discharge Tube	7568
XF8301	FUSEHOLDER: bayonet base; 100/250 volts, neon lamp, clear knob, black plastic body, 13/16" x 2-13/16" o/a.	Socket, Fuse	FH-104-3
XI8301	SOCKET, lamp: with red frosted lens; for miniature bayonet base, T-3-1/4 bulb.	Socket, I8301	TS-106-1
XV8301	SOCKET, tube: 5 pin giant.	Socket, V8301	TS-125-2

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C8401	CAPACITOR, fixed: ceramic; 1000 uufd, ±20%, 500 wvdc.	Bypass	CC-109-38
C8402 thru C8406	Same as C8401.	Bypass	
E8401	CLIP, electrical: white ceramic; phosphor bronze spring.	V8401 Plate Cap	HB-102-1
E8402	Same as E8401.	V8402 Plate Cap.	
E8403	Same as E8401.	V8403 Plate Cap	
E8404	Same as E8401.	V8404 Plate Cap	
E8405	Same as E8401.	V8405 Plate Cap	
E8406	Same as E8401.	V8406 Plate Cap	
E8407	INSULATOR, ceramic: glazed; feed-thru type.	V8401 Feed-Thru	AX-228
E8408	Same as E8407.	V8402 Feed-Thru	
E8409	Same as E8407.	V8403 Feed-Thru	
E8410	Same as E8407.	V8404 Feed-Thru	
E8411	Same as E8407.	V8405 Feed-Thru	
E8412	Same as E8407.	V8406 Feed-Thru	
E8413	FEED-TRHU: high voltage; ceramic insulated, nickel plated brass.	B- Contact	AX-220
E8414 thru E8416	Same as E8413.	Filament Contact	
E8417	Same as E8413.	HV Contact	
E8418 thru E8420	Same as E8413.	HV AC Contact	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
F8401	FUSE, cartridge: time lag; 1 amp.	HV Filament Fuse, V8401	FU-102-1
F8402	Same as F8401.	HV Filament Fuse, V8402	
F8403	Same as F8401.	HV Filament Fuse, V8403	
F8404	Same as F8401.	HV Filament Fuse, V8404	
F8405	Same as F8401.	HV Filament Fuse, V8405	
F8406	Same as F8401.	HV Filament Fuse, V8406	
L8401	COIL, R.F.: fixed; 180 uhy, ± 10 uhy; Q = 50.	Filament Fitter	CL-178
L8402	Same as L8401.	Filament Fitter	
L8403	Same as L8401.	Filament Fitter	
T8401	TRANSFORMER, power distribution: step-down; terminals 1-2, 230 VAC; terminals 3-4 2.5 V; terminals 4-5 2.5 V; terminals 3-5 5 V at 10 amps AC plus 2 amps DC. In accordance with MIL-T-27A, Type TF1RX01YY.	Filament Transformer, V8401	TF-213
T8402	Same as T8401.	Filament Transformer, V8402	
T8403	Same as T8401.	Filament Transformer, V8403	
T8404	Same as T8401.	Filament Transformer, V8404	
T8405	Same as T8401.	Filament Transformer, V8405	
T8406	Same as T8401.	Filament Transformer, V8406	
V8401	TUBE, electron: rectifier; half wave, mercury vapor.	HV Rectifier	6895
V8402 thru V8406	Same as V8401.	HV Rectifier	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
XF8401	FUSE HOLDER, bayonet base: 100/250 volts, neon lamp, clear knob, black plastic body, 13/16" x 2-13/16" o/a.	F8401 Socket	FH-104-3
XF8402	Same as XF8401.	F8402 Socket	
XF8403	Same as XF8401.	F8403 Socket	
XF8404	Same as XF8401.	F8404 Socket	
XF8405	Same as XF8401.	F8405 Socket	
XF8406	Same as XF8401.	F8406 Socket	
XV8401	SOCKET, tube: 4 pin base; twist lock.	V8401 Socket	TS-123-206-200
XV8402	Same as XV8401.	V8402 Socket	
XV8403	Same as XV8401.	V8403 Socket	
XV8404	Same as XV8401.	V8404 Socket	
XV8405	Same as XV8401.	V8405 Socket	
XV8406	Same as XV8401.	V8406 Socket	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C8501	CAPACITOR, fixed: mica; 1000 mmfd, ±10%; char. B; 500 wvdc.	SWR Bypass	CM20B102K
C8502	Same as C8501.	Cal. Bypass	
CB8501	CIRCUIT BREAKER: three pole; 230 VAC, 15 amp; series trip.	Blower Breaker	SW-269
CB8502	CIRCUIT BREAKER: single pole; 240 VAC, 25 amp; series trip.	Final Filament Breaker	SW-270
F8501	FUSE, cartridge type: time delay; 5 amps.	Interlock Fuse	FU-102-5
F8502	Same as F8501.	Breaker Motor Fuse	
F8503	FUSE, cartridge type: time delay; 2 amps.	Lights Fuse	FU-102-2
R8501 A, B	RESISTOR, variable: dual; composition; linear, ±10%, 2 watts. R8501A (Front) 50K ohms R8501B (Rear) 12.5K ohms	Calibrate Adj.	RV-108
S8501 A, B, C	SWITCH, tap: rotary; 3 sections, 7 positions; 180° total rotation in steps of 30°; 300 volts, 25 amp AC.	Filament Adj. Switch	SW-267-7-T3
S8502	SWITCH, toggle: DPDT; normally closed, 125 VAC, 6 amp, 6 terminals; base molded phenolic (black); level-bat type, aluminum sleeve -15/32 - 32thd, slotted aluminum	SWR - Cal. Switch	ST-105
XF8501	FUSE HOLDER, bayonet base: 100/250 volts, neon lamp, clear knob, black plastic body, 13/16" x 2-13/16" o/a.	Socket, F8501	FH-104-3
XF8502	Same as XF8501.	Socket, F8502	
XF8503	Same as XF8501.	Socket, F8503	

SECTION 6
SCHEMATIC DIAGRAMS

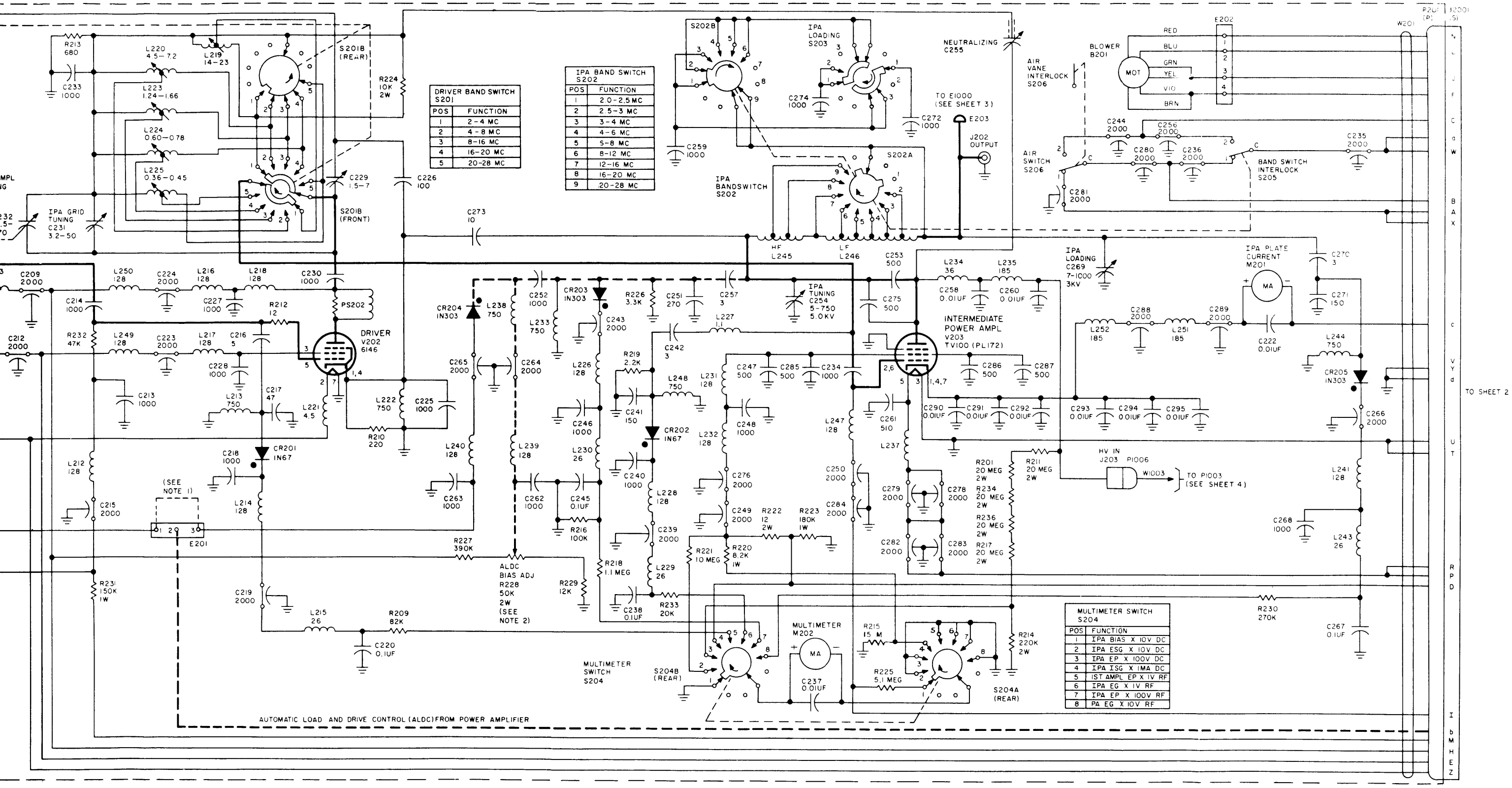
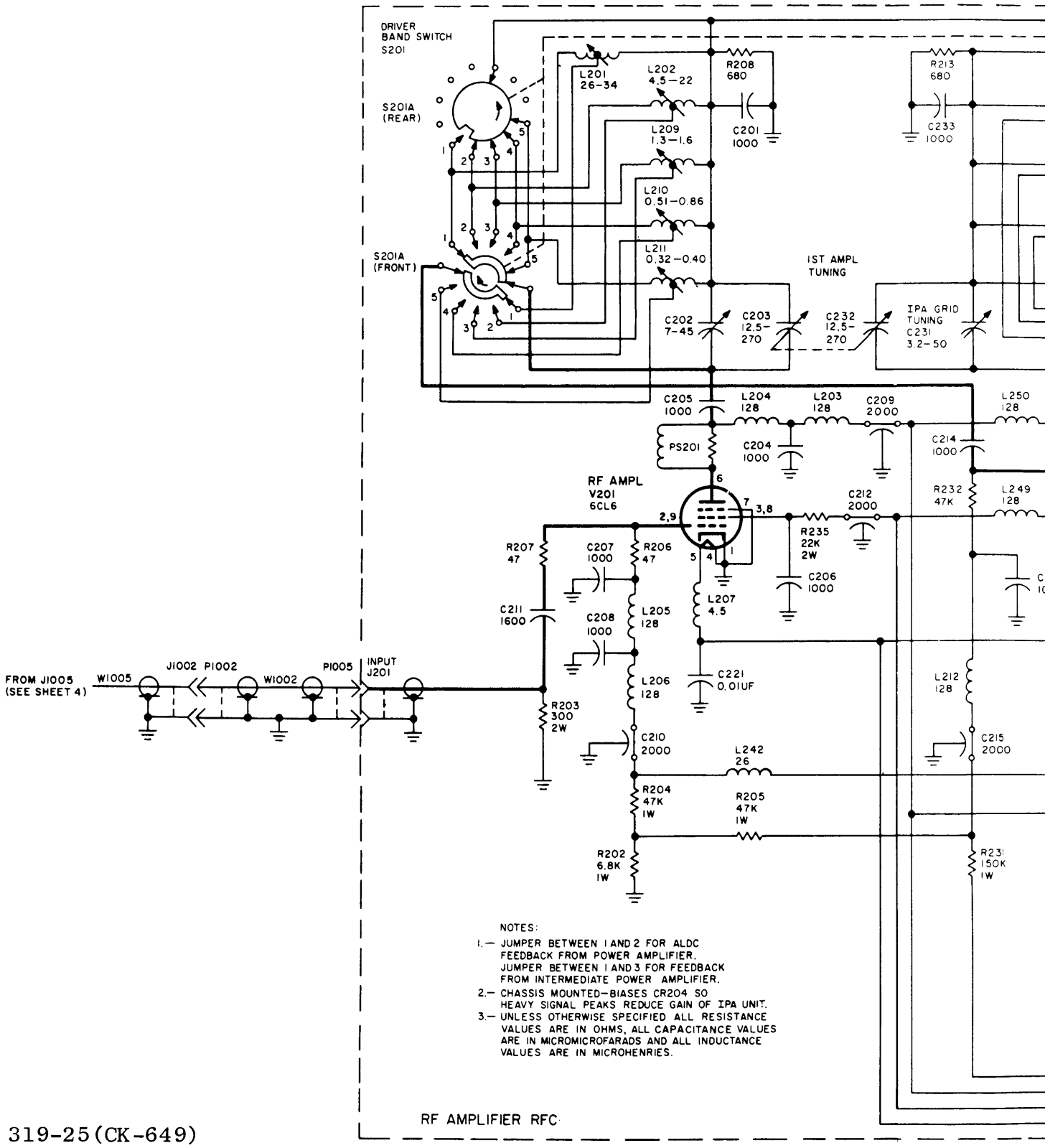


Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 1 of 9)


DRIVER BAND SWITCH S201
S201A (REAR)
S201A (FRONT)
L201 26-34
L202 4.5-22
L209 1.3-1.6
L210 0.51-0.86
L211 0.32-0.40
R208 680
C201 1000
R213 680
C233 1000
1ST AMPL TUNING
C202 7-45
C203 12.5-270
C232 12.5-270
IPA GRID TUNING C231 3.2-50
C205 1000
L204 128
L203 128
C209 2000
L250 128
PS201
C204 1000
C214 1000
RF AMPL V201 6CL6
R232 47K
L249 128
C212 2000
R235 22K 2W
C206 1000
R207 47
C207 1000
R206 47
C211 1600
C208 1000
L205 128
L207 4.5
C221 0.01UF
L206 128
L212 128
C215 2000
C210 2000
L242 26
R204 47K 1W
R205 47K 1W
R202 6.8K 1W
R231 150K 1W
R203 300 2W
FROM J1005 (SEE SHEET 4)
W1005
J1002 P1002
W1002
P1005
INPUT J201
RF AMPLIFIER RFC
NOTES:
1.— JUMPER BETWEEN 1 AND 2 FOR ALDC FEEDBACK FROM POWER AMPLIFIER. JUMPER BETWEEN 1 AND 3 FOR FEEDBACK FROM INTERMEDIATE POWER AMPLIFIER.
2.— CHASSIS MOUNTED—BIASES CR204 SO HEAVY SIGNAL PEAKS REDUCE GAIN OF IPA UNIT.
3.— UNLESS OTHERWISE SPECIFIED ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN MICROMICROFARADS AND ALL INDUCTANCE VALUES ARE IN MICROHENRIES.

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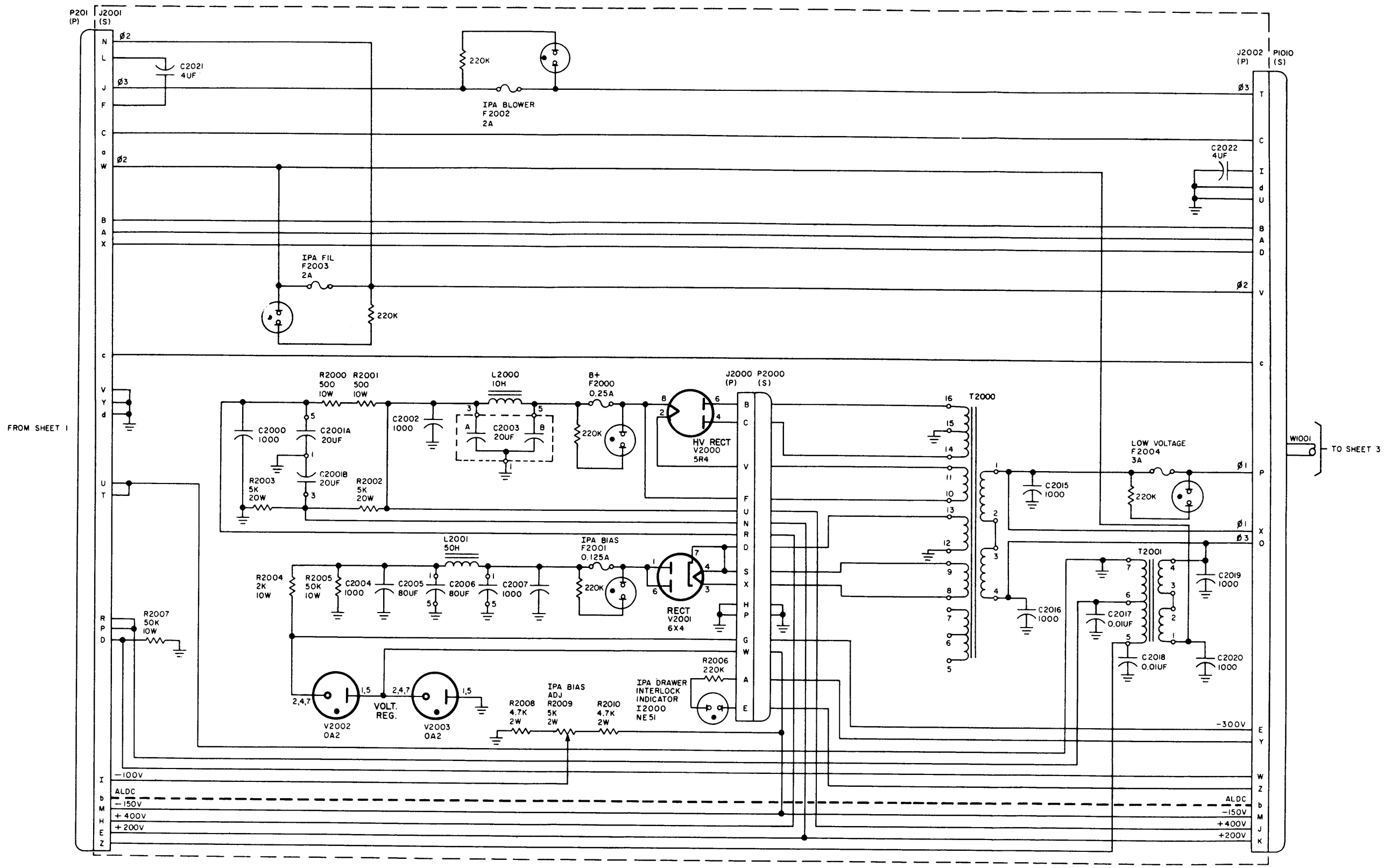


319-26(CK-649)

Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 2 of 9)

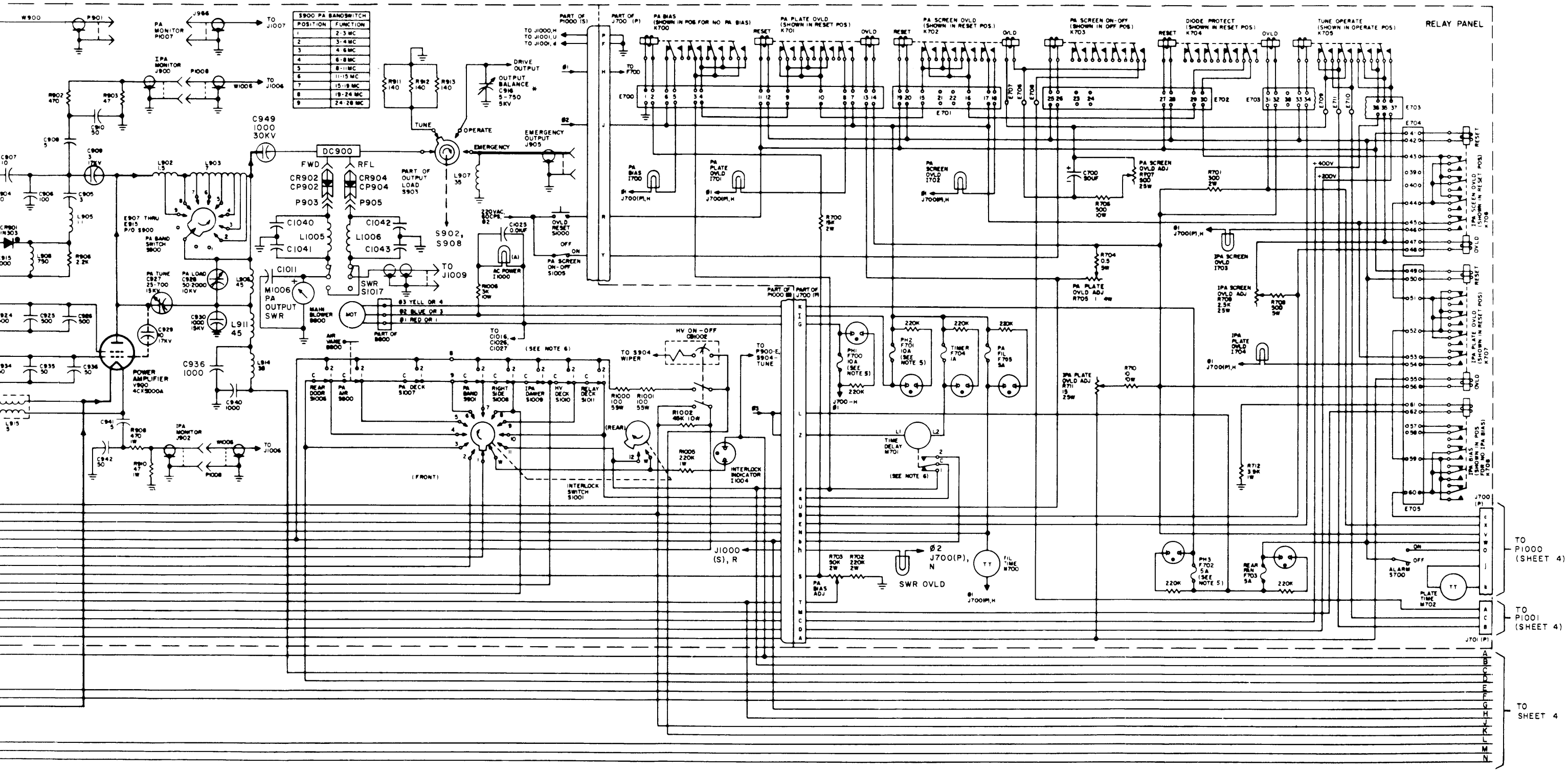
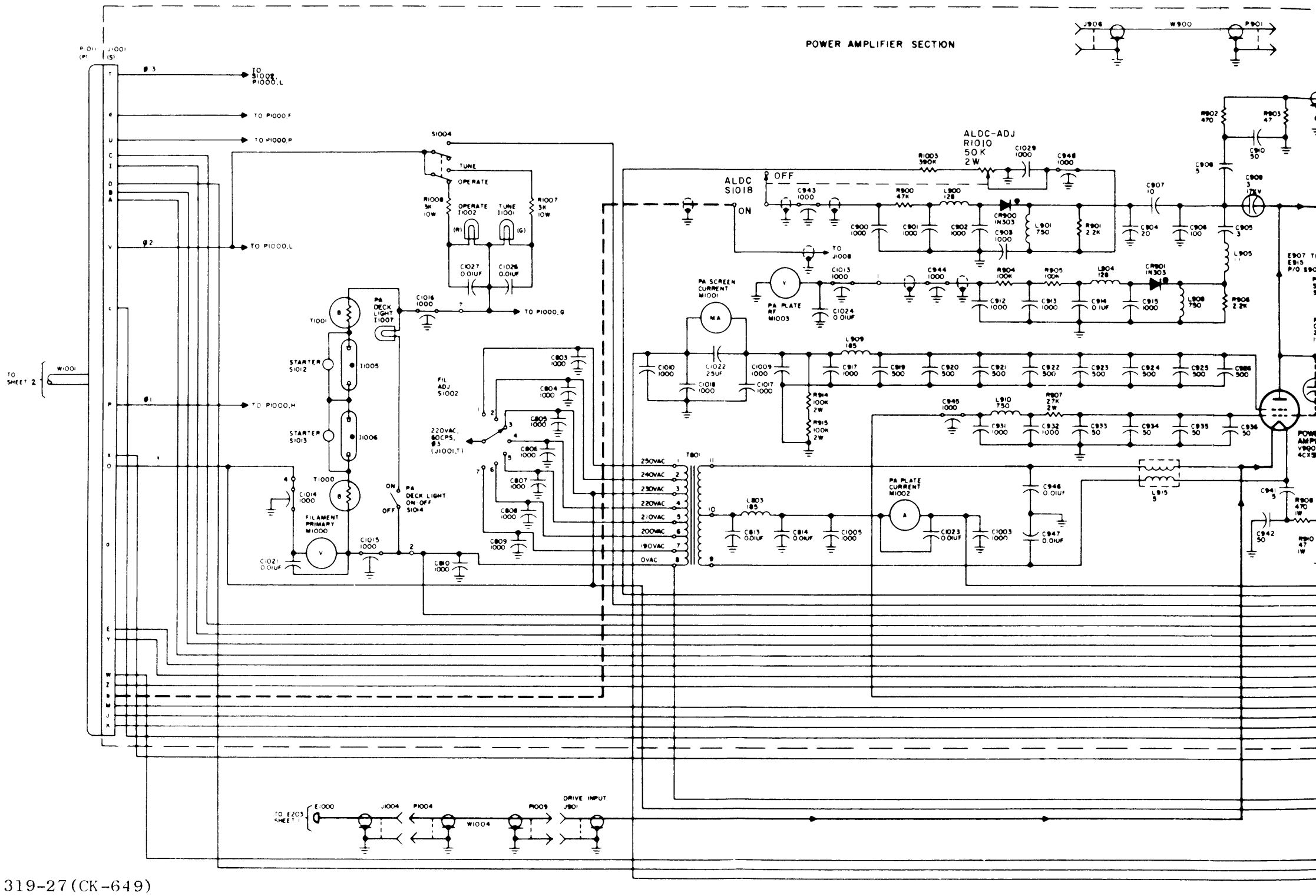


Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 3 of 9)


POWER AMPLIFIER SECTION
J906
W900
P901
ALDC-ADJ
R1010
50K
2W
ALDC
S1018
OFF
ON
TO J1008
PA SCREEN CURRENT M1001
PA PLATE RF M1003
PA PLATE CURRENT M1002
S1004
TUNE
OPERATE
OPERATE I1002
TUNE I1001
R1008 3K 10W
R1007 3K 10W
C1027 0.01UF
C1026 0.01UF
C1016 1000
TO P1000,G
PA DECK LIGHT I1007
T1001
STARTER S1012
I1005
STARTER S1013
I1006
T1000
C1014 1000
FILAMENT PRIMARY M1000
C1021 0.01UF
C1015 1000
C810 1000
PA DECK LIGHT ON-OFF S1014
ON
OFF
FIL ADJ S1002
220VAC, 60CPS, ϕ3 (J1001,T)
C803 1000
C804 1000
C805 1000
C806 1000
C807 1000
C808 1000
C809 1000
TO SHEET 2
W1001
ϕ3
ϕ2
ϕ1
TO P1000,F
TO P1000,P
TO P1000,L
TO P1000,H
TO S1008 P1000,L
TBO1
250VAC
240VAC
230VAC
220VAC
210VAC
200VAC
190VAC
0VAC
L803 185
C813 0.01UF
C814 0.01UF
C1005 1000
C1023 0.01UF
C1003 (1000)
C946 0.01UF
C947 0.01UF
L815
C941 5
C942 50
R808 470 1W
R810 47 1W
R802 470
R803 47
C810 50
C808 5
C809 3 7KV
C807 10
C804 20
C806 100
C805 3
L805 1T
R806 2.2K
C1029 1000
C948 1000
R1003 390K
R900 47K
L900 12B
C900 1000
C901 1000
C902 1000
C903 1000
CR900 IN303
L801 750
R801 2.2K
C1013 1000
C1024 0.01UF
C944 1000
R804 100K
R805 100K
L804 12B
CR901 IN303
C912 1000
C913 1000
C914 0.01UF
C915 1000
L808 750
R806 2.2K
C1010 1000
C1022 25UF
C1018 1000
C1009 1000
C1017 1000
L809 185
C917 1000
C818 500
C820 500
C821 500
C822 500
C823 500
C824 500
C825 500
C826 500
R814 100K 2W
R815 100K 2W
C945 1000
L810 750
R807 27K 2W
C931 1000
C932 1000
C933 50
C934 50
C935 50
C936 50
TO E203 SHEET 11
E1000
J1004
P1004
W1004
P1009
DRIVE INPUT J801

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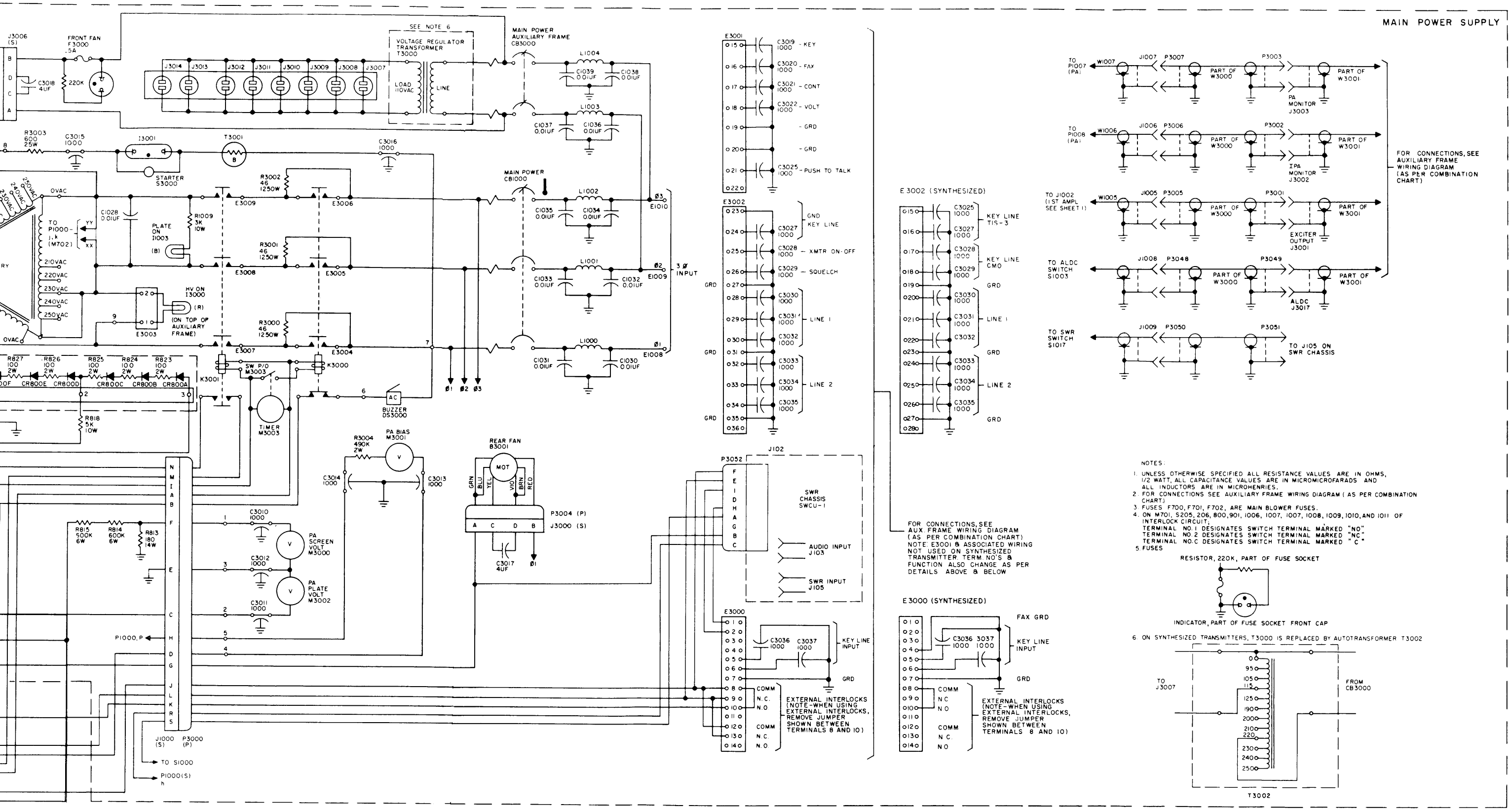
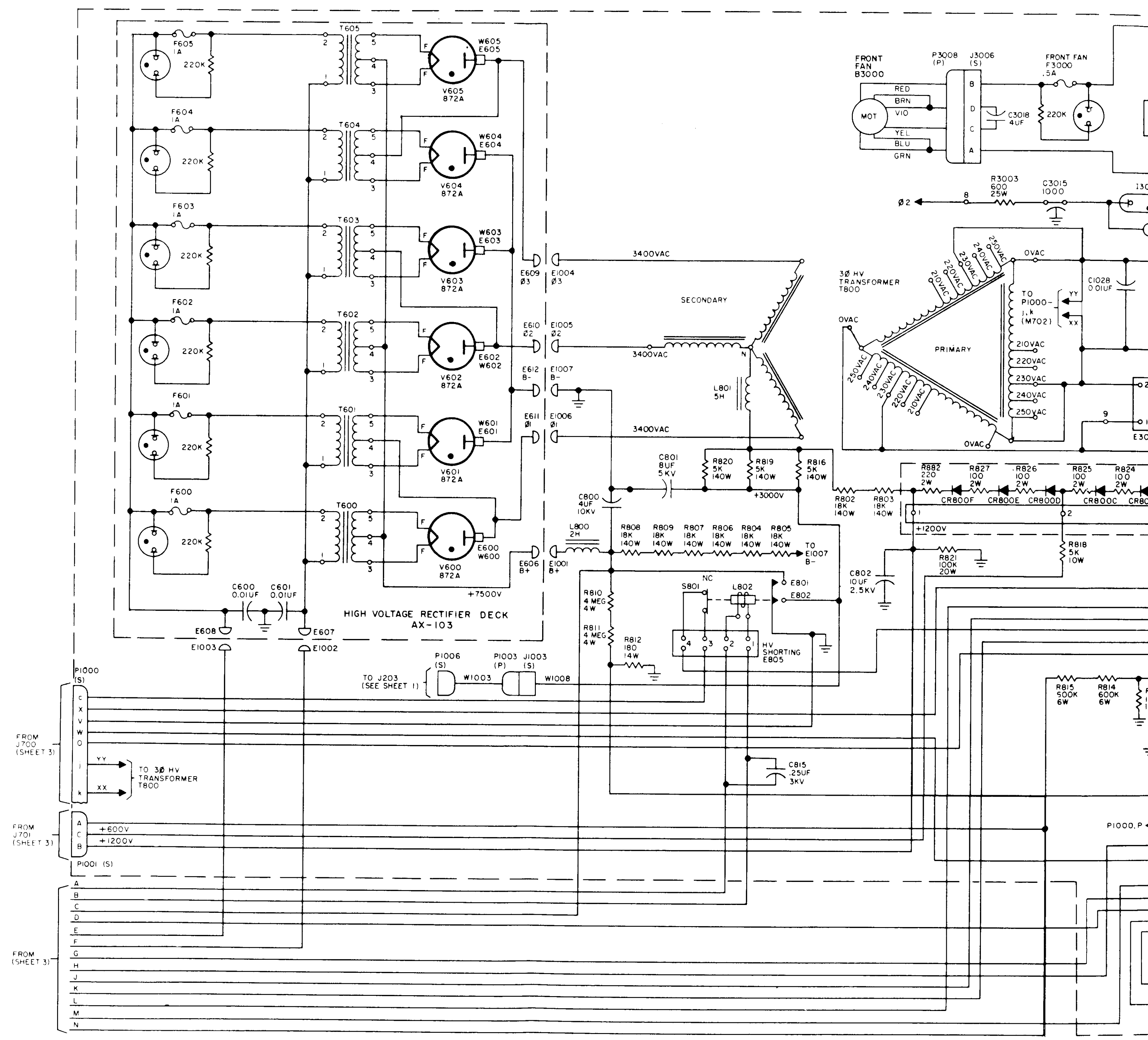


Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 4 of 9)


HIGH VOLTAGE RECTIFIER DECK
AX-103
3∅ HV TRANSFORMER T800
PRIMARY
SECONDARY
3400VAC
FRONT FAN B3000
FRONT FAN F3000 .5A
+7500V
+3000V
+1200V
+600V
HV SHORTING E805
TO J203 (SEE SHEET 1)
TO 3∅ HV TRANSFORMER T800
FROM J700 (SHEET 3)
FROM J701 (SHEET 3)
FROM (SHEET 3)

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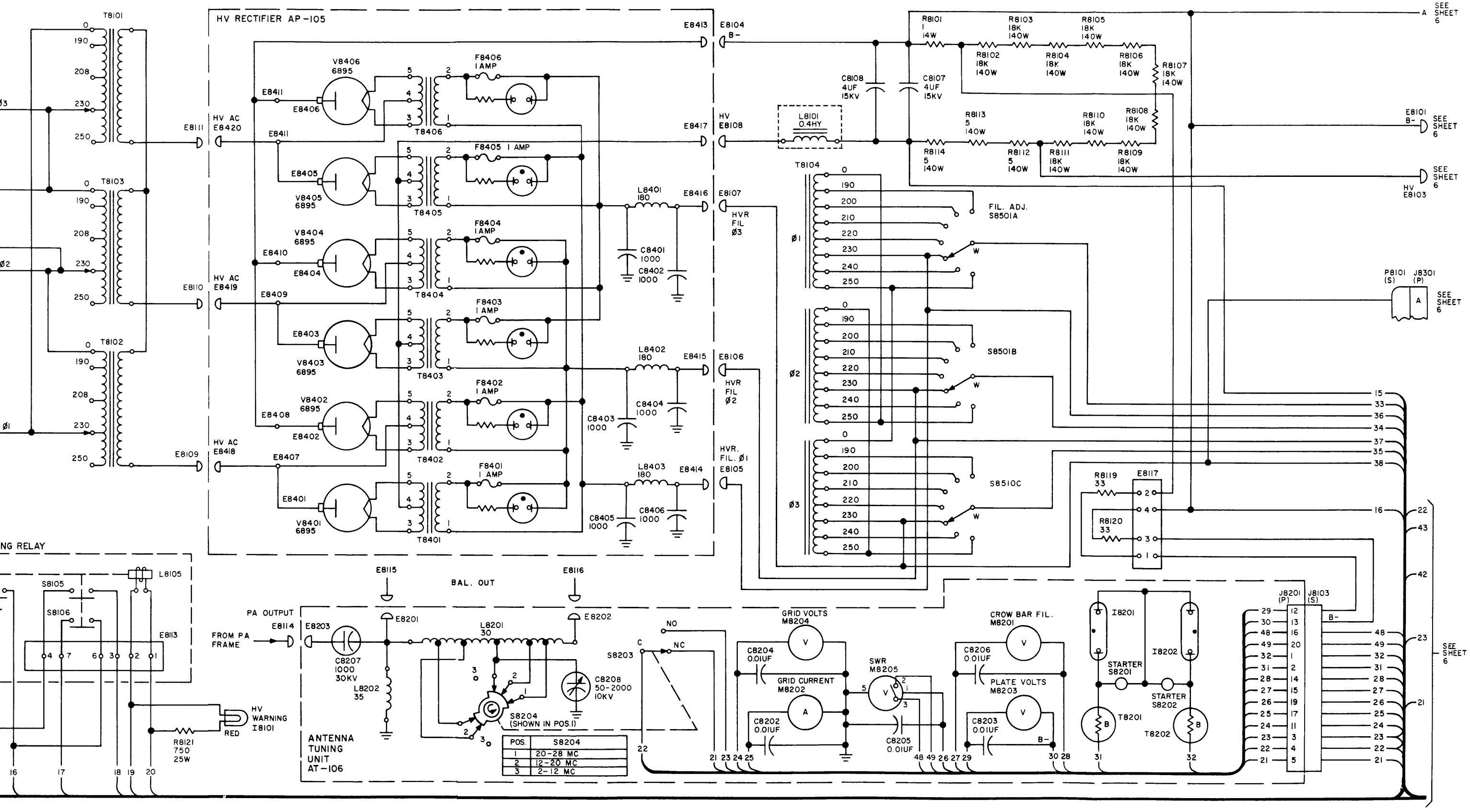
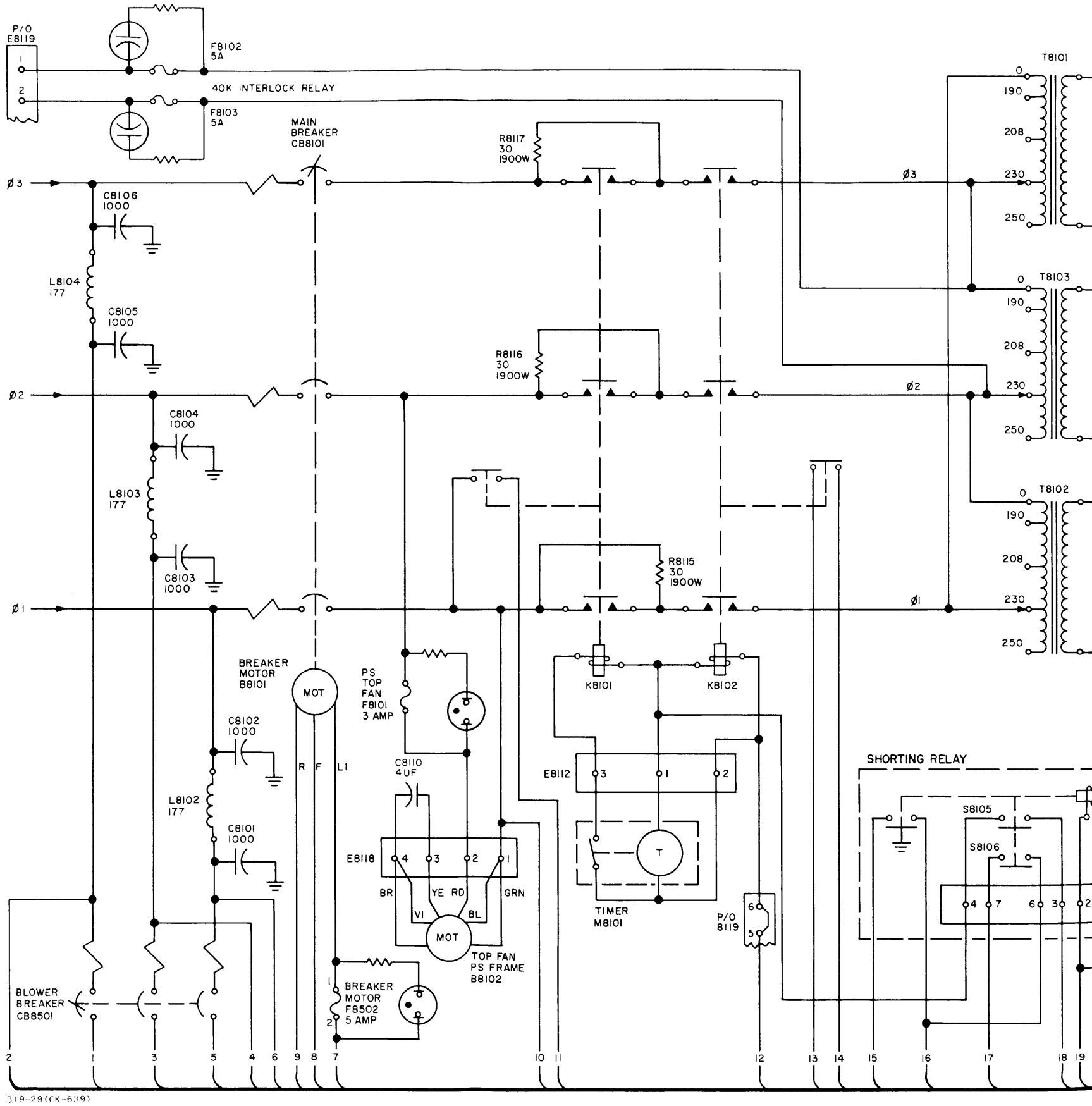


Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 5 of 9)


P/O E8119
1
2
F8102 5A
40K INTERLOCK RELAY
F8103 5A
MAIN BREAKER CB8101
R8117 30 1900W
R8116 30 1900W
R8115 30 1900W
Ø3
Ø2
Ø1
C8106 1000
L8104 177
C8105 1000
C8104 1000
L8103 177
C8103 1000
C8102 1000
L8102 177
C8101 1000
BREAKER MOTOR B8101
MOT
R F L1
PS TOP FAN F8101 3 AMP
C8110 4 UF
E8118
4 3 2 1
BR YE RD GRN
VI BL
MOT
TOP FAN PS FRAME B8102
BLOWER BREAKER CB8501
BREAKER MOTOR F8502 5 AMP
K8101
K8102
E8112
3 1 2
T
TIMER M8101
P/O 8119
6
5
SHORTING RELAY
S8105
S8106
4 7 6 3 2
T8101
T8103
T8102
0
190
208
230
250
2 1 3 5 4 6 9 8 7 10 11 12 13 14 15 16 17 18 19

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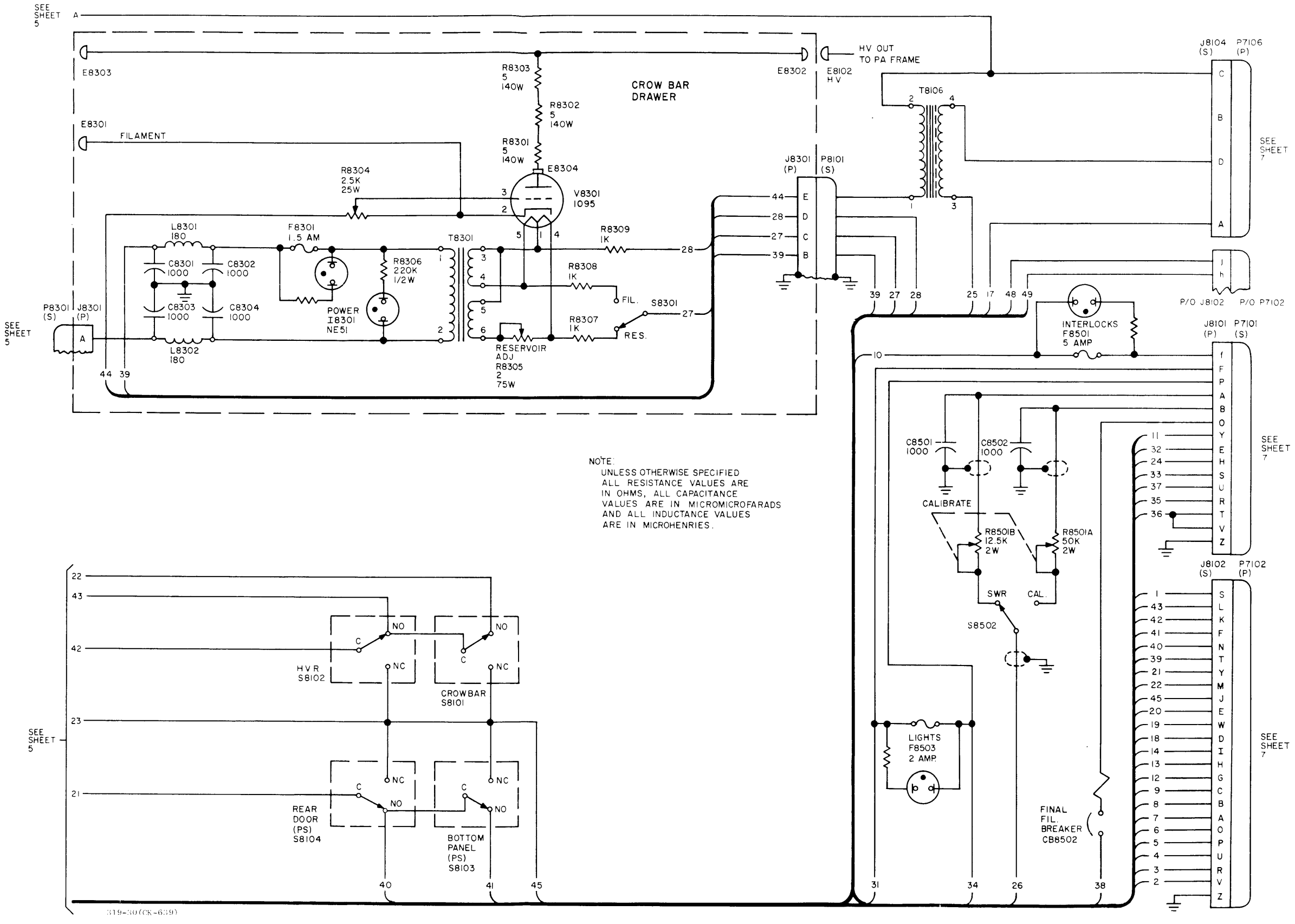
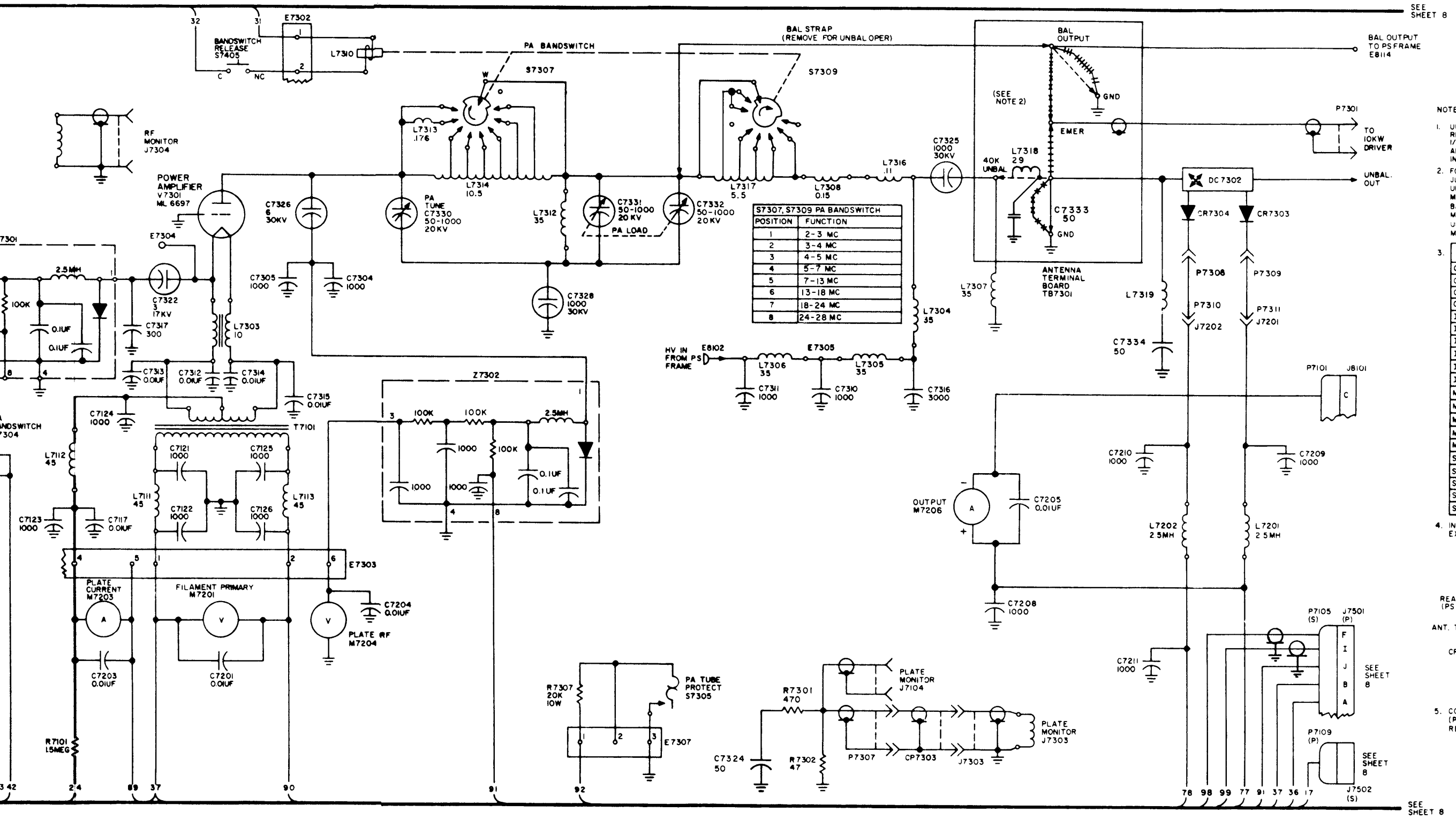


Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 6 of 9)

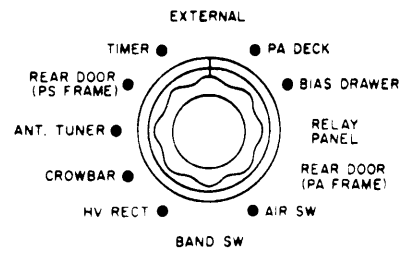


NOTES:

1. UNLESS OTHERWISE SPECIFIED ALL RESISTANCE VALUES ARE IN OHMS, 1/2 WATT, ALL CAPACITANCE VALUES ARE IN MICROMICROFARADS AND ALL INDUCTORS ARE IN MICROHENRIES.
2. FOR BALANCED OUTPUT CONNECT JUMPERS MARKED ——→ FOR UNBALANCED OUTPUT CONNECT JUMPERS MARKED - - - → FOR EMERGENCY BALANCED OUTPUT CONNECT JUMPERS MARKED ✱✱✱✱→ FOR EMERGENCY UNBALANCED OUTPUT CONNECT JUMPERS MARKED ++++++→
3.

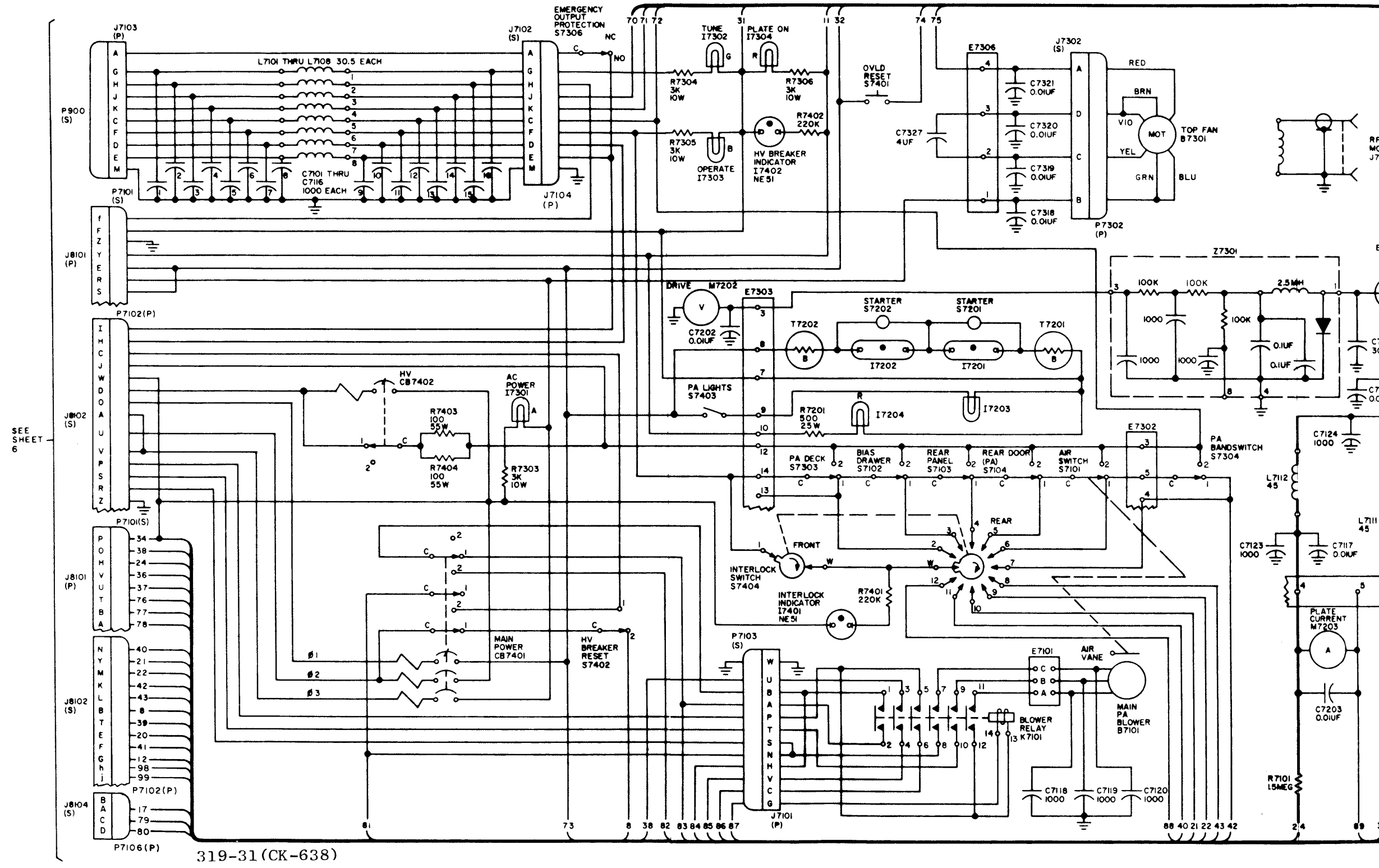
DESIGNATION	PANEL MARKING
C7330	TUNE
C7331, C7332	LOAD
CB7401	MAIN POWER
CB7402	HIGH VOLTAGE
I7301	AC POWER
I7302	TUNE
I7303	OPERATE
I7304	PLATE ON
I7401	INTERLOCK INDICATOR
I7402	HV BREAKER INDICATOR
M7201	FILAMENT PRIMARY
M7202	DRIVE
M7203	PLATE CURRENT
M7204	PLATE RF
M7205	OUTPUT
S7401	OVERLOAD RESET
S7402	HV BREAKER RESET
S7403	PA LIGHT
S7404	INTERLOCK
S7405	BANDSWITCH RELEASE

4. INTERLOCK SWITCH S7404 IS IN EXTERNAL POSITION AS SHOWN BELOW.



5. CONNECTOR DESIGNATIONS CONTAINING (P) OR (S) INDICATES PLUG OR SOCKET RESPECTIVELY.

Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 7 of 9)


SEE SHEET 6
J7103 (P)
J7102 (S)
EMERGENCY OUTPUT PROTECTION S7306
NC
NO
L7101 THRU L7108 30.5 EACH
P900 (S)
C7101 THRU C7116 1000 EACH
P7101 (S)
J7104 (P)
TUNE I7302
PLATE ON I7304
R7304 3K 10W
R7306 3K 10W
R7305 3K 10W
OPERATE I7303
HV BREAKER INDICATOR I7402 NE51
R7402 220K
OVLD RESET S7401
E7306
J7302 (S)
C7321 0.01UF
C7320 0.01UF
C7319 0.01UF
C7318 0.01UF
C7327 4UF
RED
BRN
VIO
YEL
GRN
BLU
MOT
TOP FAN B7301
P7302 (P)
Z7301
100K
2.5MH
1000
0.1UF
DRIVE M7202
C7202 0.01UF
E7303
T7202
STARTER S7202
STARTER S7201
T7201
I7202
I7201
PA LIGHTS S7403
R7201 500 25W
I7204
I7203
HV CB7402
AC POWER I7301
R7403 100 55W
R7404 100 55W
R7303 3K 10W
J8101 (P)
P7102 (P)
J8102 (S)
P7101 (S)
J8104 (S)
P7106 (P)
E7302
PA BANDSWITCH S7304
PA DECK S7303
BIAS DRAWER S7102
REAR PANEL S7103
REAR DOOR (PA) S7104
AIR SWITCH S7101
REAR
FRONT
INTERLOCK SWITCH S7404
INTERLOCK INDICATOR I7401 NE51
R7401 220K
C7124 1000
L7112 45
L7111 45
C7123 1000
C7117 0.01UF
PLATE CURRENT M7203
C7203 0.01UF
R7101 1.5MEG
MAIN POWER CB7401
HV BREAKER RESET S7402
ø1
ø2
ø3
P7103 (S)
J7101 (P)
E7101
AIR VANE
MAIN PA BLOWER B7101
BLOWER RELAY K7101
C7118 1000
C7119 1000
C7120 1000

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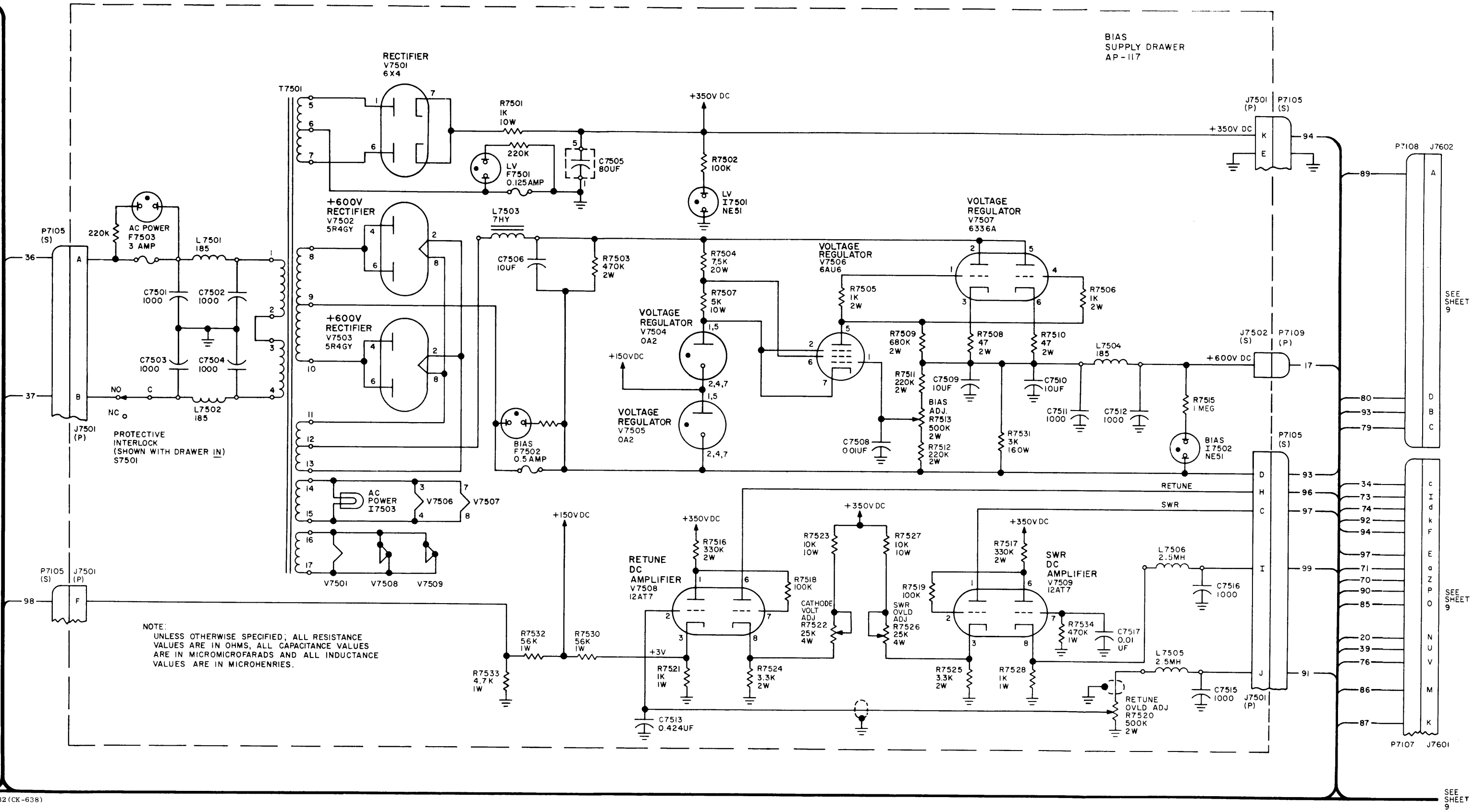


Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 8 of 9)

SEE SHEET 7

RECTIFIER V7501 6X4

T7501

R7501 1K 10W

220K

LV F7501 0.125AMP

C7505 80UF

+350V DC

R7502 100K

LV I7501 NE51

+600V RECTIFIER V7502 5R4GY

+600V RECTIFIER V7503 5R4GY

L7503 7HY

C7506 10UF

R7503 470K 2W

R7504 7.5K 20W

R7507 5K 10W

VOLTAGE REGULATOR V7504 0A2

VOLTAGE REGULATOR V7505 0A2

VOLTAGE REGULATOR V7506 6AU6

VOLTAGE REGULATOR V7507 6336A

R7505 1K 2W

R7509 680K 2W

R7508 47 2W

R7510 47 2W

R7511 220K 2W

C7509 10UF

C7510 10UF

C7511 1000

BIAS ADJ R7513 500K 2W

R7512 220K 2W

R7531 3K 160W

C7508 0.01UF

+150VDC

BIAS F7502 0.5AMP

P7105 (S)

J7501 (P)

220K

AC POWER F7503 3 AMP

L7501 185

L7502 185

C7501 1000

C7502 1000

C7503 1000

C7504 1000

NO

C

NC

PROTECTIVE INTERLOCK (SHOWN WITH DRAWER IN) S7501

AC POWER I7503

V7506

V7507

V7501

V7508

V7509

+150VDC

+350V DC

RETUNE DC AMPLIFIER V7508 12AT7

R7516 330K 2W

R7518 100K

CATHODE VOLT ADJ R7522 25K 4W

R7523 10K 10W

R7527 10K 10W

SWR OVLD ADJ R7526 25K 4W

R7519 100K

SWR DC AMPLIFI V7509 12AT7

R7517 330K 2W

R7521 1K 1W

R7524 3.3K 2W

R7525 3.3K 2W

R7528 1K 1W

+3V

C7513 0.424UF

R7532 56K 1W

R7530 56K 1W

R7533 4.7K 1W

P7105 (S)

J7501 (P)

98

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

SEE SHEET 7

319-32 (CK-638)

009640319

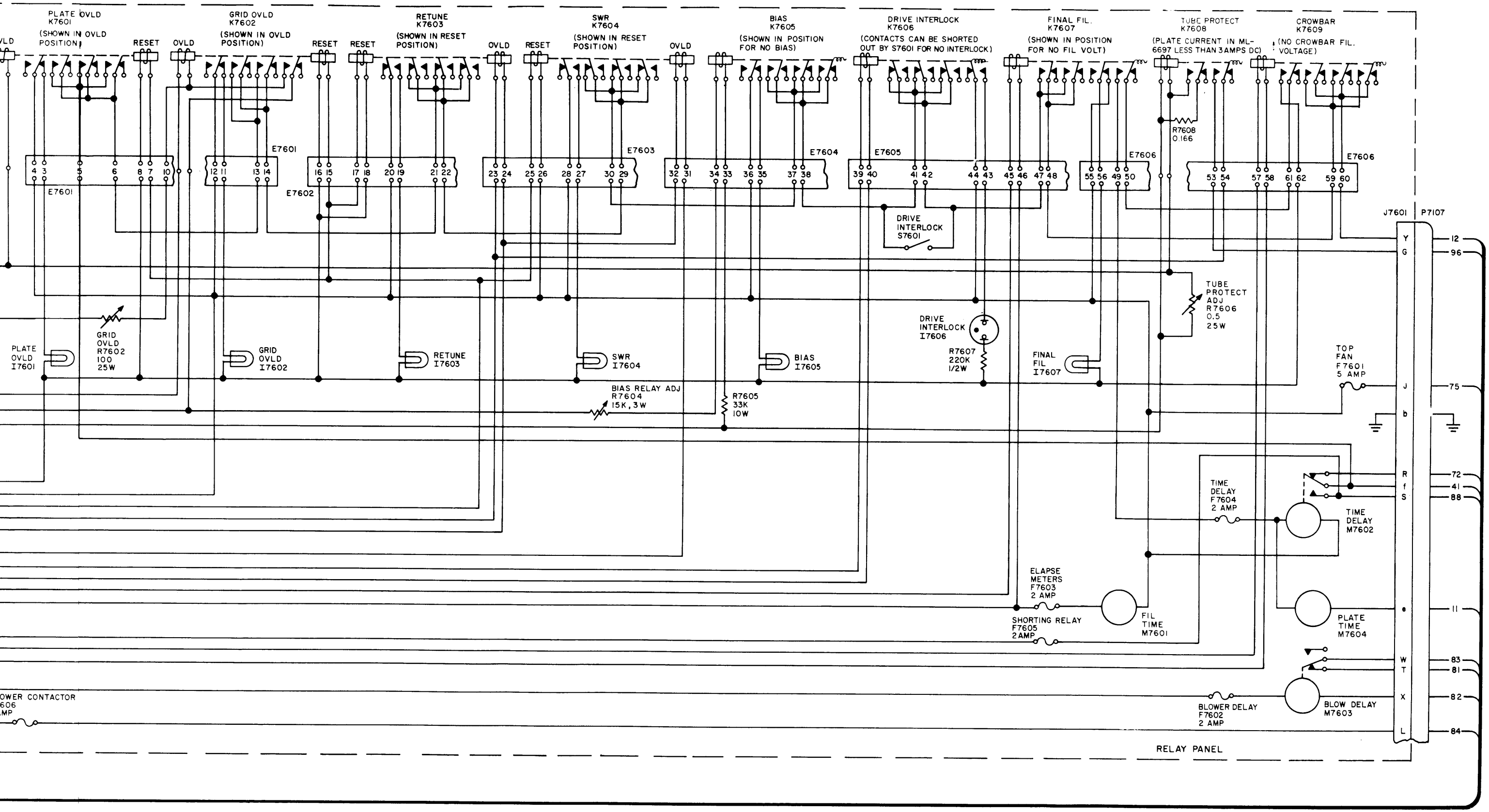
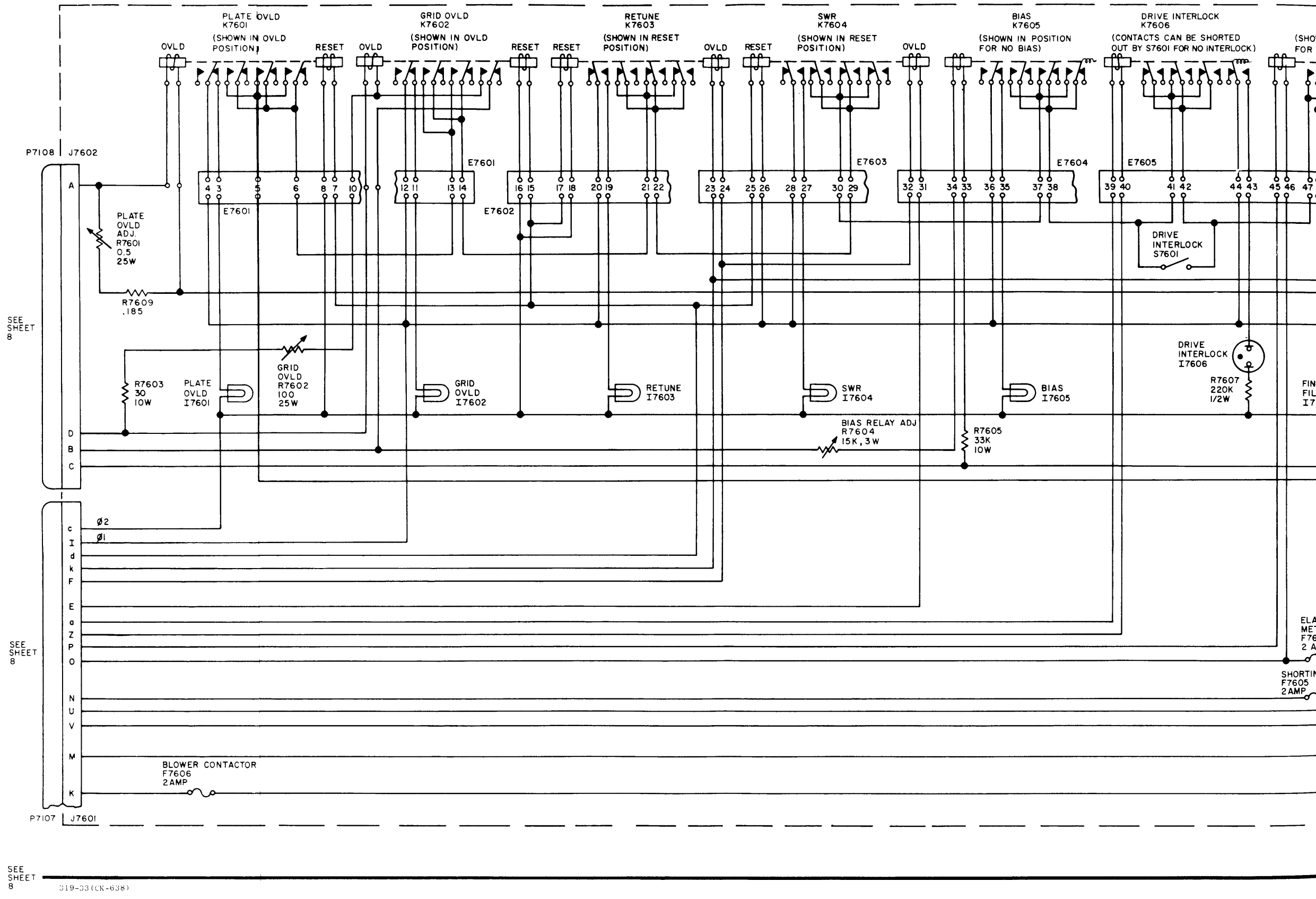


Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 9 of 9)



319-33(CK-638)

009640319