NAVSHIPS 93167 UNCLASSIFIED

TECHNICAL MANUAL

for

TRANSMITTING SET, RADIO, GPT-40K (AN/FRT-40)

THE TECHNICAL MATERIEL CORPORATION

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FOREWORD

This manual consists of five parts as follows:

Part I: A short introductory section presenting the overall characteristics of Transmitting Set, Radio, GPT-40K (AN/FRT-40), hereinafter referred to as GPT-40K; and reference data.

Part II: Technical Manual for Transmitting Set, Radio, GPT-10K (AN/FRT-39 and AN/FRT-39A), hereinafter referred to as GPT-10K, consisting of three volumes.

Part III: Supplement to Part II, describing the standard GPT-10K's modifications which enable the modified GPT-10K to drive the GPT-40K's final amplifier.

Part IV: Technical manual for GPT-40K's final amplifier and power supply.

Part V: Parts list for GPT-40K's final amplifier and power supply.

Since the GPT-40K consists of a modified GPT-10K (first and second frames) and a final amplifier with its power supply (third and fourth frames), some ambiguity in nomenclature may arise. For example, GPT-10K literature uses the terms exciter (SBE), IPA (RFB), and PA (4CX5000A tube and associated circuits). The GPT-40K uses the GPT-10K (modified) in conjunction with a final power amplifier (ML-6697 tube and associated circuits). Thus, two types of power amplifiers exist in the GPT-40K and to avoid ambiguity this instruction book refers to the modified GPT-10K's power amplifier as PA(10K) and to the GPT-40K's final power amplifier as PA(40K).

Closely allied with the PA(40K) is the PAL-40K (power amplifier linear). This term includes the PA(40K) plus parts necessary to convert a standard GPT-10K into a modified GPT-10K.

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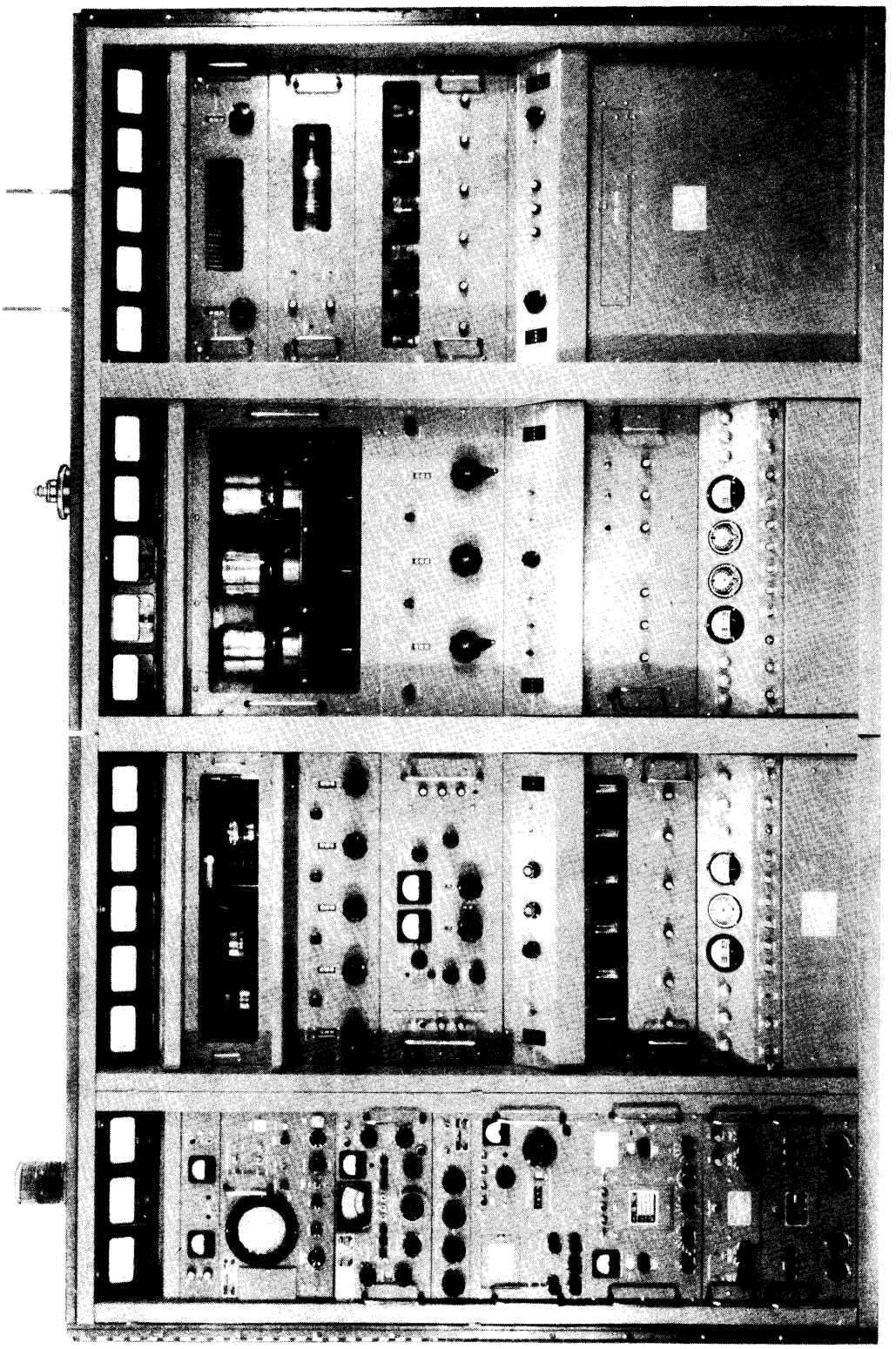


Figure 1-1. Front View, GPT-40K

PART I
TRANSMITTING SET, RADIO GPT-40K, GENERAL DESCRIPTION

1-1. INTRODUCTION.

Technical Materiel Corporation's GPT-40K is a conservatively-rated, general-purpose transmitter capable of providing 40,000-watt peak envelope power (PEP) output throughout a 4- to 28-mc range.

The GPT-40K is designed primarily for single sideband service but may be used for many types of transmission due to its large power reserve and versatility. For example:

a. CW (keyed carrier)

b. FSK (frequency-shift telegraphy)

c. Single Sideband Suppressed Carrier

d. Double Sideband Suppressed Carrier

e. Independent Sideband (separate intelligence in sidebands)

f. Single or Double Sideband, AM or MCW

TMC's highly efficient modular type construction is used throughout, and sectional design permits shipping in reasonably small containers.

Figure 1-1 shows that the GPT-40K consists of the following four chassis:

a. Extreme left: test and exciter equipment.

b. Second from left: transmitter equipment comprising two RF linear amplifiers and two IPA's (driver stages) for the GPT-40K as well as power supply, relay and control, and protective equipment.

c. Third from left: RF, relay and control, and protective equipment comprising the final PA section of the GPT-40K (receives output of item b.).

d. Extreme right: power equipment for final stage of GPT-40K.

Figure 1-2 is a block diagram of the GPT-40K. The small blocks at the extreme left represent the GPT-40K's test and exciter equipment. These are described in detail in Part II Volume II of the manual. The heavy lines represent signal flow. The SBE unit is the source of RF intelligence receiving phone, teletype, CW, or FAX signals and converting them for RF transmission.

The output of the SBE unit is fed to two RF amplifiers and two IPA's (driver stages). These, too, are described in detail in Part II, Volume I. Note that these stages, which raise the sideband level from 1 to 10,000 watts (PEP), are equipped with power supply, relay and control, protective circuits, and meters. These stages comprise the second chassis from the left, as shown in figure 1-1. Their output may be fed to three places: (1) a dummy load (for tuning and loading), (2) GPT-40K's regular antenna via an emergency connection, and (3) the final PA section of the GPT-40K.

The final PA section of the GPT-40K consists of a powerful amplifier, class AB, capable of 40,000 watts (PEP), together with ample power supply, relay and control, protective circuits, and meters. Note that the relay and interlock circuits throughout the entire GPT-40K are interconnected. This interconnection provides maximum protection both to operating personnel and equipment. Further information is given in Part IV of this manual.

1-2. FUNCTIONAL DESCRIPTION.

The GPT-40K units located on the two chassis toward the left (looking toward the front of the GPT-40K) are described in Part II Volume I, except that figures 3-1 and 3-2 in Part III replace figures 1-11-a, 1-11-b, 1-13-a, 1-13-b, and 1-13-c in Part II Volume I. The GPT-40K units located on the two chassis toward the right (looking toward the front of the GPT-40K) are described in Part IV.

1-3. REFERENCE DATA.

The following data replace tables 1-1, 1-3, 1-4, 1-6, and 1-7 in Part II Volume I:

Table 1-1. Equipment Supplied and Physical Characteristics, GPT-40K

Table 1-2. Shipping Data, GPT-40K

Table 1-3. Technical Specifications, GPT-40K

Table 1-4. Vacuum Tube Complement, GPT-40K

Table 1-5. Power Requirements, GPT-40K

TABLE 1-1. EQUIPMENT SUPPLIED AND PHYSICAL CHARACTERISTICS, GPT-40K

UNIT	COMMERCIAL DESIGNATION	QUANTITY PER GPT-40K	APPROXIMATE INSTALLATION DIMENSIONS* LENGTH	HEIGHT	DEPTH	VOLUME*	WEIGHT*
Main Frame Chassis	A/P**. Refer to TMC's Numerical Parts List AX-181.	1	33	72	38	52	500
Auxiliary Frame Chassis	A/P**. Refer to TMC's Numerical Parts List AX-182.	1	21	72	38	33	366
Base Mount and RF Base Shields	MS-2116-1 MS-2175	1 1	54	7	38	8.5	152
Sides for Frames	MS-1458-1, 2117-1	2	38	72	27	43	384
Tops for Frames	MS-1699-1	1					
Doors for Main Frame Chassis	MS-1647-1, 2118-1	2					
Doors for Auxiliary Frame Chassis	MS-1648-1, 2119-1	2					
Trim Strips	MS-1633, 1634, 1635, 1636, 1637, 1669, 1670, 1671, 1672 (2), 1920	11 pieces					
Main Power Transformer	TF-203	1	22	15-1/2	21	4.5	452

*Unless otherwise stated, dimensions are in inches, volume in cubic feet, weight in pounds.
**A/P means assembly of parts. No specific designation.

TABLE 1-1. EQUIPMENT SUPPLIED AND PHYSICAL CHARACTERISTICS, GPT-40K (C nt.)

UNIT	COMMERCIAL DESIGNATION	QUANTITY PER GPT-40K	APPROXIMATE INSTALLATION DIMENSIONS* LENGTH	HEIGHT	DEPTH	VOLUME*	WEIGHT*
Transmitting Mode Selector	SBE-3 or SBE-2	-	-	-	-	-	-
RF Oscillator	AO-101 or A-1516	1	19	8-3/4***	15	1.5	41
Power Supply	A-1397 or A-1397	1	19	5-1/4***	15	0.9	38
Frequency Shift Exciter	XFK	1	19	10-1/2***	16	1.8	48
Variable Frequency Oscillator	VOX-2 or -3	1	19	10-1/2***	16	1.8	70
Frequency Spectrum Analyzer	FSA	-	-	-	-	-	-
Analyzer	SA-1	1	19	10-1/2***	16	1.8	36
Power Supply for SA-1	PS-12	1	19	8-3/4***	9	0.9	32
Two Tone Generator	TTG	1	19	5-1/4***	13	0.8	19
RF Amplifier with Power Supply	RFB-1 AX-104	1	28-3/4	11-3/4***	18	3.4	100
Isolation Keyer	AK-100	1	19	5-1/4***	10-1/2	0.6	10
High Voltage Rectifier	TI-104	1	28-3/4	10-3/4***	15	2.7	80
Tube for PA	4CX5000A	1	5 dia	-	9	0.1	8
Tubes for High Voltage Rectifier	872A	6	2-1/4 dia	-	8	-	-
Tube for IPA	PL-172	1	4 dia	-	5	-	-

*Unless otherwise stated, dimensions are in inches, volume in cubic feet, weight in pounds.
***Rack mounted space required.

TABLE 1-1. EQUIPMENT SUPPLIED AND PHYSICAL CHARACTERISTICS, GPT-40K (C nt.)

UNIT	COMMERCIAL DESIGNATION	QUANTITY PER GPT-40K	APPROXIMATE INSTALLATION DIMENSIONS* LENGTH	HEIGHT	DEPTH	VOLUME*	WEIGHT*
High Voltage Light and Socket Assembly	AX-124	1	-	-	-	-	-
Insulator Bowl Assembly with Hardware	AX-159	1	-	-	-	-	-
Lamp, Incandescent	BI-106-1	1	-	-	-	-	-
Connector, Plug, QDS	PL-149	1	-	-	-	-	-
Power Amplifier Frame	A/P**. Refer to TMC's Numerical Parts List AX-208.	1	This frame is packed in case 14. (Refer to table 1-2 in this section.) The inside dimensions of this case are 4x4x6 inches shorter than its outside dimensions (depth, width, and height, respectively).				
Power Supply Frame	MS-1995 Consisting of A/P**. Refer to TMC's Numerical Parts List AX-211.	1	This frame is packed in case 15. (Refer to table 1-2 in this section.) The inside dimensions of the case are 4x4x6 inches shorter than its outside dimensions (depth, width, and height, respectively).				
Base Mount Base Shield	MS-1996 MS-1999	1 1	64-1/4	37-3/4	5-3/4	8.5	300 (approx)
Top Cover Front Doors Rear Doors	MS-1997 MS-2120-2 (1), MS-2118 (1) MS-2037 (1), MS-1647 (1)	1 2 2	These pieces are packed in case 17. (Refer to table 1-2 in this section.) The inside dimensions of the case are 2x2x3 inches shorter than its outside dimensions (depth, width, and height, respectively).				
Main Power Transformer	TF-211	1	26	10-1/2	22	5.0	750 (approx)
Main Power Transformer	TF-211	1	26	10-1/2	22	5.0	750 (approx)
Main Power Transformer	TF-211	1	26	10-1/2	22	5.0	750 (approx)

*Unless otherwise stated, dimensions are in inches, volume in cubic feet, weight in pounds.
**A/P means assembly of parts. No specific designation.

TABLE 1-1. EQUIPMENT SUPPLIED AND PHYSICAL CHARACTERISTICS, GPT-40K (C nt.)

UNIT	COMMERCIAL DESIGNATION	QUANTITY PER GPT-40K	APPROXIMATE INSTALLATION DIMENSIONS* LENGTH	HEIGHT	DEPTH	VOLUME*	WEIGHT*
Bias Supply Drawer	AP-104	1	10-3/4	28-3/4	12-1/4	-	-
Antenna Tuning Unit and Meter Panel Drawer	AT-101	1	15-3/4	29	21-1/2	-	-
Crowbar Drawer	AX-212	1	8	28-3/4	16-1/2	-	-
High Voltage Rectifier Drawer	AP-105	1	14	29-3/4	16-1/2	-	-
Oil-Filled Capacitors (C8107 and C8108)	CP-107	2	16	9-1/2	12	-	-
Transformer (L8101)	TF-5016	1	16-1/2	8	9-5/8	-	-
Main PA Tube (V7301)	ML-6697	1	21	8-1/2	8-1/2	-	-
Filament Transformer (T7101)	TF-215	1	-	-	-	-	-
Motor (B7101)	BL-107	1	13	10-1/2	9-1/2	-	-
1 Capacitor (Voltage Divider) 3 Vacuum Capacitors (Tuning/Loading) 1 Power on Warning Bulb 2 Fan Belts 2 Spare Fan Belts 1 Gear Puller for Blower Motor 1 Vacuum Tube CH-1095 3 Crowbar Resistors 19 Glass Resistors for Power Supply 6 Vacuum Tube (6895) Miscellaneous Hardware, Latch Stops, Cables, Wires	C0106-1000-30C CB-149		This material is packed in case 30. (Refer to table 1-2 in this section.) The inside dimensions of this case are 4x4x6 inches shorter than its outside dimensions (depth, width, and height, respectively).				

*Unless otherwise stated, dimensions are in inches, volume in cubic feet, weight in pounds.

TABLE 1-2. SHIPPING DATA, GPT-40K

CASE NO.	PART	COMMERCIAL DESIGNATION	DIMENSIONS** LENGTH	WIDTH	HEIGHT	VOLUME**	WEIGHT**
1*	Main Frame Chassis	None	42-1/2	35-1/4	79-1/4	68.7	1083
2*	Auxiliary Frame Chassis	None	42-1/2	24-1/2	76-1/4	45.5	543
3*	Base Mount and Shield	MS-1458 and MS-2175	57	8-1/4	40-3/4	11.1	175
4*	Top, Doors, Sides, and all Trim Strips	(Refer to table 1-3, Part II, Volume I, case no. 4.)	76-1/2	27-1/4	43	54.3	593
5*	Main Power Transformer	TF-203	28-1/4	19	24	7.5	507
6*	SBE, VOX, XFK	(Refer to table 1-3, Part II, Volume I, case no. 6.)	47-3/4	23	27	17.1	340
7*	Power Supply for SBE, AK-100	(Refer to table 1-3, Part II, Volume I, case no. 7.)	26-1/2	23	20-1/2	7.2	90
8*	Analyzer	SA-1	29-1/2	24	20-1/2	7.5	81
9*	Power Supply for Analyzer	PS-12	24-3/4	17-1/2	14-1/2	3.1	75
10*	Two Tone Generator	TTG	24-1/2	23	10	2.8	50
11*	RF Amplifier with Power Supply	RFB-1 and AX-104	36-1/4	26-3/4	17	8.5	178
12*	High Voltage Rectifier	T1-104	36-1/4	26-3/4	17	8.5	156
13*	Loose Items	-	29-1/2	24	20-1/2	7.5	105
14	Power Amplifier Frame	(See figure 4-2-1 in Part IV, Section 2.)	42-1/2	35-1/4	79-1/4	69.4	995
15	Power Supply Frame	(See figure 4-2-1 in Part IV, Section 2.)	42-1/2	35-1/4	79-1/4	69.4	985
16	Base Mount and Shield	(See figure 4-2-1 in Part IV, Section 2.)	68	40	8	12.6	215
17	Top, Front and Rear Doors	(See figure 4-2-1 in Part IV, Section 2.)	76-1/2	20	44	39.0	475

*Refer to table 1-3, Part II Volume I for GPT-10K.
**Unless otherwise stated, dimensions are in inches, volume in cubic feet, weight in pounds.

TABLE 1-2. SHIPPING DATA, GPT-40K (C nt.)

CASE NO.	PART	COMMERCIAL DESIGNATION	DIMENSIONS** LENGTH	WIDTH	HEIGHT	VOLUME**	WEIGHT**
18	Main Power Transformer	TF-211	26-1/4	16-1/2	38	9.6	649
19	Main Power Transformer	TF-211	26-1/4	16-1/2	38	9.6	649
20	Main Power Transformer	TF-211	26-1/4	16-1/2	38	9.6	649
21	Bias Supply Drawer	AP-104	36-1/4	26-3/4	17	9.6	166
22	Antenna Tuning Unit and Meter Panel Drawer	AT-101	36-1/2	30-1/2	22-3/4	14.7	200
23	Crowbar Drawer	AX-212	36-1/4	26-3/4	17	9.6	127
24	High Voltage Rectifier Drawer	AP-105	36-1/2	30-1/2	22-3/4	14.7	242
25	Two Capacitors	CP-107	23	14	18	3.4	207
26	Transformer	TF-5016	22	11-1/2	10	1.5	154
27	Main PA Tube	ML-6697	28	26-1/2	33-1/4	14.3	140
28	Filament Transformer	TF-215	13	16	8-1/2	1.0	158
29	Motor	BL-107	22-1/2	16-1/4	16-1/4	3.4	125
30	Loose Items	-	51	23	30	20.4	200

**Unless otherwise stated, dimensions are in inches, volume in cubic feet, weight in pounds.

TABLE 1-3. TECHNICAL SPECIFICATIONS, GPT-40K

FREQUENCY RANGE	4 to 28 mc, bandswitched.
OUTPUT POWER	40,000 watts, 2 tone PEP, 40 db 3rd and 5th order. 20,000 watts, CW or frequency-shift telegraphy.
OPERATING MODES	CW, MCW, SSB, ISB, DSB or frequency-shift telegraphy.
TUNING	All tuning and bandswitching controls are on the front panels. (No plug-in components.)
OUTPUT IMPEDANCE	50 ohms unbalanced, 600 ohms balanced; pi-L network.
FREQUENCY CONTROL	a. Built-in high stability master oscillator in the VOX for CW and FSK operation.
	b. 10 oven-controlled crystal positions plus external oscillator position in the SBE. c. Three additional oven-controlled crystal positions in the XFK.
DISTORTION PRODUCTS	Better than 40 db down relative to PEP output. (Refer to OUTPUT POWER.)
UNWANTED SIDEBAND REJECTION	1000-cycle single tone, 60 db down.
HARMONIC SUPPRESSION	Second harmonic at least 50 db from PEP output, third harmonic at least 65 db from PEP output.
CARRIER INSERTION	-55 db to full output.
ALDC	An automatic load and drive control is provided to limit distortion during high drive peaks or load changes.
AUDIO INPUTS	600 ohms balanced, -20 to +10 dbm continuously adjustable for full RF output.
AUDIO RESPONSE (Each Sideband)	a. Flat within $\pm$1.5 db, 350 to 3300 cycles.* b. Flat within $\pm$1.5 db, 350 to 7500 cycles.*
VOX OPERATION	Voice control with anti-trip features. Adjustable gain and squelch.
METERING	Large size illuminated meters accurately indicate operation of all circuits.
DISTORTION MEASURING	Built-in analyzer.
PRIMARY POWER REQUIREMENTS	230 volts AC, 50 or 60 cycles, 3 phase, approximately 75,000 watts.
SAFETY FEATURES	Overload and bias protection with automatic recycling and alarm. Safety interlocks at all high voltage points.
COOLING	Filtered, forced air cooling. Semipressurized cabinet.
TEMPERATURE AND HUMIDITY	Designed to operate in any ambient temperature between the limits of 0°C and 50°C for any value of humidity up to 90%.
TUBE COMPLEMENT	Refer to table 1-4.
*Depending upon filter ordered with SBE.	

TABLE 1–4. VACUUM TUBE COMPLEMENT, GPT–40K

1 PA (10K)	2 IPA (10K)	3 P.S. for Item 2	4 AX-103	5 SBE	6 P.S. for Item 5	7 VOX	8 XFK	9 TTG	10 SLM	11 FSA	12 PS-12	13 ISK	14 PA (40K)	15 BIAS Supply	16 CROW-BAR	17 HV Rect.	Tube	Total
1																	4CX5000A	1
	1			2													6CL6	3
	1			1													6146	2
	1																PL172	1
		1			1									2			5R4	4
		1					1	1	1					1			6X4	5
		2			1	1			SLM-1=1					2			0A2	7
									SLM-1=1								0B2	1
			6														872A	6
				4													6AB4	4
				2						4							6U8	6
				3				2		1		1		2			12AT7	9
				3		3	3	4		4		1					12AU7	18
				3						1							6AH6	4
				1													6AL5	1
						1											5V4G	1
						1											6BE6	1
						6											6AQ5	6
						1											6C4	1
						1											6AB4	1
							1										6J6	1

TABLE 1–4. VACUUM TUBE COMPLEMENT, GPT–40K (C nt.)

1 PA (10K)	2 IPA (10K)	3 P.S. for Item 2	4 AX-103	5 SBE	6 P.S. for Item 5	7 VOX	8 XFK	9 TTG	10 SLM	11 FSA	12 PS-12	13 ISK	14 PA (40K)	15 BIAS Supply	16 CROW-BAR	17 HV Rect.	Tube	Total
							2			1							6BE6	3
							1										2E26	1
							1										5U4G	1
							2										0B2	2
									2								6U8A	2
										1							12BE26	1
										2							6BH6	2
										1							12AL5	1
										2				1			6AU6	3
										1							5ADP7	1
										1	1						5651	2
											1						5Y3GT	1
											1						6AS7G	1
											1						12AX7	1
													1				6697	1
														1			6336A	1
															1		1095	1
																6	6895	6

TABLE 1-5. POWER REQUIREMENTS, GPT-40K

UNIT	POWER REQUIREMENT
GPT-40K, total (including exciters and test equipment)	230 volts, 190 amps, 50 and 60 cps, 3 phase
GPT-10K (modified), total (including exciters and test equipment)	230 volts, 36 amps, 50 and 60 cps, 3 phase.
GPT-10K (modified), net (excluding exciters and test equipment)	230 volts, 34 amps, 50 and 60 cps, 3 phase
Transmitting Mode Selector SBE-3	115 volts, 1.3 amps, 50 and 60 cps, 1 phase
Frequency Shift Exciter XFK	115 volts, 1.6 amps, 50 and 60 cps, 1 phase
Variable Frequency Oscillator VOX-2 or -3	115 volts, 2.2 amps, 50 and 60 cps, 1 phase
Frequency Spectrum Analyzer FSA	115 volts, 1.6 amps, 50 and 60 cps, 1 phase
Two Tone Generator TTG	115 volts, 0.3 amp, 50 and 60 cps, 1 phase

NOTE

Single-phase, 115-volt power is derived from 3-phase power via regulating transformer in the standard GPT-10K.

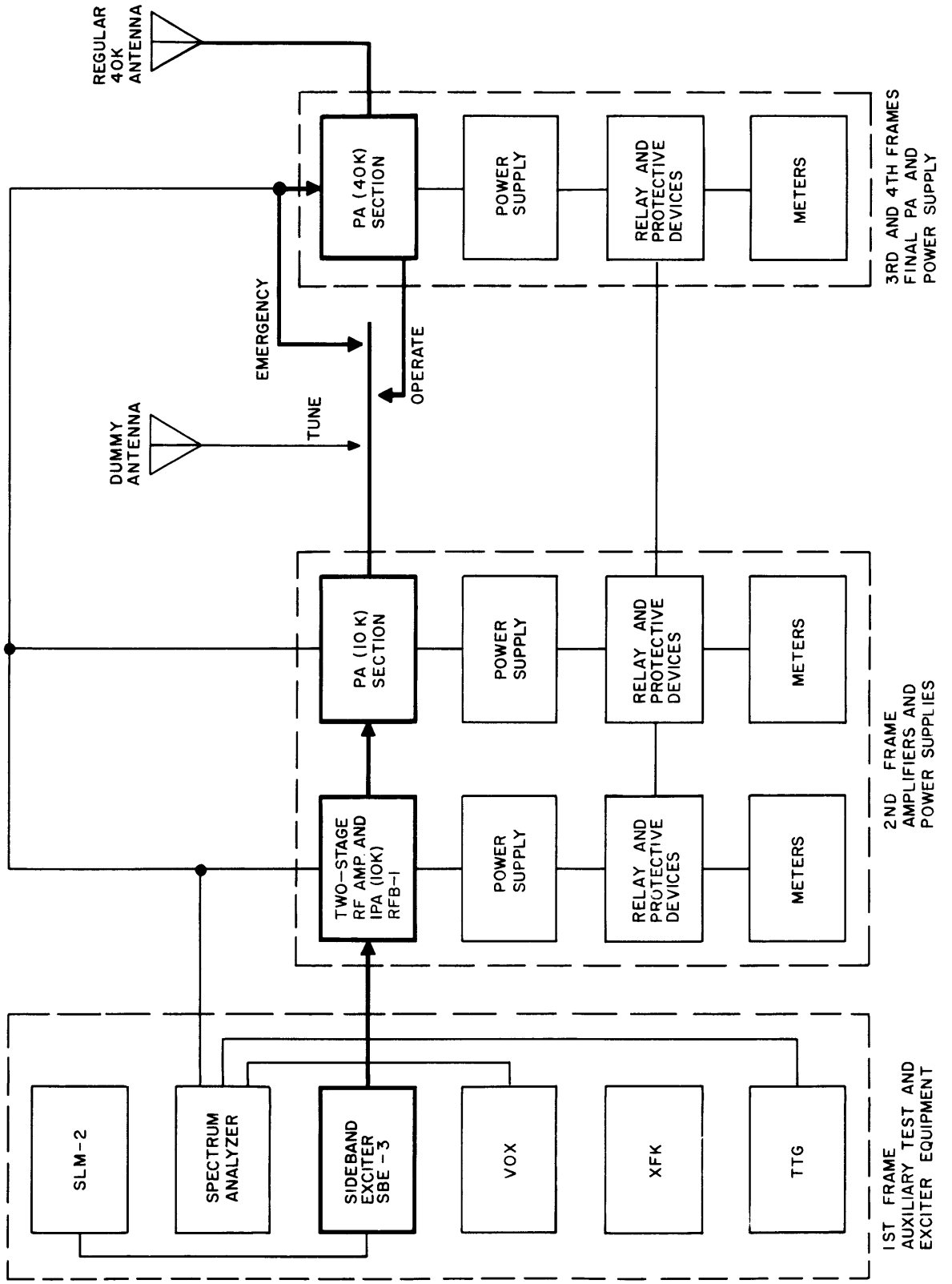


Figure 1-2. Block Diagram, GPT-40K

PART II
TECHNICAL MANUAL FOR PA(10K)

Refer to Technical Manual for Transmitting Set, Radio, GPT-10K (AN/FRT-39 and AN/FRT-39A), consisting of three volumes.

PART III
GPT-10K's MODIFICATIONS

3-1. INTRODUCTION.

The GPT-40K consists of four frames (Part I, figure 1-2) as follows:

Frame	Equipment
1	Auxiliary test and exciter.
2	Two RF(10K), IPA(10K), PA(10K), and their power supplies.
3 and 4	PA(40K) and its power supply.

The first two frames constitute a standard GPT-10K modified to become the PA(10K). The standard GPT-10K is described in Part II; the modifications required to mate the standard GPT-10K with the PA(40K) are described in the following paragraphs.

NOTE

Arrangement of this part of the manual parallels Part II. Modifications to Volume I of Part II are described on a section by section basis below. No changes to Volume II are necessary. Modifications relative to Volume III are listed in paragraph 3-9 below.

3-2. CHANGES TO PART II, VOLUME I, SECTION 1.

The general descriptive matter, functional descriptions, and the reference data in Volume I are equally applicable to both the standard and modified GPT-10K. However, the standard GPT-10K's power amplifier section, in particular, and the middle compartment of the main power supply (figures 1-11-a, 1-11-b, 1-13-a, 1-13-b, and 1-13-c in Volume I) are different from correponding ones in the modified GPT-10K (figures 3-1-a, 3-1-b, 3-1-c, 3-1-d, and 3-2 in this section). Below are some of the principal changes that enable the modified GPT-10K to mate with the PA(40K). These changes are described in detail in paragraph 3-5 below.

Figure	Modified GPT-10K Replacing Standard GPT-10K Equipments
3-1-a, 3-1-b, 3-1-c, 3-1-d	Three 140-ohm, 900-watt resistors (dummy load) associated with 3-position OUTPUT LOADING switch (TUNE, OPERATE, EMERGENCY) replace the standard GPT-10K's antenna OUTPUT LOADING coils. OUTPUT LOADING gear train is used to operate the selector switch.
3-1-a, 3-1-b, 3-1-c, 3-1-d	Coupling capacitor C911 is remounted.
3-1-a, 3-1-b, 3-1-c, 3-1-d	FSA monitor wiring is arranged to monitor RF in two of three places in GPT-40K: IPA(10K), PA(10K), and PA(40K).
3-1-a 3-1-b, 3-1-c, 3-1-d	PA(10K)'s EMERGENCY and OPERATE output wiring assemblies differ from standard GPT-10K's unbalanced and balanced antenna wiring assemblies.
3-1-a, 3-1-b, 3-1-c, 3-1-d.	EXTERNAL RF probe in PA(10K)'s tank circuit.
3-2	PA(10K) to PA(40K) interconnecting signal cables.
	Shields, covers, and power input details are discussed in paragraph 3-3 below.

3-3. CHANGES TO PART II, VOLUME I, SECTION 2.

Figure 2-1 (sheet 2) in Volume I shows cabinet enclosures and accessories of a standard GPT-10K. Assembly details associated with the unbalanced output bracket (MS-1605), on which a QDL feedthrough receptacle connector (Model JJ-137) is mounted, indicate the need for outlet holes in GPT-10K's two side shields (MS-1592 and MS-1830) and side panel (MS-1460). Figure 2-6 (sketch 1) in Volume I shows QDL receptacle connector details. When a standard GPT-10K is operated on balanced output, the unbalanced coverplate (MS-2258) is bolted on to GPT-10K's MS-1460. When the standard GPT-10K is converted for use in a GPT-40K, the following modifications are required:

Figure 3-3-a in this section shows the right side, top inside shield on the main frame. The hole designated X is the access hole for the PA(40K)'s EMERGENCY antenna supply. The hole designated Y is the access hole for the PA(40K)'s OPERATE input. The hole designated Z is the access hole for a standard PA(10K)'s unbalanced antenna operation. The right side, top inside shield on the main frame of a standard GPT-10K has access holes X and Y covered by a plate, and hole Z is uncovered. The shield on a modified GPT-10K has access holes X and Y uncovered, and hole Z is covered by a plate.

Figure 3-3-b in this section shows the right side shield on the main frame. Figure 3-3-c in this section shows the left side shield of abutting GPT-40K's PA frame. Figures 3-3-a, 3-3-b, and 3-3-c show that the modified GPT-10K accommodates two antenna outlets: the holes designated X accommodate the PA(40K)'s EMERGENCY antenna lead; the holes designated Y, the PA(40K)'s OPERATE lead. A feed-through insulation assembly supports the PA(40K)'s OPERATE lead. A QDL feed-through connector supports the PA(40K)'s EMERGENCY antenna lead. The hole designated W on figure 3-3-b in this section is an access hole for a cable interconnecting the PA(10K) and PA(40K) frames.

Figure 2-4 in Volume I is modified as follows to fulfill the requirements of a modified GPT-10K: the 3-phase wires, 1, 2, and 3, fed from customer's (ungrounded) 230-volt, 60-cycle power supply, are fed instead from PA(40K)'s power supply. The PA (10K)'s base assembly has an access hole to accommodate the change. The main power transformer has a 230-volt tap which is connected to GPT-40K's DRIVER INTERLOCK relay K7606 via the cable mentioned in the preceding paragraph.

Comparison of figure 2-6 in Volume I with figure 3-4 in this section shows circuit changes between GPT-10K's 4CX5000A tube (V900) and associated antenna under the following two conditions of 10-kw (PEP) operation: standard GPT-10K "normal" operation (balanced or unbalanced) and modified GPT-10K "emergency" operation (balanced or unbalanced). Figure 3-4 in this section shows that under emergency balanced operation use is made of GPT-40K's antenna tuning unit and meter panel drawer; consequently, GPT-10K's 4CX5000A tube faces a pi-L network looking toward the rhombic antenna. Figure 3-4 in this section also shows that under emergency unbalanced operation GPT-10K's 4CX5000A tube faces only a pi network looking toward the 50-ohm antenna. This result is satisfactory under emergency GPT-10K operation.

Figure 3-5a in this section shows major assembly differences between GPT-10K's standard and modified PA sections. The heavy dashed lines show the assemblies common to the two sections. Conversion from the standard to the modified PA sections, therefore, involves replacing the remaining assemblies of the standard with the remaining assemblies of the modified PA sections. The procedure for doing this is tabulated below and will be clarified by figures 3-1-a, 3-1-b, 3-1-c, 3-1-d, 3-2, and 3-11 through 3-15 in this section. Figure 3-5b in this section shows the assemblies of parts required to modify PA(10K)'s ceiling in order to mate with GPT-40K's final amplifier section.

CONVERSION OF EXISTING GPT-10K's TO MATE WITH GPT-40K's FINAL AMPLIFIER SECTION:

Disassembly of GPT-10K's PA (See figure 2-1, sheet 1, of Part II, Volume I):

a. Remove all external connections to the top and/or right side of the GPT-10K.

b. Remove right front door from hinges. (See callout 2, figure 2-1 of Volume II).

c. Remove right side panel. (See callout 8.)

d. Remove right side PA inner shield.

e. If operating unbalanced, remove right side unbalanced output connectors, connections, and mounting bracket. (See callout 26.)

f. If operating balanced, remove top bowls and connections. (See callout 25.)

g. Remove all connection to antenna tuning unit and meter panel drawer. (See figures 3-1-a, 3-1-b, 3-1-c, 3-1-d, and 3-5-b in this section.)

h. Disassemble entire shaft assembly, front panel, knob, counter, and gears connected with the antenna tuning unit and meter panel drawer. (See figures 3-1-a, 3-1-b, 3-1-c, 3-1-d, and 3-5-b in this section.)

i. Remove antenna tuning unit and meter panel drawer. (See figures 3-1-a, 3-1-b, 3-1-c, 3-1-d, and 3-5-b in this section.)

MODIFICATION OF GPT-10K's PA:

a. Drill two holes in right side shield upper front corner near roof of PA compartment (figure 3-6 in this section) for attachment of emergency bracket.

b. Drill two holes in right front corner of PA deck (figure 3-6 in this section) for attachment of detent bracket.

c. Install AS-117 MODE SELECTOR switch, bolting it to four holes left vacant by removal of antenna tuning unit and meter panel drawer in standard GPT-10K.

d. Install emergency bracket, bolting it to two holes specified in item c above.

e. Install detent bracket, bolting it to two holes specified in item b above.

f. Connect the eight incoming wires to, or outgoing wires from, AS-117 to associated electrical components. (See figure 3-5, sheet 2.)

3-4. CHANGES TO PART II, VOLUME I, SECTION 3.

The controls on the standard and modified GPT-10K are alike and serve the same purpose with the following exceptions:

STANDARD GPT-10K	MODIFIED GPT-10K
OUTPUT LOADING (control 19) L912 and L913 in conjunction with OUTPUT BAL (control 18) C916 form part of the antenna tuning unit and meter panel drawer (L network).	OUTPUT LOADING (19) S903 in conjunction with OUTPUT BAL (18) C916 and three 140-ohm resistors R911, R912, and R913 form part of the AS-117. For further discussion, refer to paragraph 3-5 above.

STANDARD GPT-10K	MODIFIED GPT-10K
PA OUTPUT control (5) M1004 measures PA's output current to 72-ohm unbalanced antenna; PA's output current to 600-ohm balanced antenna is measured by two meters on top of the GPT-10K. These meters are located in the two legs of the rhombic, respectively.	PA OUTPUT (5) M1004 measures PA's output current regardless of whether three-position selector switch S903 is in the TUNE, OPERATE, or EMERGENCY position. In the TUNE position the meter registers the current to three 140-ohm resistors R911, R912, and R913 (50-ohm load); in the OPERATE position, the meter registers the current to GPT-40K's final amplifier in the EMERGENCY position, the meter registers the current supplied to GPT-40K's antenna, balanced or unbalanced.
Contains no external monitor circuit (pickup loop)	Contains an external monitor circuit (pick-up loop) to monitor RF in 4CX5000A's tank circuit. (See figure 3-1-c in this section.)

Control 19 is used in steps 26a and 26b. (Refer to paragraph 3-3 in Part II Volume I.) Under modified GPT-10K operation, control 19 is used to select GPT-10K's output feed: TUNE (50-ohm dummy load), OPERATE (GPT-40K's final amplifier), and EMERGENCY (GPT-40K's antenna circuit).

3-5. CHANGES TO PART II, VOLUME I, SECTION 4.

Standard power amplifier V900, described in paragraph 4-4-b in Volume I is modified as shown in figure 3-7 in this section. "X" wiring and "Y" wiring are shown in order to reveal the changes quickly. The "X" wiring applies to the standard power amplifier. Figure 3-7 in this section with "X" wiring is identical with figure 4-12. The "Y" wiring applies to the modified power amplifier. The following differences are readily apparent:

STANDARD AMPLIFIER	MODIFIED AMPLIFIER
Jumpers are used to establish output to balanced and unbalanced antenna.	No jumpers.
OUTPUT LOADING coils L912 and L913 are used.	Three-position selector switch S903 is used. Position of switch affects output circuit supplied by the amplifier as well as interlock circuit. For further interlock details of the changed circuit, refer to following discussion of figures 3-8 and 3-9 in this section.
Unbalanced output J903 is provided. (See figure 4-13 in Volume I.)	Emergency output J905 replaces unbalanced output J903. (See figure 3-7 in this section.)
Balanced output to rhombic is provided via E905 and E906. (See bowls in roof of PA compartment in figure 2-1 in Volume I.)	Drive output to GPT-40K's final amplifier provided via 50-ohm unbalanced circuit.
L907 is used in parallel with C916.	OUTPUT BAL capacitor C916 is used without L907.

The standard GPT-10K's interlock circuit (positions 1 through 10), described in paragraph 4-4c in Volume I is modified as shown in figure 3-8 in this section. "X" and "Y" wiring are shown in order to reveal the changes quickly. The "X" wiring applies to the standard interlock circuit. Figure 3-8 in this section with "X" wiring is identical with figure 4-15 in Volume I. The "Y" wiring applies to the modified interlock circuit. The following differences are readily apparent: The standard circuit is opened up and includes components in the GPT-40K's final amplifier stage. The contactor of relay K8102 and indicator I7302 (TUNE) and I7303 (OPERATE) interconnect in the standard circuit via two half wafers on the shaft of three-position selector switch S903. (See note, figure 3-8 in this section.)

The standard GPT-10K's interlock circuit (positions 11 and 12), described in paragraph 4-4c in Volume I is modified as shown in figure 3-9 in this section. "X" and "Y" wiring are shown in order to reveal the changes quickly. The "X" wiring applies to the standard interlock circuit. Figure 3-9 in this section with "X" wiring is identical with figure 4-16 in Volume I. The "Y" wiring applies to the modified interlock circuit. The following differences are readily apparent: The standard circuit is opened up and includes components in the GPT-40K's final amplifier stage. As stated above, the contactor of relay K8102 via terminals F, G, H of P900 (S) and indicators I7302 (TUNE) and I7303 (OPERATE) via terminals D, E of P900 (S) interconnect in the standard circuit via two half wafers (S902, S904) on the shaft of three-position selector switch S903.

The standard GPT-10K's main power circuit described in paragraph 4-6 in Volume I, is modified as shown in figure 3-10 in this section. "X" and "Y" wiring are shown in order to reveal the change quickly. The "X" wiring applies to the standard power circuit. Figure 3-10 in this section with "X" wiring is identical with figure 4-20 in Volume I. The "Y" wiring applies to the modified power circuit. The following differences are readily apparent: One of the 230-volt main power primaries is bridged. Its voltage locks up relay K7606 DRIVER INTERLOCK, a component of GPT-40K's relay panel.

3-6. CHANGES TO PART II, VOLUME I, SECTION 5.

Comparison of figures 5-4, 5-5, 5-6, and 5-7 in Volume I with corresponding figures 3-11 through

3-14 in this section shows the changes to the PA compartment, standard versus modified GPT-10K, respectively. The callouts in figures 3-11 through 3-14 in this section are for the purpose of quickly pointing out the differences.

Comparison of figure 5-8 in Volume I with corresponding figure 3-15 in this section shows the changes to the coil blower compartment, standard versus modified GPT-10K, respectively. The callouts in figure 3-15 in this section are for the purpose of quickly pointing out the differences.

3-7. CHANGES TO PART II, VOLUME I, SECTION 6.

None.

3-8. CHANGES TO PART II, VOLUME I, SECTION 7.

Replace figure 7-10 in Volume I with figure 3-16 in this section and figure 7-12 in Volume I with figure 3-17 in this section.

3-9. CHANGES TO PART II, VOLUME II, SECTIONS 1 THROUGH 7.

Replace figure 7-10 in Volume II with figure 3-16 in this section and figure 7-12 in Volume II with figure 3-17 in this section.

3-10. CHANGES TO PART II, VOLUME III.

SYMBOL	STANDARD GPT-10K	MODIFIED GPT-10K	REMARKS
A901	AX-120	NOT USED.	
A902	AX-120	NOT USED.	
C904	CM20C200J	CM15C200J	
C907	CC215L100B	CC215L100D	
C909	CO-102-3-17	CO-102-3	
C910	CM15C500J	CM15C510J	
C942	CM20B500J	CM20B510J	
E900 through E904	AX-152	NOT USED.	
E905 and E906	AX-159	NOT USED.	
E913	AX-129	NONE	
J903	Cust. Request	NOT USED.	
J905	NONE	JJ-137	
J906	NONE	JJ-172	
L900	CL-177	A-1045	
L907	CL-166	NOT USED.	
L909	CL-178	A-1126	
L912	AC-102	NOT USED.	
L913	AC-102	NOT USED.	
L914	CL-179	A-1163	
P900	NONE	MS3106B20-275	
P901	NONE	PL-169	
R911	NOT USED.	RR-117-140	
R912	NOT USED.	RR-117-140	
R913	NOT USED.	RR-117-140	
S902	NONE	SW-169	
S903	NONE	AS-117	
S904	NONE	WS-109	

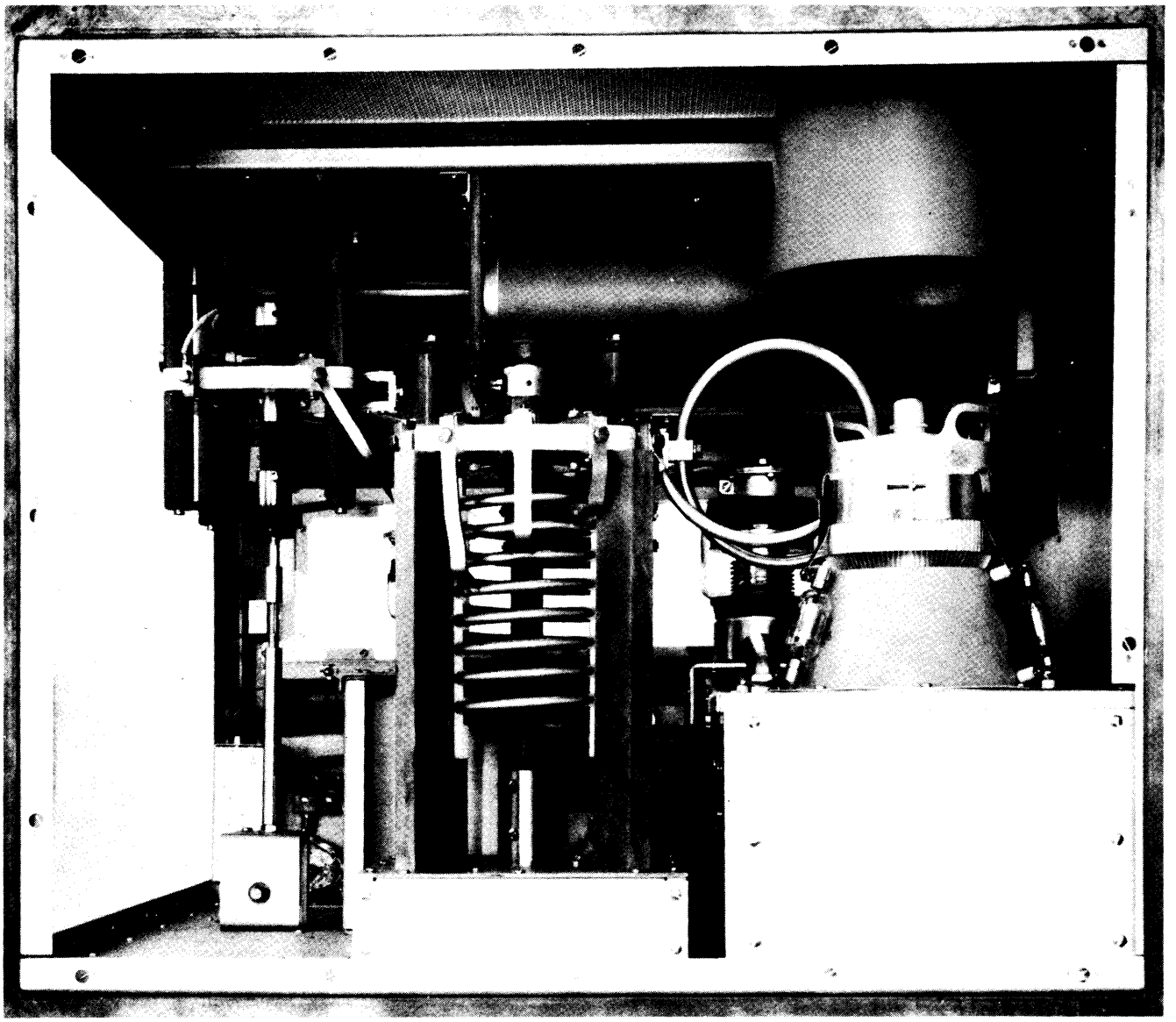


Figure 3-1-a. Modified GPT-10K's PA Compartment, Full Rear View

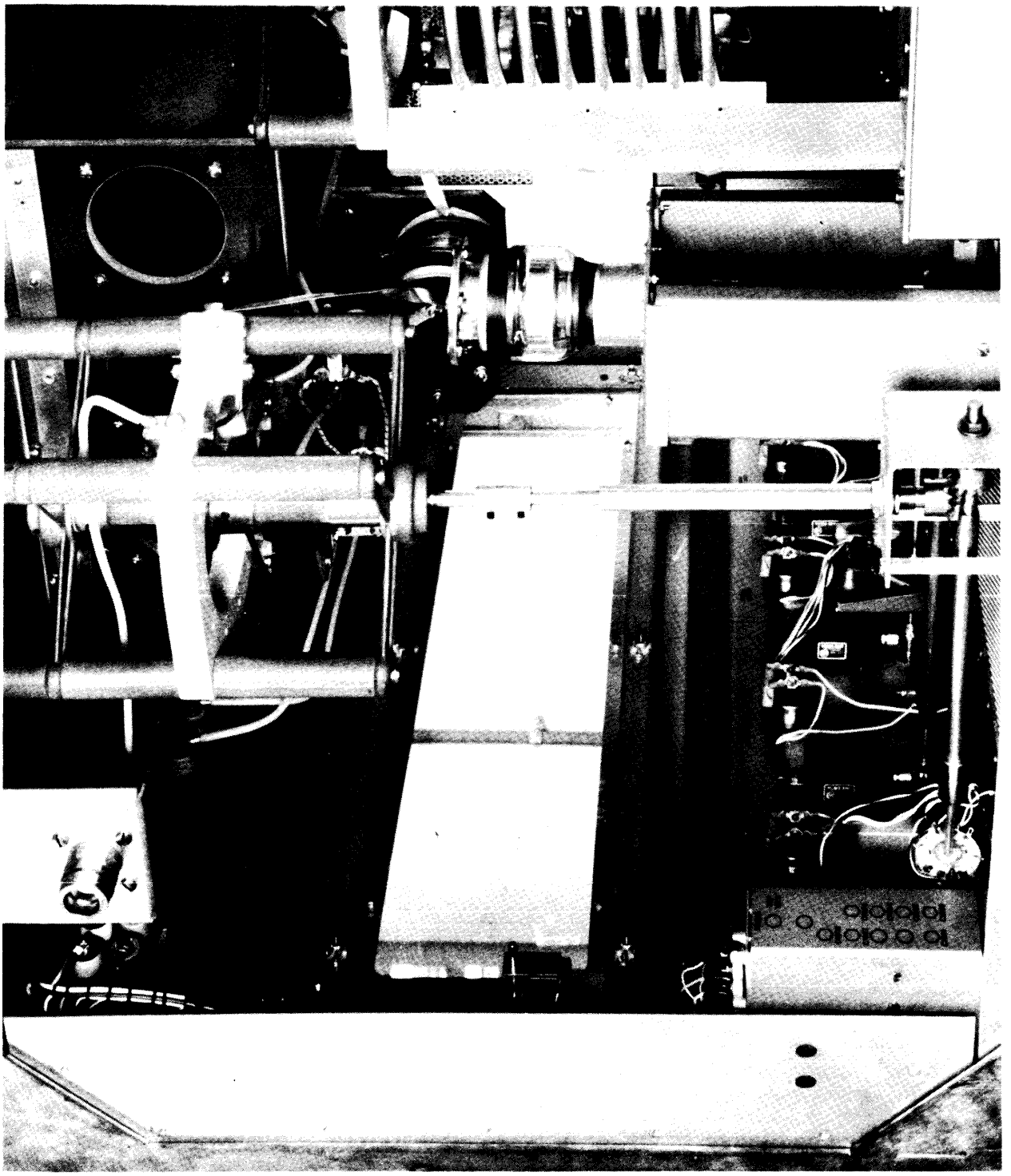


Figure 3-1-b. Modified GPT-10K's PA Compartment, 45-Degree Angle Side View

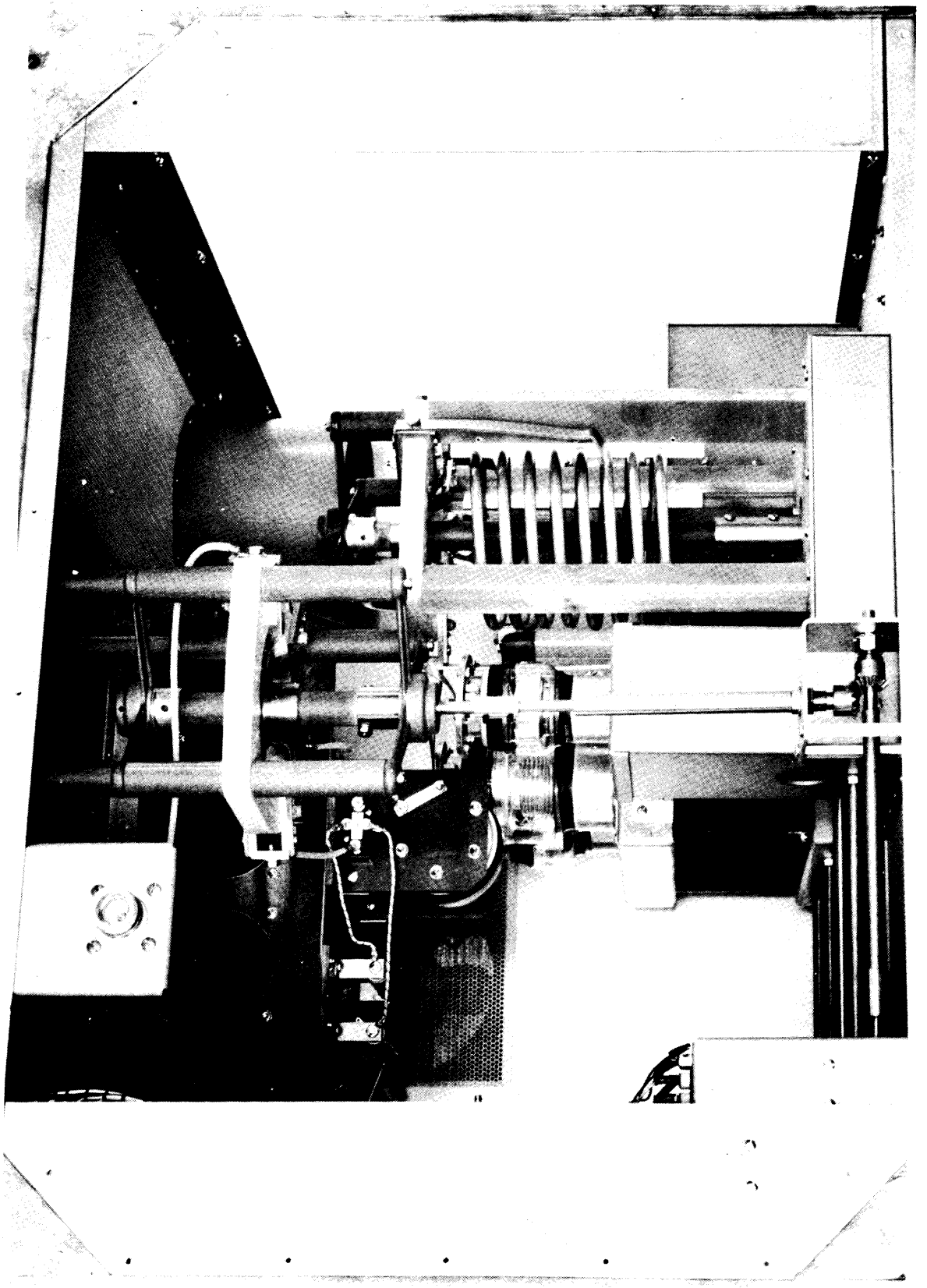


Figure 3-1-c. Modified GPT-10K's PA Compartment, 135-Degree Angle Side View

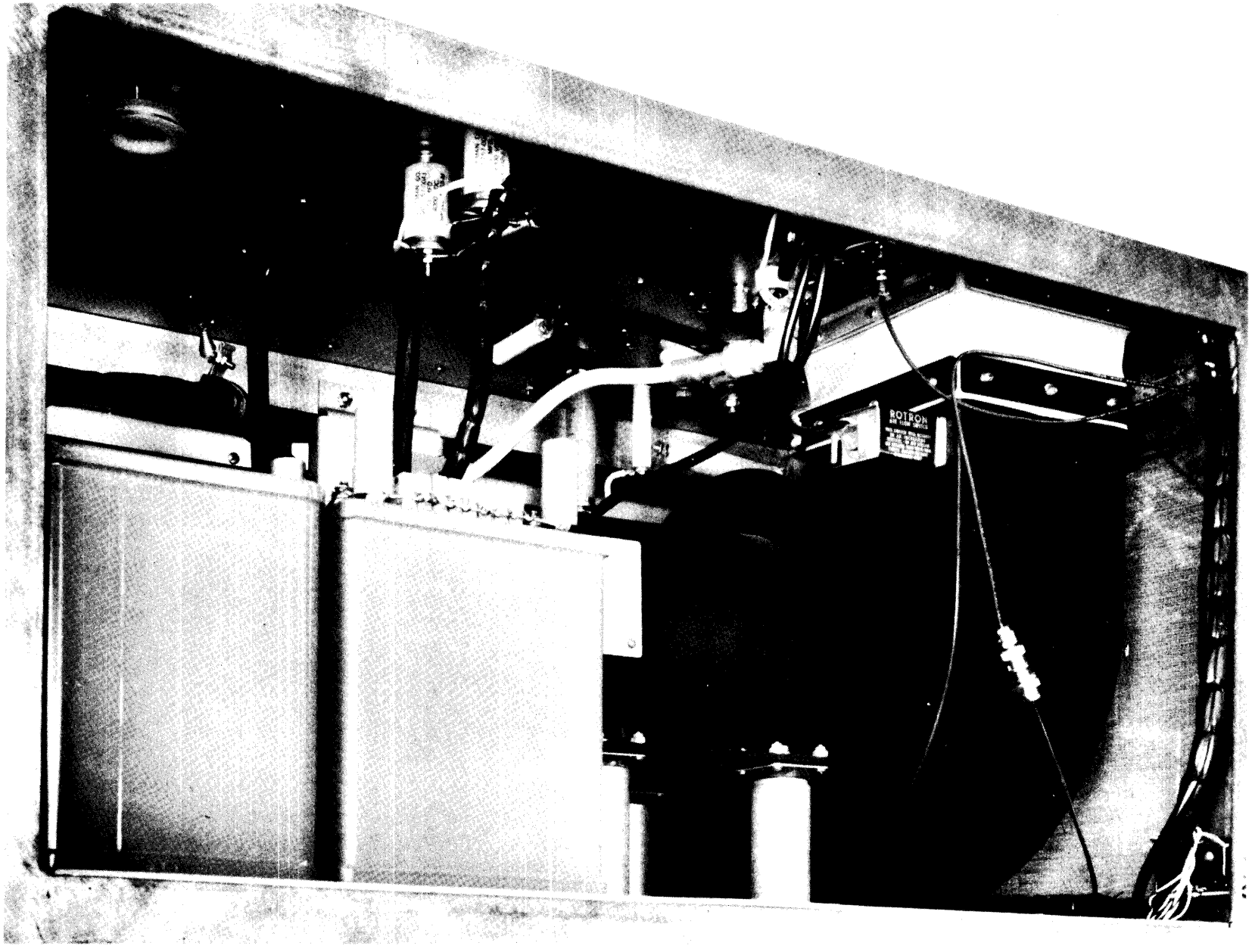


Figure 3-1-d. Modified GPT-10K's FSA Monitor Wiring Showing Coaxial Connectors to IPA(10K), PA(10K), and PA(40K)

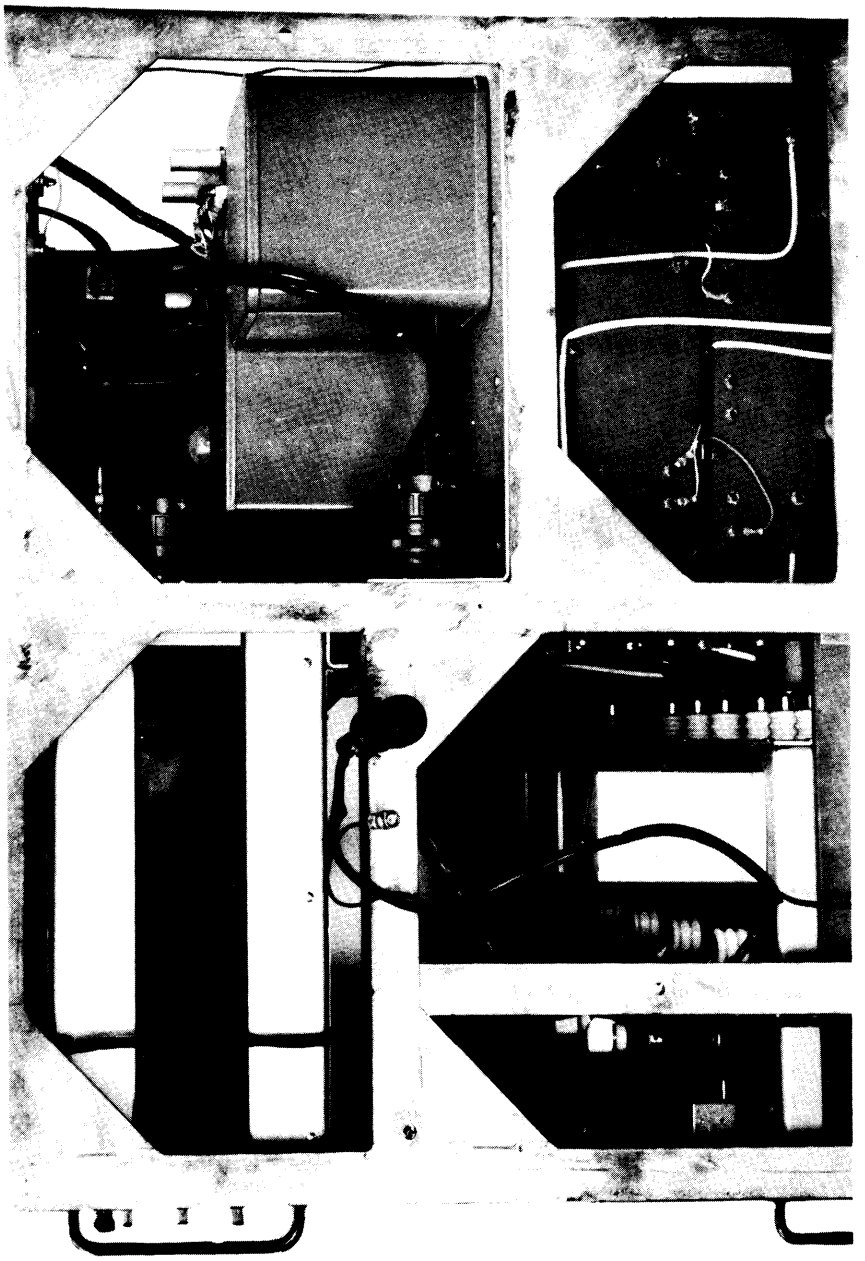
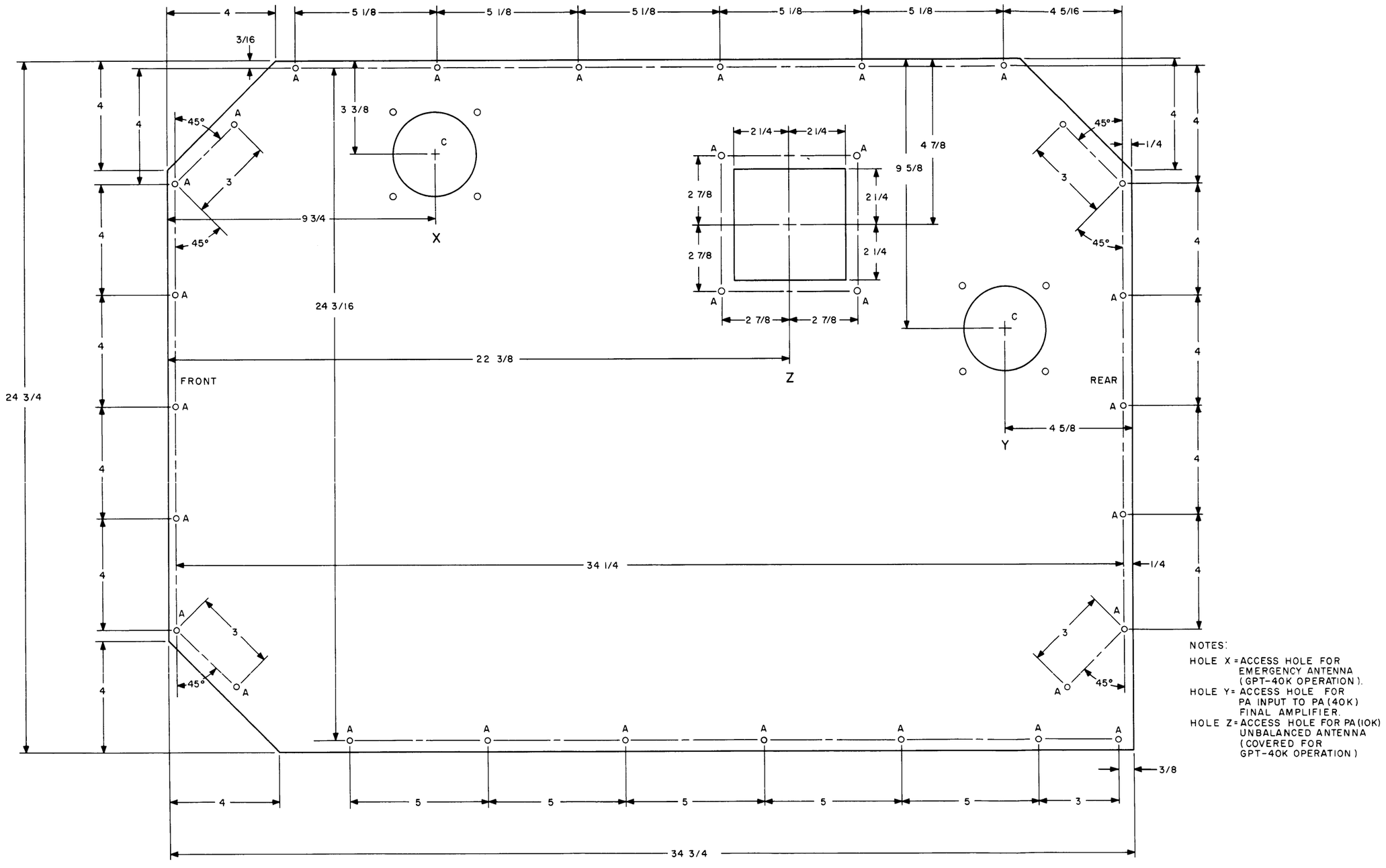


Figure 3-2. Modified GPT-10K's Signal Cables Interconnecting GPT-40K's Third and Fourth Frames



NOTES:

HOLE X = ACCESS HOLE FOR EMERGENCY ANTENNA (GPT-40K OPERATION).

HOLE Y = ACCESS HOLE FOR PA INPUT TO PA(40K) FINAL AMPLIFIER.

HOLE Z = ACCESS HOLE FOR PA(10K) UNBALANCED ANTENNA (COVERED FOR GPT-40K OPERATION)

Figure 3-3-a. Modified GPT-10K's Right Side Top Inside Shield

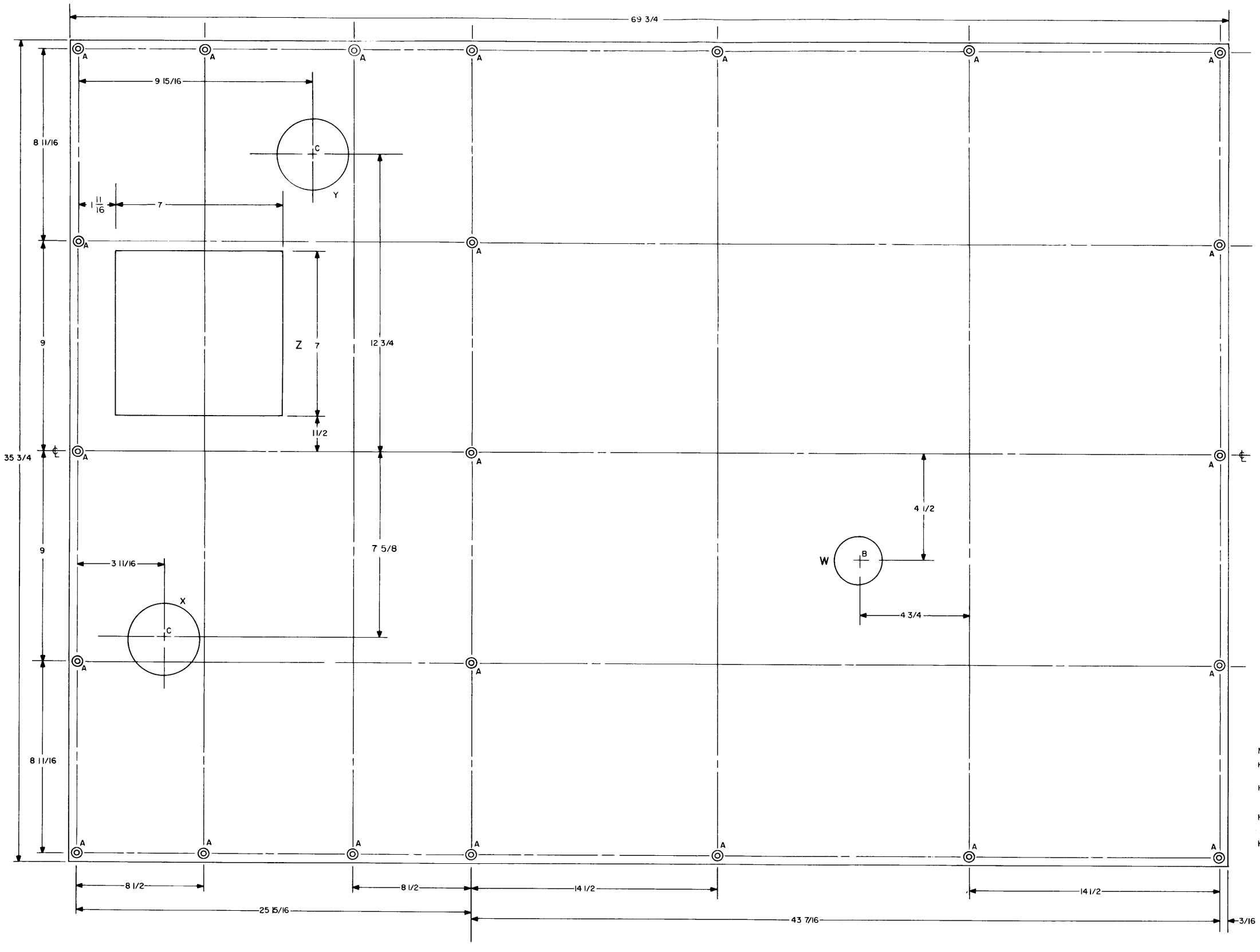


Figure 3-3-b. Modified GPT-10K's Right Side Shield

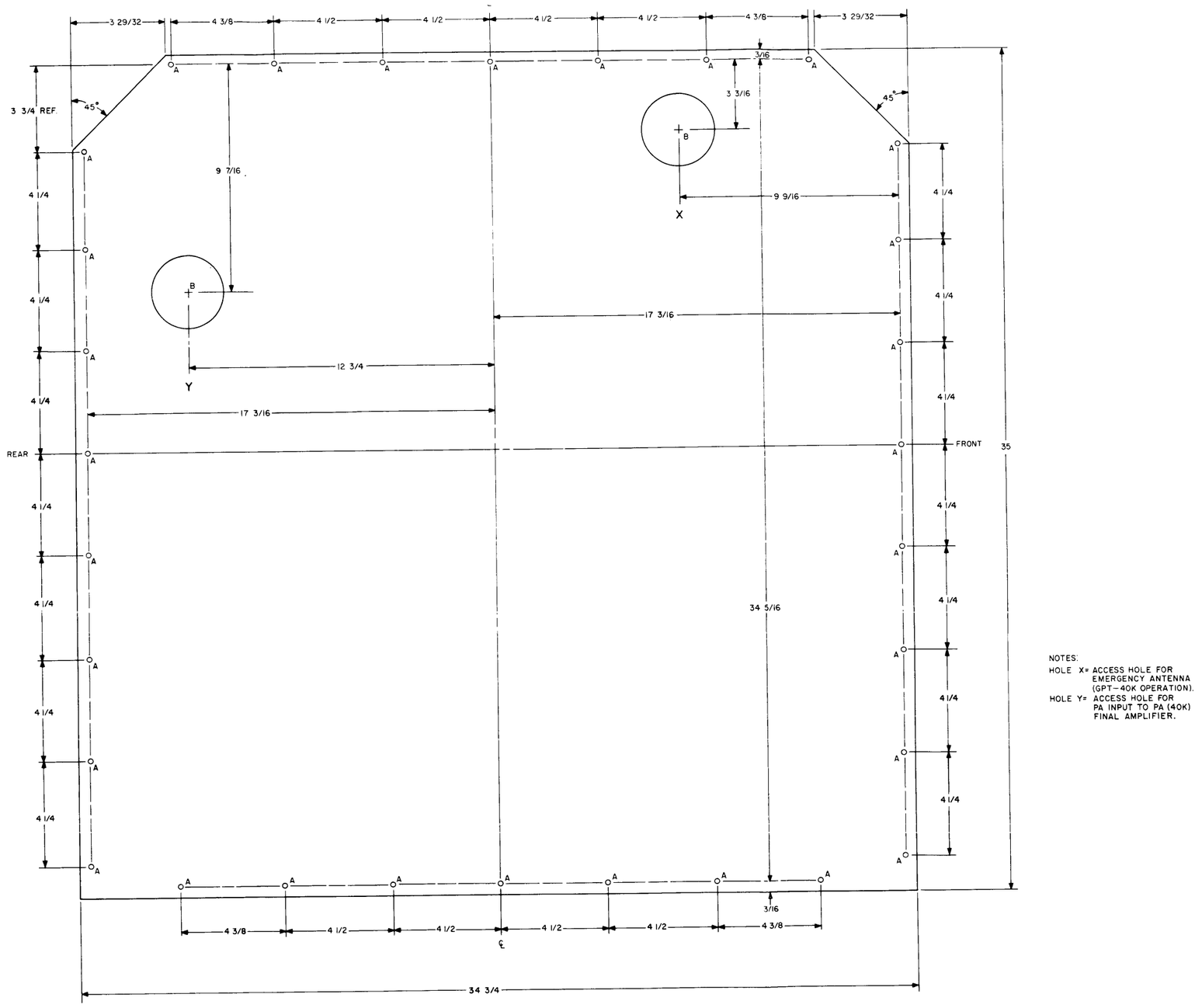


Figure 3-3-c. GPT-40K's Left Side PA Frame Shield

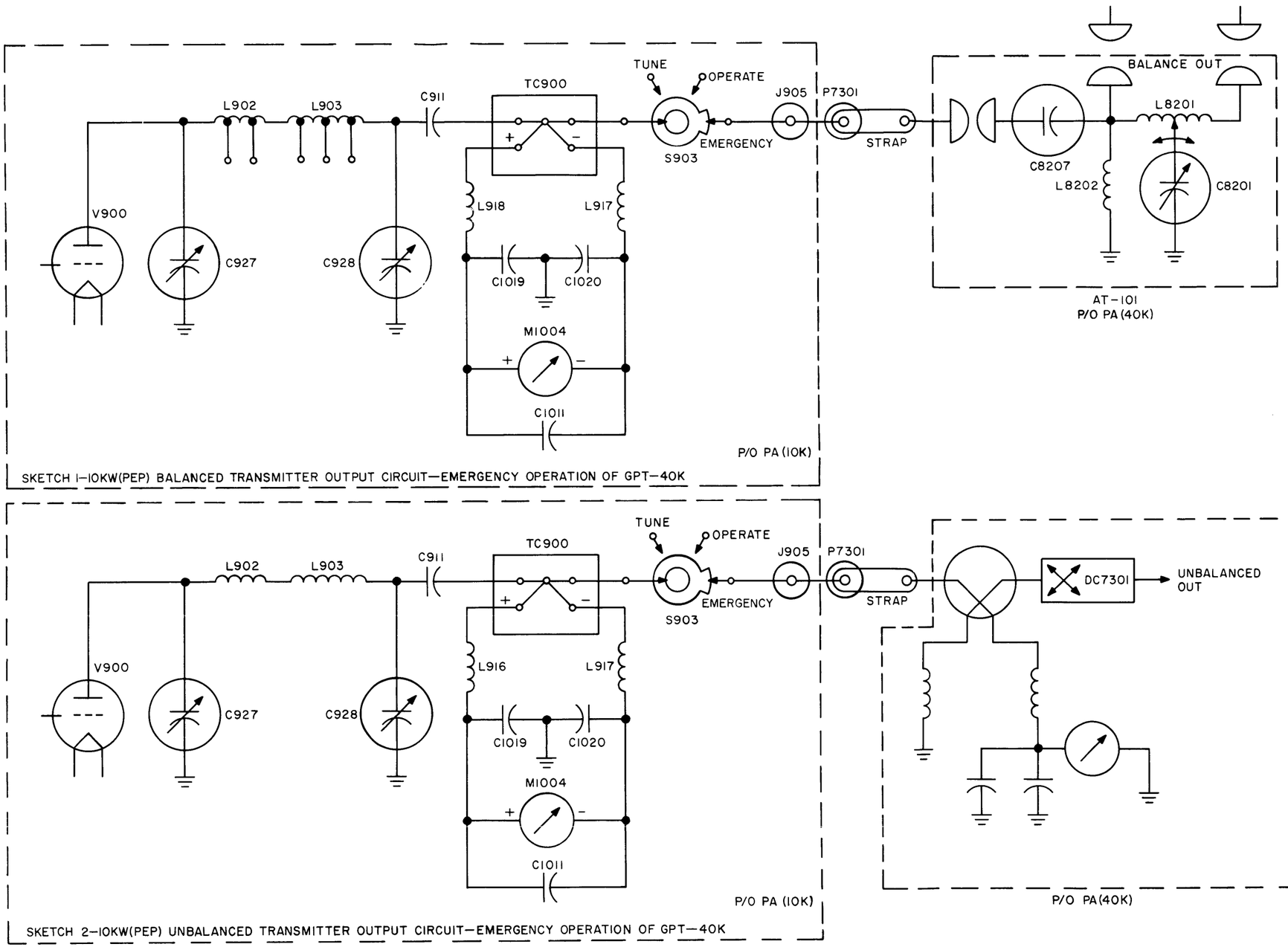


Figure 3-4. Modified GPT-10K's Output Circuit Operation with Balanced and Unbalanced Emergency Antennas

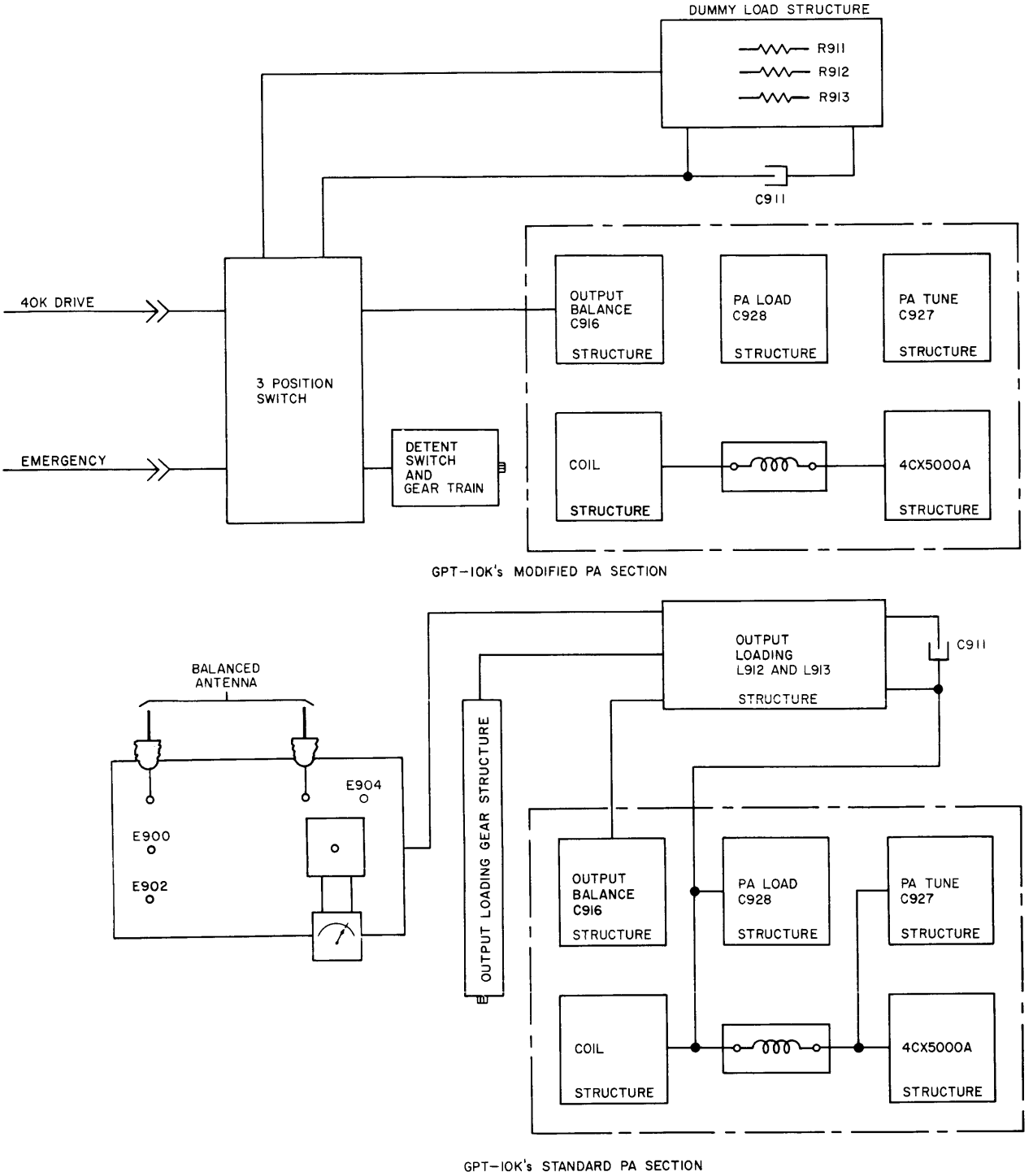


Figure 3-5. Major Assembly Differences between GPT-10K's Standard and Modified PA Section (Sheet 1 of 2)

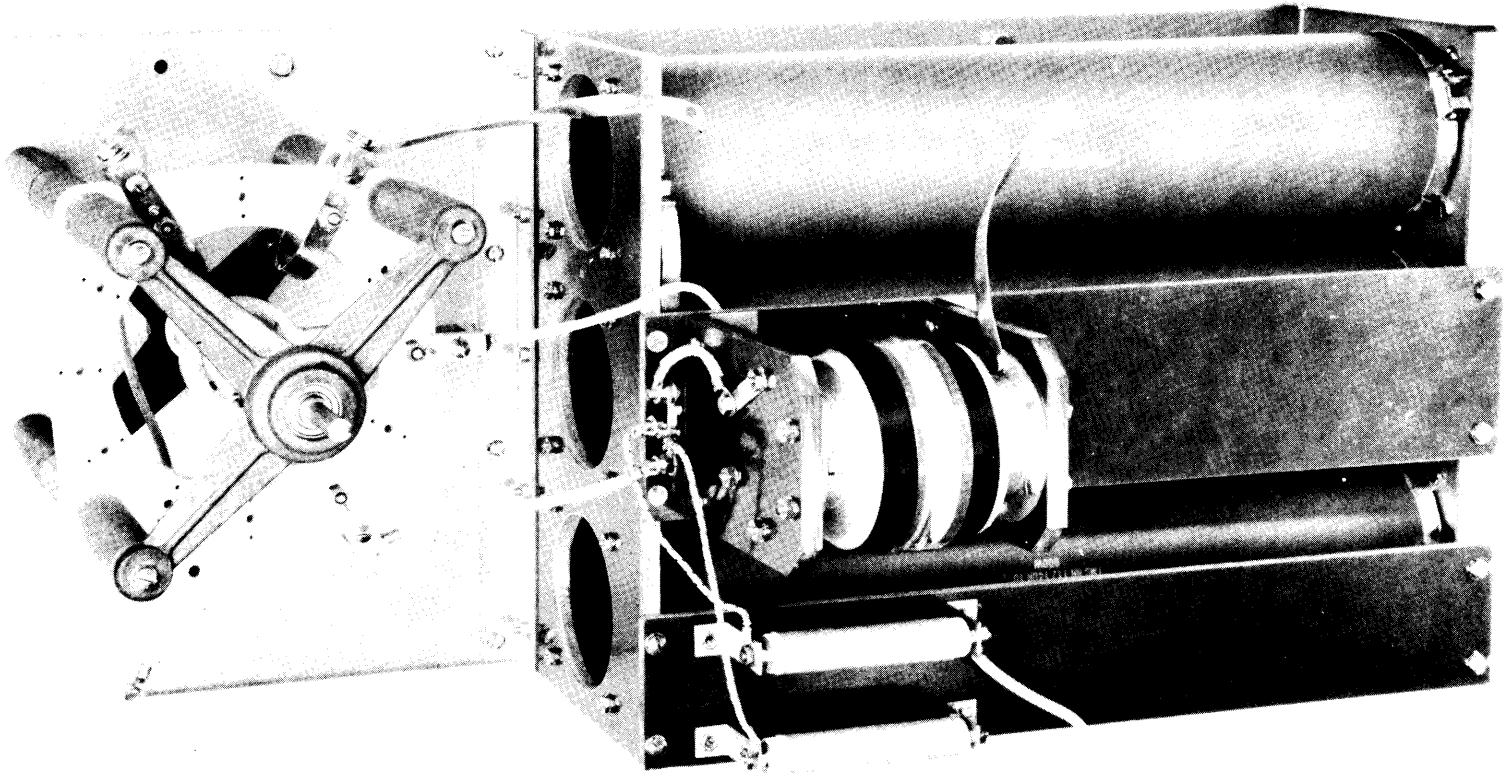


Figure 3-5. Major Assembly Differences between GPT-10K's Standard and Modified PA Section (Sheet 2 of 2)

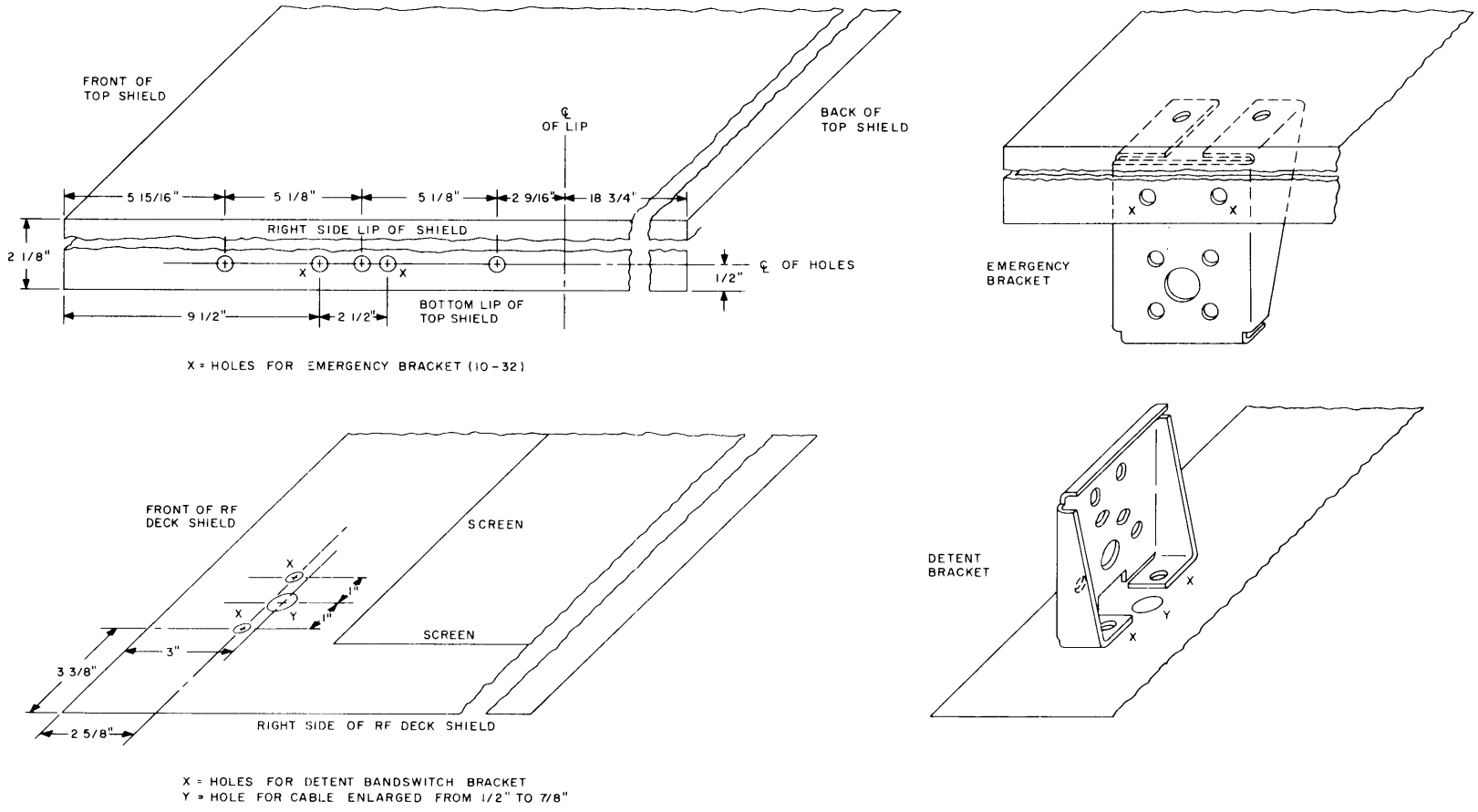
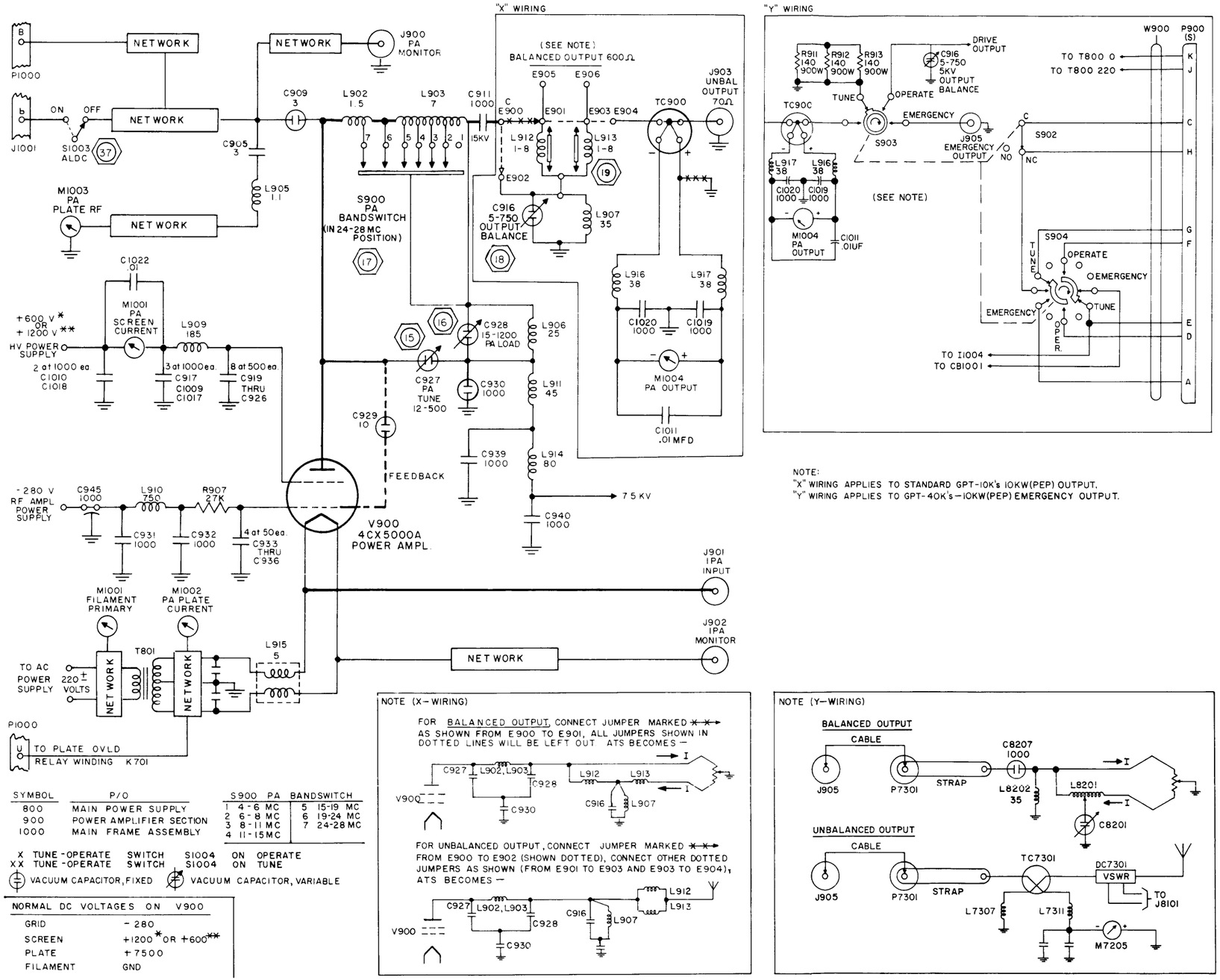
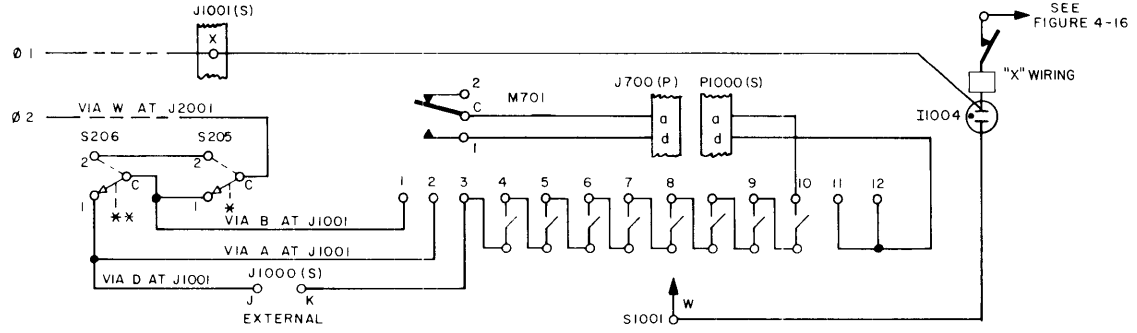


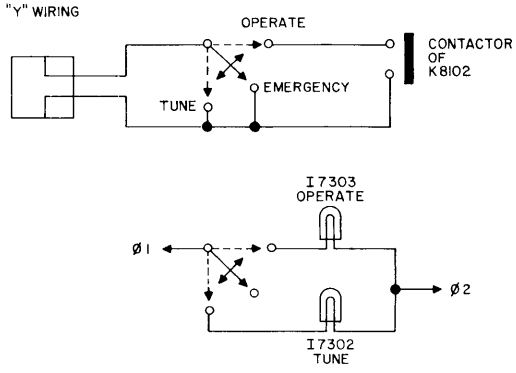
Figure 3-6. Additional Holes Required to Accommodate Attachment of GPT-40K's Emergency and Detent Brackets



NOTE:
"X" WIRING APPLIES TO STANDARD GPT-10K's 10KW(PEP) OUTPUT.
"Y" WIRING APPLIES TO GPT-40K's—10KW(PEP) EMERGENCY OUTPUT.

Figure 3-7. Simplified Schematic Diagram, Standard vs Modified GPT-10K's PA Circuit





GENERAL: IN ALL 10 FOLLOWING CASES, Ø1 REACHES WIPER OF SWITCH 1001

CASE	CONDITION	CIRCUIT
1	BANDSWITCH INTERLOCK S205 CLOSED	Ø2 REACHES WIPER W VIA C,1 OF S205; 1 OF S1001.
2	AIR SWITCH S206 CLOSED	Ø2 REACHES WIPER W VIA C,1 OF S205; C,1 OF S206; 2 OF S1001.
3	EXTERNAL CLOSED	Ø2 REACHES WIPER W VIA C,1 OF S205; C,1 OF S206; J,K CLOSED; 3 OF S1001.
4	REAR DOOR S1006	SEE CASE 3 EXCEPT 4 OF S1001 CLOSED.
5	PA AIR SWITCH S800	SEE CASE 4 EXCEPT 5 OF S1001 CLOSED.
6	PA DECK SWITCH S1007	SEE CASE 5 EXCEPT 6 OF S1001 CLOSED.
7	PA BANDSWITCH S901	SEE CASE 6 EXCEPT 7 OF S1001 CLOSED.
8	RIGHT SIDE SWITCH S1008 IPA DRAWER SWITCH S1009	SEE CASE 7 EXCEPT 8 OF S1001 CLOSED. NOT CONNECTED TO S1001, SEE SECTION 4-3b
9	HV DECK SWITCH S1010	SEE CASE 8 EXCEPT 9 OF S1001 CLOSED.
10	RELAY DECK S1011	SEE CASE 9 EXCEPT 10 OF S1001 CLOSED.
11	TIMER SWITCH M901	SEE FIGURE 4-16
12	NORMAL	

* S205 PLACEMENT CONTROLLED BY BANDSWITCH S202

** S206 PLACEMENT CONTROLLED BY AIR VANE SWITCH S206

NOTE:

THREE POSITION SELECTION SWITCH S903 HAS TWO HALF ON SHAFT WITH HEAVY DUTY OUTPUT CIRCUIT TO DUMMY LOAD, EMERGENCY FEED, FINAL GPT-40K PA DRIVE. FIRST HALF WAFER TIES GPT-40K'S CONTACTOR OF RELAY K8102 INTO MODIFIED GPT-10K'S INTERLOCK CIRCUIT; SECOND HALF WAFER TIES GPT-40K'S INDICATING LIGHTS I7302 AND I7303 INTO S903'S POSITION.

Figure 3-8. Simplified Schematic Diagram, Standard vs Modified GPT-10K's Interlock Circuits, Positions 1 through 10

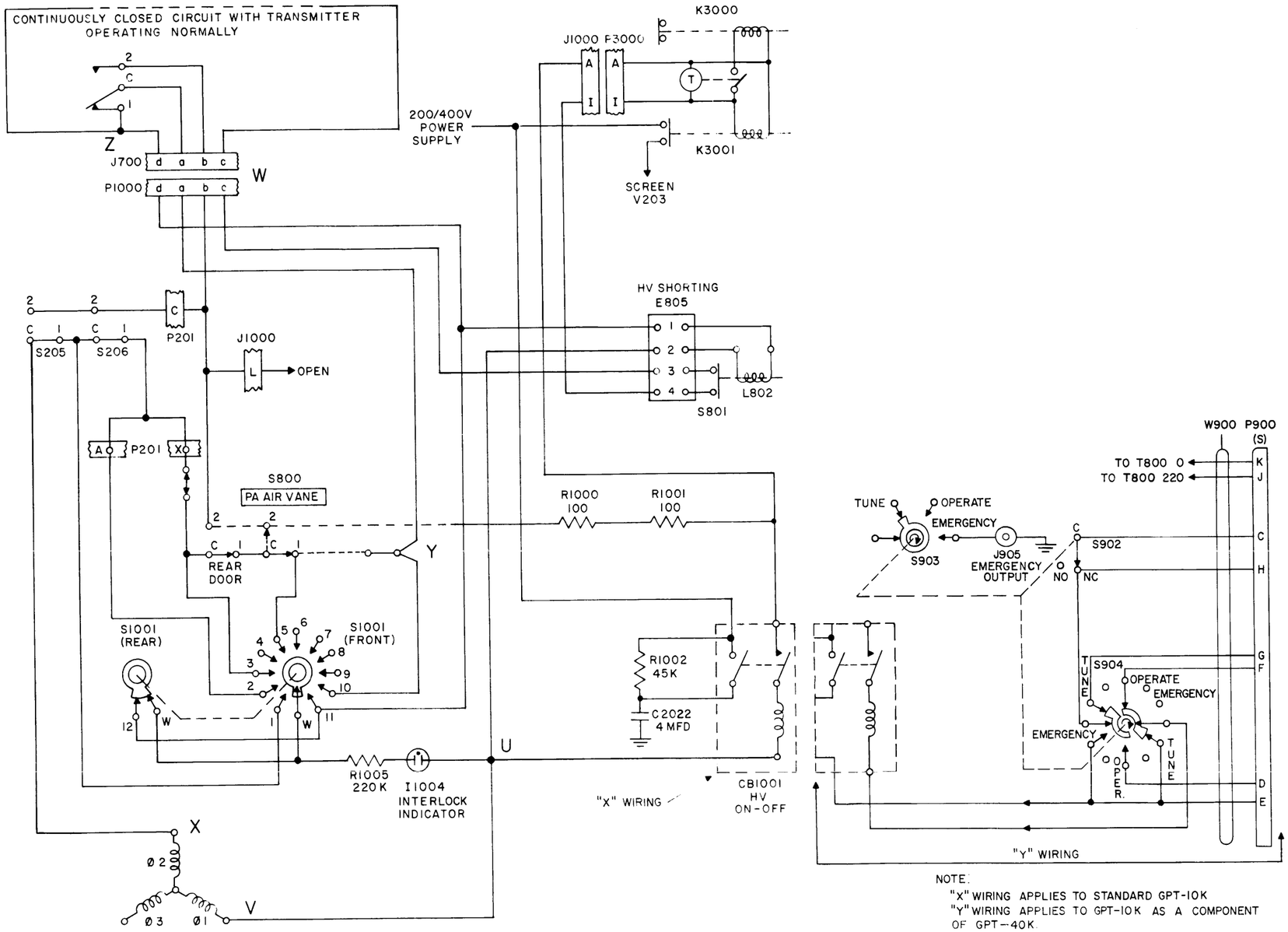
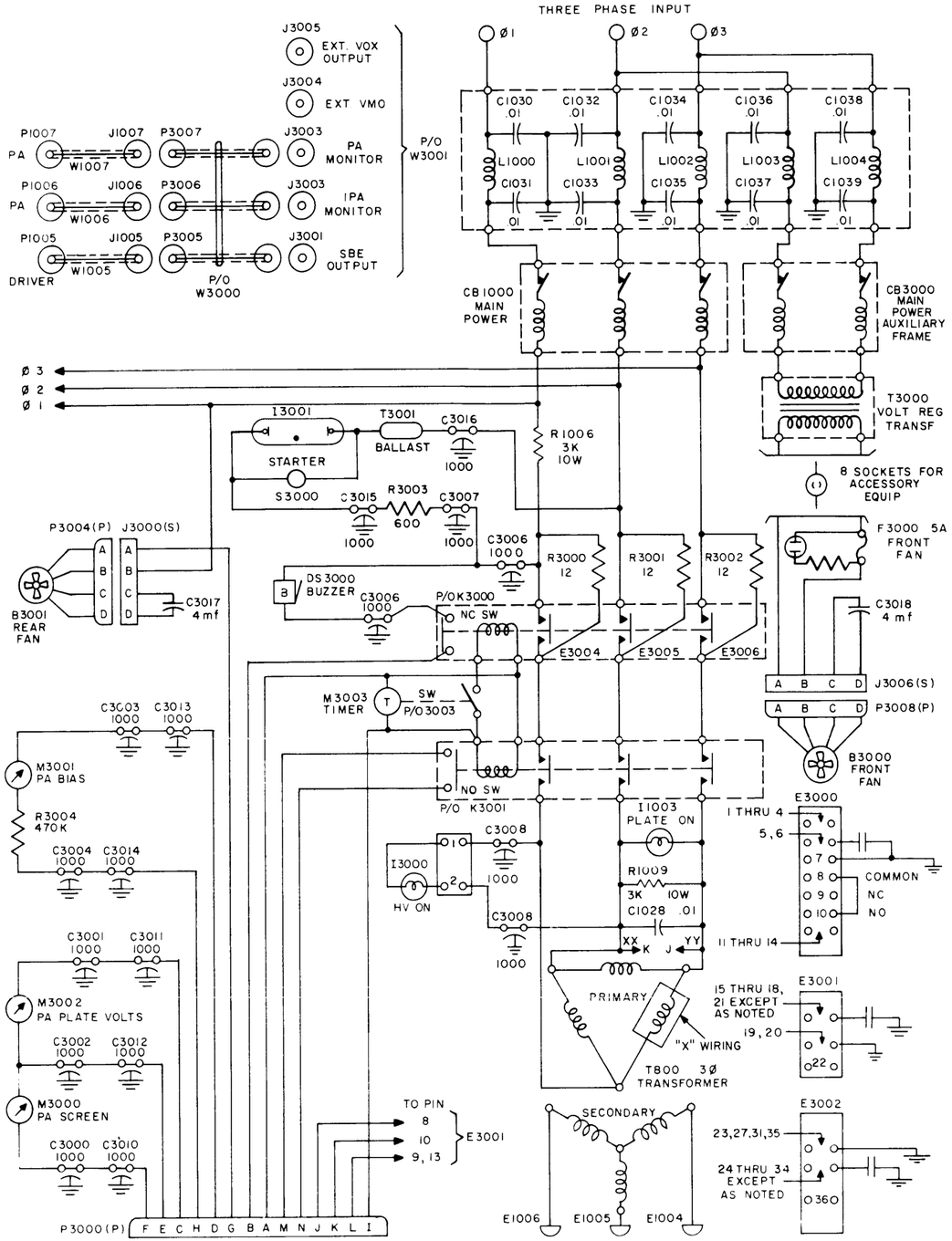


Figure 3-9. Simplified Schematic Diagram, Standard vs Modified GPT-10K's Interlock Circuits, Positions 11 and 12



NOTE:
"X" WIRING APPLIES TO STANDARD GPT-10K
"Y WIRING APPLIES TO GPT-10K AS A COMPONENT OF GPT-40K.

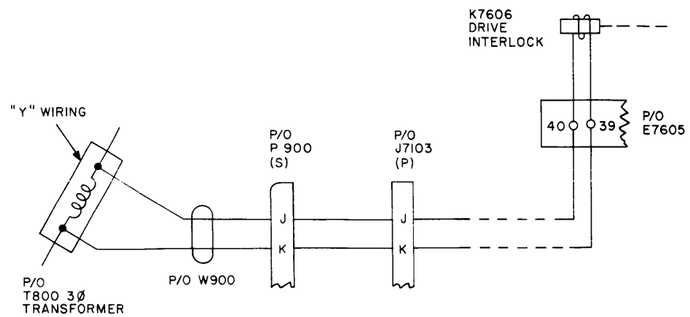


Figure 3-10. Simplified Schematic Diagram, Standard vs Modified GPT-10K's Main Power Circuit

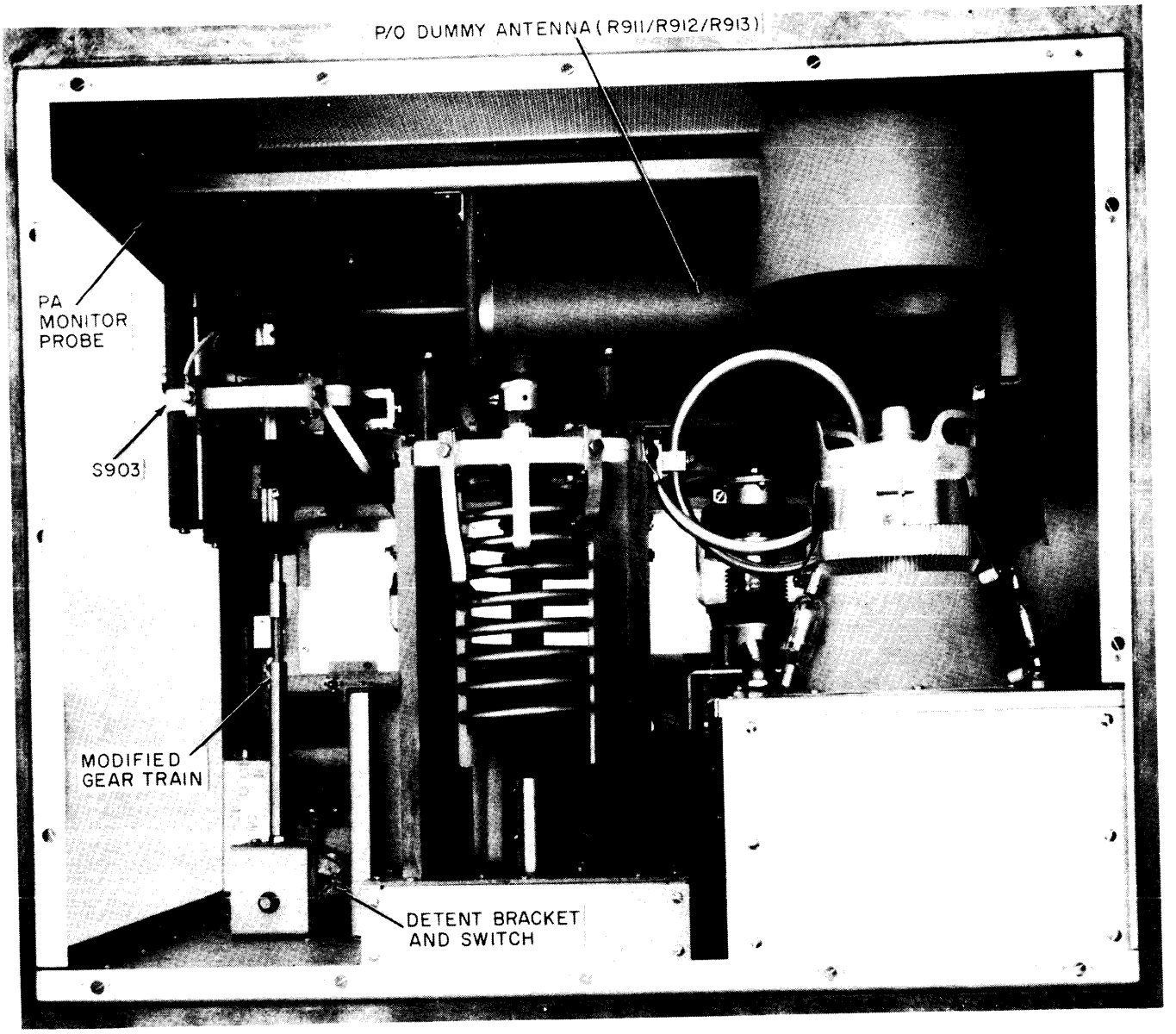


Figure 3-11. Modified GPT-10K's PA Compartment with Callouts on Changed Components, Full Rear View

Original

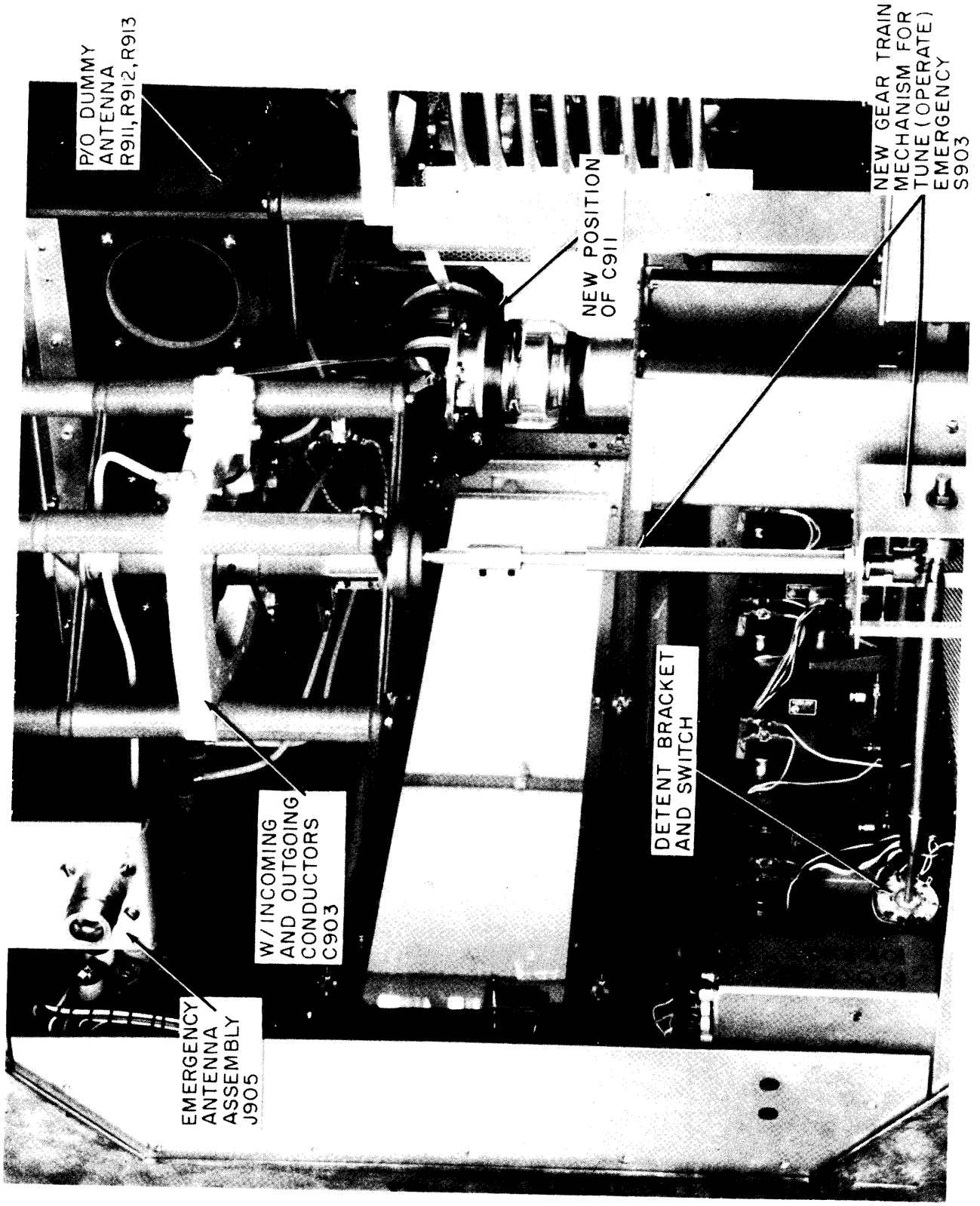


Figure 3-12. Modified GPT-10K's PA Compartment with Callouts on Changed Components, 45-Degree Angle Side View

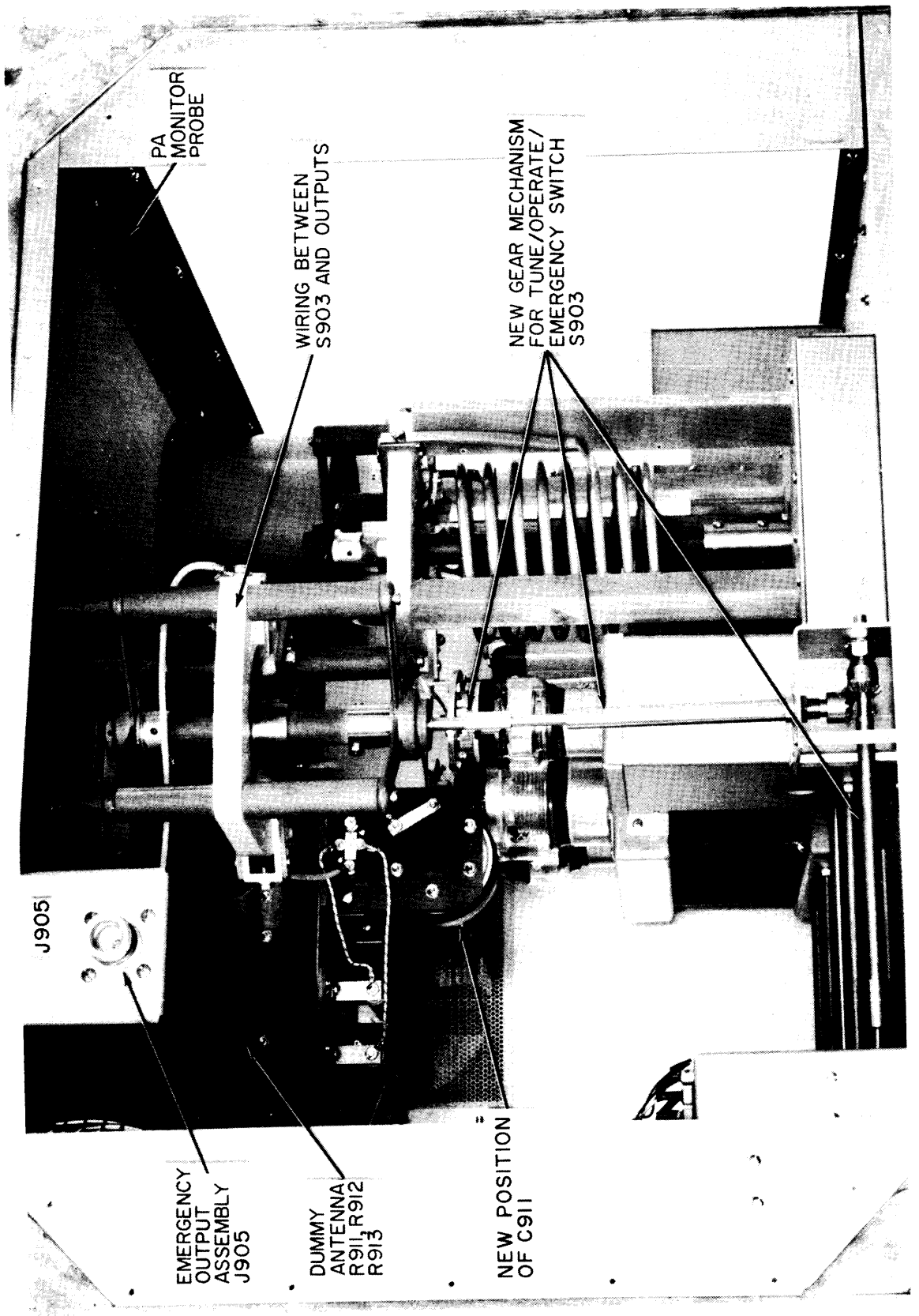


Figure 3-13. Modified GPT-10K's PA Compartment with Callouts on Changed Components, 135-Degree Angle Side View

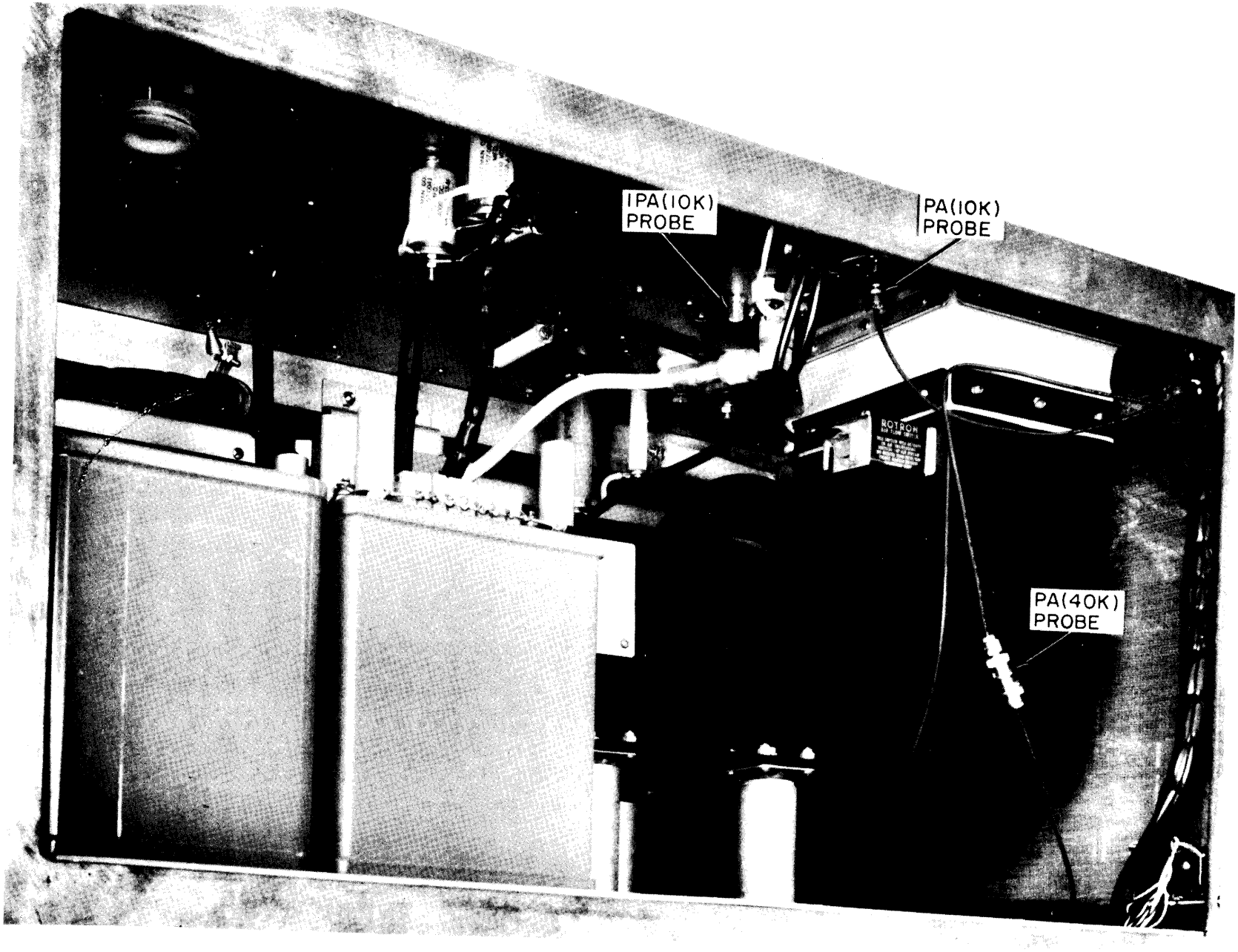


Figure 3-14. Modified GPT-10K's FSA Monitor Wiring Showing Coaxial Connectors with Callouts on Changed Components

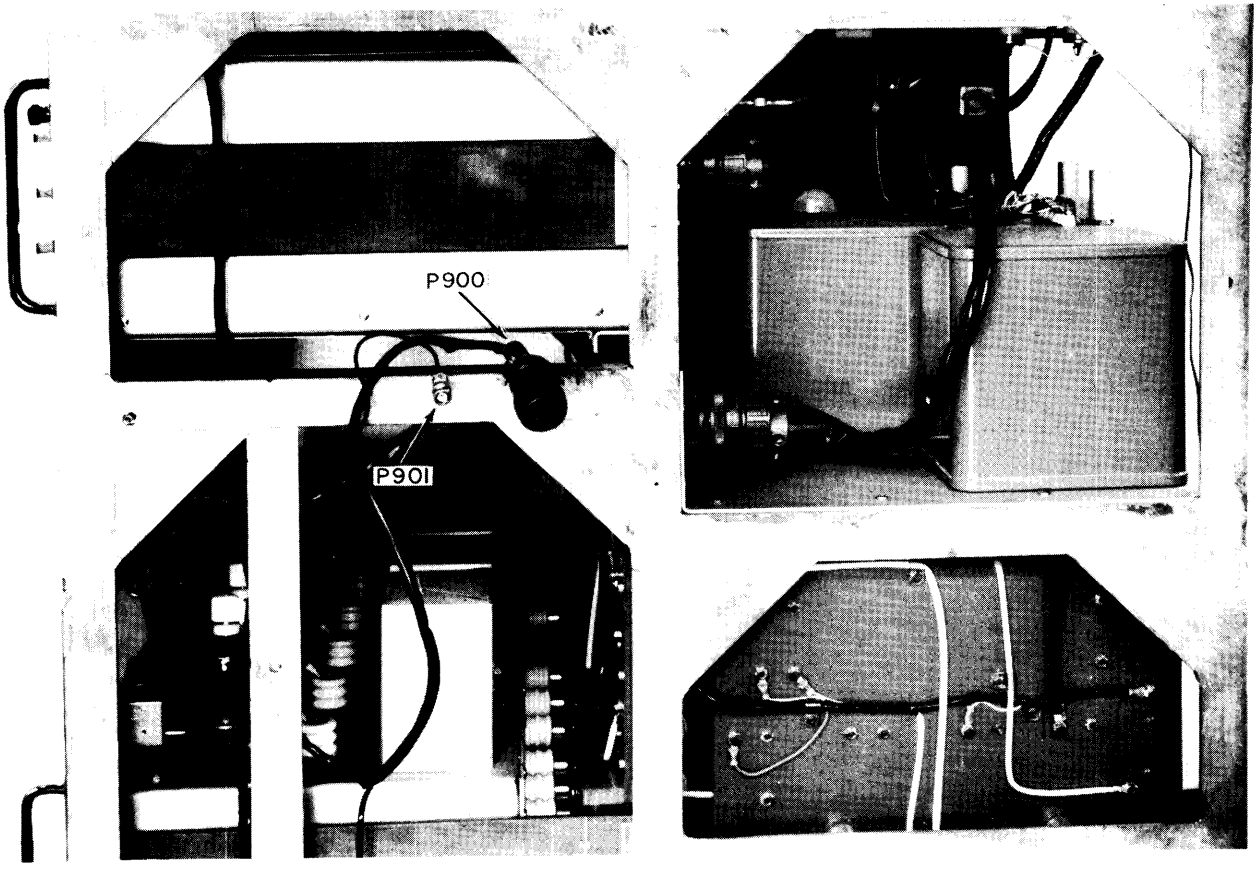
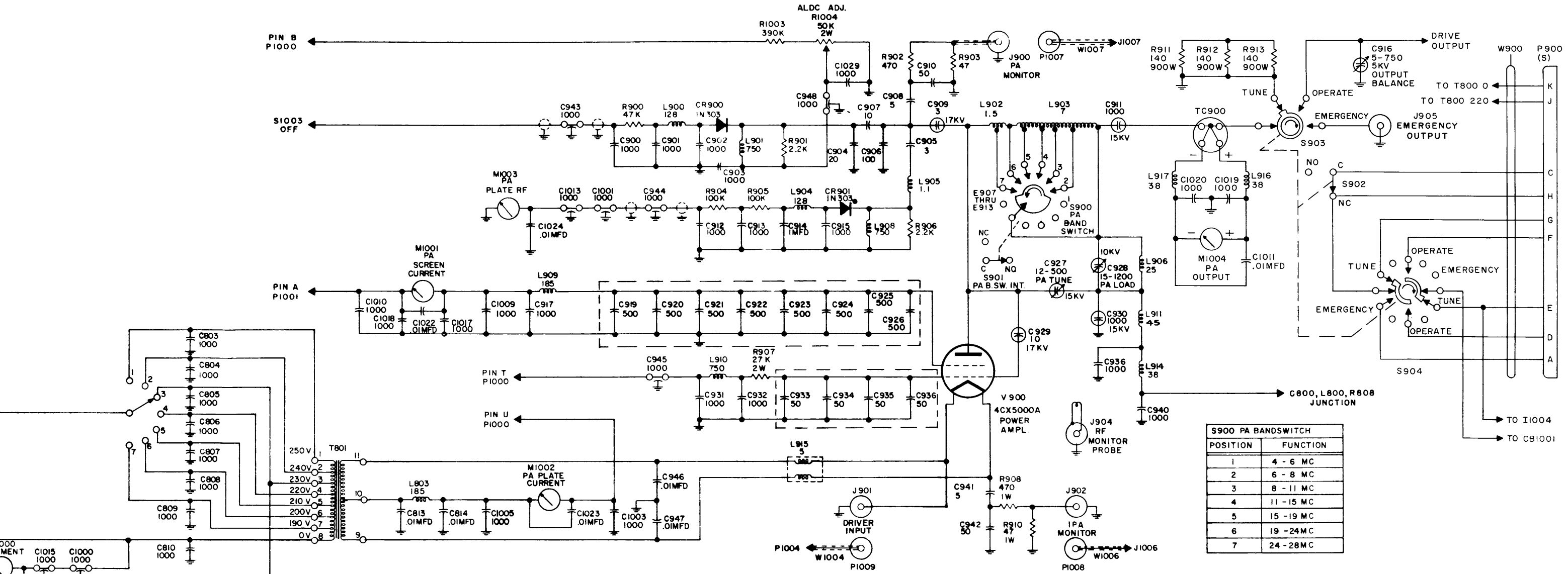


Figure 3-15. Modified GPT-10K's Signal Cables Interconnecting GPT-40K's Third and Fourth Frames with Callouts on Changed Components



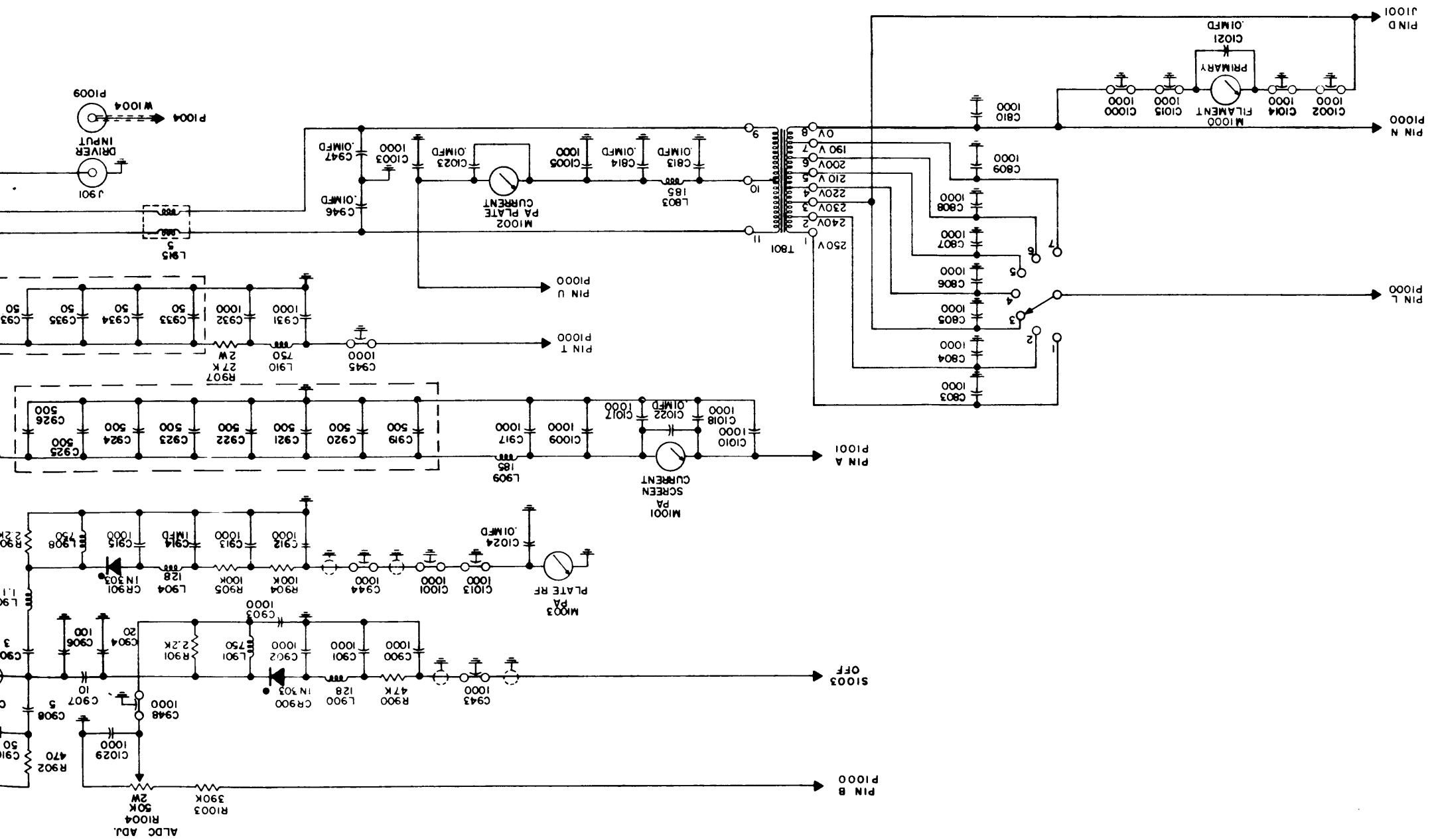
S900 PA BANDSWITCH	
POSITION	FUNCTION
1	4 - 6 MC
2	6 - 8 MC
3	8 - 11 MC
4	11 - 15 MC
5	15 - 19 MC
6	19 - 24MC
7	24 - 28MC

NOTES-
UNLESS OTHERWISE SPECIFIED-
1. ALL CAPACITORS ARE IN μμF.D.
2. ALL RESISTORS ARE 1/2 WATT.
3. ALL COILS ARE IN MICROHENRIES.
4. S900 SHOWN IN POSITION 1.
5. S901 IS P/O INTERLOCK SYSTEM. SEE MASTER SCHEM.(CK-403) FOR CONNECTIONS.
6. THE 800 & 1000 SYMBOL SERIES SHOWN ARE NOT P/O P.A.

LAST SYMBOLS	MISSING SYMBOLS
C948	C937, 938, 918
CR901	
*E913	
J904	
L917	
R910	R909
S901	
TC900	
V900	

* NOTE
E907 THRU E913 ARE S900 CONTACTS

Figure 3-16. Schematic Diagram, Modified GPT-10K's PA Section


PIN D
J1001
C1021
.01MFD
PRIMARY
M1000
FILAMENT
C1002
1000
C1014
1000
C1015
1000
C1000
1000
PIN N
P1000
C810
1000
C809
1000
C808
1000
C807
1000
C806
1000
C805
1000
C804
1000
C803
1000
T801
0V 8
190 V 7
200V 6
210 V 5
220V 4
230V 3
240V 2
250V 1
9
10
11
7
6
5
4
3
2
1
PIN L
P1000
M1002
PA PLATE
CURRENT
L803
185
C813
.01MFD
C814
.01MFD
C1005
1000
C1023
.01MFD
C1003
1000
C947
.01MFD
C946
.01MFD
J901
DRIVER
INPUT
P1004
W1004
P1009
L815
5
PIN U
P1000
PIN T
P1000
C935
50
C934
50
C933
50
C932
1000
C931
1000
R907
27K
2W
L910
750
C945
1000
C925
500
C926
500
C924
500
C923
500
C922
500
C921
500
C920
500
C919
500
C917
1000
C1009
1000
C1017
.01MFD
C1022
.01MFD
C1018
1000
C1010
1000
L909
185
M1001
PA
SCREEN
CURRENT
PIN A
P1001
C1024
.01MFD
C1013
1000
C1001
1000
C944
1000
R905
100K
R904
100K
C913
1000
C912
1000
L904
128
C914
.1MFD
C915
1000
L908
750
R906
2.2K
CR901
1N303
PLATE RF
M1003
PA
C903
1000
C904
20
C906
100
C907
10
C908
5
C948
1000
C943
1000
R900
47K
L900
128
CR900
1N303
C902
1000
C901
1000
C900
1000
L901
750
R901
2.2K
S1003
OFF
R902
470
C1029
1000
ALC ADJ.
R1004
50K
2W
R1003
390K
PIN B
P1000

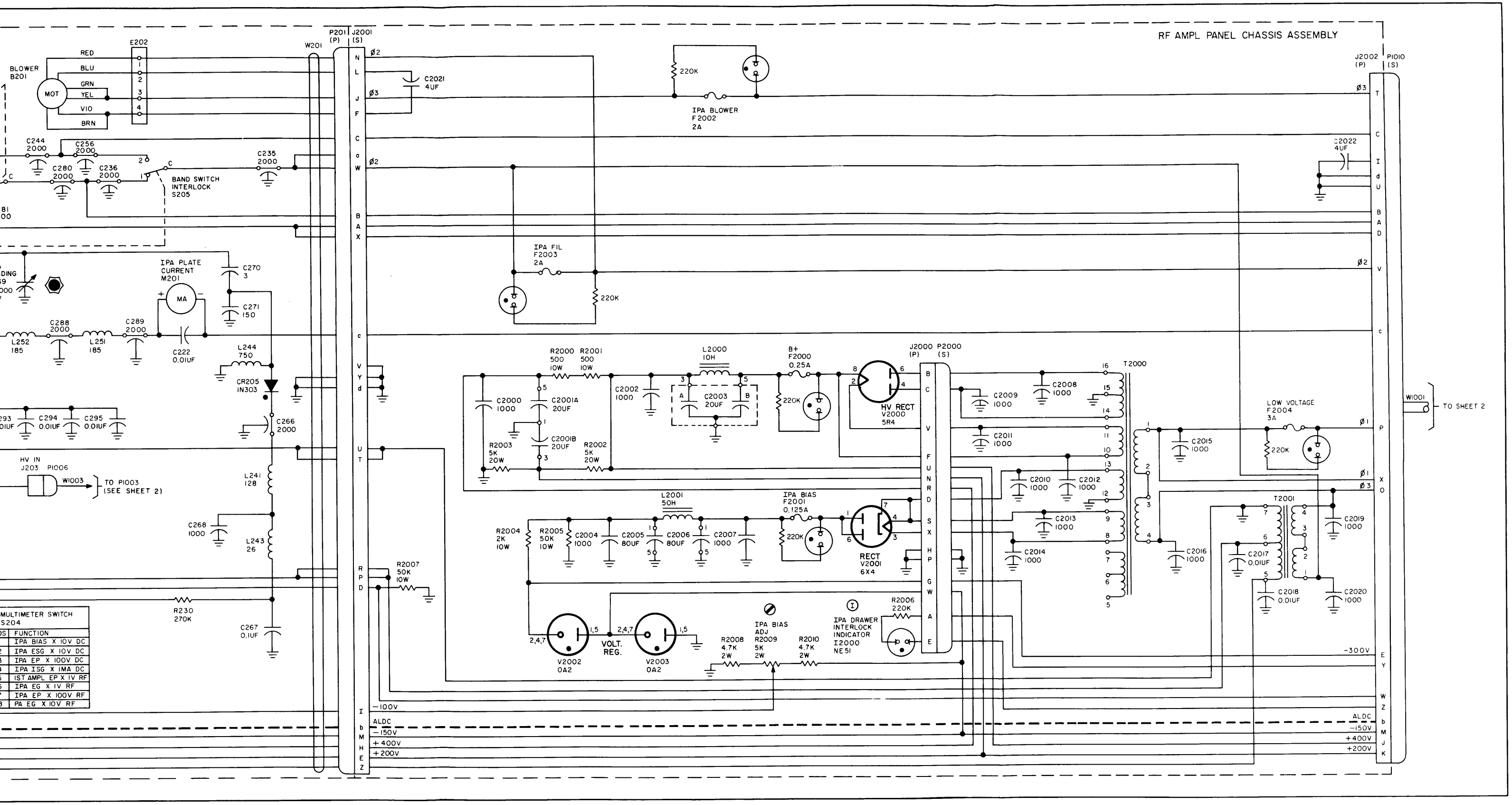
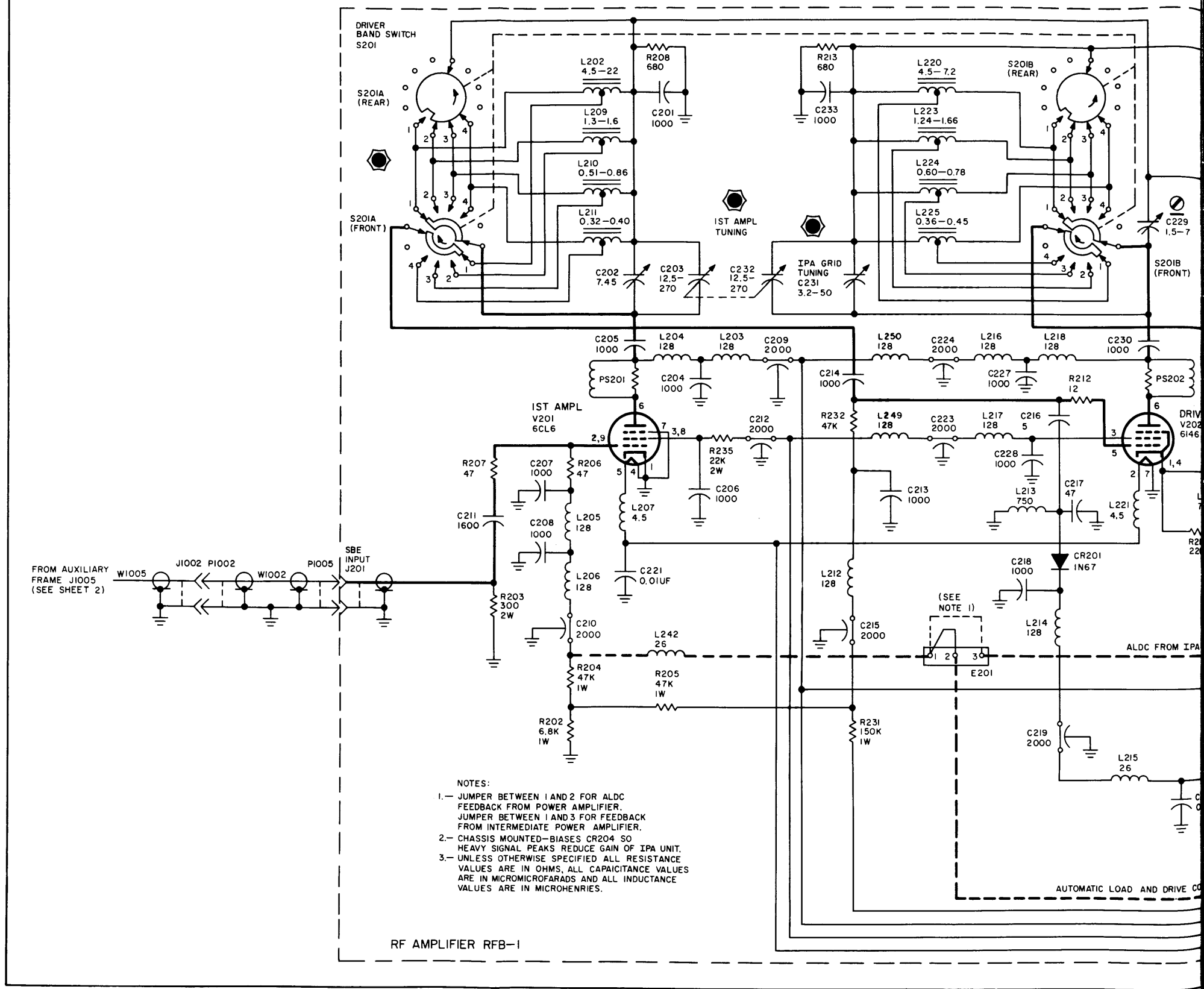


Figure 3-17. Schematic Diagram, Modified PA(10K) (Sheet 1 of 2)

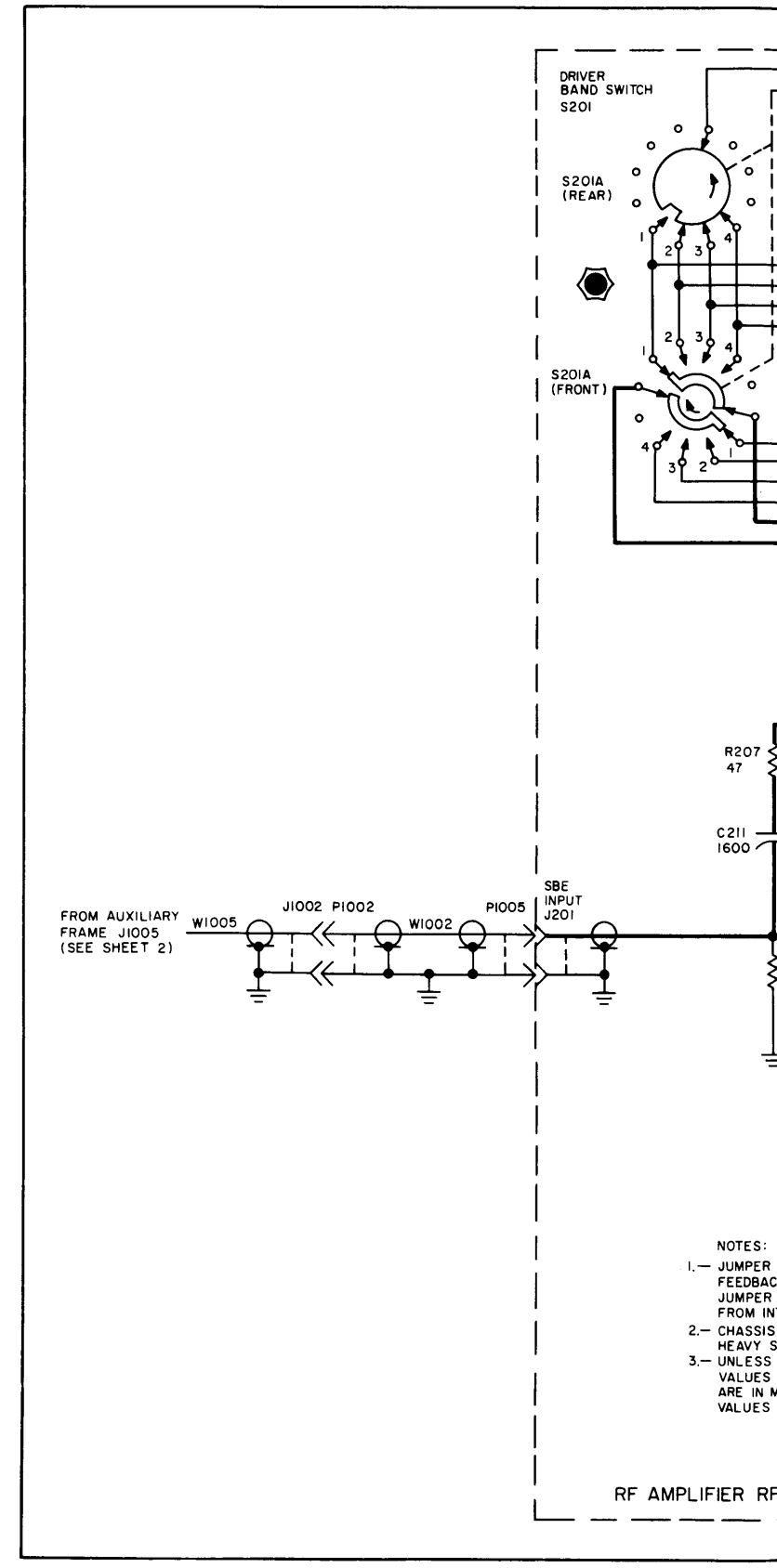
MULTIMETER SWITCH S204	
POS	FUNCTION
1	IPA BIAS X 10V DC
2	IPA ESG X 10V DC
3	IPA EP X 100V DC
4	IPA ISG X 1MA DC
5	1ST AMPL EP X 1V RF
6	IPA EG X 1V RF
7	IPA EP X 100V RF
8	PA EG X 10V RF

IPA BAND SWITCH S202	
POS	FUNCTION
1	4–6 MC
2	6–8 MC
3	8–12 MC
4	12–16 MC
5	16–20 MC
6	20–28 MC

DRIVER BAND SWITCH S201	
POS	FUNCTION
1	4–8 MC
2	8–16 MC
3	16–20 MC
4	20–28 MC

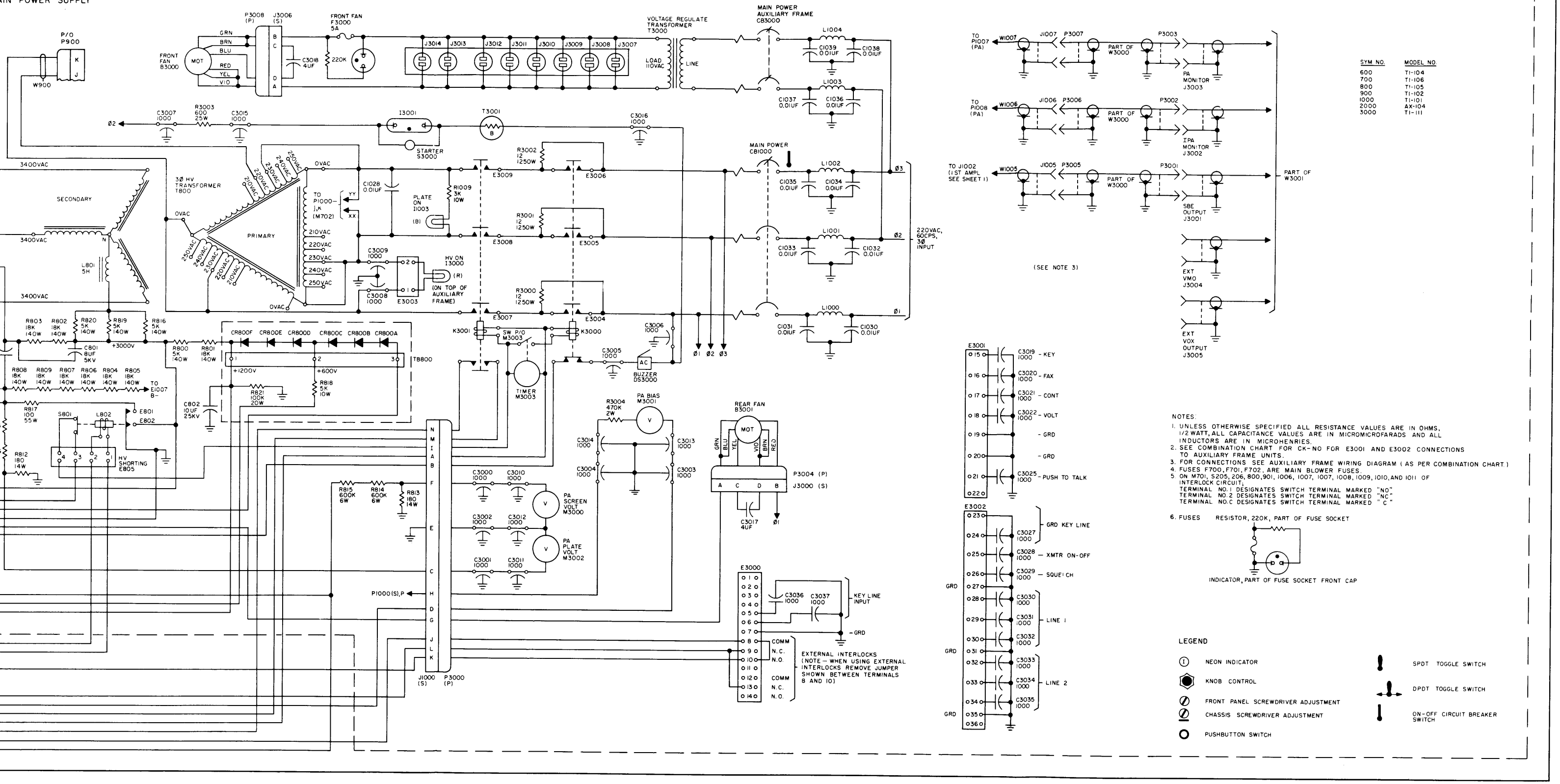

DRIVER BAND SWITCH S201
S201A (REAR)
S201A (FRONT)
L202 4.5–22
L209 1.3–1.6
L210 0.51–0.86
L211 0.32–0.40
R208 680
C201 1000
C202 7.45
C203 12.5–270
IST AMPL TUNING
C232 12.5–270
IPA GRID TUNING C231 3.2–50
R213 680
C233 1000
L220 4.5–7.2
L223 1.24–1.66
L224 0.60–0.78
L225 0.36–0.45
S201B (REAR)
S201B (FRONT)
C229 1.5–7
C205 1000
L204 128
L203 128
C209 2000
PS201
C204 1000
L250 128
C224 2000
L216 128
L218 128
C230 1000
C214 1000
C227 1000
R212 12
PS202
IST AMPL V201 6CL6
R232 47K
L249 128
C223 2000
L217 128
C216 5
C212 2000
R235 22K 2W
C228 1000
R207 47
C207 1000
R206 47
C206 1000
C213 1000
C217 47
L213 750
L221 4.5
C211 1600
C208 1000
L205 128
L207 4.5
C221 0.01UF
CR201 1N67
C218 1000
L212 128
C215 2000
(SEE NOTE 1)
L214 128
ALDC FROM IPA
E201
FROM AUXILIARY FRAME J1005 (SEE SHEET 2)
W1005
J1002 P1002
W1002
P1005
SBE INPUT J201
R203 300 2W
L206 128
C210 2000
L242 26
R204 47K 1W
R205 47K 1W
R202 6.8K 1W
R231 150K 1W
C219 2000
L215 26
AUTOMATIC LOAD AND DRIVE CO
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 CAPAICITANCE VALUES ARE IN MICROMICROFARADS AND ALL INDUCTANCE VALUES ARE IN MICROHENRIES.
RF AMPLIFIER RFB–1

CK415


DRIVER
BAND SWITCH
S201
S201A
(REAR)
S201A
(FRONT)
R207
47
C211
1600
FROM AUXILIARY
FRAME J1005
(SEE SHEET 2)
W1005
J1002 P1002
W1002
P1005
SBE
INPUT
J201
NOTES:
1.— JUMPER
FEEDBAC
JUMPER
FROM IN
2.— CHASSIS
HEAVY S
3.— UNLESS
VALUES
ARE IN M
VALUES
RF AMPLIFIER RF

CK415

AIN POWER SUPPLY



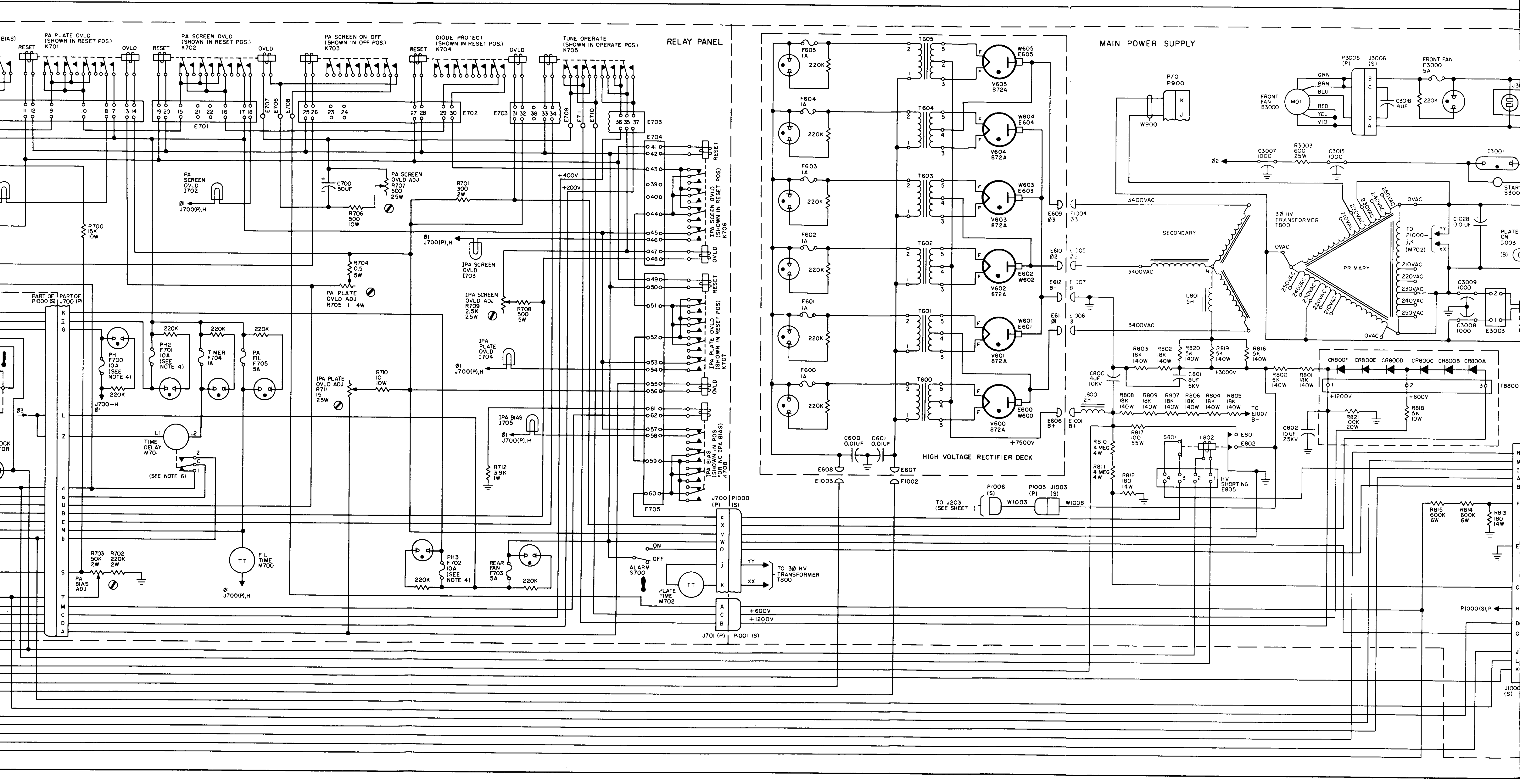
SYM NO.	MODEL NO.
600	TI-104
700	TI-106
800	TI-105
900	TI-102
1000	TI-101
2000	AX-104
3000	TI-111

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. SEE COMBINATION CHART FOR CK-NO FOR E3001 AND E3002 CONNECTIONS TO AUXILIARY FRAME UNITS.
3. FOR CONNECTIONS SEE AUXILIARY FRAME WIRING DIAGRAM (AS PER COMBINATION CHART.)
4. FUSES F700, F701, F702, ARE MAIN BLOWER FUSES.
5. ON M701, S205, 206, 800, 901, 1006, 1007, 1007, 1008, 1009, 1010, AND 1011 OF INTERLOCK CIRCUIT;
   TERMINAL NO.1 DESIGNATES SWITCH TERMINAL MARKED "NO"
   TERMINAL NO.2 DESIGNATES SWITCH TERMINAL MARKED "NC"
   TERMINAL NO.C DESIGNATES SWITCH TERMINAL MARKED " C "
6. FUSES RESISTOR, 220K, PART OF FUSE SOCKET

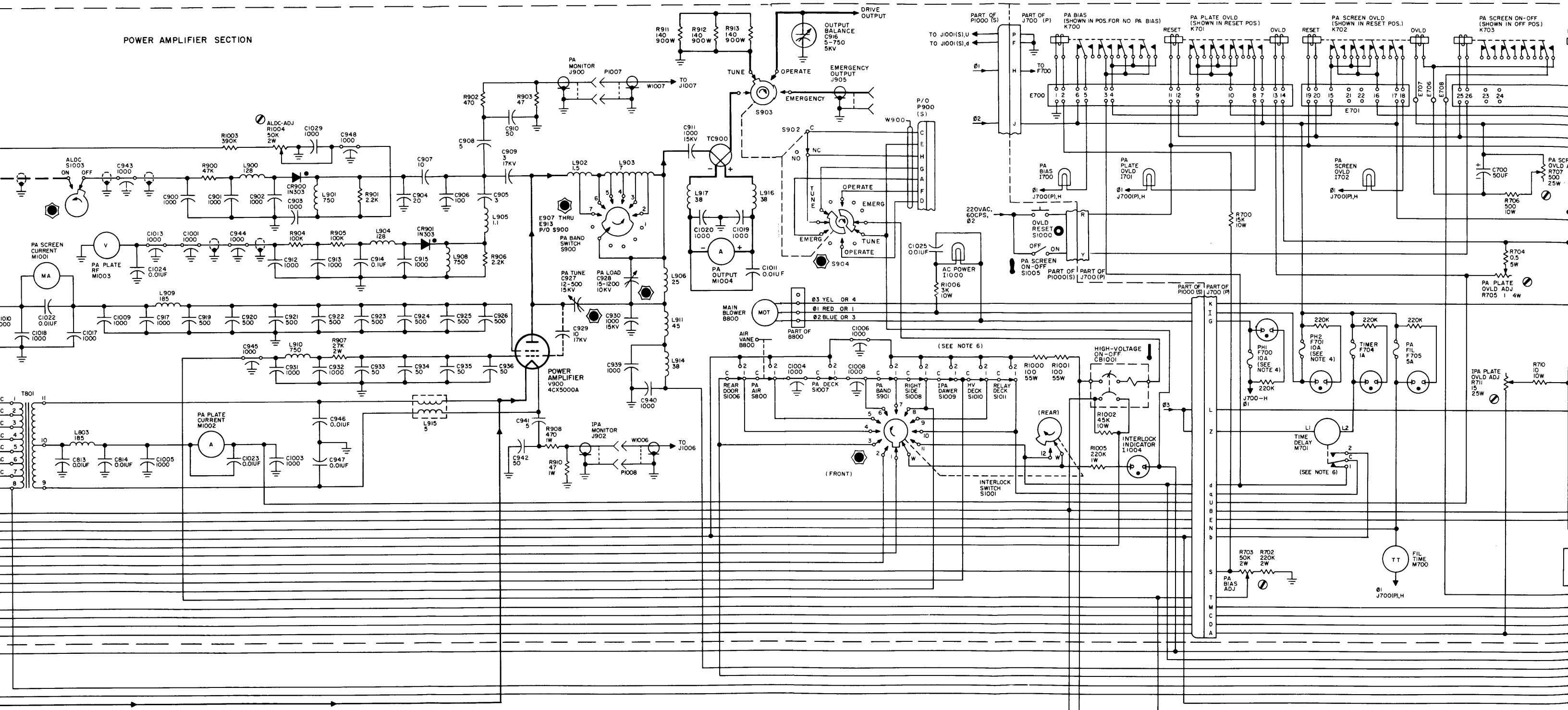
LEGEND

- NEON INDICATOR
- KNOB CONTROL
- FRONT PANEL SCREWDRIVER ADJUSTMENT
- CHASSIS SCREWDRIVER ADJUSTMENT
- PUSHBUTTON SWITCH
- SPDT TOGGLE SWITCH
- DPDT TOGGLE SWITCH
- ON-OFF CIRCUIT BREAKER SWITCH

Figure 3-17. Schematic Diagram, Modified PA(10K) (Sheet 2 of 2)


RELAY PANEL
MAIN POWER SUPPLY
HIGH VOLTAGE RECTIFIER DECK
PA PLATE OVLD (SHOWN IN RESET POS.) K701
PA SCREEN OVLD (SHOWN IN RESET POS.) K702
PA SCREEN ON-OFF (SHOWN IN OFF POS) K703
DIODE PROTECT (SHOWN IN RESET POS.) K704
TUNE OPERATE (SHOWN IN OPERATE POS.) K705
IPA SCEEN OVLD (SHOWN IN RESET POS) K706
IPA PLATE OVLD (SHOWN IN RESET POS) K707
IPA BIAS (SHOWN IN POS FOR NO IPA BIAS) K708
RESET
OVLD
E701
E702
E703
E704
E705
+400V
+200V
PA SCREEN OVLD I702
C700 50UF
PA SCREEN OVLD ADJ R707 500 25W
R706 500 10W
R701 300 2W
R700 15K 10W
R704 0.5 5W
PA PLATE OVLD ADJ R705 1 4W
IPA SCREEN OVLD I703
IPA SCREEN OVLD ADJ R709 2.5K 25W
R708 500 5W
IPA PLATE OVLD I704
IPA PLATE OVLD ADJ R711 15 25W
R710 10 10W
IPA BIAS I705
R712 3.9K 1W
Ø1 J700(P),H
PART OF P1000 (S)
PART OF J700 (P)
PH1 F700 10A (SEE NOTE 4)
PH2 F701 10A (SEE NOTE 4)
TIMER F704 1A
PA FIL F705 5A
220K
J700-H Ø1
TIME DELAY M701
(SEE NOTE 6)
R703 50K 2W
R702 220K 2W
PA BIAS ADJ
FIL TIME M700
PH3 F702 10A (SEE NOTE 4)
REAR FAN F703 5A
ALARM S700
ON
OFF
PLATE TIME M702
J700 (P)
P1000 (S)
J701 (P)
P1001 (S)
+600V
+1200V
TO 3Ø HV TRANSFORMER T800
F600 1A
F601 1A
F602 1A
F603 1A
F604 1A
F605 1A
T600
T601
T602
T603
T604
T605
V600 872A
V601 872A
V602 872A
V603 872A
V604 872A
V605 872A
+7500V
C600 0.01UF
C601 0.01UF
E607
E608
E1002
E1003
TO J203 (SEE SHEET 1)
P1006 (S)
W1003
P1003 (P)
J1003 (S)
W1008
P/O P900
W900
FRONT FAN B3000
FRONT FAN F3000 5A
P3008 (P)
J3006 (S)
C3018 4UF
C3007 1000
R3003 600 25W
C3015 1000
I3001
START S300
3Ø HV TRANSFORMER T800
SECONDARY
PRIMARY
3400VAC
L801 5H
TO P1000- j,K (M702)
C1028 0.01UF
PLATE ON I1003
C3009 1000
C3008 1000
E3003
R803 18K 140W
R802 18K 140W
R820 5K 140W
R819 5K 140W
R816 5K 140W
+3000V
C80C 4UF 10KV
C801 8UF 5KV
R800 5K 140W
R801 18K 140W
CR800F
CR800E
CR800D
CR800C
CR800B
CR800A
TB800
+1200V
+600V
R821 100K 20W
R818 5K 10W
L800 2H
R808 18K 140W
R809 18K 140W
R807 18K 140W
R806 18K 140W
R804 18K 140W
R805 18K 140W
TO E1007 B-
R817 100 55W
R810 4 MEG 4W
R811 4 MEG 4W
R812 180 14W
S801
L802
E801
E802
HV SHORTING E805
C802 10UF 25KV
R815 600K 6W
R814 600K 6W
R813 180 14W
P1000(S),P
J1000 (S)

POWER AMPLIFIER SECTION



POWER AMPLIFIER SECTION

P1011 (P) / J1001 (S)

T
d → TO P1000(S),F
U
C
I
D
B
A
V → Ø2
c
P → Ø1
X
O
E
Y
W
Z
b
M
J
K

TO SHEET 1 — W1001

Ø3

TO P1000(S),P

S1004 — 220VAC, 60CPS, Ø2 — TUNE / OPERATE

R1008 3K 10W — OPERATE I1002 (R) — TUNE I1001 (G) — R1007 3K 10W

C1027 0.01UF — C1026 0.01UF

C1006 1000 — C1017 1000 → TO P1000,G

T1001 — I1007 — STARTER S1012 — I1005

STARTER S1013 — I1006

T1000 — ON / OFF — PA DECK LIGHT ON-OFF S1014

C1002 1000 — C1014 1000

FILAMENT PRIMARY M1000 (V)

C1021 0.01UF — C1015 1000 — C1000 1000 — C810 1000

FIL ADJ S1002

220VAC, 60CPS, Ø3 (P1000-L)

C803 1000 — C804 1000 — C805 1000 — C806 1000 — C807 1000 — C808 1000 — C809 1000

T801

250VAC	1
240VAC	2
230VAC	3
220VAC	4
210VAC	5
200VAC	6
190VAC	7
0VAC	8
	9
	10
	11

L803 185 — C813 0.01UF — C814 0.01UF — C1005 1000

PA PLATE CURRENT M1002 (A) — C1023 0.01UF — C1003 1000

C946 0.01UF — C947 0.01UF

ALDC S1003 (ON / OFF) — ALDC-ADJ R1004 50K 2W — C1029 1000 — C948 1000

R1003 390K — C943 1000

R900 47K — L900 128 — C900 1000 — C901 1000 — C902 1000 — CR900 IN303 — C903 1000 — L901 750 — R901 2.2K

C907 10 — C904 20 — C906 100

PA SCREEN CURRENT M1001 (MA) — C1022 0.01UF — C1018 1000

PA PLATE RF M1003 (V) — C1024 0.01UF

C1013 1000 — C1001 1000 — C944 1000 — R904 100K — R905 100K — L904 128 — CR901 IN303 — C912 1000 — C913 1000 — C914 0.1UF — C915 1000 — L908 750 — R906 2.2K

C1010 1000 — C1009 1000 — L909 185 — C919 500 — C920 500 — C921 500 — C922 500 — C923 500 — C924 500 — C925 500 — C926 500 — C1017 1000

C945 1000 — L910 750 — R907 27K 2W — C931 1000 — C932 1000 — C933 50 — C934 50 — C935 50 — C936 50

L915 5

R902 470 — R903 47 — C910 50 — C908 5 — C909 3 17KV — C905 3 — L905 1.1

R911 140 900W — R912 140 900W — R913 140 900W

PA MONITOR J900 — PI007 — W1007 → TO J1007

OUTPUT BALANCE C916 5-750 5KV → DRIVE OUTPUT

TUNE / OPERATE — S903 — EMERGENCY OUTPUT J905 — EMERGENCY

P/O P900 (S) — W900

S902 (C / NC / NO)

TUNE: OPERATE / EMERG — EMERG / TUNE / OPERATE — S904

E907 THRU E913 P/O S900

PA BAND SWITCH S900

L902 1.5 — L903 7

C911 1000 15KV — TC900

L917 38 — L916 38

C1020 1000 — C1019 1000 — PA OUTPUT M1004 (A) — C1011 0.01UF

PA TUNE C927 12-500 15KV — PA LOAD C928 15-1200 10KV

L906 25 — L911 45 — L914 38

C929 10 17KV — C930 1000 15KV — C939 1000 — C940 1000

POWER AMPLIFIER V900 4CX5000A

C941 5 — R908 470 1W — C942 50 — R910 47 1W

IPA MONITOR J902 — W1006 → TO J1006 — P1008

C1025 0.01UF — AC POWER I1000 — R1006 3K 10W — 220VAC, 60CPS, Ø2

MAIN BLOWER B800 (MOT) — PART OF B800 — Ø3 YEL OR 4 — Ø1 RED OR 1 — Ø2 BLUE OR 3

AIR VANE B800

C1006 1000 — C1004 1000 — C1008 1000 (SEE NOTE 6)

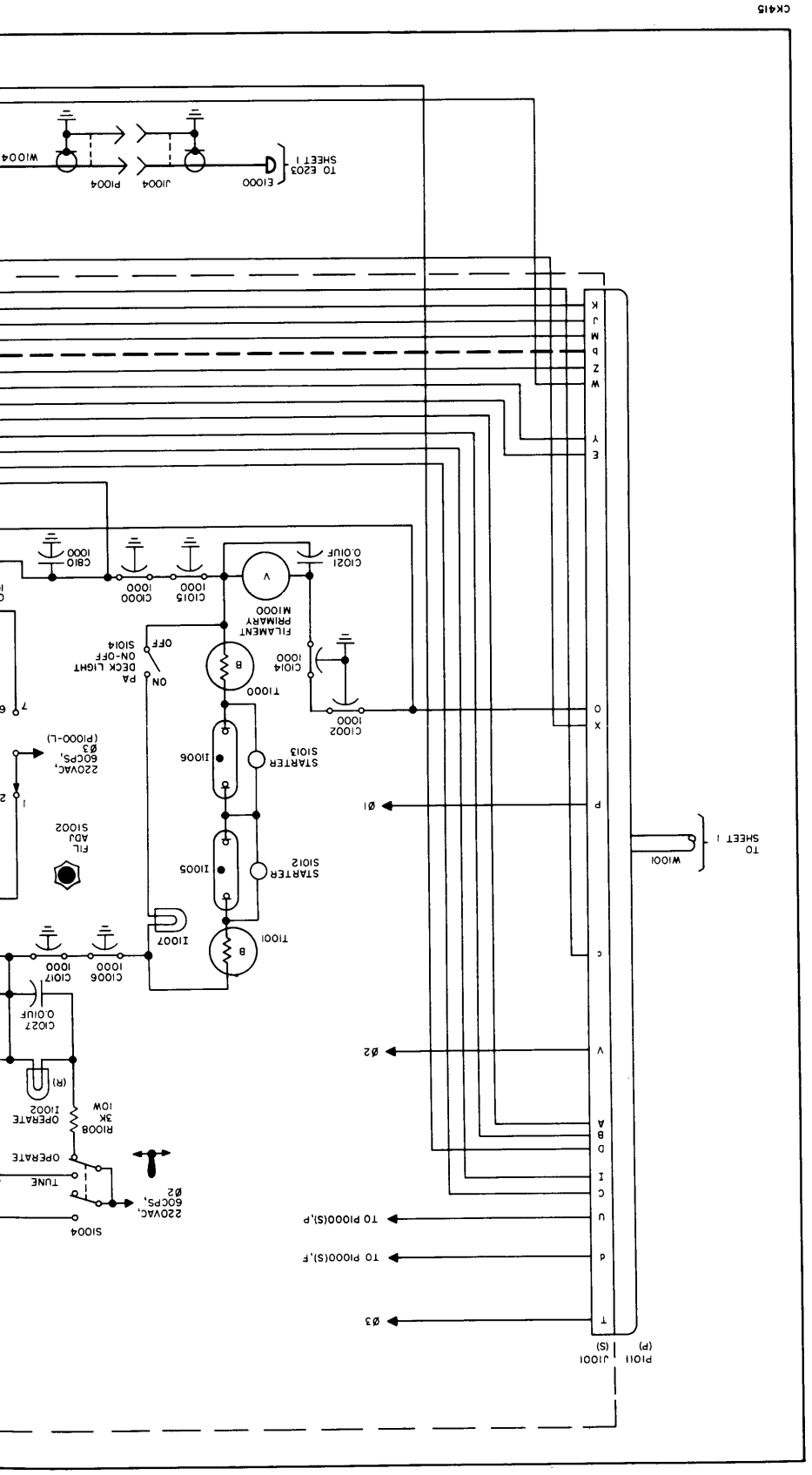
REAR DOOR S1006 — PA AIR S800 — PA DECK S1007 — PA BAND S901 — RIGHT SIDE S1008 — IPA DRAWER S1009 — HV DECK S1010

(FRONT)

INTER SWITCH S1001

E1000 — TO E203 SHEET 1 — J1004 — P1004 — W1004 — P1009 — DRIVE INPUT J901

CK415


TO E203 SHEET 1
E1000
J1004
P1004
W1004
W1001
TO SHEET 1
P1011 (P)
J1001 (S)
T
d
U
C
I
B
A
O
X
P
C
V
Z
M
K
Y
E
Ø1
Ø2
Ø3
TO P1000(S),P
TO P1000(S),F
C1021 0.01UF
C1000 1000
C1015 1000
C1014 1000
C1002 1000
C1016 1000
C1017 1000
C1027 0.01UF
C1006 1000
C1007 1000
FILAMENT PRIMARY M1000
T1000
T1001
PA DECK LIGHT ON-OFF S1014
ON
OFF
STARTER S1013
STARTER S1012
I1006
I1005
I1007
FIL ADJ S1002
R1008 3K 10W
OPERATE T1002
(R)
OPERATE
TUNE
220VAC, 60CPS, Ø2
220VAC, 60CPS, Ø3 (P1000-L)
S1004

PART IV
PA(40K) AND POWER SUPPLY SECTIONS

SECTION 1
GENERAL DESCRIPTION

4-1-1. INTRODUCTION.

Refer to Part I for a general description of the GPT-40K. Figure 1-1 in Part I or figure 4-1-1 in this section shows that the GPT-40K consists of four frames as follows:

a. Extreme left frame: test and exciter equipment.

b. Second frame from left: transmitter equipment comprising two RF linear amplifiers and two IPA's (driver stages) for the GPT-40K as well as power supply, relay and control, and protective equipment.

c. Third frame from left: RF, relay and control, and protective equipment comprising the final PA section of the GPT-40K (receives output of item b).

d. Extreme right frame: power equipment for final stage of GPT-40K.

Figure 4-1-2 in this section shows that the main assemblies on GPT-40K's third and fourth frames are as follows:

a. Compartment containing PA(40K)'s RF circuits.

b. Compartment containing PA(40K)'s blower equipment and filament transformer.

c. Meter panel, main control panel, bias supply drawer, and relay panel.

d. Compartment containing main power and filament adjust transformers.

e. High voltage rectifier drawer.

f. Crowbar drawer.

g. Antenna tuning unit and meter panel drawer.

h. Power supply control panel.

4-1-2. FUNCTIONAL DESCRIPTION.

a. GENERAL. - The following paragraphs are limited to photographs of each GPT-40K unit together with brief functional descriptions. The theory underlying each unit, with supporting simplified schematic diagrams, is contained in Part IV Section 4 of the manual.

b. THIRD FRAME ASSEMBLIES. (See figure 4-1-3.) - See figure 4-1-1 for the overall front view of the PA(40K)'s RF and blower equipment, and filament transformer, compartments. Figure 4-1-3 shows the overall rear view of these compartments.

c. COMPARTMENT CONTAINING PA(40K)'s RF CIRCUITS. (See figures 4-1-4 and 4-1-5.) - Figure 4-1-4 shows details of the PA(40K)'s RF compartment which is air cooled. In photograph 1 of figure 4-1-4, the coil (L7303), in the back right upper corner, carries 205 amps of filament current and, in conjunction with four 0.01-mf capacitors on the reverse far side of the compartment, acts as an RF filter. The tube, V7301 (ML-6697), is GPT-40K's 40-kw (PEP) triode. The vacuum capacitor in the front right lower corner, C7326 (6 mmf), is connected between V7301's plate and ground and forms part of a capacitor-voltage divider for metering purposes. The left half of photograph 1 shows the coils in PA(40K)'s pi-L output network together with the two-wafer PA bandswitch. Inductors L7305 and L7304 and capacitors C7310, C7316, and C7325 are visible above the coils and bandswitch.

Photographs 2 and 3 of figure 4-1-4, together with photographs 1 and 2 of figure 4-1-5, show other details in the PA(40K)'s RF compartment: vacuum capacitors C7303, C7302, C7301, and C7328; and the gear train drive for PA's bandswitch. Close to the compartment's ceiling are thermocouple TC7301 and SWVR transformer DC7301 in PA's unbalanced output circuit.

d. COMPARTMENT CONTAINING PA(40K)'s BLOWER EQUIPMENT AND FILAMENT TRANSFORMER. (See figure 4-1-6.) - The three photographs of figure 4-1-6 show the PA(40K)'s 3-hp motor and associated blower which supplies cooling air through PA(40K) tube V7301 (1750 cubic feet per minute) filament transformer T7101; and numerous filter components.

e. METER PANEL, MAIN CONTROL PANEL, AND BIAS SUPPLY DRAWER. (See figures 4-1-1, 4-1-5, 4-1-7, and 4-1-8.)

Panel	Front View	Rear View
Meter (third frame)	4-1-1	
PA Tune	4-1-1	4-1-5
Main Control	4-1-1	
Bias Supply Drawer	4-1-1	4-1-8
Indicator Control	4-1-1	4-1-7

f. FOURTH FRAME ASSEMBLIES. (See figure 4-1-9.) - See figure 4-1-1 for the overall front view of the fourth frame compartments which contain the main transformer and motorized circuit breaker, the high voltage rectifier drawer, the antenna tuning unit and meter panel drawer, the power control panel, and the crowbar drawer.

Figure 4-1-9, photograph 1, shows the overall rear view of the fourth frame. Figure 4-1-9, photograph 2, shows the overall front view of the fourth frame when its three drawers are removed.

g. COMPARTMENT CONTAINING MAIN POWER AND FILAMENT ADJUST TRANSFORMERS. (See figure 4-1-10.) - Figure 4-1-10, photograph 1, shows the motorized circuit breaker in the foreground and the three main power transformers in the background. Toward the left side is a terminal box containing filters. One of three filament transformers is below the filters.

Figure 4-1-10, photograph 2, shows two of the three main transformers, above which is the rear side of the power supply control panel.

h. HIGH VOLTAGE RECTIFIER DRAWER. (See figure 4-1-11.) - Figure 4-1-11 shows a front and top view as well as a bottom view of the high voltage rectifier drawer, which consists of six 6895 tubes. The DC output of these tubes is 12 kv.

i. POWER SUPPLY CONTROL PANEL. (See figure 4-1-12.) - Figure 4-1-12 shows the rear assembly of the power supply control panel which is also visible in photograph 2 of figure 4-1-10.

j. ANTENNA TUNING UNIT AND METER PANEL DRAWER. (See figure 4-1-13.) - Figure 4-1-13, photograph 1, shows the front and top views of the antenna tuning unit and meter panel drawer which consists of an L section that connects to the pi section in the output of the PA(40K) tube. The photograph shows a three-position bandswitch (4-14, 14-20, 20-28 mc), two vacuum capacitors, one variable inductor, and one fixed inductor. The five meters in the fourth frame's antenna tuning unit and meter panel drawer are also evident.

Figure 4-1-13, photograph 2, shows the rear and top view of the antenna tuning unit and meter panel drawer. A chain drive actuates the bandswitch under control of the BAND MCS knob on the front panel.

k. CROWBAR DRAWER. (See figure 4-1-14.) - Figure 4-1-14 shows a top view of the crowbar drawer which contains a thyratron (type ML-1095), a filament transformer, and accessory electronic components. This tube acts to short B+ to B- under abnormal bias conditions on the PA(40K) tube.

l. ANTENNA TUNING UNIT AND METER PANEL DRAWER, AND OTHER CONTROL PANELS.

Panel	Front View	Other View
Antenna Tuning Unit and Meter Panel Drawer	4-1-1	4-1-13
Crowbar Drawer	4-1-1	4-1-14
High Voltage Rectifier Drawer	4-1-1	4-1-11
Power Supply Control	4-1-1	4-1-12

4-1-3. REFERENCE DATA.

Refer to paragraph 1-3 of Part I.

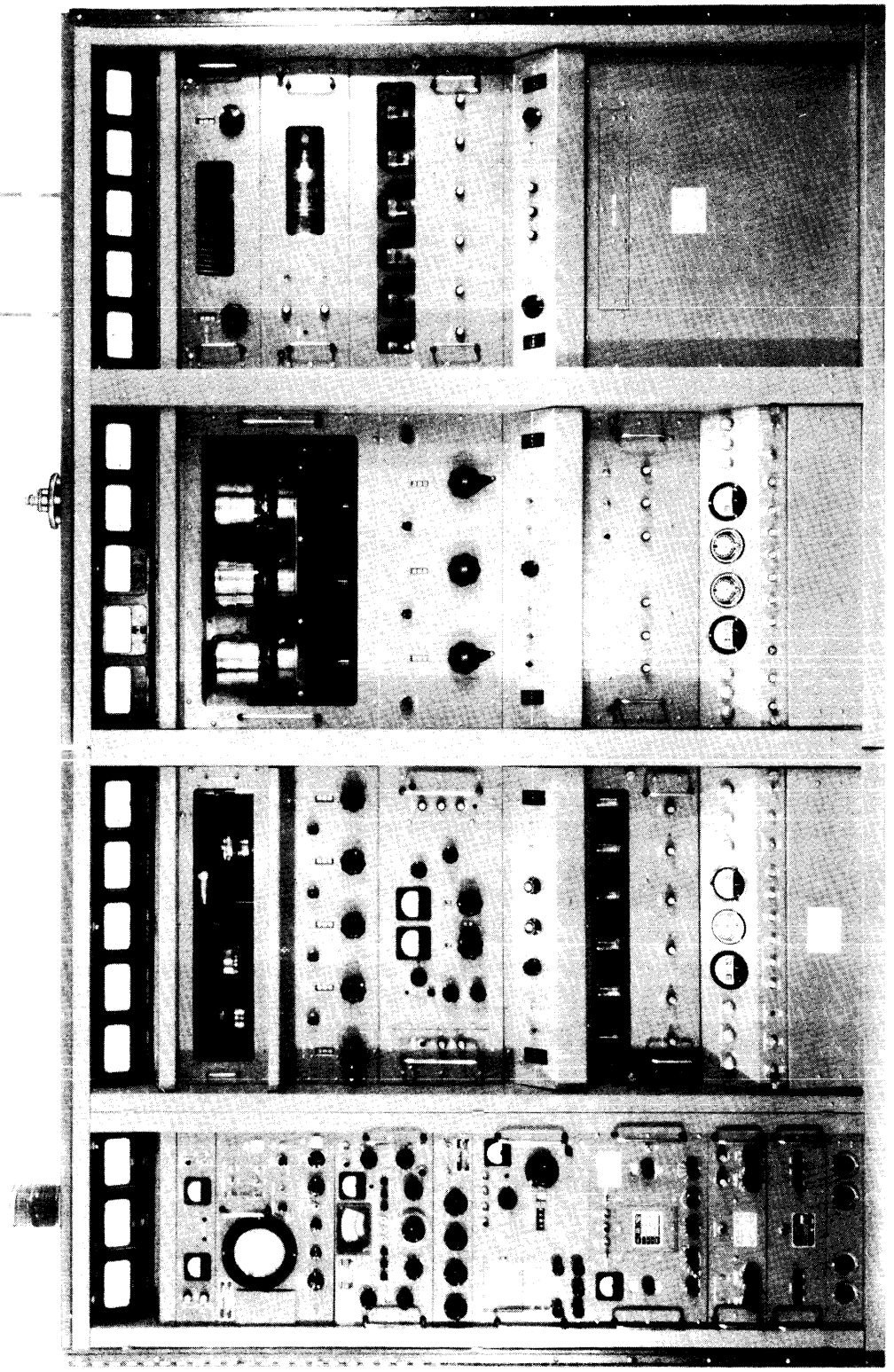
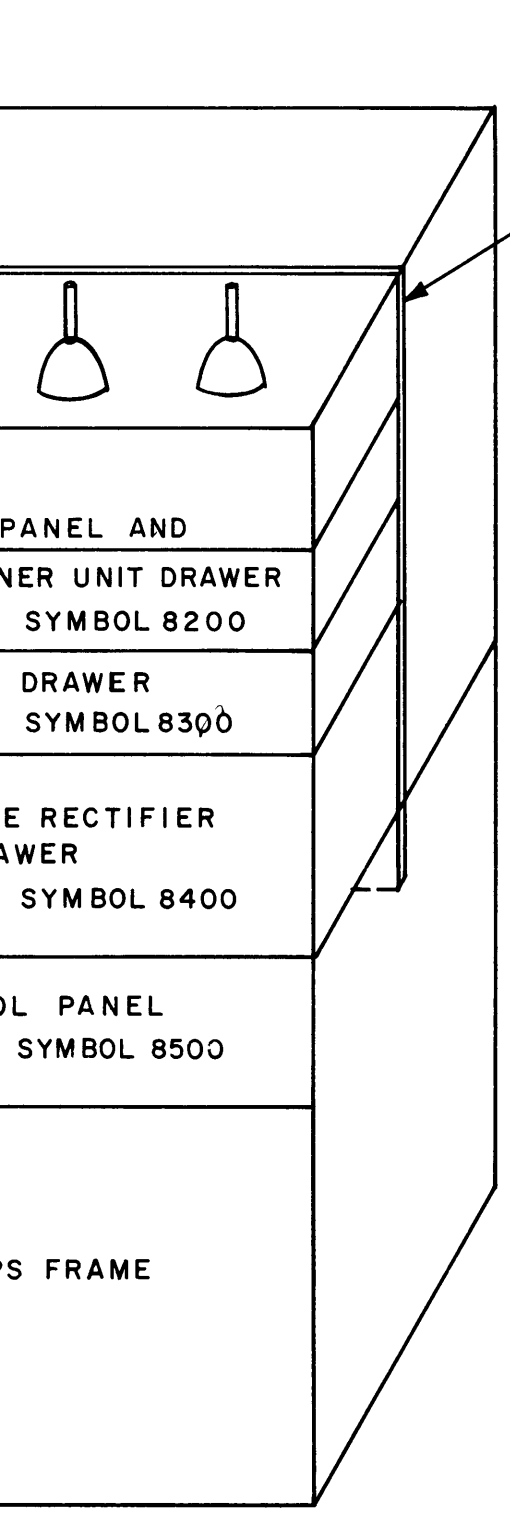
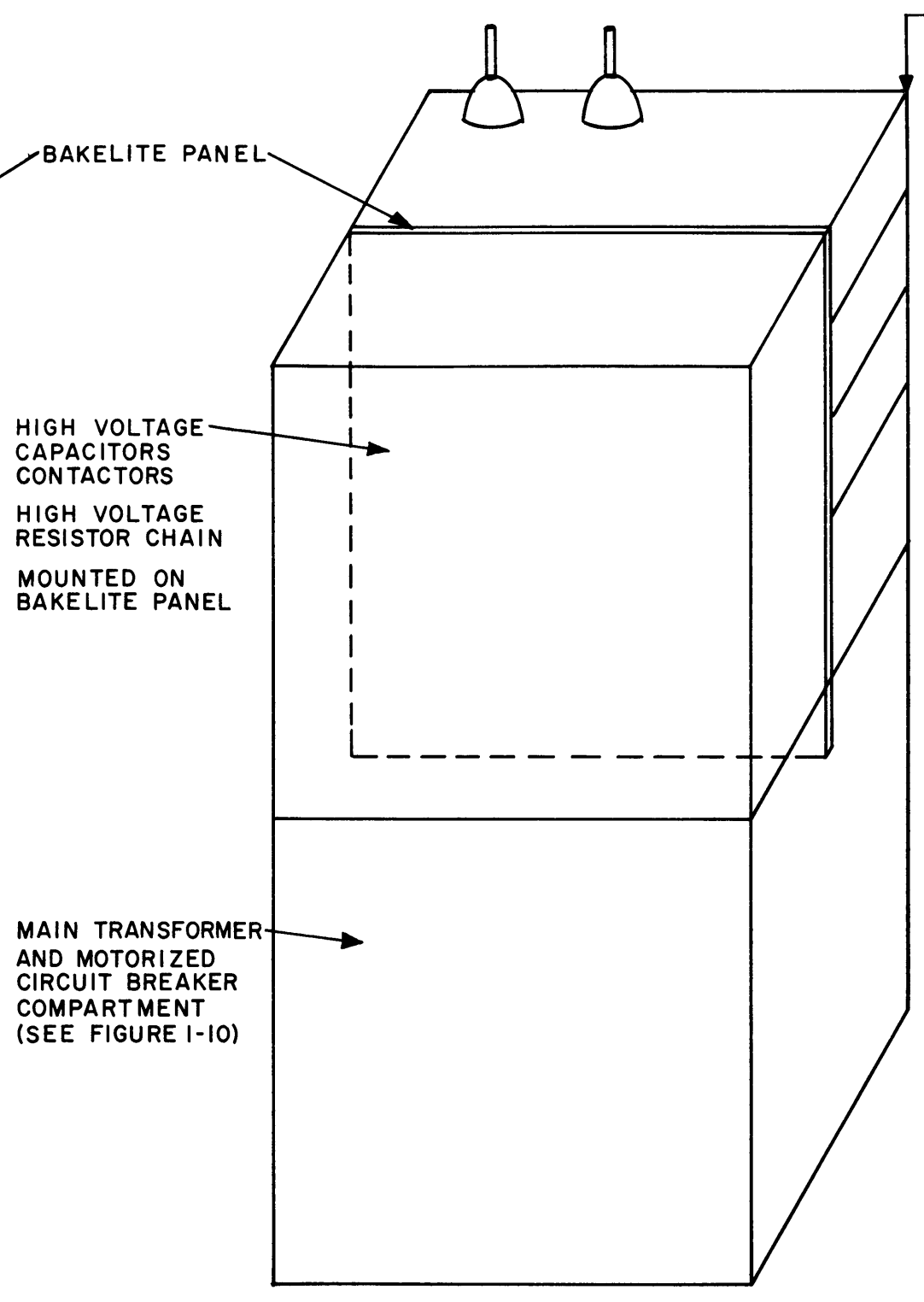


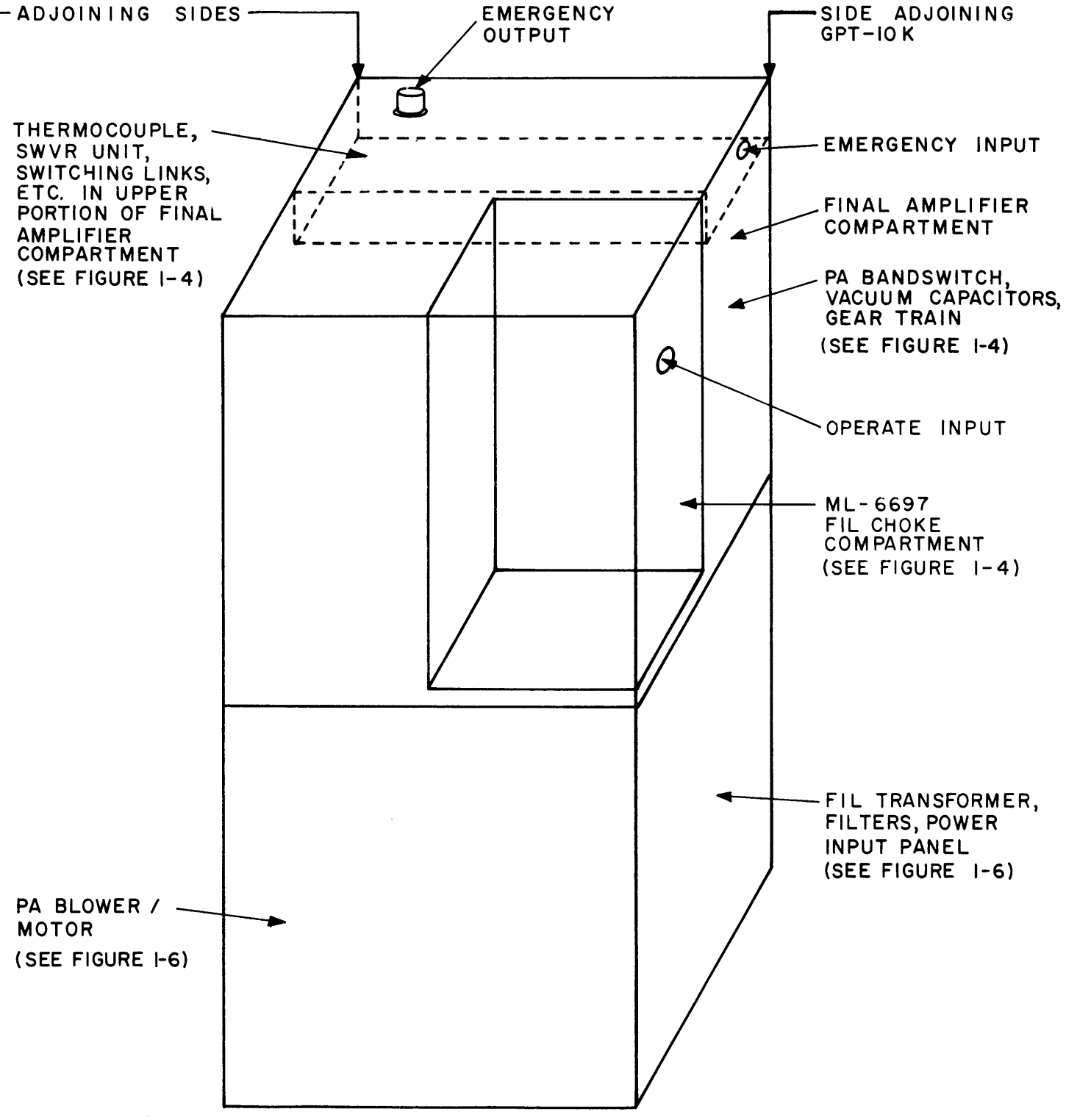
Figure 4-1-1. Front View, GPT-40K



FRAME
SYMBOL 8100
FRAME SUB-ASS'Y

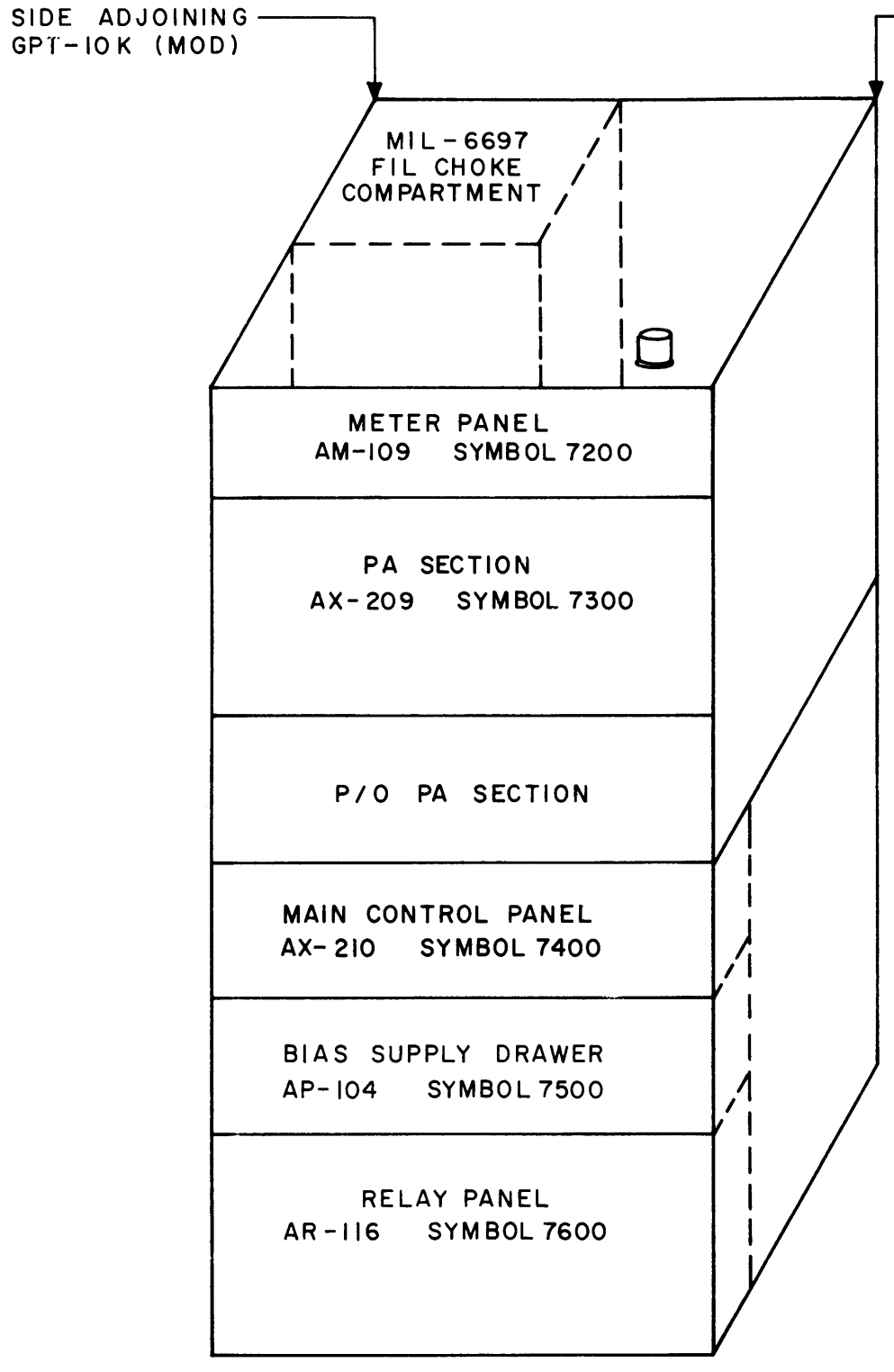


PS FRAME (REAR)
(SEE FIGURE 1-9)

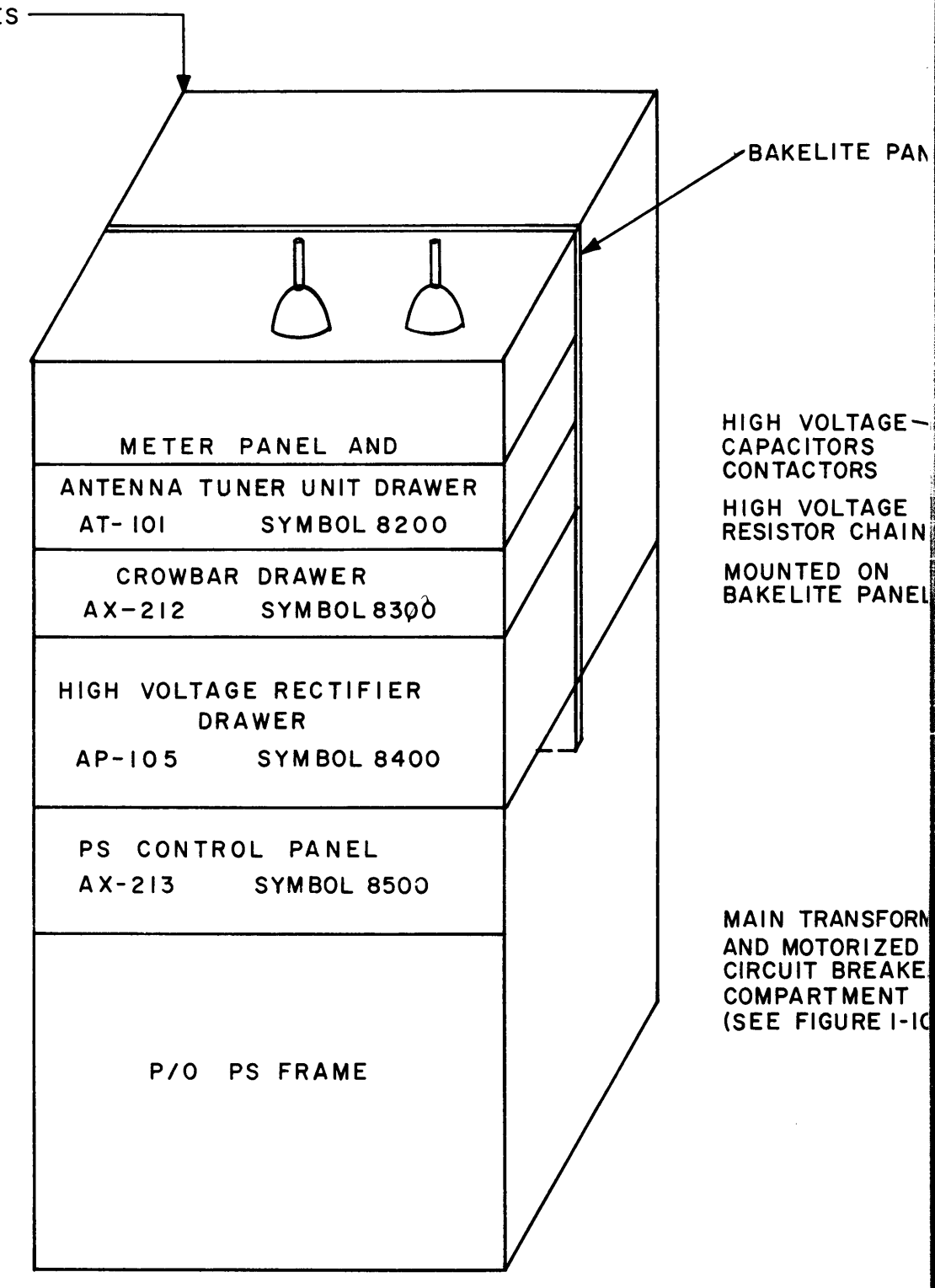


PA FRAME (REAR)
(SEE FIGURE 1-3)

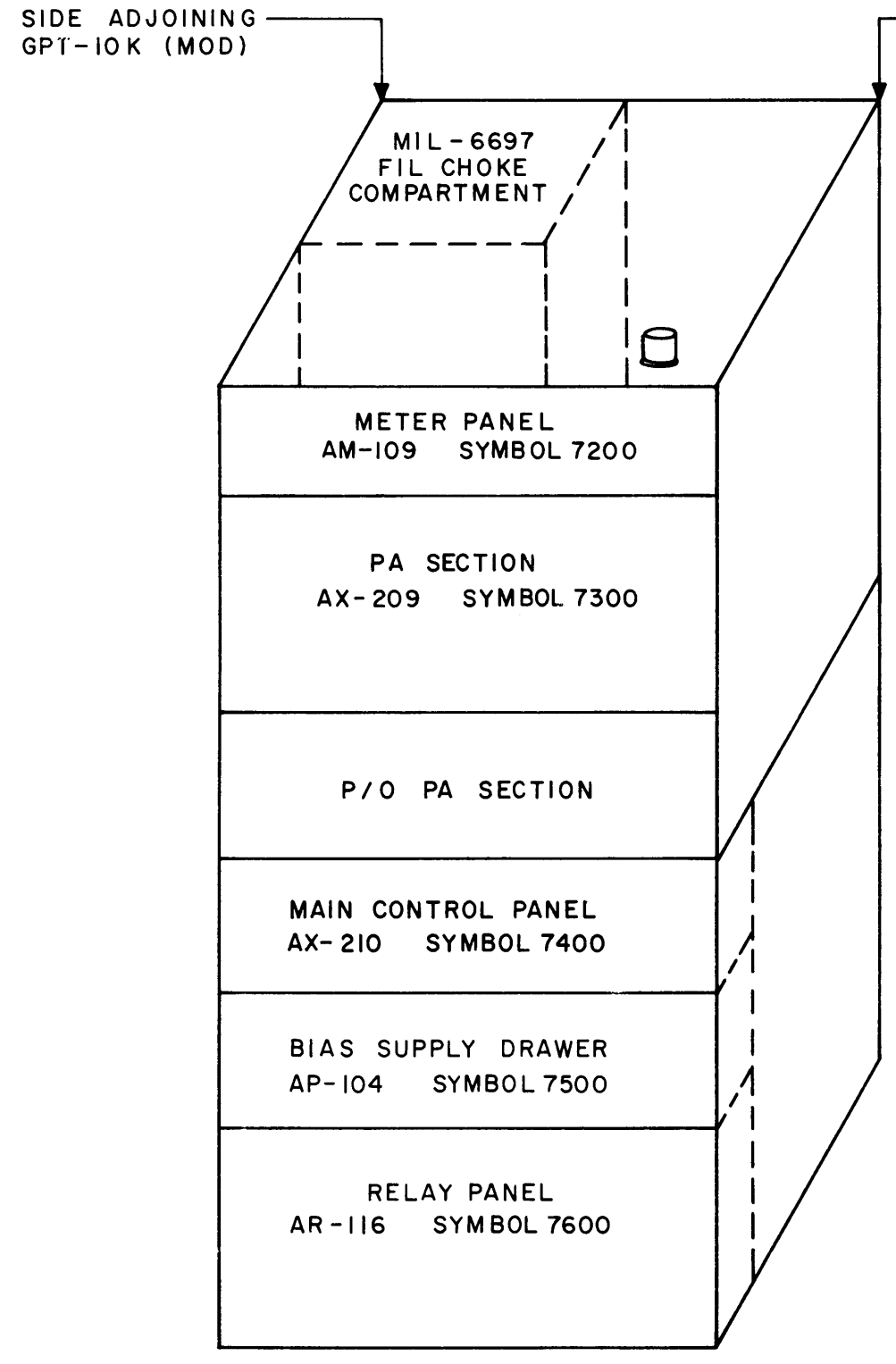
Figure 4-1-2. Isometric Diagram, Third and Fourth Frames, GPT-40K



PA FRAME
AP-102 SYMBOL 7100
AX-208 FRAME SUB-ASS'Y



PS FRAME
AP-103 SYMBOL 8100
AX-211 FRAME SUB-ASS'Y



PA FRAME
AP-102 SYMBOL 7100
AX-208 FRAME SUB-ASS'Y

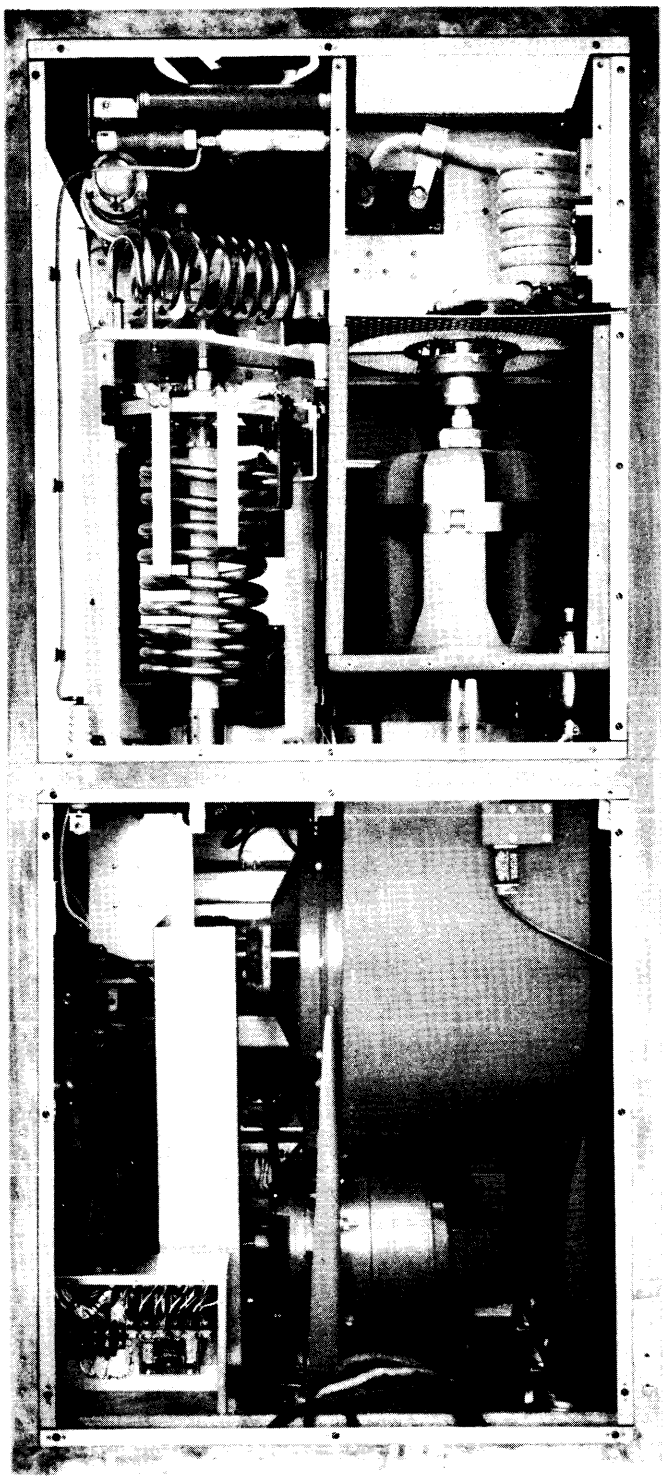


Figure 4-1-3. Overall Rear View, Third Frame, GPT-40K

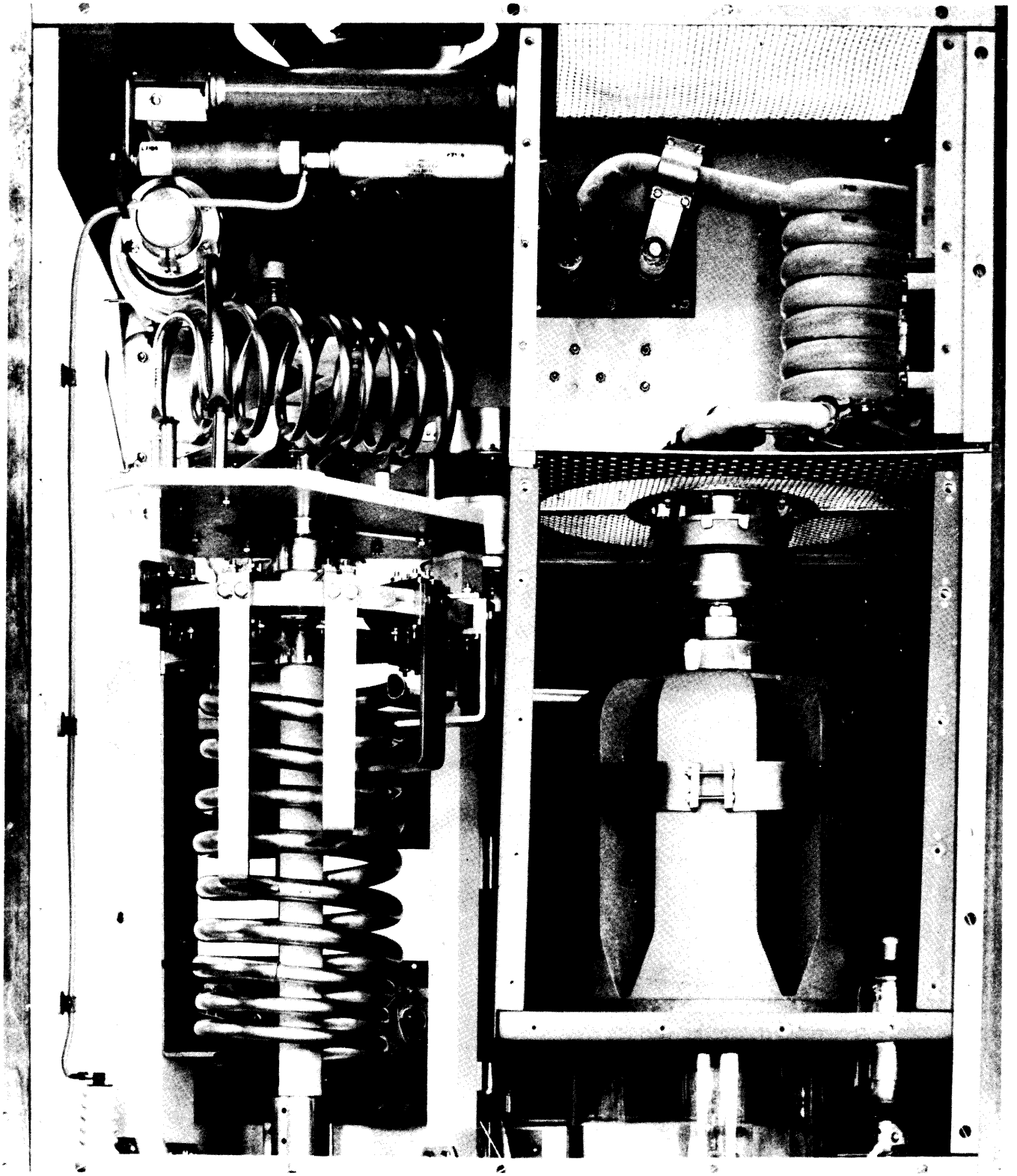


Figure 4-1-4. Rear and Side Views, PA Capacitor/Coil/Gear Train Compartment, GPT-40K (Sheet 1 of 3)

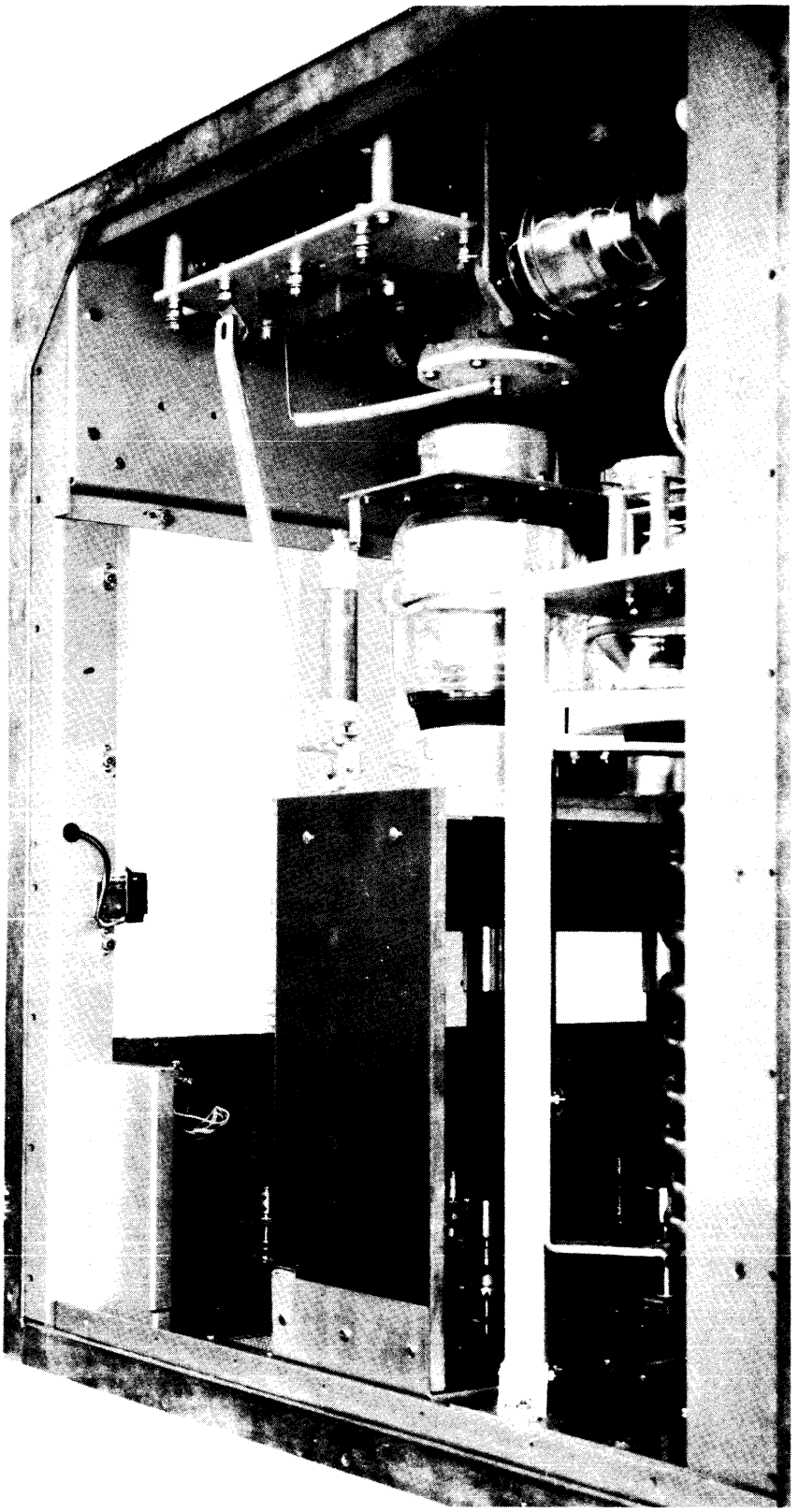


Figure 4-1-4. Rear and Side Views, PA Capacitor/Coil/Gear Train Compartment, GPT-40K (Sheet 2 of 3)

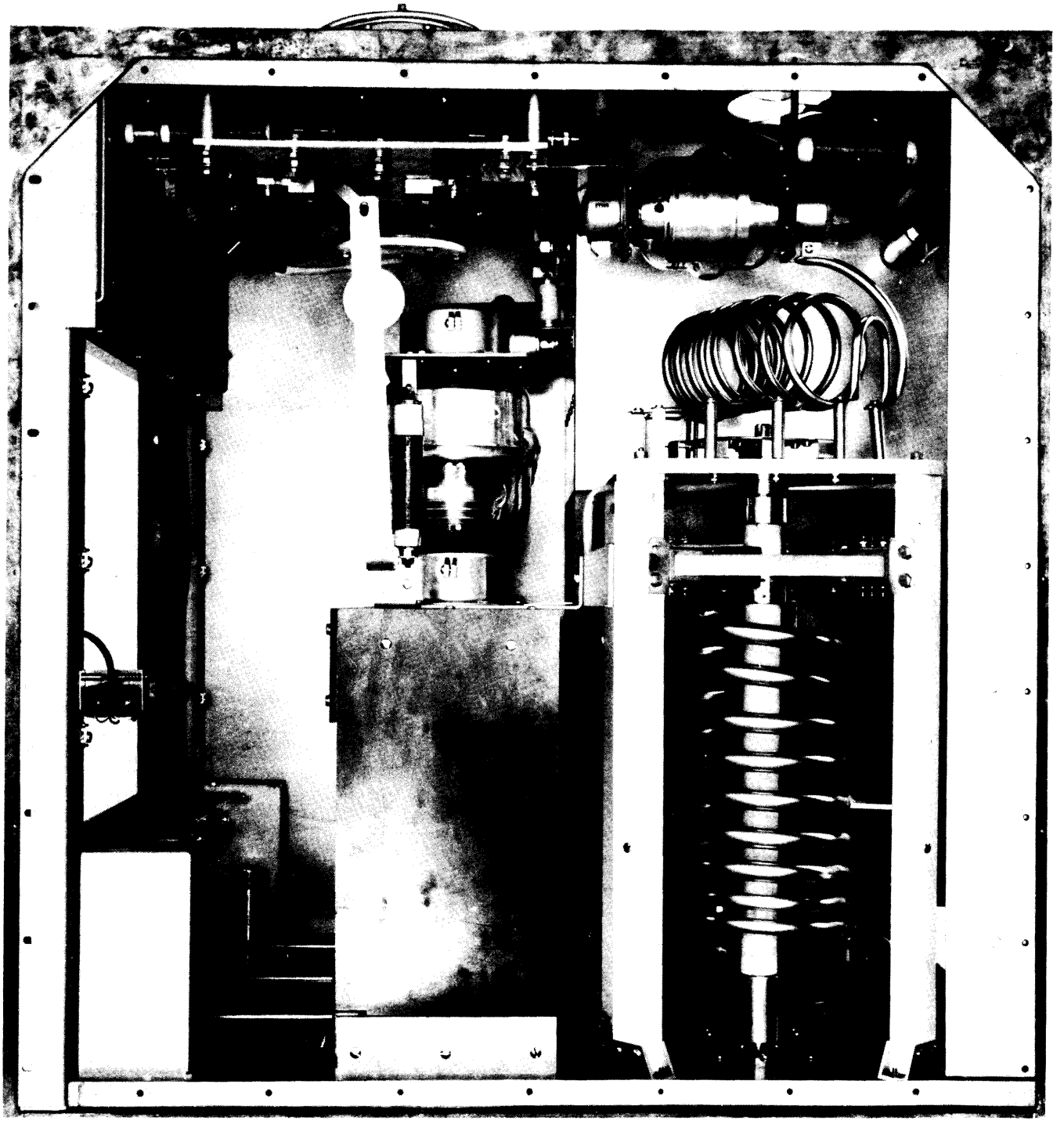


Figure 4-1-4. Rear and Side Views, PA Capacitor/Coil/Gear Train Compartment, GPT-40K (Sheet 3 of 3)

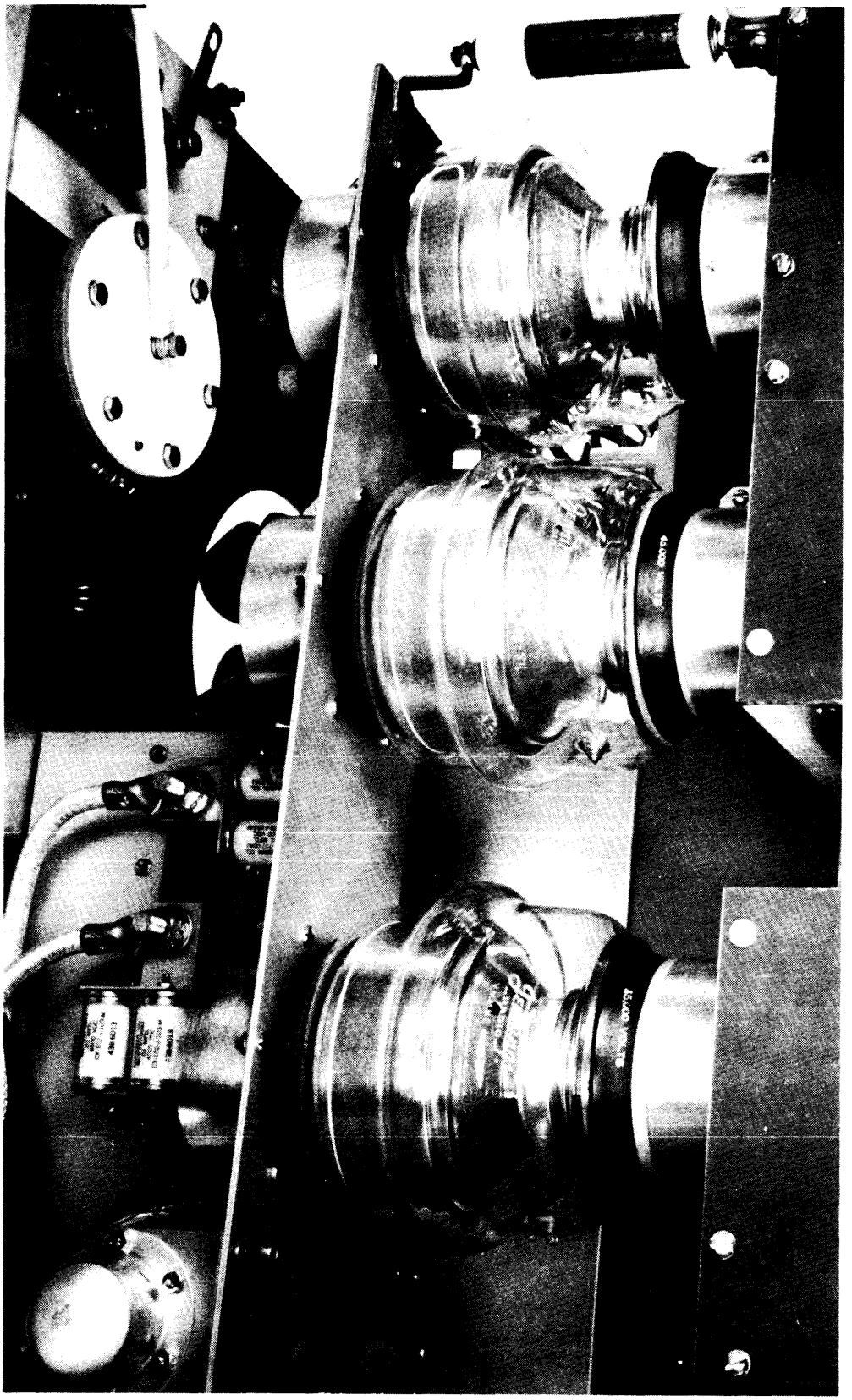


Figure 4-1-5. PA Capacitor/Coil/Gear Train Details, GPT-40K (Sheet 1 of 2)

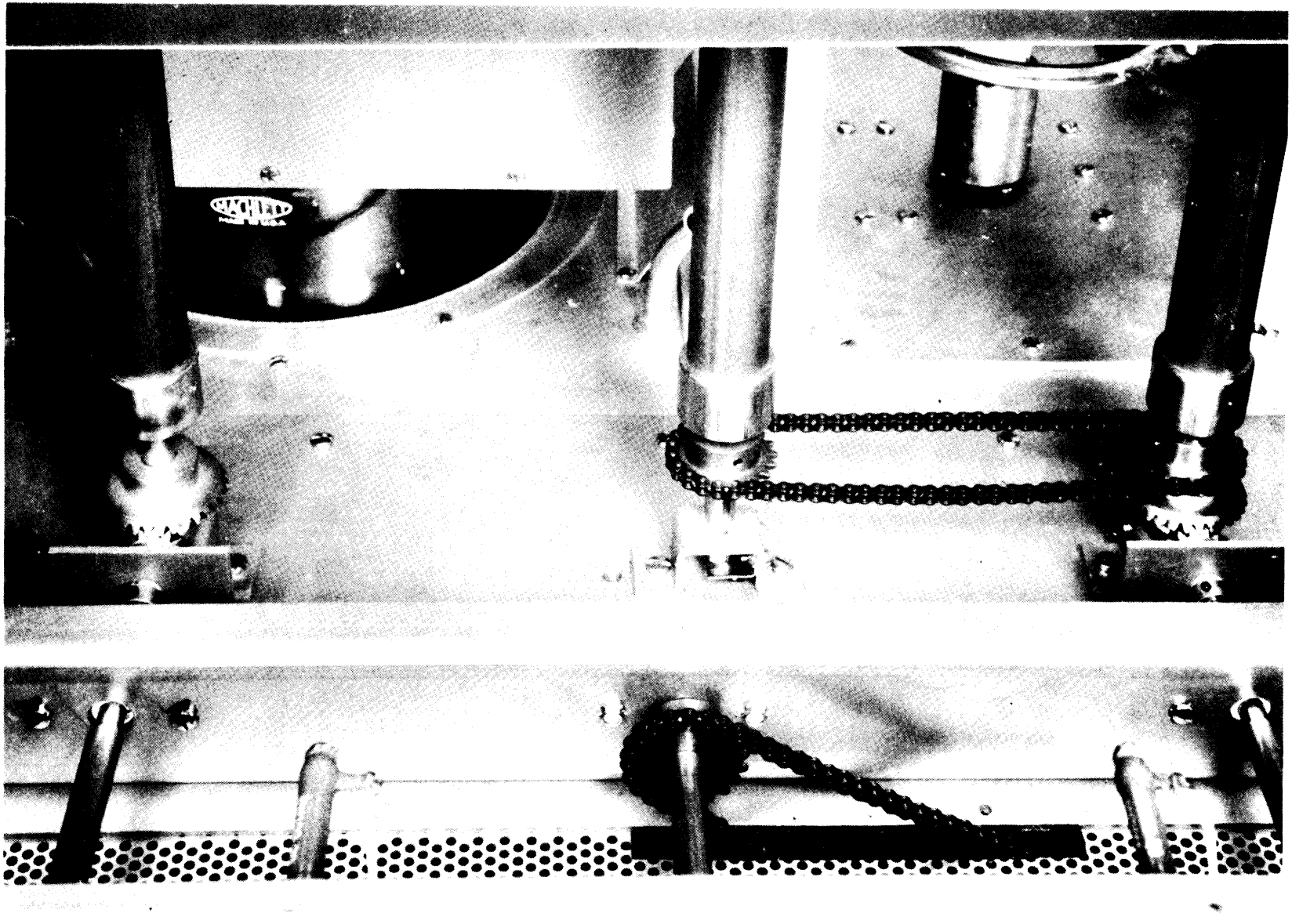


Figure 4-1-5. PA Capacitor/Coil/Gear Train Details, GPT-40K (Sheet 2 of 2)

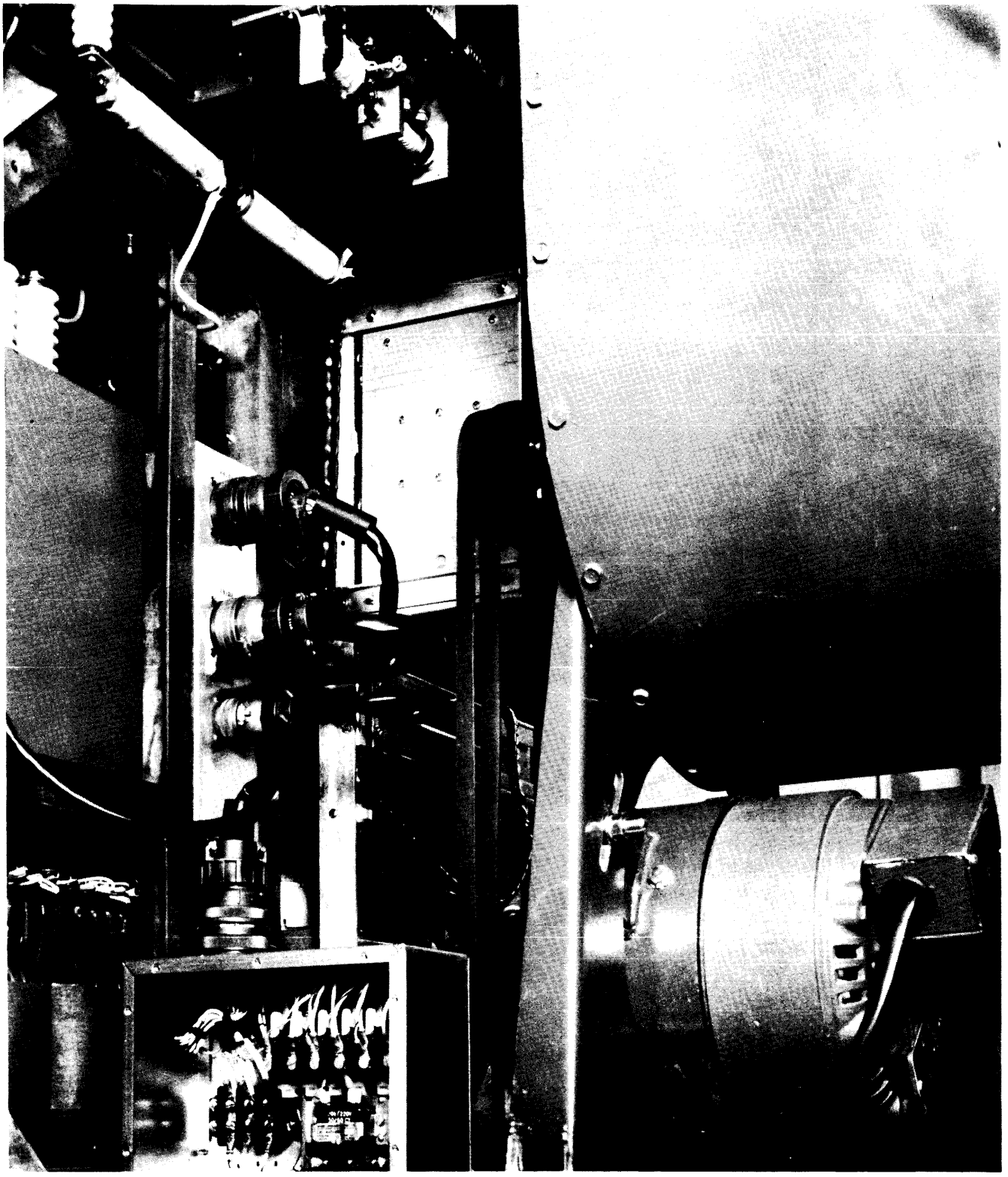


Figure 4-1-6. Front and Rear Views, PA Blower Compartment, GPT-40K (Sheet 1 of 3)

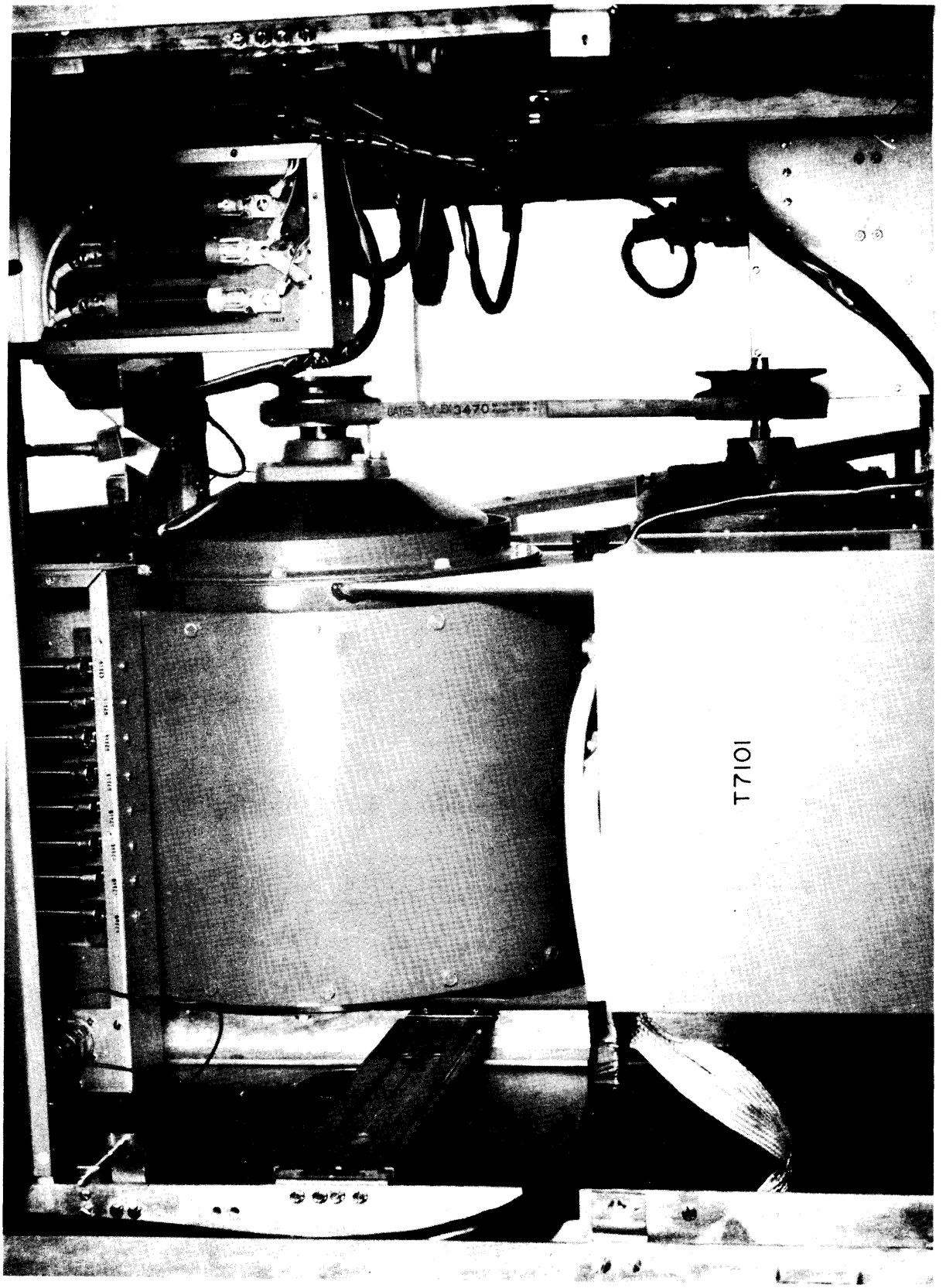


Figure 4-1-6. Front and Rear Views, PA Blower Compartment, GPT-40K (Sheet 2 of 3)

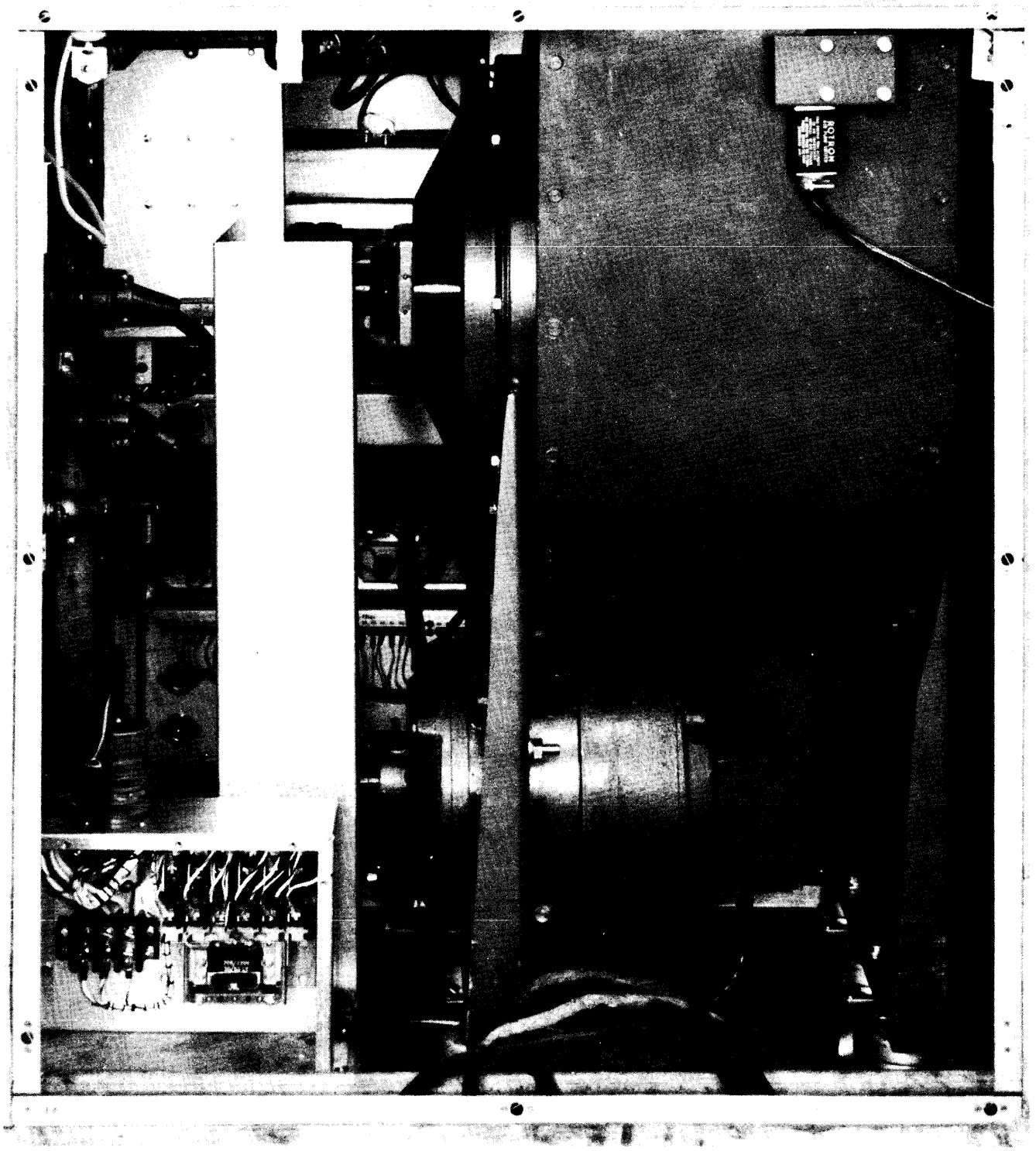


Figure 4-1-6. Front and Rear Views, PA Blower Compartment, GPT-40K (Sheet 3 of 3)

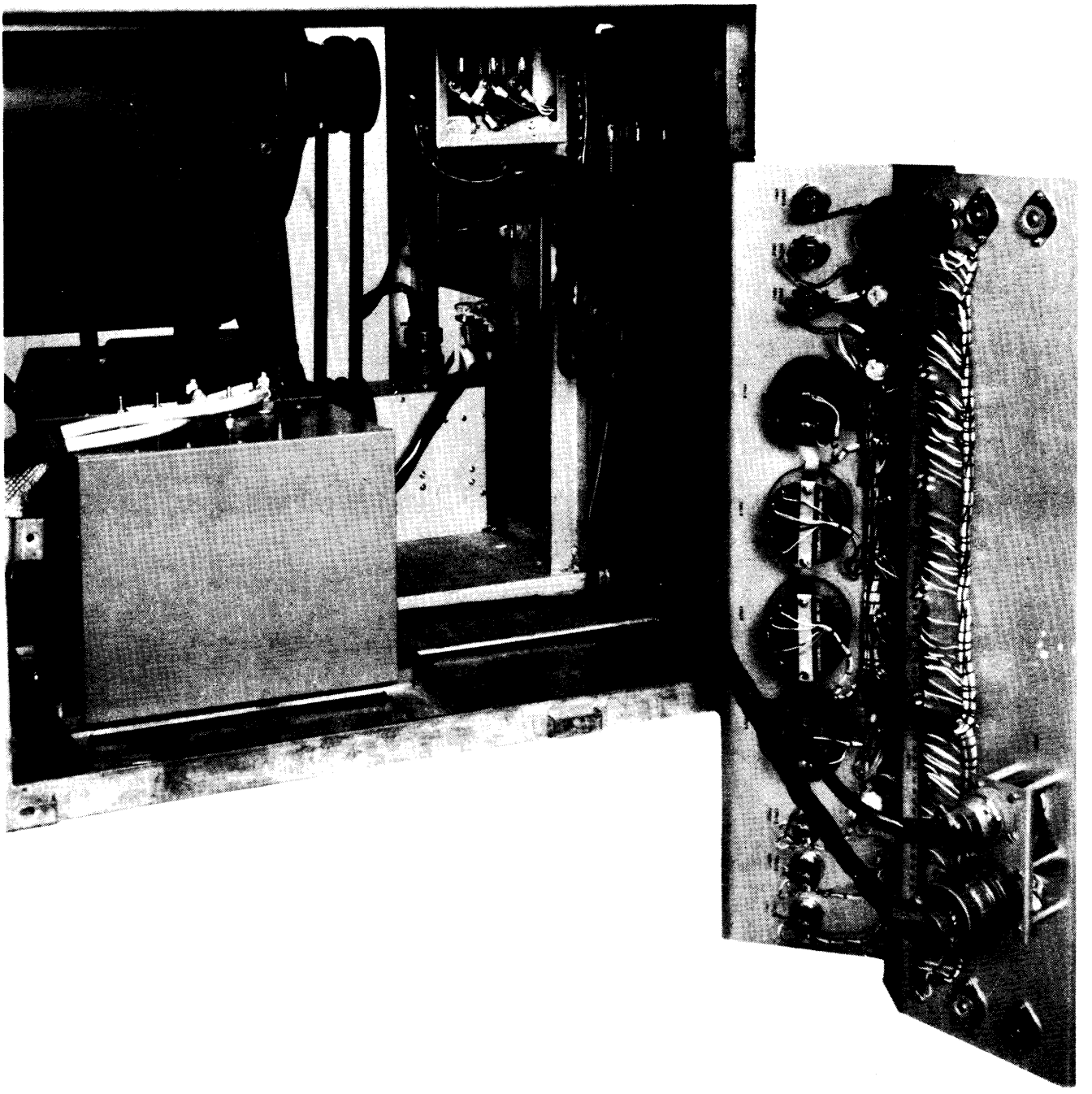


Figure 4-1-7. Rear View, Indicator Control Panel, GPT-40K

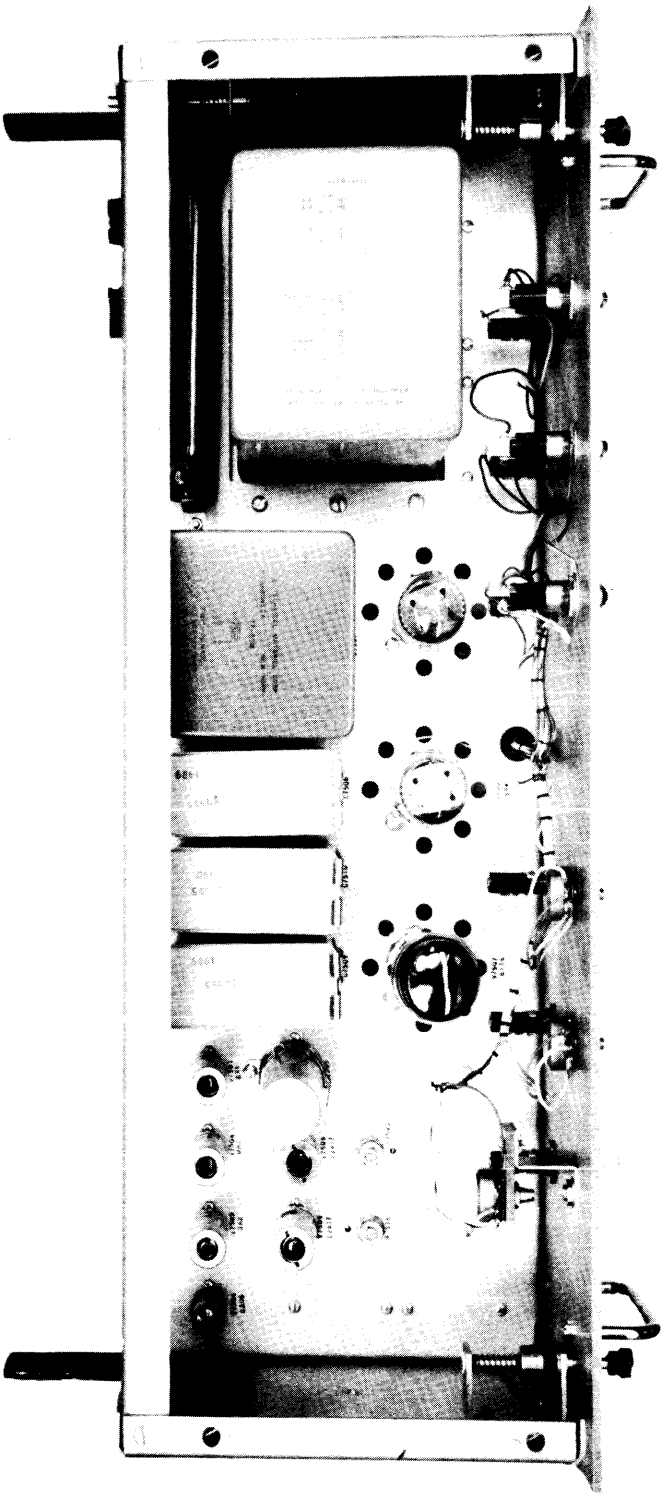
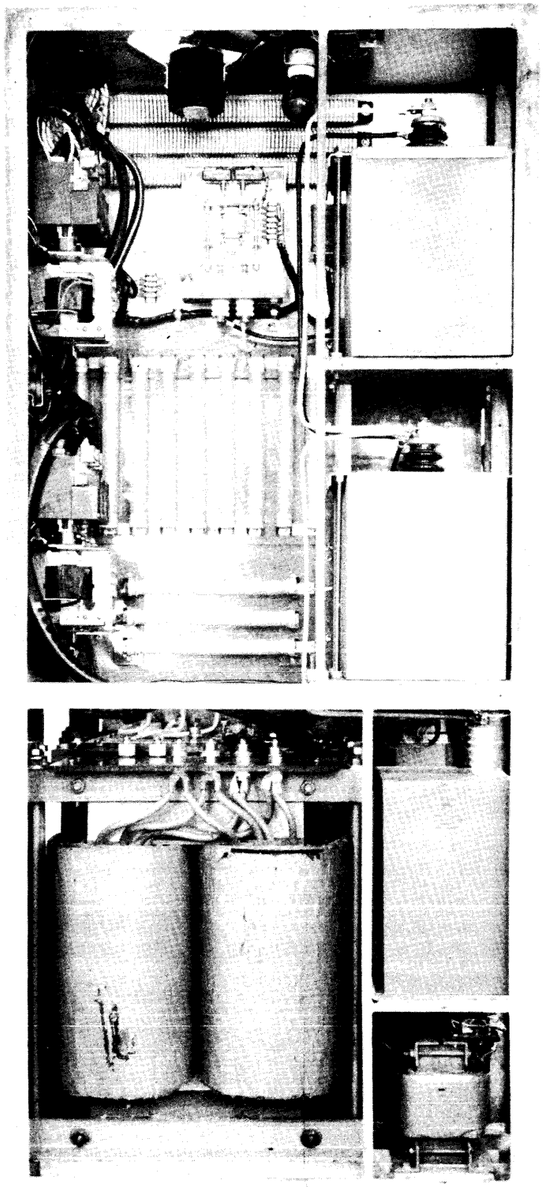


Figure 4-1-8. Top View, Bias Supply Drawer, GPT-40K



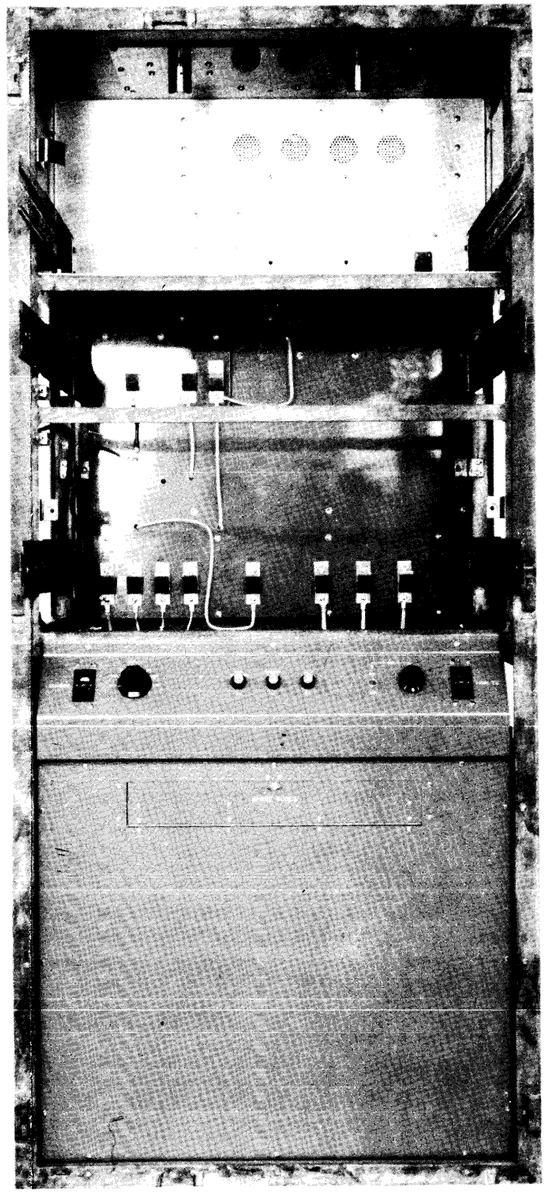
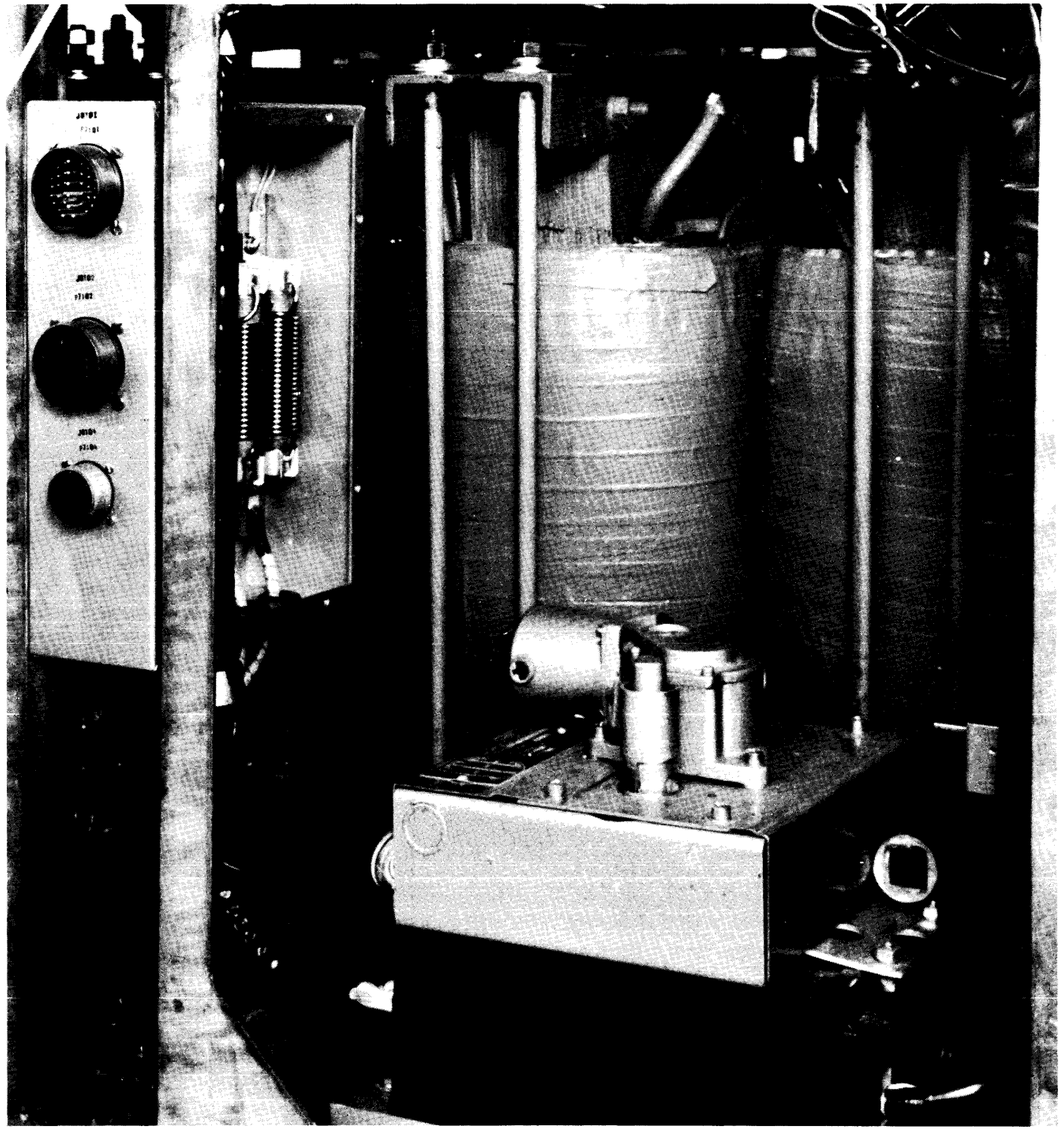


Figure 4-1-9. Overall Rear and Front (Removable Drawers Removed) Views, Fourth Frame, GPT-40K



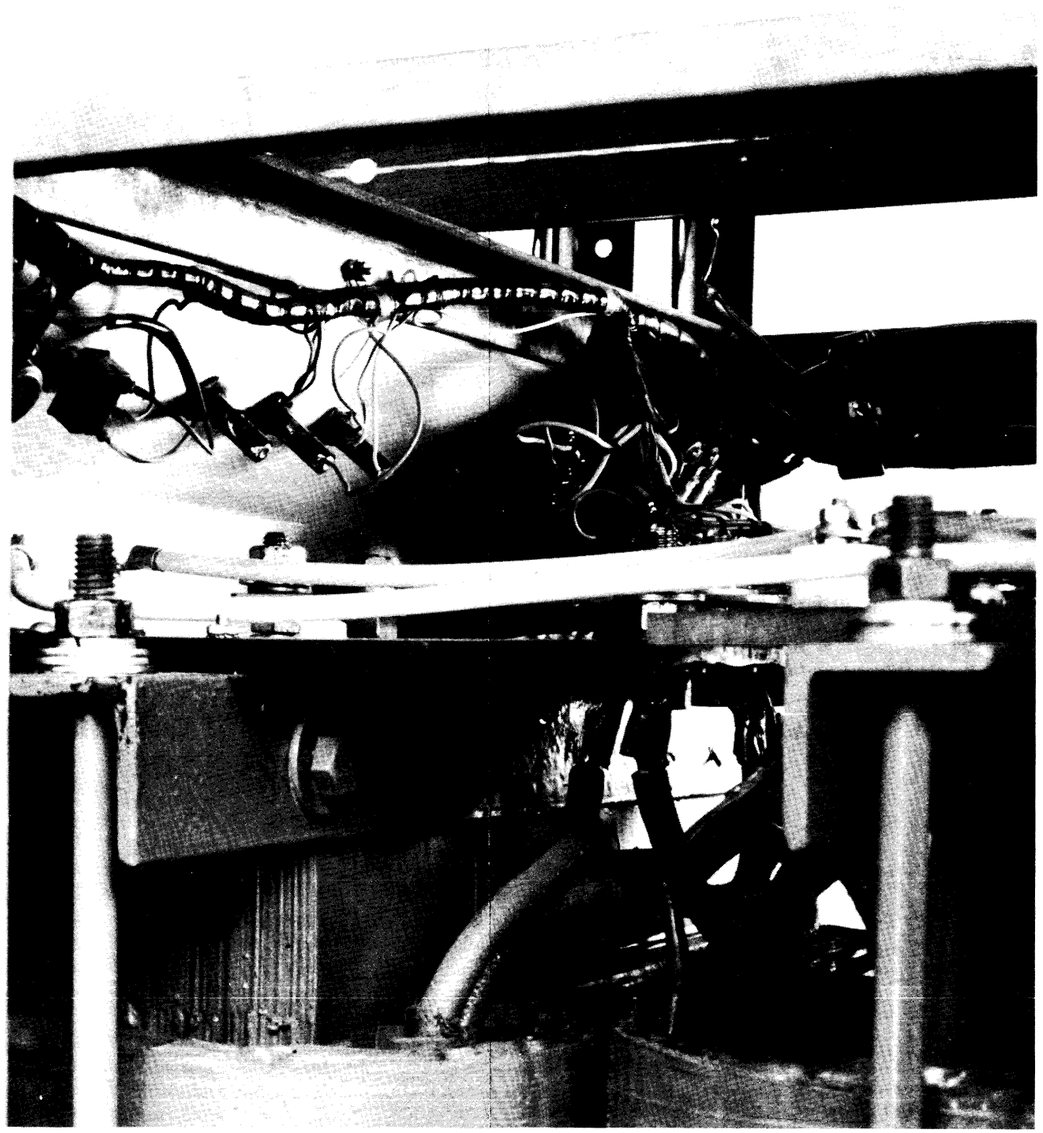


Figure 4-1-10. Side Views, Main Transformer and Motorized Circuit Breaker Compartment, GPT-40K

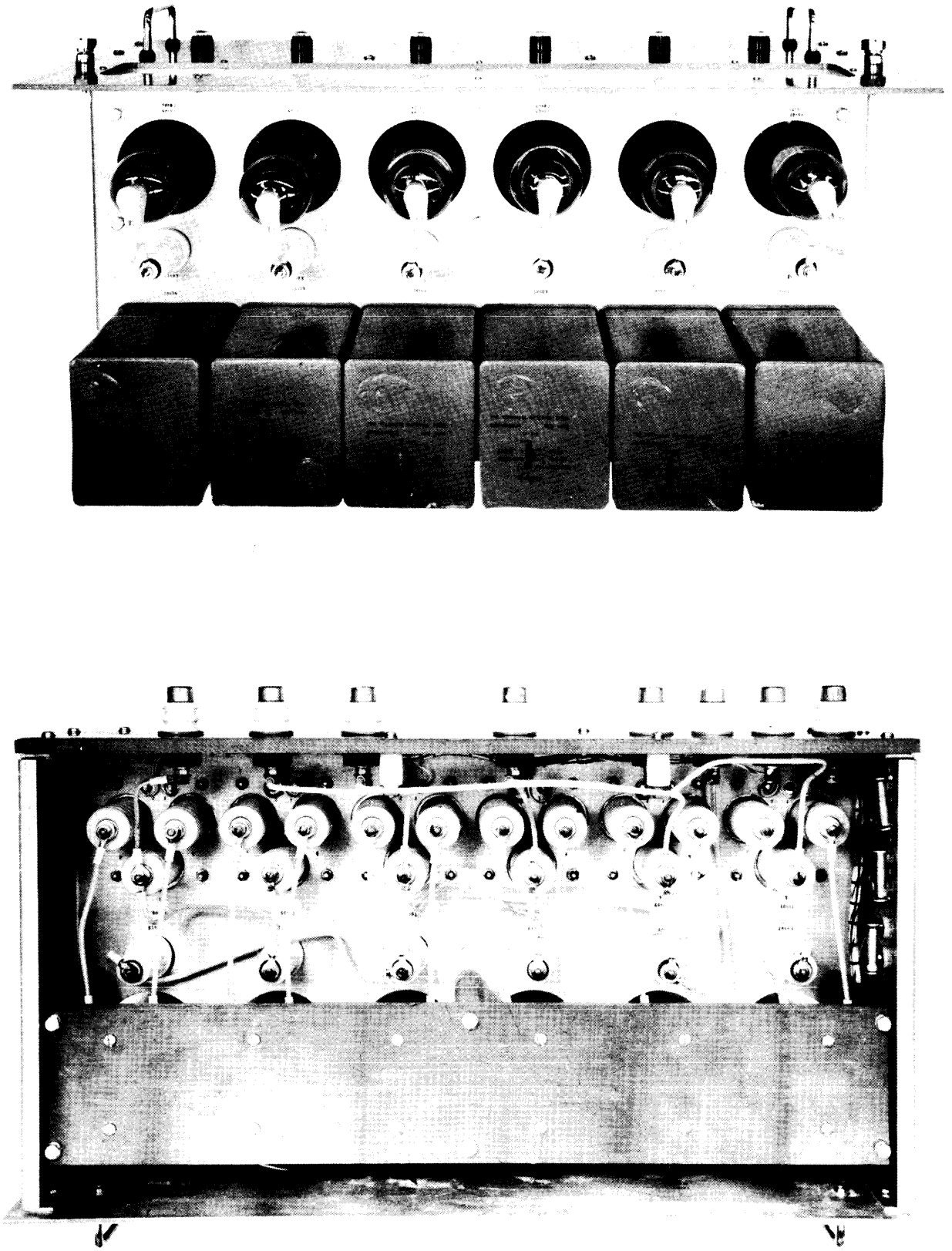


Figure 4-1-11. Top and Bottom Views, High Voltage Rectifier Drawer, GPT-40K

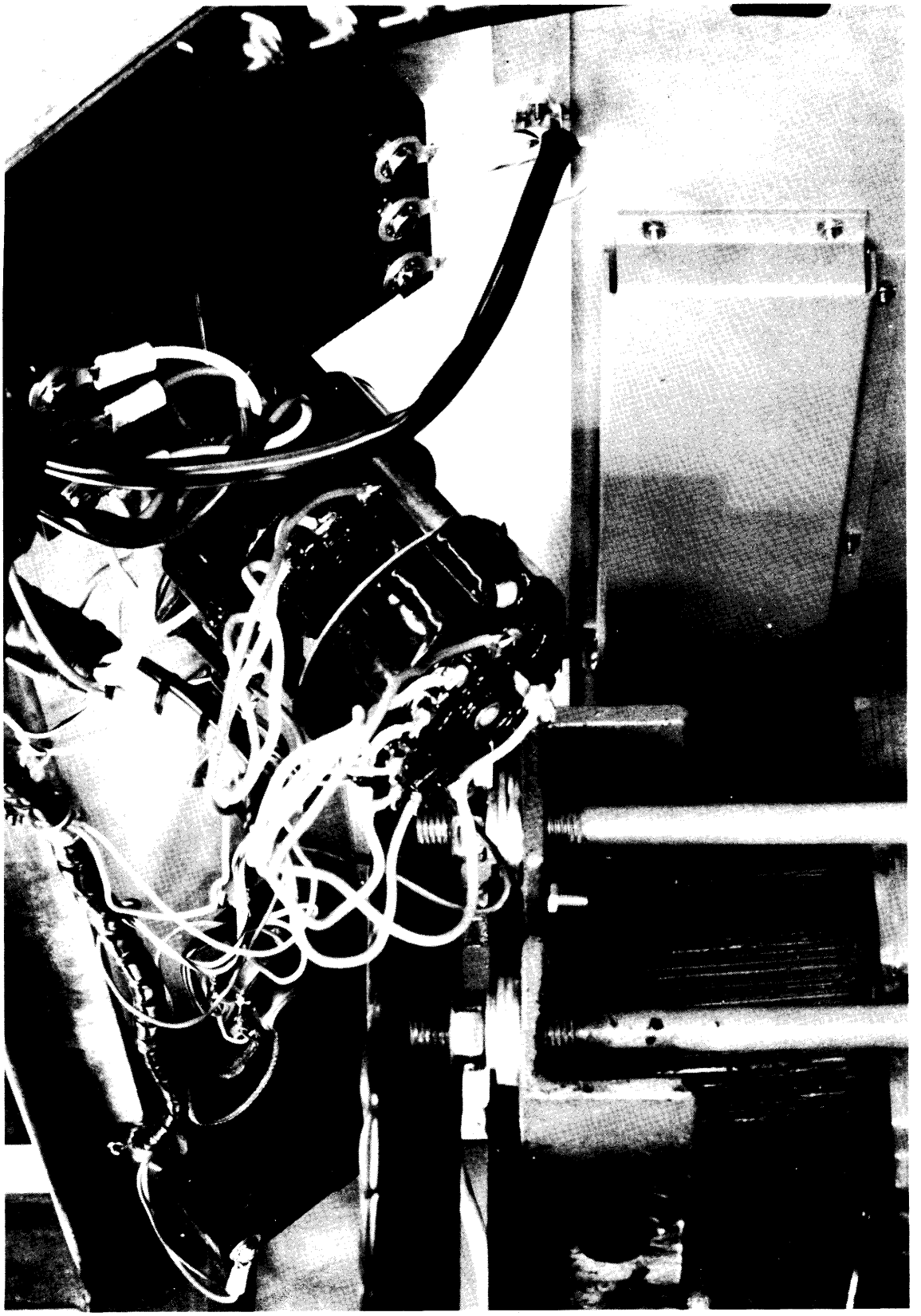


Figure 4-1-12. Rear View, Power Supply Control Panel, GPT-40K

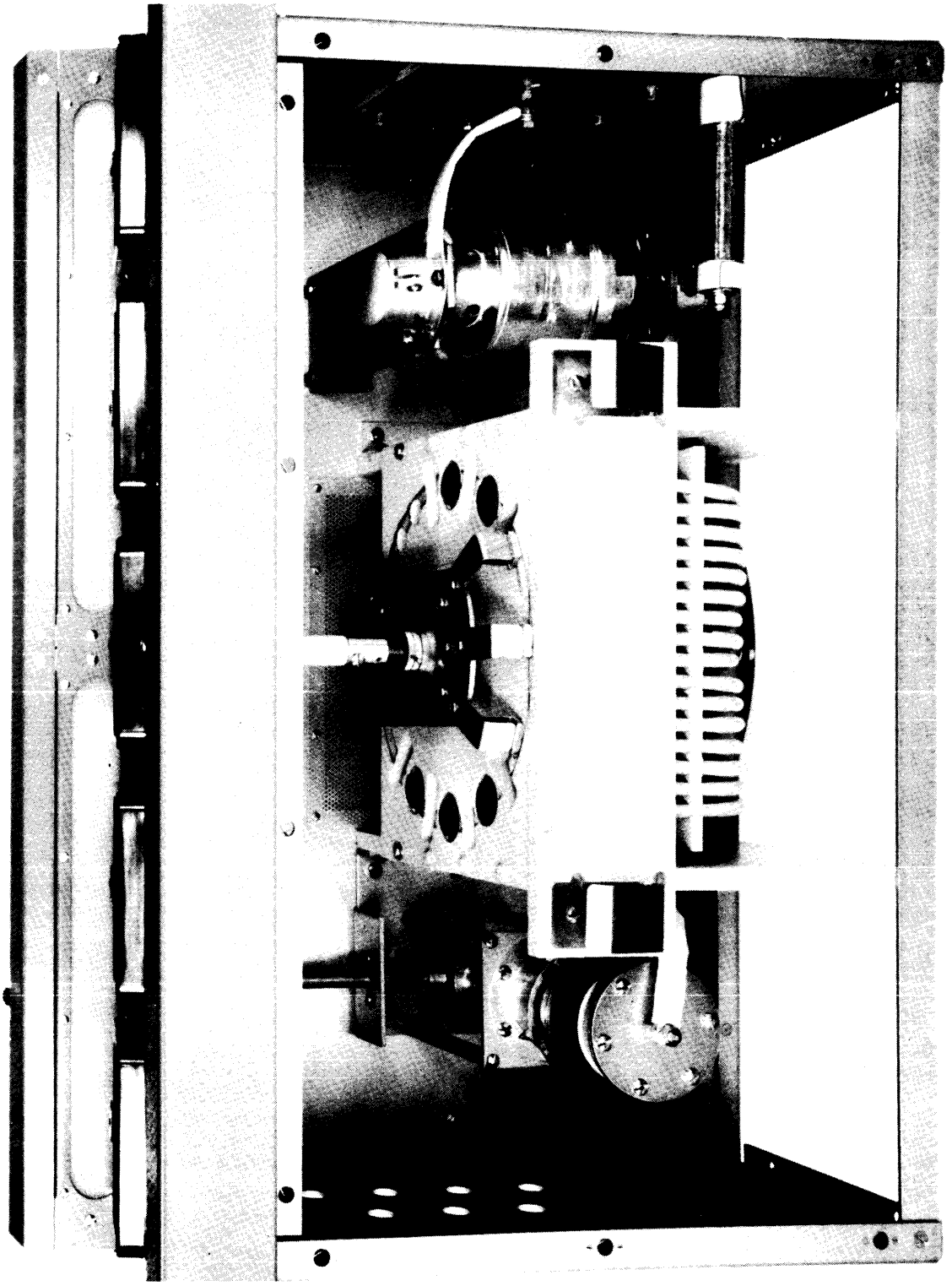


Figure 4-1-13. Front/Top and Rear/Top Views, Antenna Tuning Unit and Meter Panel Drawer, GPT-40K (Sheet 1 of 2)

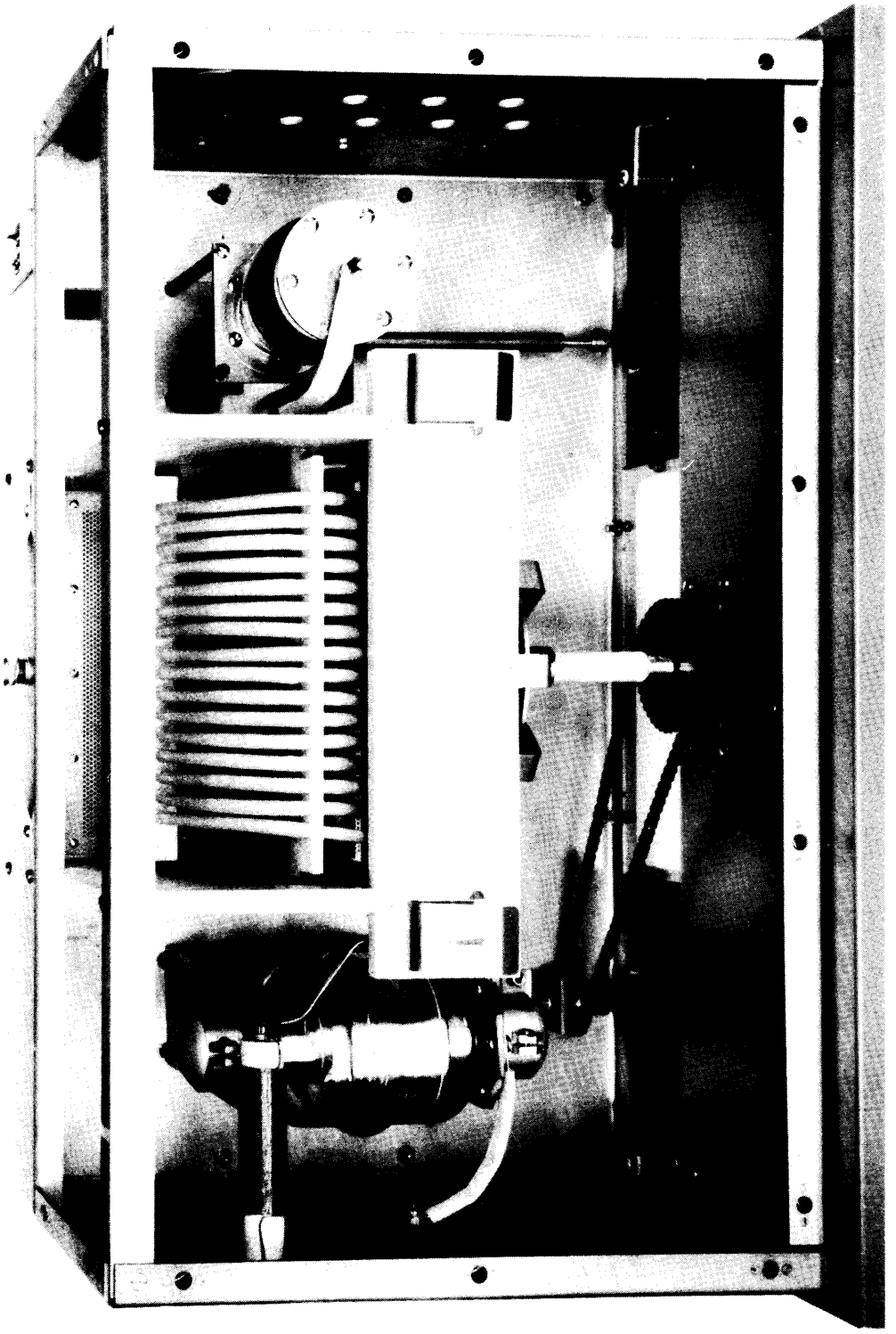


Figure 4-1-13. Front/Top and Rear/Top Views, Antenna Tuning Unit and Meter Panel Drawer, GPT-40K (Sheet 2 of 2)

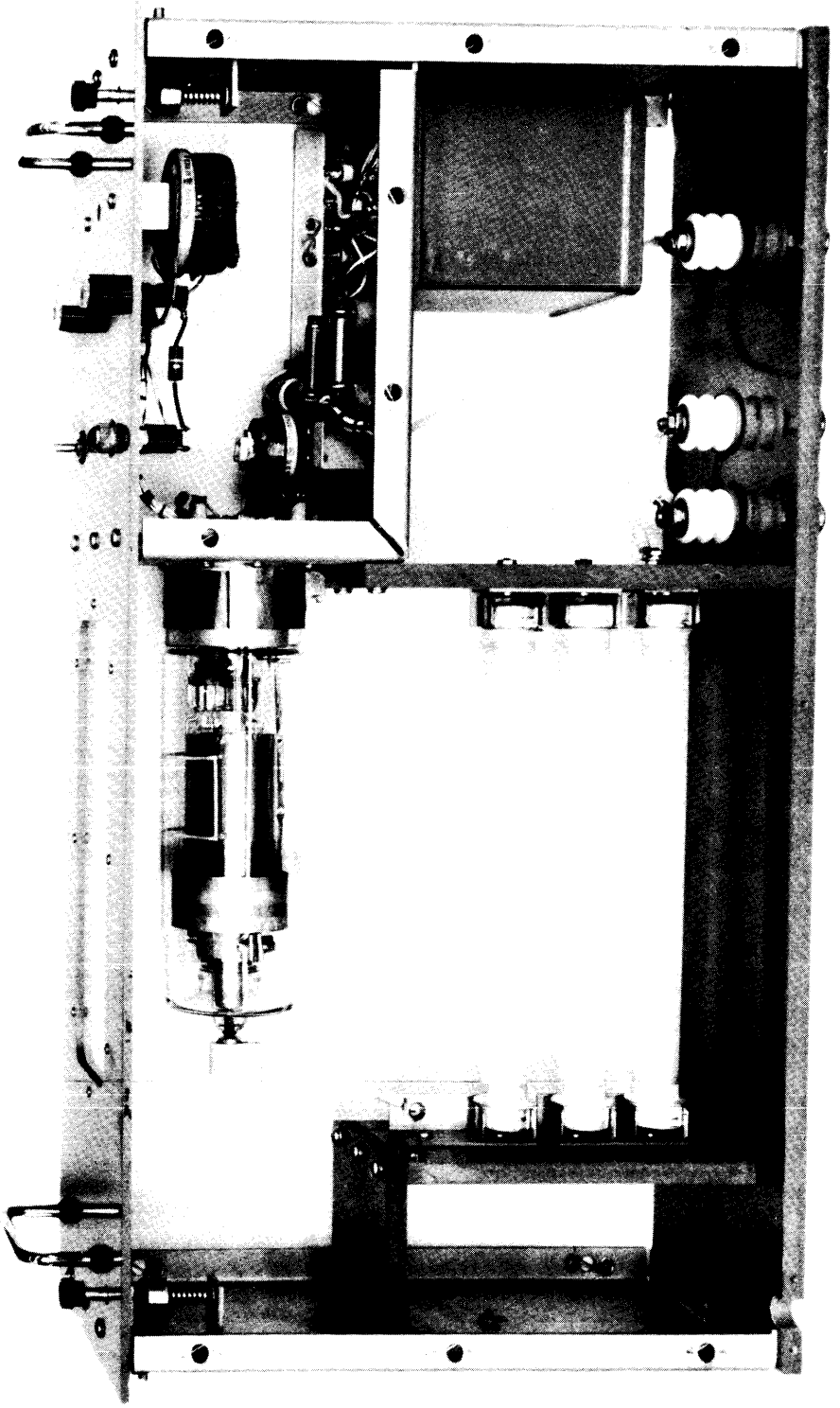


Figure 4-1-14. Top View, Crowbar Drawer, GPT-40K

SECTION 2

INSTALLATION

4-2-1. GENERAL.

As shown in table 1-2 in Part I, the GPT-40K is shipped in 30 wooden cases. On arrival, uncrate each and carefully inspect for damage. If any damage is found, notify the carrier or supply department immediately. Inspect all packing material for parts shipped as loose items. Loose items are packaged in cases 13 and 30, each package being designated with the assembly name using its contents. Case 30 also contains two complete instruction manuals which should be read and understood for proper installation, operation, and maintenance.

The contents of the 30 cases are packaged according to military specifications. The units are wrapped to avoid being scratched, placed in cartons, cushioned against shock, and wrapped and sealed with waterproof material within which the units are kept dry with a desiccant.

Figure 4-2-1 presents an exploded view of GPT-40K's framework. As shown, GPT-40K's framework consists of four frames, a number of shields, and miscellaneous parts such as trim, door latches, insulators, a warning light, small parts of hardware, etc. These are stamped with identifying numbers which serve as callouts in the following description. Generally, the parts are drilled and shaped so that they fit correctly in one position only.

4-2-2. PRODUCTION LINE CHECKOUT.

Before any GPT-40K is shipped, it has been assembled on the test floor and thoroughly checked against the manufacturer's specifications. This procedure eliminates assembly line errors and guarantees that a GPT-40K fully satisfies all design requirements. After this thorough checkout, the GPT-40K is disassembled and packed for customer use. The packaging operation, in turn, minimizes troubles that may develop in transit.

4-2-3. PLACEMENT OF GPT-40K.

After unpacking and inspecting the equipment and before assembling the GPT-40K in its operating location, select a location that provides a minimum clearance of 3 feet at the sides, 4 feet in the rear, 4-1/2 feet in the front, and 1 foot overhead. The reason for this is shown by the floor plan details in figure 4-2-1. The overhead clearance is the clearance above the highest component on top of the GPT-40K itself; that is, the insulators, or transmissions line, or warning lamp, or RF meters (balanced transmission), whichever is the highest.

The first step in the assembly of the GPT-40K is to place its base assembly properly, laying it level and bolted to the floor. In order to power the GPT-40K conveniently, the base assembly may be placed over the conduit raceway. Figures 4-2-2a, b illustrate access holes for incoming and outgoing power and signal conductors. The notes on figure 4-2-2 call out the purpose of all the access holes.

4-2-4. ASSEMBLY OF GPT-40K.

WARNING

High Power Tubes: Upon primary installation or upon replacement, a power tube such as type ML-6697 Machlett, as used in the GPT-40K, should be given adequate time to age. This can be accomplished by allowing the filament full time to heat before application of plate voltage. The GPT-40K should then be run with residual plate current applied but with no drive (DC condition) for a minimum of 2 hours. The GPT-40K should then be operated at half power for the next 24 hours; thereafter, full power may be applied for continuous duty.

Air Temperature: Sufficient air is supplied to the ML-6697 tube to dissipate safely 32 kw at 50°C incoming air. Correctly tuned, the ML-6697 tube should dissipate about 28 kw. Normal incoming air should be approximately 30°C and outgoing approximately 72°C. If for any reason the tube is being overheated due to operation with full plate current in and little or no output, or because incoming air is superheated, thermostat in the air exhaust stream cuts the GPT-40K off the air. This result is indicated by the RETUNE light on the relay panel. When the thermostat cools, the GPT-40K may again be placed in operation, but the operator should remove the cause, either by correctly tuning the GPT-40K or reducing power, so that its plate dissipation is not exceeded.

a. GENERAL. - The same general assembly procedures apply to the GPT-40K as apply to the GPT-10K even though details are considerably different. For example:

(1) The contents of GPT-40K's 30 boxes are taken out; these include partially assembled frames, shields, base assemblies, loose/end items of various types (motors, transformers, trim, panels, cabling doors, hardware, etc.), units in removable drawers, tubes, etc.

(2) The base assemblies are properly installed.

(3) Power, signal, and ground leads are pulled into place.

(4) The base shields are placed on top of the base assemblies.

(5) The partially assembled frames are placed on top of the base shields.

(6) The frames are bolted together.

(7) The frames are bolted to the base assemblies.

(8) The loose/end items are placed in their respective partially assembled frames. For example, the PA blower motor, the three main PA power transformers, PA tube, oil-filled capacitors, heavy-duty inductors, etc.

(9) Cables are interconnected.

(10) The frames are equipped with shields, trim, panels, tops, doors, etc.

The following paragraphs present details on the assembly of GPT-40K's four frames.

b. ASSEMBLY OF FIRST AND SECOND FRAMES. - Assembly of the GPT-10K is described in Part II, Volume I, paragraph 2-4. The assembly procedure for GPT-40K's first and second frame is similar to the GPT-10K. However, minor differences exist. For example, in paragraph 4-2-4a(2) above, allowance must be made for mating the PA(10K) and PA(40K) bases. In paragraph 4-2-4a(3) and 4-2-4a(4) above, allowance must be made for proper cable interconnections between GPT-40K's four frames. Again in paragraphs 4-2-4a(5), 4-2-4a(6), and 4-2-4a(7), allowance must be made in the sequence of bolting GPT-40K's four frames together and in bolting each frame to its base. When the framework is in proper place, the loose/end items can be added in logical order.

c. ASSEMBLY OF THIRD AND FOURTH FRAMES. - Locations of equipment units called out below are shown on photographs in Section 5 of Part IV. Hardware to fasten units to their respective frames is found in case 30.

STEP	DESCRIPTION
1	Position base assembly as stated above.
2	Connect three incoming 230-volt main supply power leads to AC power terminal panel. (See figure 4-2-2a.) Connect ground lead to one of four bolts that fastens panel to base (bolt is uninsulated from base). Pull power and signal wires through access holes to their respective terminals. (See figure 4-2-2a.)

WARNING

Circuit must be open between customer's supply line voltage and AC power terminal panel during entire assembly procedure. Only after completion of GPT-40K assembly may the 230-volt, 3-phase main supply circuit be closed.

STEP	DESCRIPTION
3	Place bottom shield on base assembly.
4	Mount PA(40K) frame (from case 14, table 1-2 in Part I) and power supply frame (from case 15, table 1-2 in Part I) on top of bottom shield. Bolt frames together and to base assembly.
5	Install blower motor BL-107 (from case 29, table 1-2). This operation requires temporary removal of guard.
6	Install filament transformer TF-215.
7	Install main power transformers TF-211 (from cases 18, 19, and 20, table 1-2 in Part I). Installation is practical through access holes adjacent to transformer. If the three transformers have slightly different sizes, place the smallest transformer in the middle position.
8	Install two oil-filled capacitors CP-107 (from case 25, table 1-2 in Part I).
9	Install 0.4-henry choke TF-5016 (from case 26, table 1-2 in Part I).
10	Connect inter- and intra-frame cables as follows:

Connector	Connector	Where Connection Is Made
P7102(P)	J8102(S)	PS Frame
P7101(S)	J8101(P)	PS Frame
P7106(P)	J8104(S)	PS Frame
J8201(P)	J8103(S)	PS Frame
J7103(P)	P900(S)	PA Frame
J7102(S)	P7104(P)	PA Frame
P7105(S)	J7501(P)	PA Frame
P7109(P)	J7502(S)	PA Frame
J7302(S)	P7302(P)	PA Frame
J7601( )	P7107( )	PA Frame
J7602( )	P7108( )	PA Frame
J7101(P)	P7103(S)	PA Frame
J8301(P)	P8101(S)	PS Frame

11	Insert individual units in removable drawers in their respective places.
12	Install shields, doors, and trim (from case 17, table 1-2 in Part I). The procedure is similar to that detailed in Part II, Volume I, paragraph 2-4.

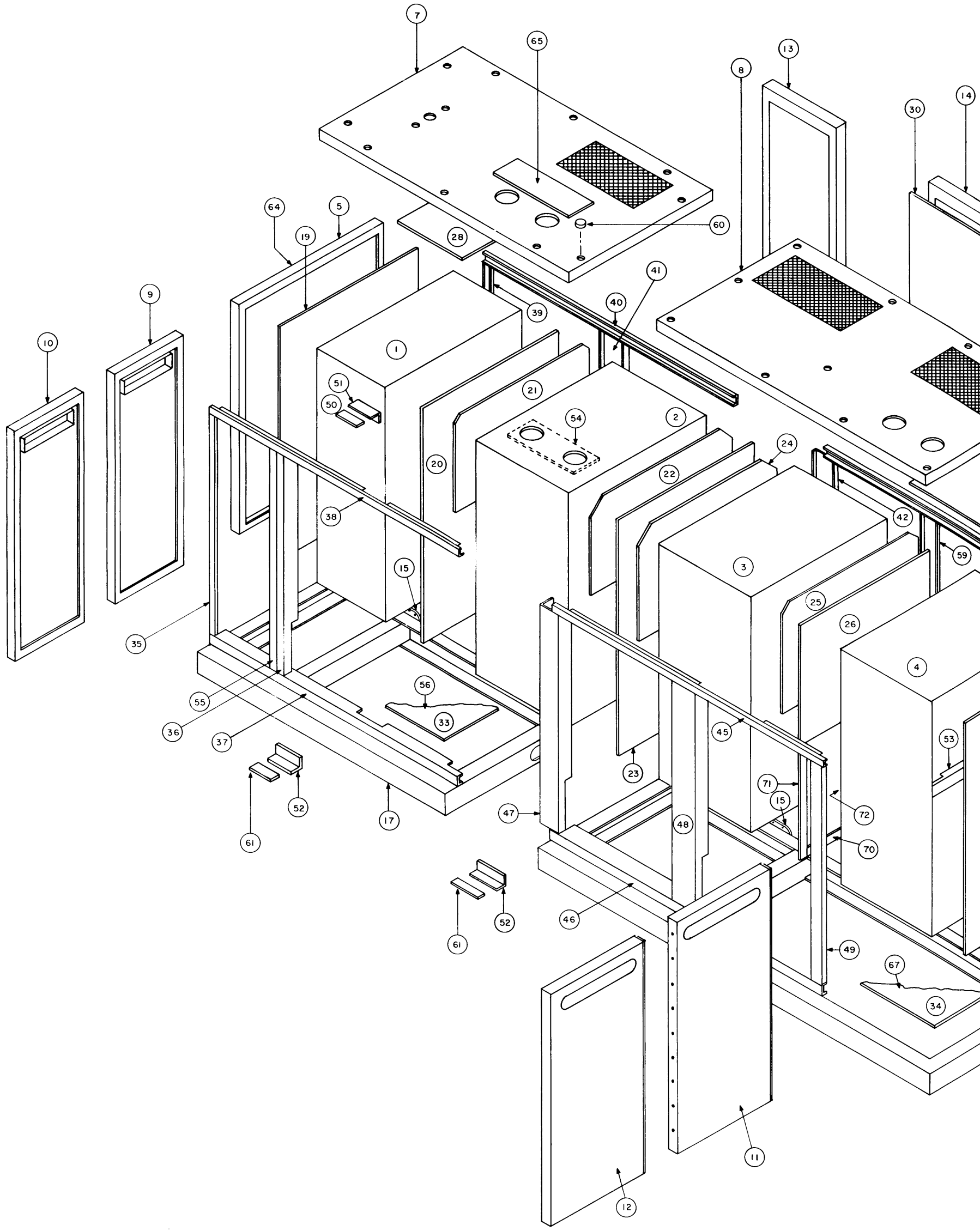
4-2-5. SUPPLEMENTARY INSTRUCTIONS FOR INSTALLATION USING 50-CYCLE POWER SUPPLY.

The main power supply circuit requires no adjustment for 50-cycle versus 60-cycle power supply with the following exceptions: The main PA(40K) blower must be speeded up to force adequate air through PA(40K)'s ML-6697 tube. To do this, replace the "60-cycle" pulley on the blower with the "50-cycle" pulley in case 30, table 1-2 in Part I. A pulley puller is also a loose item in case 30. To tighten the blower's belt, adjust position of associated motor.

The Sola constant current regulator transformer, T3000, located in GPT-40K's first frame, is provided with terminals that enable it to supply regulated 115-volt, single-phase power to all the exciter and test equipments mounted on the auxiliary frame chassis. For more detail, refer to Part II, Volume I, paragraph 2-6.

4-2-6. INITIAL ADJUSTMENTS AND CHECKOUT.

As stated in paragraph 4-2-2 above, the GPT-40K has been adjusted, thoroughly tested, and checked out on the manufacturer's test floor just prior to shipment. Barring rough handling during shipment and installation, initial factory adjustments and checkouts, as detailed in paragraph 4-6-4c in Part IV, should indicate that the equipment is ready for services. If otherwise, the troubleshooting procedures in Part IV Section 5 should be started.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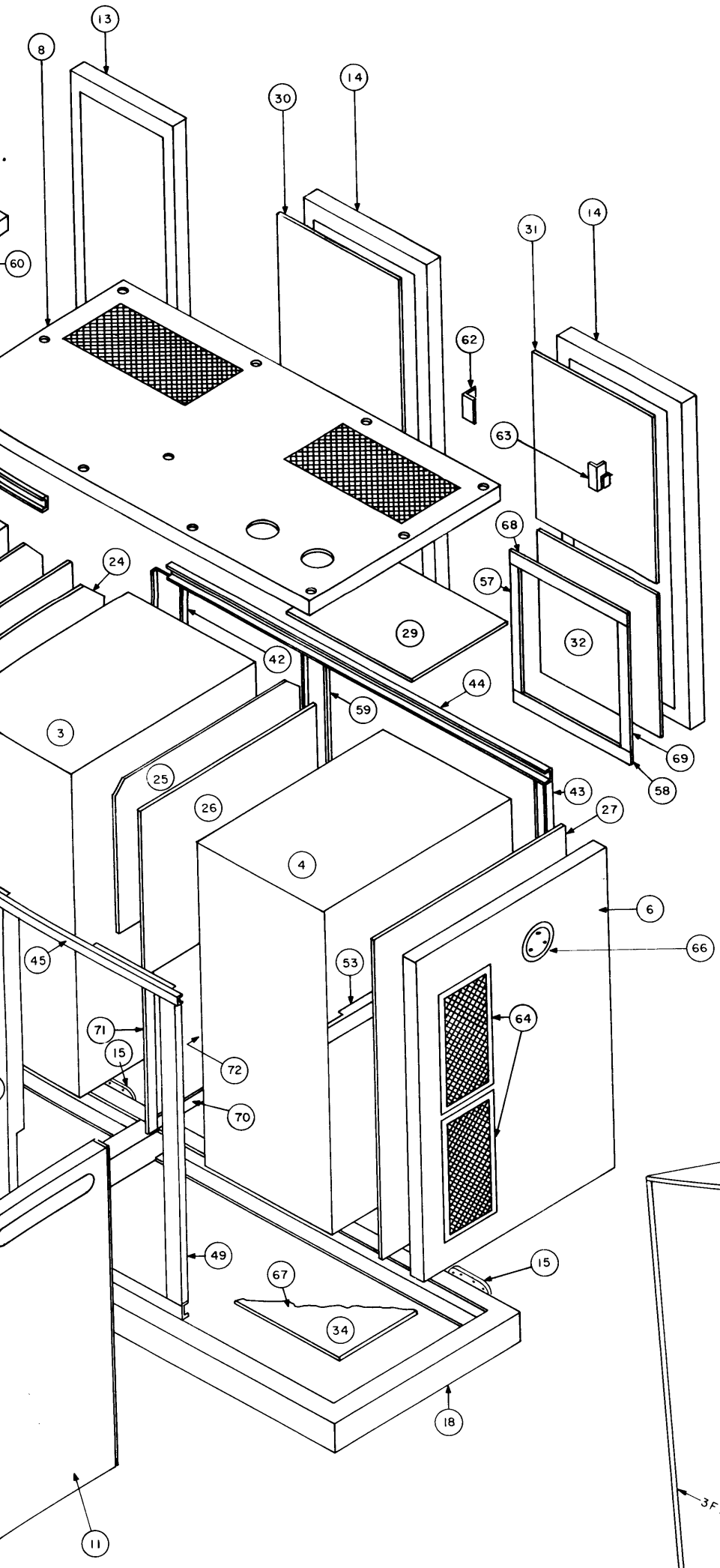


REQ	ITEM	PART NO.	DESCRIPTION	
1	72	MS-2299-2	SPACER BOTTOM RT. SIDE REAR	
1	71	MS-2299-1	SPACER BOTTOM RT. SIDE FRONT	
1	70	MS-2303	SPACER BOTTOM RT. SIDE	
1	69	MS-2302	STRIP RT. SIDE PA FR.	
1	68	MS-2301	STRIP TOP REAR PA. FR.	
1	67	MS-2336	COVER AC ACCESS ON ITEM 34	
1	66	MS-2258	COVER UN BAL.	
	65	MS-2442	COVER BOWL OPENING	
3	64	MS-2255	COVER EXP. METAL FILTER	
3	63	MS-2042	BRACKET DOOR MTG. RT. SIDE	
3	62	MS-2041	BRACKET DOOR MTG. LT. SIDE	
	61	MS-2122	PLATE LATCH BOTTOM	
46	60	HB-101-6-B	PLUG BUTTOM	
1	59	MS-2051	TRIM RT. SIDE REAR PA. FR.	
1	58	MS-2226	STRIP BOTTOM REAR PA FR	
1	57	MS-2227	STRIP LEFT SIDE REAR PA FR	
2	56	MS-1850-A	DOOR ACCESS	
1	55	MS-1637	TRIM, HINGED RT. SIDE AUX. F R	
1	54	MS-2338	PLATE BLANK, CONVERSION IT. 2	
1	53	PM-603	BAR, SUPPORT TRANS. PS. FR.	
1	52	MS-2103	BRACKET MTG. DOOR LATCH	
1	51	MS-1661	BRACKET	
1	50	MS-1660	PLATE TOP	
1	49	MS-2025	TRIM RT. SIDE P.S. FR.	
1	48	MS-2027	TRIM, PS & PA FR. FRONT	
1	47	MS-2026	TRIM FRONT LT. SIDE PA-MAIN FR.	
1	46	MS-2029	TRIM FRONT, BOTTOM	
1	45	MS-2028	TRIM FRONT TOP	
2	44	MS-2053	TRIM TOP & BOTTOM REAR	
1	43	MS-1671	TRIM REAR PS FR.	
1	42	MS-2052	TRIM REAR, LT. SIDE PA. FR	
1	41	MS-1669	TRIM REAR MAIN AUX. FR.	
2	40	MS-1672	TRIM REAR TOP & BOTTOM	
1	39	MS-1670	TRIM REAR AUX. FR.	
1	38	MS-1635	TRIM FRONT TOP	
1	37	MS-1636	TRIM BOTTOM	
1	36	MS-1634	TRIM, LT. SIDE HINGED MAIN FR.	
1	35	MS-1920	TRIM, HINGED AUX. FR.	
1	34	MS-1999	SHIELD BASE	
1	33	MS-2175	SHIELD BASE	
1	32	MS-2186	SHIELD BOTTOM REAR PA. FR.	
1	31	MS-1993	SHIELD REAR PA. FR.	
1	30	MS-1594	SHIELD REAR MAIN FR.	
1	29	MS-2035	SHIELD TOP REAR P.S. FR.	
1	28	MS-1604	SHIELD TOP AUX. FR.	
1	27	MS-2018	SHIELD RT. SIDE PS FR	
1	26	MS-2200	SHIELD RT. SIDE, EXT. PA. FR.	
1	25	MS-1991	SHIELD RT. SIDE PA. FR.	
1	24	MS-1990	SHIELD LT. SIDE PA. FR.	
1	23	MS-1830	SHIELD RT. SIDE MAIN FR.	
1	22	MS-1592	SHIELD RT. SHIELD MAIN FR.	
1	21	MS-1593	SHIELD LT. SIDE MAIN FR.	
1	20	MS-1829	SHIELD LT. SIDE	
1	19	MS-1831	SHIELD LT SIDE AUX FR	
1	18	MS-1996	BASE	
1	17	MS-1458	BASE	
1	16	MS-1647	DOOR REAR MAIN PS. FR.	
3	15	MS-1850 S	DOOR ACCESS ON ITEM 17& 18	
2	14	MS-2037	DOOR REAR MAIN & PA FR	
1	13	MS-1648	DOOR REAR AUX.	
1	12	MS-2120-2	DOOR FRONT PA. FR.	
1	11	MS-2118	DOOR FRONT PS. FR.	
1	10	MS-2120-1	DOOR FRONT MAIN FR.	
1	9	MS-2119	DOOR FRONT AUX. FR.	
1	8	MS-1997	COVER TOP	
1	7	MS-1699	COVER TOP	
1	6	MS-2116	COVER, RT. SIDE	
1	5	MS-2117	COVER, LT. SIDE	
1	4	MS-1995	POWER SUPPLY FRAME	
1	3	MS-1994	POWER AMP. FRAME	
1	2	MS-1456	MAIN FRAME	
1	1	MS-1455	EXCITER FR.	

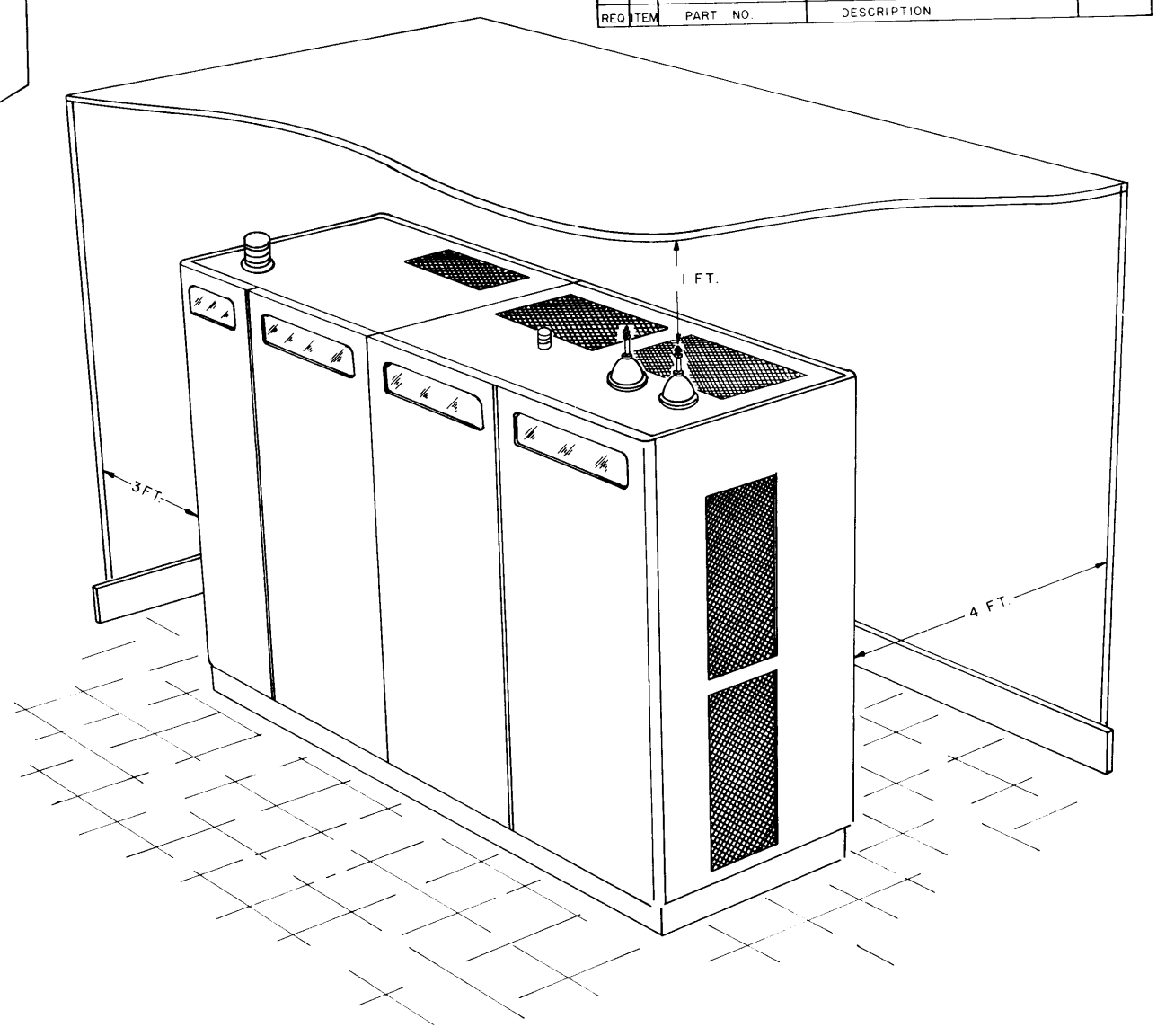
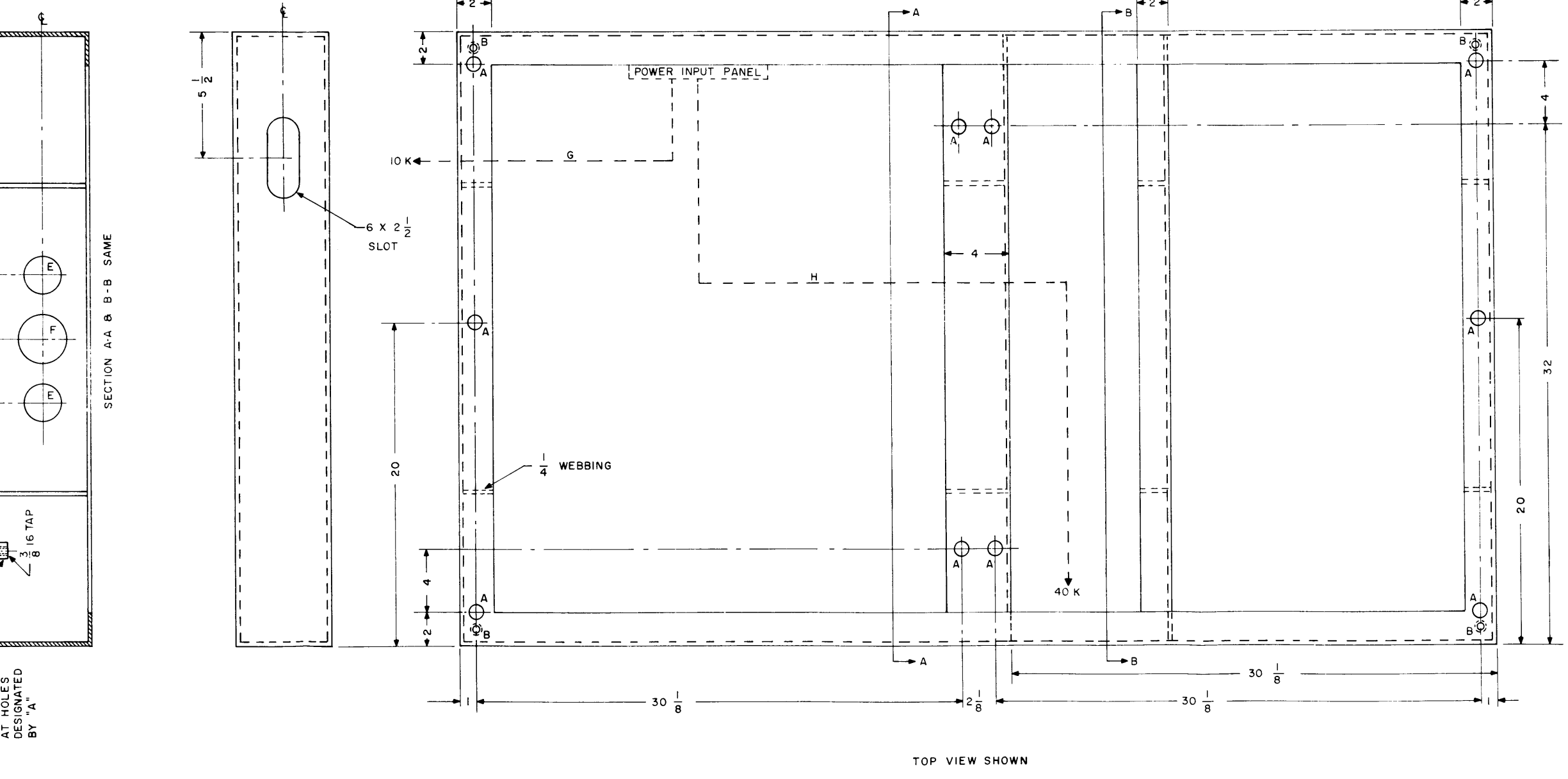
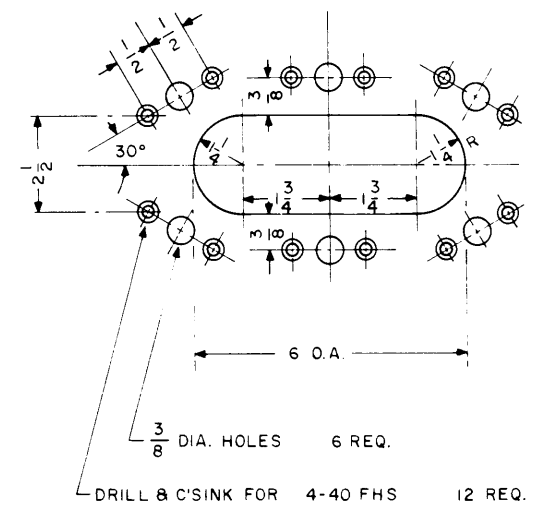


Figure 4-2-1. Exploded View, Assembly Drawing, GPT-40K



A - 7/16 DIA. HOLES (TOP ONLY)	10 REQ.
B - DRILL & TAP FOR 8-32	4
C - DRILL & C'SINK FOR 1/4 20 FHS. (SEE NOTE 1)	4
D - SEE DETAIL BELOW	2



NOTE -
FOR ACCESS COVER PLATE USE TMC PART NO. MS-1850-SB

E - 2" DIA. HOLES	2 REQ
F - 3" DIA HOLE	1 REQ

NOTE : 1
FOUR (4) "C" HOLES USED TO MOUNT POWER INPUT (3-PHASE, 230-VOLT) CONDUCTORS TO PA (10K)

G - SHOWS ROUTE OF 3-PHASE 230-VOLT-CONDUCTORS TO PA (10)K INPUT TERMINAL.

H - SHOWS ROUTE OF 3-PHASE 230-VOLT-CONDUCTORS TO PA (40)K INPUT TERMINAL.

Figure 4-2-2. Installation Diagram, GPT-40K's Base and Bottom Shield (Sheet 1 of 2)

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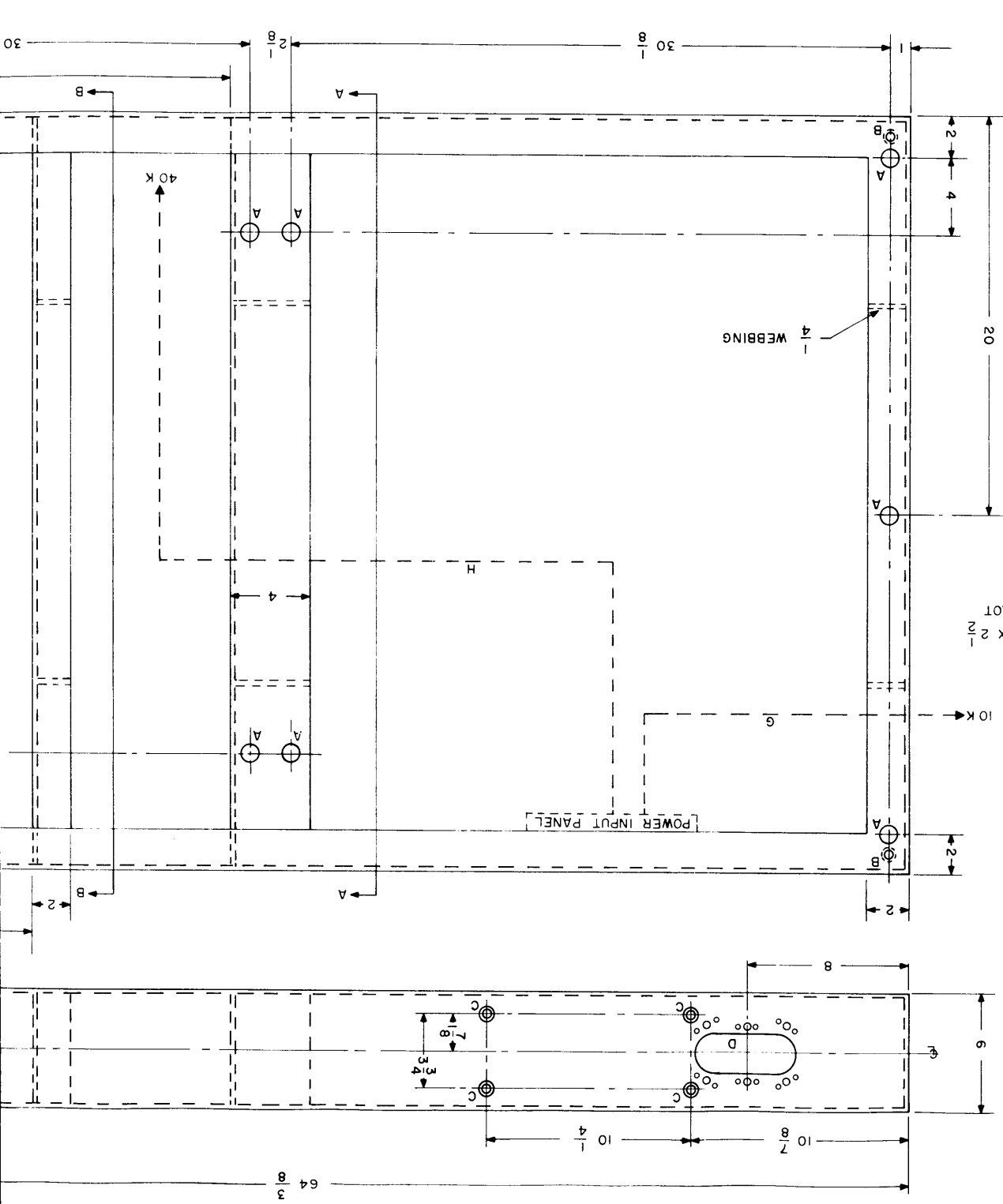
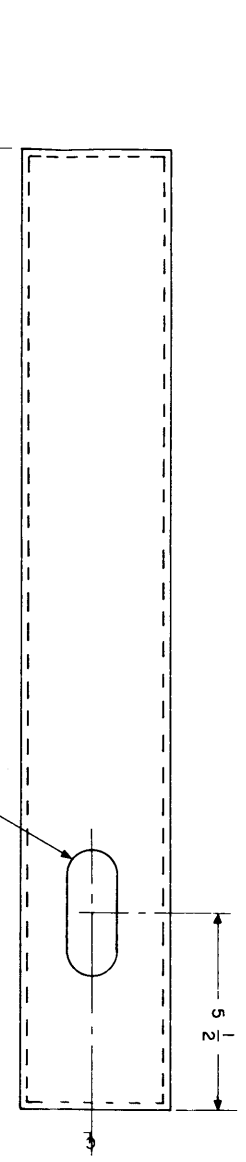
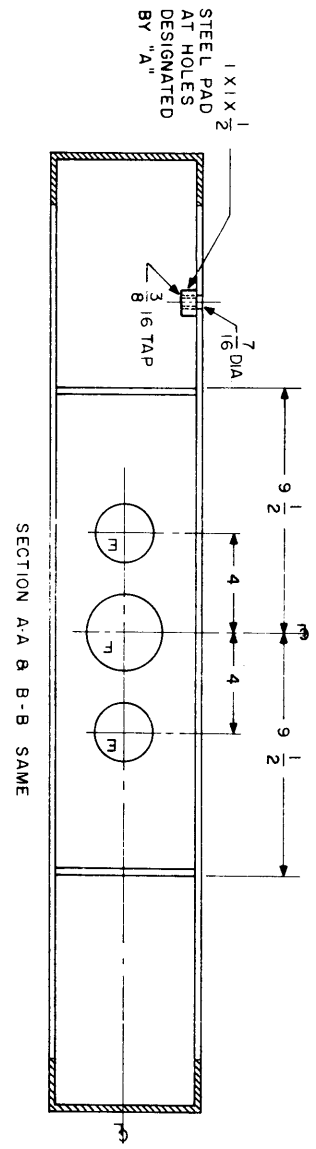
TOP VIEW SHOWN







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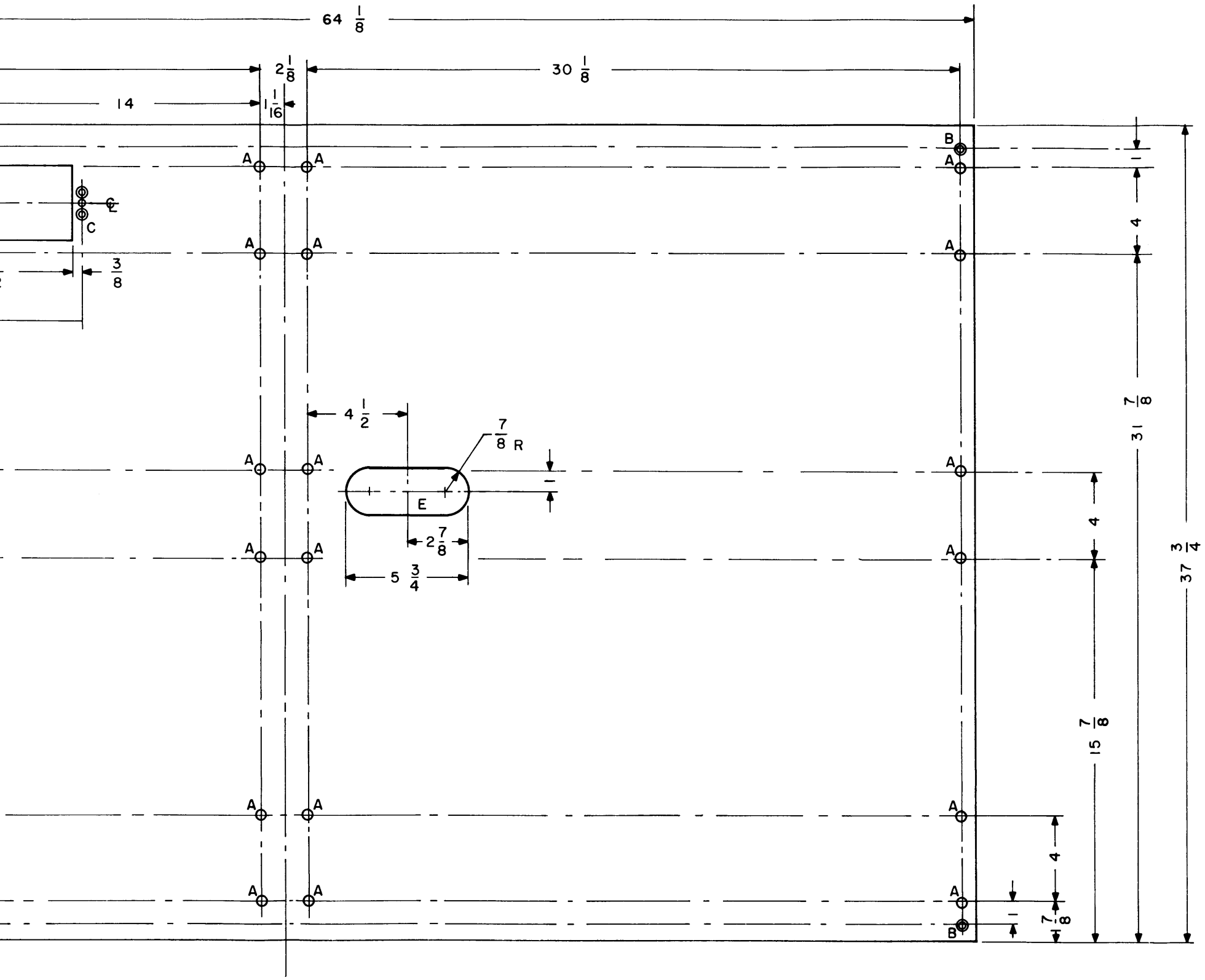
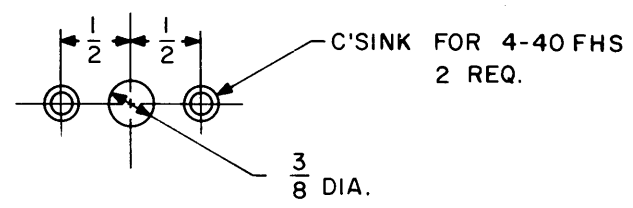


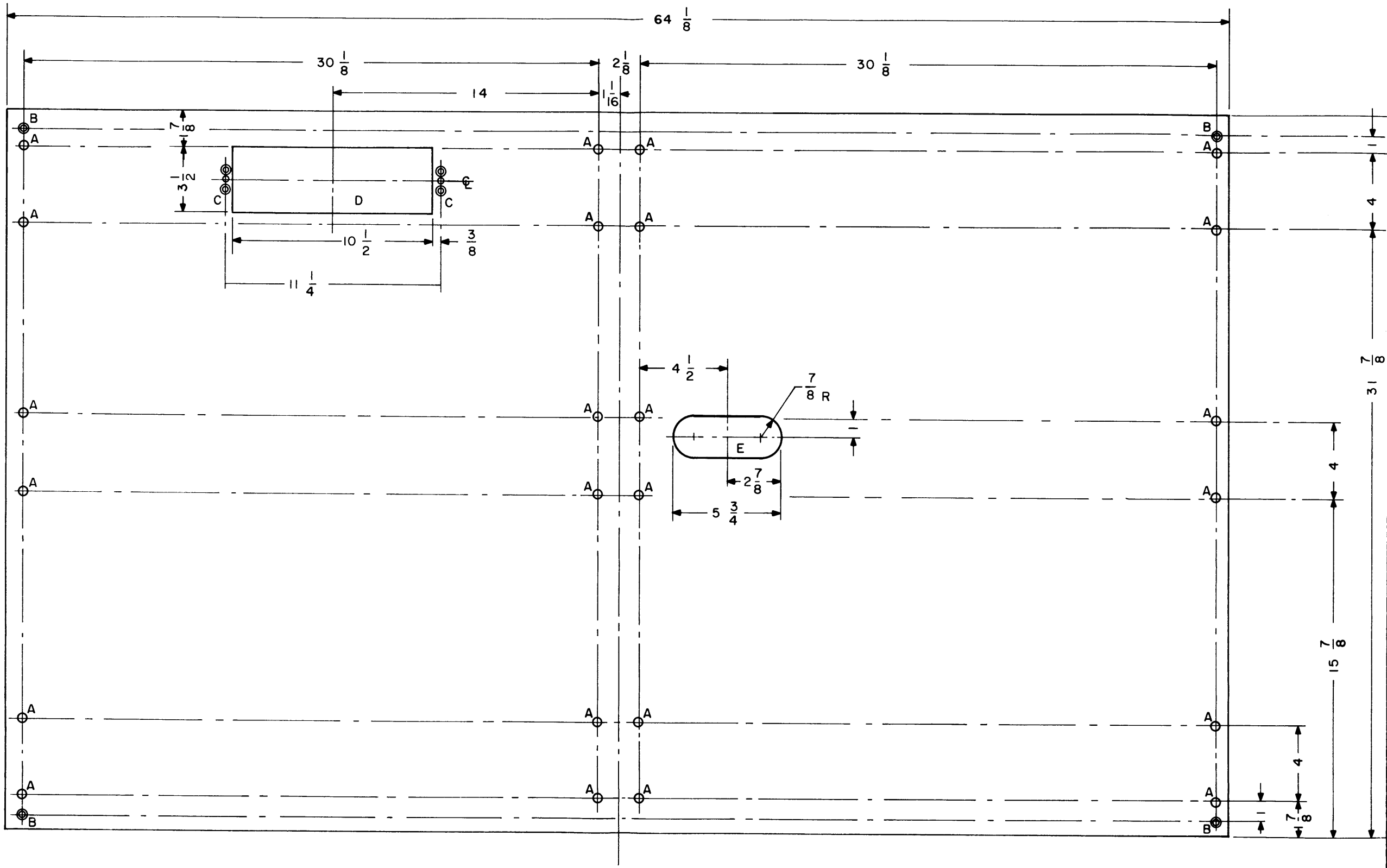
HOLES	REQ.
A - 1/2 (.500) DIA.	24
B - 8-32	4
C - SEE DETAIL	



D- ACCESS HOLE FOR AC POWER TERMINAL PANEL.

E-ACCESS HOLE FOR 3 PHASE 230- VOLT CONDUCTORS TO GPT-40K'S PA.

Figure 4-2-2. Installation Diagram, GPT-40K's Base and Bottom Shield (Sheet 2 of 2)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SECTION 3

OPERATOR'S SECTION

4-3-1. INTRODUCTION.

WARNING

High Power Tubes: Upon primary installation or upon replacement, a power tube such as type ML-6697 Machlett, as used in the GPT-40K, should be given adequate time to age. This can be accomplished by allowing the filament full time to heat before application of plate voltage. The GPT-40K should then be run with residual plate current applied but with no drive (DC condition) for a minimum of 2 hours. The GPT-40K should then be operated at half power for the next 24 hours; thereafter, full power may be applied for continuous duty.

Air Temperature: Sufficient air is supplied to the ML-6697 tube to dissipate safely 32 kw at 50°C incoming air. Correctly tuned, the ML-6697 tube should dissipate about 28 kw. Normal incoming air should be approximately 30°C and outgoing approximately 72°C. If for any reason the tube is being overheated due to operation with full plate current in and little or no output, or because incoming air is superheated, thermostat in the air exhaust stream cuts the GPT-40K off the air. This result is indicated by the RETUNE light on the relay panel. When the thermostat cools, the GPT-40K may again be placed in operation, but the operator should remove the cause, either by correctly tuning the GPT-40K or reducing power, so that its plate dissipation is not exceeded.

The following procedures describe four modes of GPT-40K operation:

a. Output of PA(10K) fed to balanced 600-ohm antenna (rhombic).

b. Output of PA(10K) fed to unbalanced 50-ohm antenna.

c. Output of PA(40K) fed to balanced 600-ohm antenna (rhombic).

d. Output of PA(40K) fed to unbalanced 50-ohm antenna.

The above order of operating procedures takes into consideration that items c and d make use of items a and b.

Before undertaking any of the operating procedures listed above, the straps in GPT-40K's balanced and unbalanced antenna circuits should be arranged for the proper mode of GPT-40K operation. See figures 4-4-1 and 4-4-2 in this manual.

4-3-2. PRELIMINARY STEPS.

The following tuning and loading procedures make use of figures 4-3-1 and 4-3-2 to facilitate location of controls on PA(40K)'s front panel. Associated table 4-3-1 interprets these controls in terms of panel markings and designations of components and parts on schematic drawings.

a. AUXILIARY FRAME EQUIPMENT. - The auxiliary frame equipment should be placed in operating condition as stated briefly in Part II, Volume I, paragraph 3-2, or as detailed in Part II Volume II.

b. APPLICATION OF POWER TO PA(10K) AND PA(40K) SECTIONS.

(1) Turn PA(10K)'s OUTPUT LOADING switch to TUNE (control 19 on figure 3-1-a of Part II Volume I).

(2) Turn PA(10K)'s MAIN POWER switch on (control 32 on figure 3-1-a of Part II Volume I).

(3) Turn PA(40K)'s MAIN POWER switch on (control 219 on figure 4-3-1).

(4) Allow 20- to 30-minute GPT-40K warm-up time. (A longer time may be needed to vaporize the mercury in the high voltage rectifiers if the GPT-40K has been out of service for a considerable length of time.)

4-3-3. TUNING AND LOADING PROCEDURES.

a. OUTPUT OF PA(10K) FED TO BALANCED 600-OHM ANTENNA.

(1) Check that the straps in GPT-40K's balanced and unbalanced antenna circuits are arranged for the proper mode of GPT-40K operation. Refer to paragraph 4-3-1 above.

(2) After the warm-up period indicated in paragraph 4-3-2b(4), tune and load the PA(10K) as stated in Part II, Volume I, Section 3. Since the OUTPUT LOADING switch is in TUNE position (paragraph 4-3-2b(1) above), tune and load the PA(10K) for a 50-ohm unbalanced antenna.

(3) Momentarily reduce PA(10K)'s drive by turning the SBE's OUTPUT switch fully counterclockwise preliminary to performing step (7) below.

(4) Momentarily set PA(10K)'s HIGH VOLTAGE switch OFF (control 41 on figure 3-1-a of Part II, Volume I) before performing step (6) below.

(5) Turn PA(10K)'s OUTPUT LOADING switch to EMERGENCY (control 19 on figure 3-1-a of Part II, Volume I).

(6) Turn PA(10K)'s HIGH VOLTAGE switch on.

(7) Turn SBE's OUTPUT switch clockwise as necessary to tune and load the PA(10K) on the PA(10K)'s 600-ohm balanced antenna. To do this requires performing step (8) below.

(8) Retune and reload the PA(10K) as stated in Part II, Volume I, Section 3. Since the unmodified PA(10K)'s OUTPUT LOADING coil is replaced in the modified PA(10K) by the antenna tuning unit and meter panel drawer which contains BAND MCS switch and BALANCE capacitor controls (249 and 250 on figure 4-3-2), these controls provide balance in the outgoing and returning currents to the rhombic.

b. OUTPUT OF PA(10K) FED TO UNBALANCED 50-OHM ANTENNA.

(1) Same as paragraph 4-3-3a(1).

(2) Same as paragraph 4-3-3a(2).

(3) Same as paragraph 4-3-3a(3).

(4) Same as paragraph 4-3-3a(4).

(5) Same as paragraph 4-3-3a(5).

(6) Same as paragraph 4-3-3a(6).

(7) Same as paragraph 4-3-3a(7).

(8) Retune and reload the PA(10K) as stated in Part II, Volume I, Section 3. Since the unmodified GPT-10K's OUTPUT LOADING coil has been replaced by the modified GPT-10K's OUTPUT LOADING switch, the retuning and reloading operations for PA(10K) are made without the use of an L section such as exists in the unmodified GPT-10K's antenna tuning unit and meter panel drawer.

c. OUTPUT OF PA(40K) FED TO BALANCED 600-OHM ANTENNA.

(1) Same as paragraph 4-3-3a(1).

(2) Same as paragraph 4-3-3a(2).

(3) Same as paragraph 4-3-3a(3).

(4) Same as paragraph 4-3-3a(4).

(5) Turn PA(10K)'s OUTPUT LOADING switch to OPERATE (control 19 on figure 3-1-a of Part II, Volume I).

(6) Turn TUNE, BAND SW and LOAD knobs (controls 210, 211, and 212 on figure 4-3-1) to prescribed settings of GPT-40K's tuning chart (figure 4-3-3).

(7) Turn BAND MCS and BALANCE knobs (controls 249 and 250 on figure 4-3-2) to prescribed settings of GPT-40K's tuning chart (figure 4-3-3).

(8) Same as paragraph 4-3-3a(6). The GPT-40K's high voltage does not go on until step (9) below is performed.

(9) Turn PA(40K)'s HIGH VOLTAGE switch ON (control 220 on figure 4-3-1).

(10) With PA(10K)'s reduced drive, paragraph 4-3-3a(3), and with all interlocks closed and all relays in a no trouble position (no relay indicator lamp is on), the PA(40K) section is ready for tuning and loading as follows:

(11) Check PA(10K)'s PA PLATE CURRENT, PA(40K)'s DRIVE, and PA(40K)'s PLATE CURRENT indications. The indications should agree approximately with the following values:

PA(10K)'s PA PLATE CURRENT control 3: 0.5 amp
PA(40K)'s DRIVE control 202: 200 mils
PA(40K)'s PLATE CURRENT control 203: 1.5 amps

(12) Increase PA(10K)'s drive by turning SBE's OUTPUT switch clockwise until PA(10K)'s PLATE CURRENT (control 203) increases appreciably, say to 2.0 amps.

(13) Tune PA(40K) for dip (control 210) and load PA(40K) for 40-kw (PEP) output (controls 212 and 250). The 40-kw (PEP) output into a 600-ohm balanced antenna requires 5.7 amps in each leg of the rhombic. If the actual antenna's impedance differs from a 600-ohm resistance load, the antenna current for 40-kw (PEP) differs correspondingly from 5.7 amps.

(14) Check PA(40K)'s meter indications which should agree approximately with the following values:

DRIVE control 202: 300 to 600 volts RF
PLATE CURRENT control 203: 4 to 5 amps
PLATE RF control 204: 7.5 to 10 kv
OUTPUT control 205: No reading
GRID CURRENT control 244: 0 to 125 mils
GRID VOLTS control 245: 450 to 550 volts
PLATE VOLTS control 246: 11 kv
CROWBAR FILAMENT control 247: 3 to 5.7 volts
SWR control 248: No reading

(15) Check that plate current of, say, 4.5 amps, means a power at the plate of 11 x 4.5 or 49.5 kw (average); check that antenna power is 40 kw (PEP) or 20 kw (average). Refer to preceding item (13). Check that the difference, 29.5 kw, which is dissipated in the PA tube, is not intolerable.

d. OUTPUT OF PA(40K) FED TO UNBALANCED 50-OHM ANTENNA.

(1) Same as paragraph 4-3-3a(1).

(2) Same as paragraph 4-3-3a(2).

(3) Same as paragraph 4-3-3a(3).

(4) Same as paragraph 4-3-3a(4).

(5) Same as paragraph 4-3-3c(5).

(6) Same as paragraph 4-3-3c(6).

(7) Same as paragraph 4-3-3c(8).

(8) Same as paragraph 4-3-3c(9).

(9) Same as paragraph 4-3-3c(10).

(10) Same as paragraph 4-3-3c(11).

(11) Same as paragraph 4-3-3c(12).

(12) Tune PA(40K) for dip (control 210) and load PA(40K) for 40-kw (PEP) output (controls 212 and 250). The 40-kw (PEP) output into a 50-ohm unbalanced antenna requires 20 amps input to the antenna. The maximum SWR meter deflection (control 248) during the tune and load operation should not exceed 4. If the actual antenna's impedance differs from a 50-ohm resistance load, the antenna current for 40 kw (PEP) differs correspondingly from 20 amps.

(13) Check PA(40K)'s meter indications which should agree approximately with the following values:

DRIVE control 202: 300 to 600 volts RF
PLATE CURRENT control 203: 4 to 5 amps
PLATE RF control 204: 7.5 to 10 kv
OUTPUT control 205: 20 amps
GRID CURRENT control 244: 0 to 125 mils
GRID VOLTS control 245: 450 to 550 volts
PLATE VOLTS control 246: 11 kv
CROWBAR FILAMENT control 247: 3 to 5.7 volts
SWR control 248: Less than 4

(14) Same as paragraph 4-3-3c(15).

TABLE 4-3-1. TABLE OF EQUIVALENT CONTROL DESIGNATIONS

SERIAL DESIGNATION (SEE FIGURES 4-3-1 AND 4-3-2)	PANEL DESIGNATION (SEE FIGURES 4-3-1 AND 4-3-2)	COMPONENT DESIGNATION ON OVERALL SCHEMATIC (SEE FIGURE 4-7-1)
METER PANEL (THIRD FRAME)		
201	FILAMENT PRIMARY	Meter M7201
202	DRIVE	Meter M7202
203	PLATE CURRENT	Meter M7203
204	PLATE RF	Meter M7204
205	OUTPUT	Meter M7205
PA TUNE PANEL		
206	AC POWER	Indicator I7301
207	TUNE	Indicator I7302
208	OPERATE	Indicator I7303
209	PLATE ON	Indicator I7304
210	TUNE	Knob C7301
211	BAND SW	Knob S7301
212	LOAD	Knob C7302/C7303

TABLE 4-3-1. TABLE OF EQUIVALENT CONTROL DESIGNATIONS (Cont.)

SERIAL DESIGNATION (SEE FIGURES 4-3-1 AND 4-3-2)	PANEL DESIGNATION (SEE FIGURES 4-3-1 AND 4-3-2)	COMPONENT DESIGNATION ON OVERALL SCHEMATIC (SEE FIGURE 4-7-1)
	MAIN CONTROL PANEL	
213	BAND SWITCH RELEASE	Switch S7405
214	OVERLOAD RESET	Switch S7401
215	INTERLOCK	Indicator I7401
216	HV BREAKER INDICATOR	Indicator I7402
217	HV BREAKER RESET	Switch S7402
218	P.A. LIGHT ON/OFF	Switch S7403
219	MAIN POWER	Circuit breaker CB7401
220	HIGH VOLTAGE	Circuit breaker CB7402
221	INTERLOCK	Knob S7404
	BIAS SUPPLY DRAWER	
222	BIAS ADJUST	Potentiometer R7513
223	SWR OVLD. ADJUST	Potentiometer R7529
224	RETUNE OVLD. ADJUST	Potentiometer R7520
225	A.C. POWER	Indicator I7301
226	BIAS	Indicator I7502
227	L.V.	Indicator I7501
	RELAY PANEL	
228	BIAS	Indicator I7605
229	PLATE OVLD.	Indicator I7601
230	GRID OVLD.	Indicator I7602
231	FILAMENT TIME	Meter M7601
232	TIME DELAY	Meter M7602
233	BLOWER DELAY	Meter M7603
234	PLATE TIME	Meter M7604
235	RETUNE	Indicator I7603
236	SWR	Indicator I7604
237	FINAL FILAMENT	Indicator I7607
238	BIAS RELAY ADJ	Potentiometer R7604
239	PLATE OVLD. ADJ	Potentiometer R7601

TABLE 4–3–1. TABLE OF EQUIVALENT CONTROL DESIGNATIONS (C nt.)

SERIAL DESIGNATION (SEE FIGURES 4-3-1 AND 4-3-2)	PANEL DESIGNATION (SEE FIGURES 4-3-1 AND 4-3-2)	COMPONENT DESIGNATION ON OVERALL SCHEMATIC (SEE FIGURE 4-7-1)
240	GRID OVLD. ADJ	Potentiometer R7602
241	TUBE PROTECT	Potentiometer R7605
242	DRIVER INTERLOCKS IND	Indicator I7606
243	DRIVER INTERLOCKS ON/OFF	Switch S7601
	METER PANEL (FOURTH FRAME)	
244	GRID CURRENT	Meter M8202
245	GRID VOLTS	Meter M8204
246	PLATE VOLTS	Meter M8203
247	CROWBAR FILAMENT	Meter M8201
248	SWR	Meter M8205
	ANTENNA TUNING UNIT AND METER PANEL DRAWER	
249	BAND MCS	Knob S8203 and S8204
250	BALANCE	Knob C8201
	CROWBAR DRAWER	
251	POWER	Indicator I8301
252	RESERVOIR FILAMENT	Switch S8301
	POWER SUPPLY CONTROL PANEL	
253	BLOWER	Circuit breaker CB8501
254	FIL. ADJ.	Knob S8501
255	CAL./SWR	Switch S8502
256	CAL./SWR	Knob R8501
257	FINAL FIL.	Circuit breaker CB8502

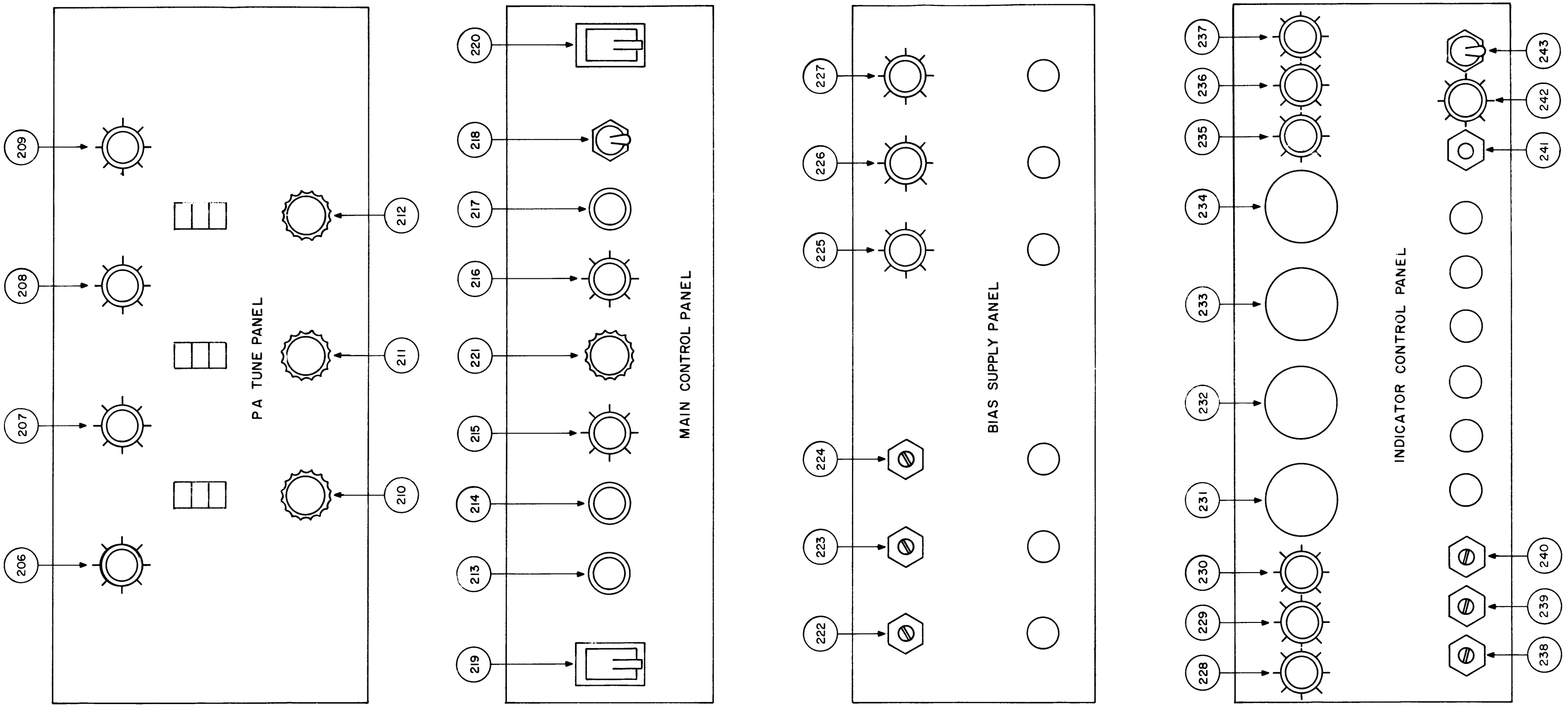
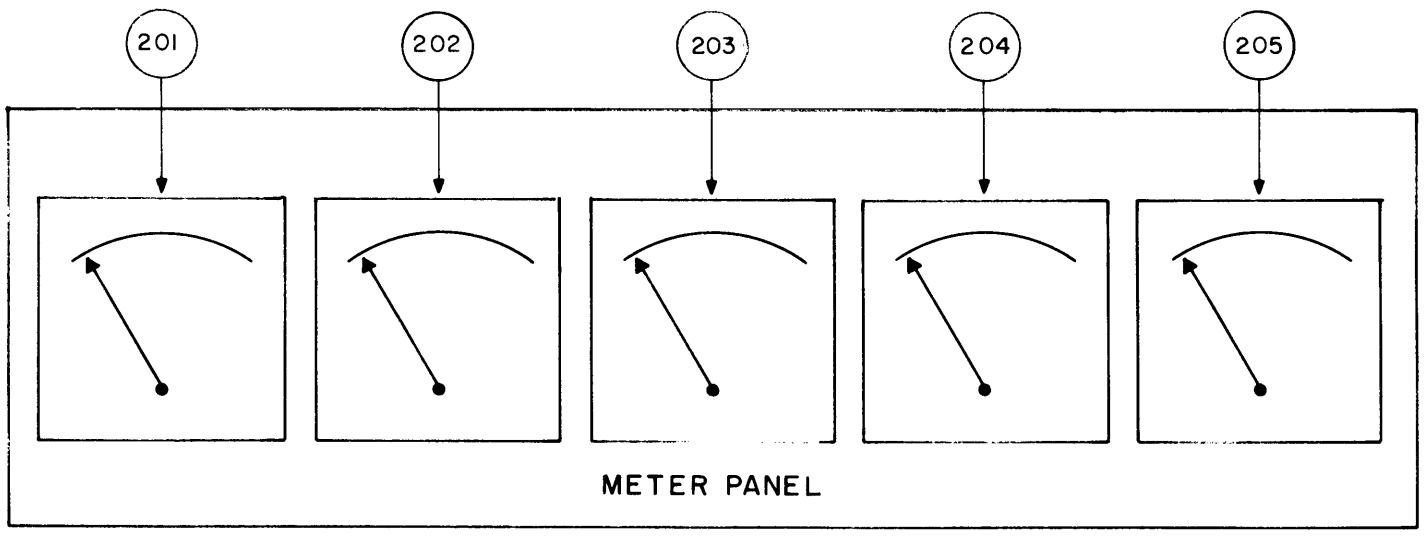
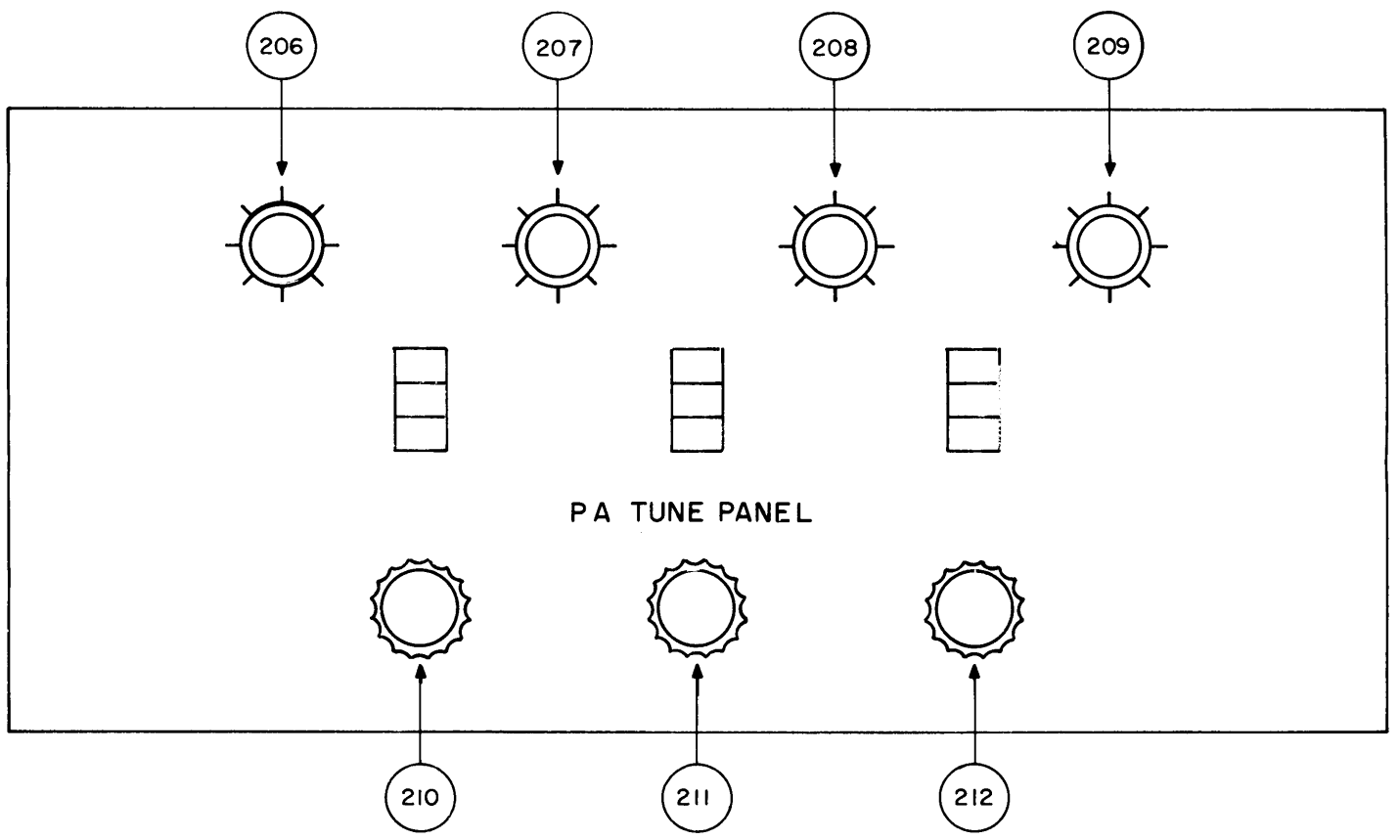
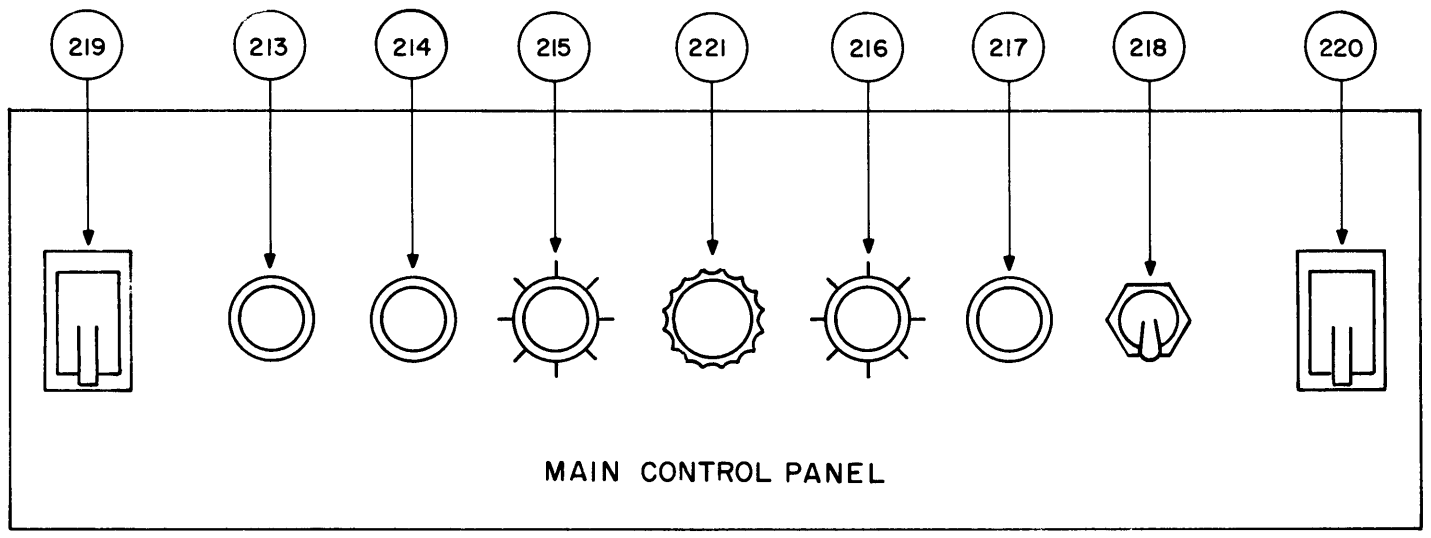
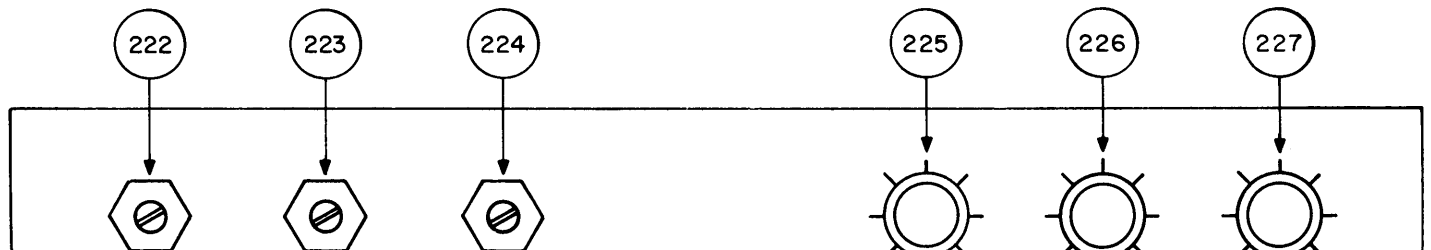


Figure 4-3-1. Tuning Controls, Third Frame, GPT-40K


201
202
203
204
205
METER PANEL


206
207
208
209
PA TUNE PANEL
210
211
212


219
213
214
215
221
216
217
218
220
MAIN CONTROL PANEL


222
223
224
225
226
227

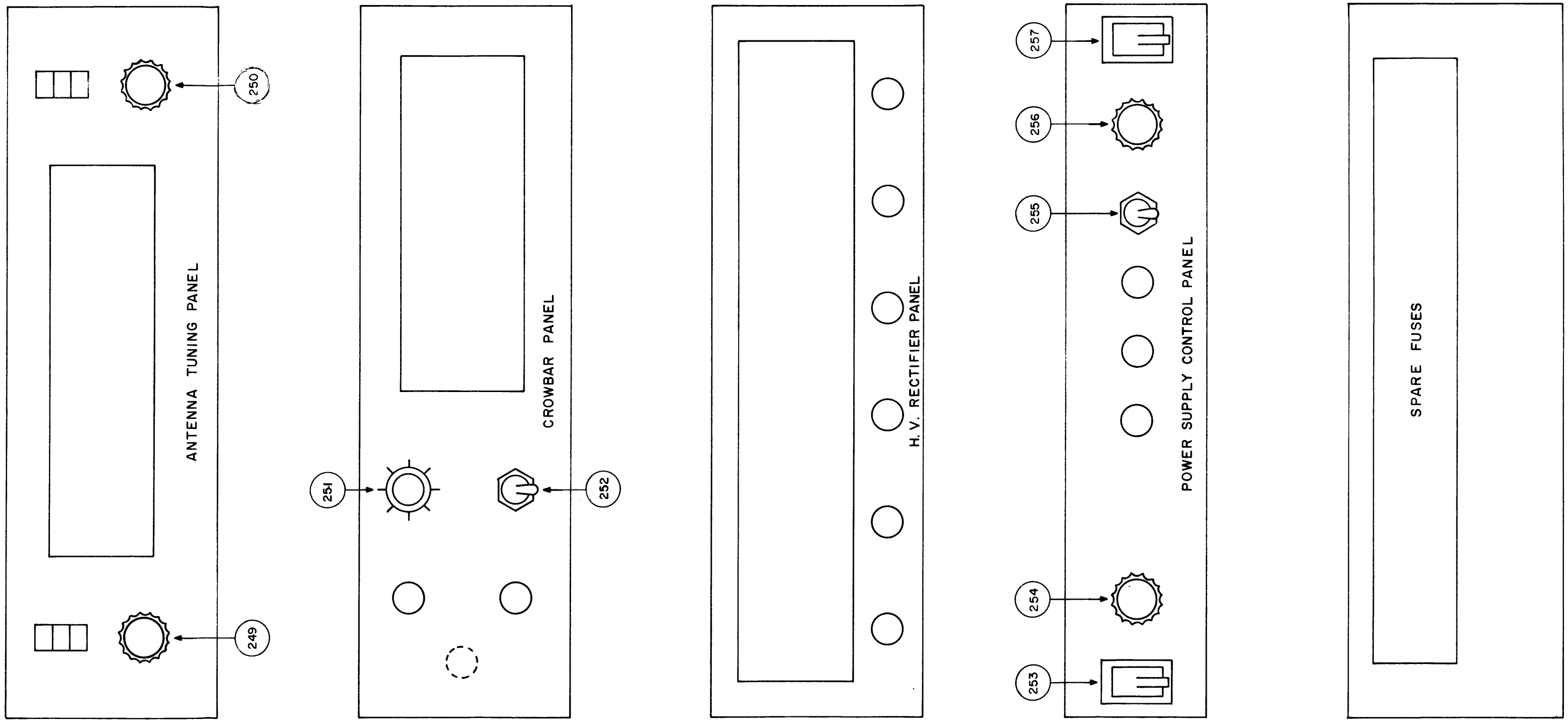
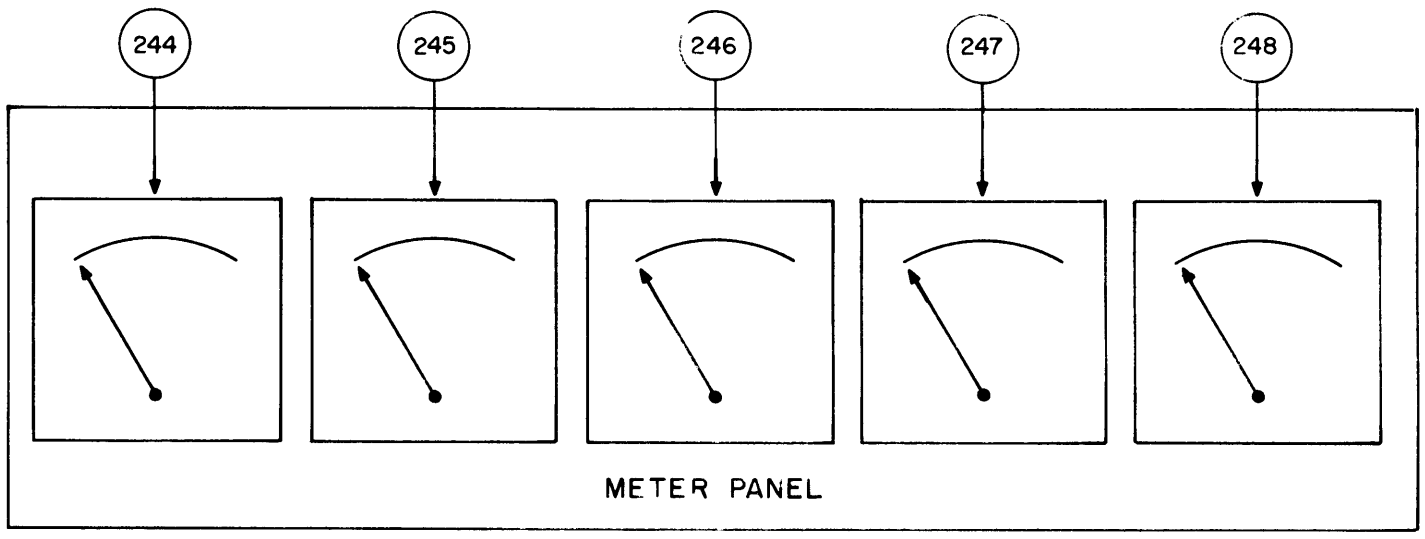
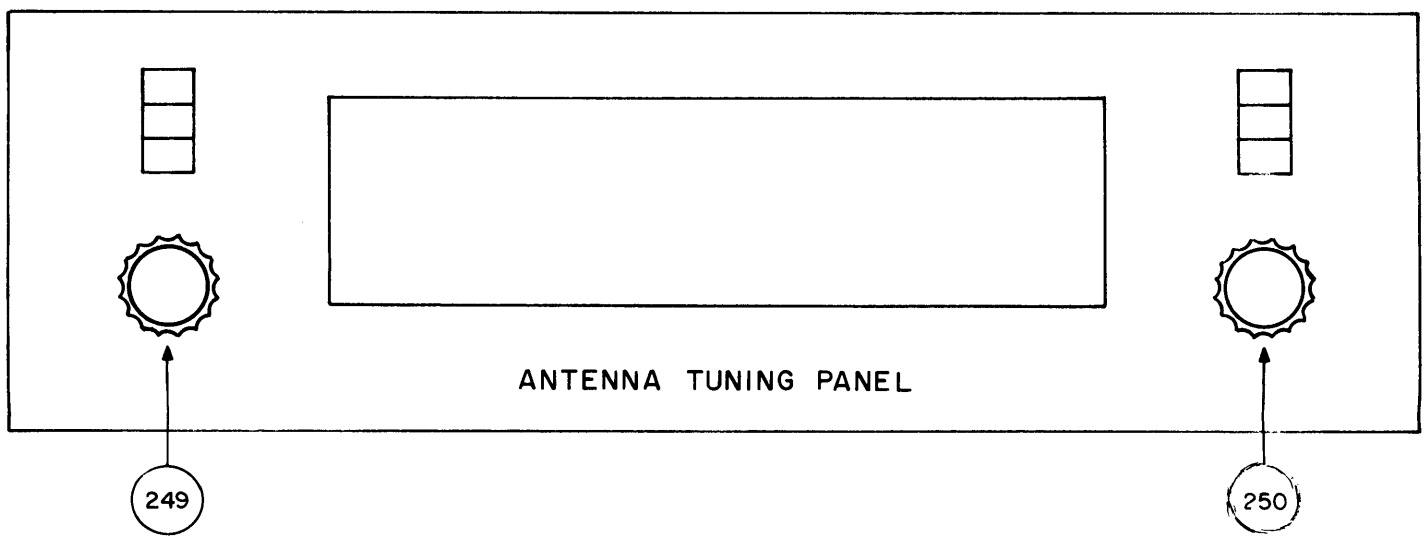
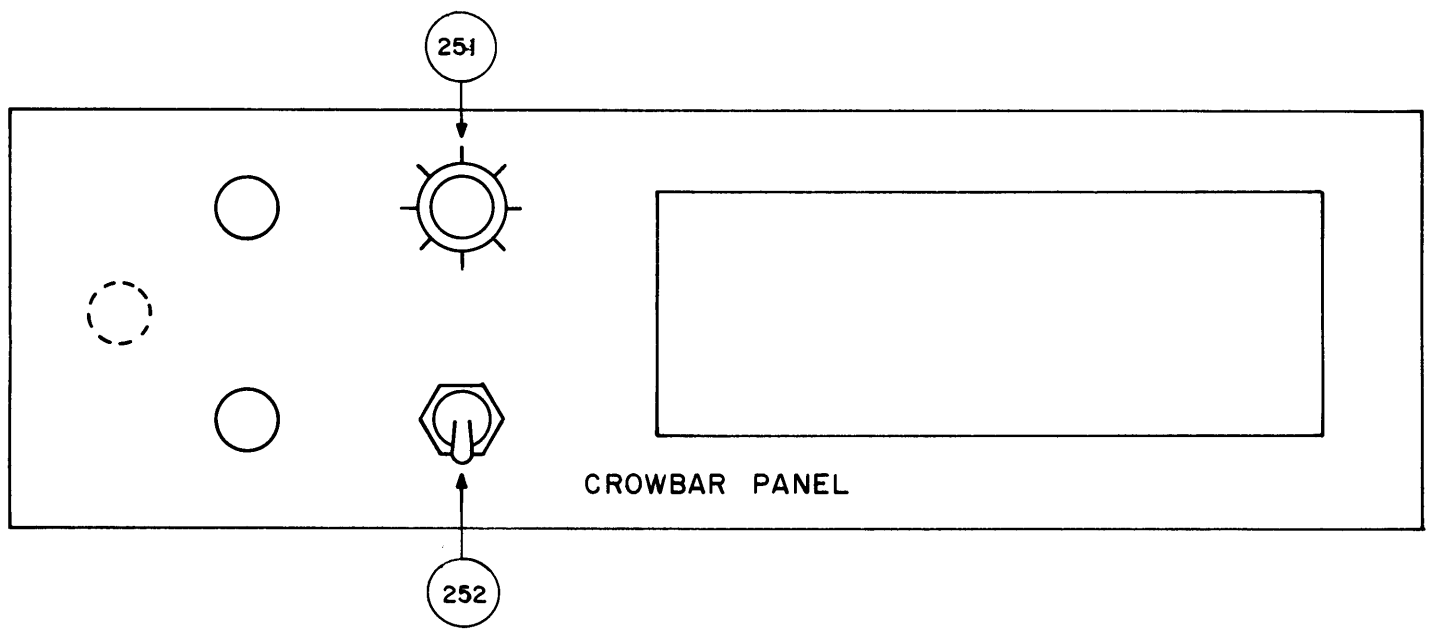


Figure 4-3-2. Tuning Controls, Fourth Frame, GPT-40K


244
245
246
247
248
METER PANEL


ANTENNA TUNING PANEL
249
250


251
CROWBAR PANEL
252

H.V. RECTIFIER PANEL

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ON				BALANCED OPERATION												UNBALANCED OPERATION						
PA TUNING				FINAL TUNING/LOADING												FINAL TUNING/LOADING						REMARKS
PA LOAD	OUT-PUT LOAD	OUTPUT CUR. DUMMY ANT.	DIST.	ANT. BAND	FINAL BAND	RF DRIVE KV	TUNE	LOAD	DC MIL GRID	DC AMPS PLATE	RF PLATE KV (NOTE 1)	40KW I_1/I_2	% DISTORT	20KW I_1/I_2	% DISTORT	40K BAND	40K TUNE	40K LOAD	% DISTORTION 20KW	% DISTORTION 40KW	LOAD CUR.	
640	099	6	35	4-15	4-5	.25	440	618	40	4.0	4.0	6.0/6.0	35	4.0/4.0	35	4-5	467	785	40	35	21	FOR 50Ω UNBALANCE: 40KW(PEP) MEANS APPROX. 20 AMPS; 20KW (PEP) MEANS APPROX. 14.1 AMPS ON A TWO TONE TEST.
624	099	5	35	4-15	4-5	.27	179	365	90	4.0	4.0	6.0/6.0	35	4.0/4.0	35	4-5	174	530	40	35	21	FOR 600Ω BALANCE: 40KW(PEP) MEANS APPROX. 6AMPS; 20KW(PEP) MEANS APPROX. 4AMPS ON A TWO TONE TEST.
624	099	6	35	4-15	5-6	.27	415	678	90	4.0	4.0	6.0/6.0	35	4.0/4.0	35	5-6	387	789	40	37	21	NOTE 1: VALUES IN THIS COLUMN ARE RMS. MULTIPLY BY 1.414 FOR PEAK VOLTS.
624	099	5.5	35	4-15	5-6	.28	241	375	60	4.0	4.0	6.0/6.0	38	4.0/4.0	38	5-6	186	622	40	39	21	
624	099	7	35	4-15	6-8	.28	525	684	90	4.2	4.0	6.0/6.0	35	4.0/4.0	35	6-8	498	789	40	35	20	
644	099	5	35	4-15	6-8	.28	144	448	40	4.2	4.0	6.0/6.0	40	4.0/4.0	40	6-8	169	503	40	35	21	
644	099	6	35	4-15	8-11	.27	465	786	10	4.7	4.8	5.5/5.5	40	4.0/4.0	40	8-11	501	784	41	35	21	
403	350	5	35	4-15	8-11	.35	151	408	25	4.0	4.0	5.5/5.5	40	4.0/4.0	35	8-11	182	377	40	35	21	
660	350	6	35	4-15	11-15	.35	279	617	40	4.0	4.0	5.5/5.5	40	4.0/4.0	40	11-15	339	500	40	35	21	
362	095	7	35	15-20	11-15	.40	047	298	40	4.0	4.0	6.4/6.4	35	4.0/4.0	37	11-15	111	221	40	35	21	WARNING THIS CHART IS FOR ILLUSTRATIVE PURPOSES ONLY. IN ANY GIVEN CASE THE CHART TO USE INITIALLY IS THE ONE APPLICABLE TO THE SPECIFIC TRANSMITTER, THAT IS, THE ONE THAT COMES WITH THE TRANSMITTER. LATER, ONES DERIVED WHEN THE TRANSMITTER IS ASSOCIATED WITH ACTUAL ANTENNAS, ARE THE CHARTS TO USE.
362	099	8	35	15-20	15-19	.37	193	512	70	3.5	4.0	6.0/6.0	35	4.0/4.0	37	15-19	306	310	42	35	21	
341	196	9	35	20-28	15-19	.40	075	230	40	3.9	3.2	6.2/6.2	35	4.0/4.0	40	15-19	158	170	41	35	21	
341	196	9	35	20-28	19-24	.40	219	373	40	3.9	3.2	6.2/6.2	35	4.0/4.0	40	19-24	182	500	45	36	20	
275	000	10	35	20-28	19-24	.40	061	205	40	4.5	3.2	6.2/6.2	35	4.0/4.0	40	19-24	067	360	40	35	21	
275	000	9	40	20-28	24-28	.32	118	243	20	4.1	3.0	6.2/6.2	35	4.0/4.0	40	24-28	131	281	40	37	21	
207	000	10	30	20-28	24-28	.32	006	149	20	4.2	3.0	5.4/5.4	40	4.0/4.0	40	24-28	054	190	40	35	20	
216	18	5	ANAL-YZER	249	211	202	210	212	244	203	204	——	ANAL-YZER	——	ANAL-YZER	211	210	212	ANALYZER		205	

Figure 4-3-3. Representative Tuning Chart, GPT-40K, Balanced/Unbalanced Operation

BALANCED / UNBALANCED OPERATION											BALANCED OPERATION												
VOX		IPA			PA TUNING						FINAL TUNING/LOADING												
FREQ M.C.	VOX	IPA BAND	TUNE	LOAD	BAND	PA TUNE	PA LOAD	OUT-PUT LOAD	OUTPUT CUR. DUMMY ANT.	DIST.	ANT. BAND	FINAL BAND	RF DRIVE KV	TUNE	LOAD	DC MIL GRID	DC AMPS PLATE	RF PLATE KV (NOTE 1)	40KW I_1/I_2	/ DISTORT	20KW I_1/I_2	/ DISTORT	
4	2250 X2	4-6	121	000	4-6	260	640	099	6	35	4-15	4-5	.25	440	618	40	4.0	4.0	6.0/6.0	35	4.0/4.0	35	
5	2750 X2	4-6	175	000	4-6	167	624	099	5	35	4-15	4-5	.27	179	365	90	4.0	4.0	6.0/6.0	35	4.0/4.0	35	
5	2750 X2	4-6	175	000	4-6	167	624	099	6	35	4-15	5-6	.27	415	678	90	4.0	4.0	6.0/6.0	35	4.0/4.0	35	
6	3250 X2	6-8	126	000	6-8	192	624	099	5.5	35	4-15	5-6	.28	241	375	60	4.0	4.0	6.0/6.0	38	4.0/4.0	38	
6	3250 X2	6-8	126	000	6-8	192	624	099	7	35	4-15	6-8	.28	525	684	90	4.2	4.0	6.0/6.0	35	4.0/4.0	35	
8	2125 X4	6-8	180	025	8-11	191	644	099	5	35	4-15	6-8	.28	144	448	40	4.2	4.0	6.0/6.0	40	4.0/4.0	40	
8	2125 X4	6-8	180	025	8-11	191	644	099	6	35	4-15	8-11	.27	465	786	10	4.7	4.8	5.5/5.5	40	4.0/4.0	40	
11	2875 X4	8-12	187	117	11-15	164	403	350	5	35	4-15	8-11	.35	151	408	25	4.0	4.0	5.5/5.5	40	4.0/4.0	35	
11	2875 X4	8-12	189	109	11-15	164	360	350	6	35	4-15	11-15	.35	279	617	40	4.0	4.0	5.5/5.5	40	4.0/4.0	40	
15	3875 X4	12-16	199	066	15-19	141	362	095	7	35	15-20	11-15	.40	047	298	40	4.0	4.0	6.4/6.4	35	4.0/4.0	37	
15	3875 X4	12-16	199	066	15-19	142	362	099	8	35	15-20	15-19	.37	193	512	70	3.5	4.0	6.0/6.0	35	4.0/4.0	37	
19	2437.5 X8	16-20	195	060	19-24	136	341	196	9	35	20-28	15-19	.40	075	230	40	3.9	3.2	6.2/6.2	35	4.0/4.0	40	
19	2437.5 X8	16-20	195	060	19-24	136	341	196	9	35	20-28	19-24	.40	219	373	40	3.9	3.2	6.2/6.2	35	4.0/4.0	40	
24	3062.5 X8	20-28	185	018	24-28	174	275	000	10	35	20-28	19-24	.40	061	205	40	4.5	3.2	6.2/6.2	35	4.0/4.0	40	
24	3062.5 X8	20-28	185	018	24-28	174	275	000	9	40	20-28	24-28	.32	118	243	20	4.1	3.0	6.2/6.2	35	4.0/4.0	40	2
28	3562.5 X8	20-28	205	053	24-28	150	207	000	10	30	20-28	24-28	.32	006	149	20	4.2	3.0	5.4/5.4	40	4.0/4.0	40	2
NUMERICAL CONTROL DESIG. SEE FIG. 3-1		26	28	30	17	15	16	18	5	ANAL-YZER	249	211	202	210	212	244	203	204	——	ANAL-YZER	——	ANAL-YZER	

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SECTION 4
PRINCIPLES OF OPERATION

4-4-1. INTRODUCTION.

Figure 1-2 in Part I shows that GPT-40K's third and fourth frames consist of the PA(40K) RF section, the PA(40K) power supply section, and relay and control and protective devices, and meter sections.

4-4-2. GPT-40K's THIRD FRAME.

(See figures 4-4-1 and 4-4-2.)

Figure 4-4-1 (sketches 1 and 2) is a block diagram of the PA(40K) section whose principal components consist of a Machlett ML-6697 tube and a pi-L antenna tuning unit associated with either a balanced 600-ohm or an unbalanced 50-ohm antenna. The unbalanced antenna circuit contains a standing wave ratio indicator. Figure 4-4-1 (sketches 3 and 4) is a block diagram of the PA(10K) section whose principal components consist of a 4CS5000A tube and a pi-L or pi antenna unit associated with a balanced 600-ohm or an unbalanced 50-ohm antenna, respectively.

Figure 4-4-2 is a simplified schematic diagram of the GPT-40K's PA sections. The output of the PA(10K) section, which includes tuning and loading capacitors C927 and C928, respectively, is fed to the OUTPUT LOADING switch (see upper left portion of the figure). The switch channels the PA(10K)'s output to one of three places: dummy antenna, emergency 10-kw (PEP) circuit, and nominal 40-kw (PEP) circuit. The dummy antenna is used during GPT-40K's tuneup and loading operations. The emergency circuit is used when the nominal circuit is not required or is inoperative. The nominal 40-kw (PEP) circuit contains a triode, V7301, operating with grounded grid. Its filament receives approximately 205 amps at 13 volts and its plate, approximately 12 kv. Normal output is 40 kw (PEP) or close to 6 amps into a 600-ohm rhombic antenna. Meters M7201 through M7204 monitor the important electrical parameters of the tube. Circuit details are given on GPT-40K's overall schematic, figure 4-7-1 in Part IV of the manual.

Continuing along the output circuit toward the antenna, one encounters a pi section consisting of TUNE capacitor C7301, PA loading inductor L7302 with its BAND SW S7301, and LOAD capacitors C7302 and C7303 together with the PA plate monitor pickup coil. The next circuit component is a set of links which provides for regular or emergency operation with balanced or unbalanced antennas. For example:

		Link Position	
Operation	Antenna	Link No. 1	Link No. 2
40 kw	Balanced	N/U	R/B
40 kw	Unbalanced	R/U	N/U
10 kw	Balanced	N/U	E/B
10 kw	Unbalanced	E/U	N/U

Both 40- and 10-kw operation with balanced antennas require the use of the L section consisting of inductor L8201 with BAND MCS switch and BALANCE capacitor C8201. The 40-kw operation with unbalanced antenna requires the use of the L section consisting of inductor L7301 and part of LOAD capacitors C7302 and C7303. The 10-kw operation with unbalanced antenna requires no L section. Unbalanced antenna operation makes use of standing wave ratio indicator DC7301 and thermocouple TC7301 with its associated OUTPUT meter M7205.

Figure 4-4-2 also shows a protective feature. Powerful thyratron V8301, a Chatham tube type CH-1095, has its plate connected to high voltage rectifier's B+ (12 kv) and its cathode to high voltage rectifier's B-; its grid is connected to a potentiometer bridging trigger transformer T8105. Abnormal disturbances in GPT-40K's bias supply drawer triggers GPT-40K's thyratron, thereby shorting GPT-40K's supply to B-.

4-4-3. GPT-40K's FOURTH FRAME.

(See figure 4-4-3.)

Figure 4-4-3 is a functional block diagram of the PA(40K)'s power supply section. Incoming 3-phase, 230-volt, 50 or 60-cycle power divides at point "A". When BLOWER circuit breaker (control 253 on figure 4-3-2 in Part IV) is manually closed, main PA blower B7101 (refer to point "B") operates, provided blower relay K7101 contactors are closed. The terminals used on jack/plug connectors enroute are indicated to facilitate a check with the main schematic diagram 4-7-1 in Part IV. Three-phase power also reaches point "C". If the microswitches are as shown, phase 2 reaches terminal B of J8102; terminal A of J8102 is connected to phase 1; accordingly, breaker motor B8101 closes main circuit breaker CB8101 and 3-phase energy reaches contactors K8101 and K8102.

If MAIN POWER circuit breaker CB7401, control 219 of figure 4-3-1 in Part IV (refer to point "C") and FINAL FIL. breaker CB8502 (control 257 on figure 4-3-2 in Part IV) are closed, both the high voltage rectifier and the final PA filaments are turned on. Operation of HIGH VOLTAGE circuit breaker CB7402 (control 220 on figure 4-3-1 in Part IV) now closes contactors K8101 and K8102 provided conditions are suitable in the interlock circuit, in TIMER M8101, and in shorting relay K8101 (dead-man). Main power transformer T8101 now supplies high voltage to the high voltage rectifier electrodes, which in turn supply B+ to the PA(40K) amplifier tube type ML-6697.

Figure 4-4-3 indicates a number of protective devices which are described in detail in paragraph 4-4-4 below. The wiring into, and out of, these devices is complicated; details are reserved for the cabling diagrams in Section 5 of Part IV.

4-4-4. PROTECTIVE CIRCUITS.

(See figures 4-4-4, 4-4-5, and 4-4-6.)

Figure 4-4-4 is a functional block diagram of the GPT-40K's interlock protective circuits. The lower half of the diagram shows the interlock circuits in the PA(10K)'s section of the GPT-40K. These circuits are described in detail in Part II, Volume I. The upper half of the diagram shows the interlock circuits in the PA(40K)'s section of the GPT-40K. The general pattern of operation is the same for both the PA(10K) and PA(40K) sections of the GPT-40K. Some circuit differences exist because the circuits to be protected in the two sections differ.

The following is a brief description of the operation of the interlock circuits in the PA(40K) section of the GPT-40K. Phase 1 from main circuit breaker CB8101 is supplied to point "A". If the PA DECK interlock switch is closed, the setting of the INTERLOCK switch in position 2 establishes a circuit between phase 2 of MAIN POWER circuit breaker CB7401 and phase 1 of main circuit breaker CB8101; INTERLOCK indicator I7401, therefore, goes on. As in the case of the PA(10K) section, contactors follow the mechanical interlock switches in the relay panel (refer to points "B" to "C") and in the main power supply circuit, the main power supply timer, and the high voltage shorting switch (deadman). (Refer to points "C" to "D".) Only when all the mechanical and electrical interlock switches or contacts are closed does HIGH VOLTAGE circuit breaker CB7402 remain closed.

Besides fuses, there are four other types of transmitter protection: overload relays and devices responsive to poor tuning/loading, timing devices, heating devices, and shorting devices. These are described briefly in the following paragraphs.

Figure 4-4-5 is a schematic diagram of the relay panel protective circuits of the PA(40K) section of GPT-40K.

Figure 4-4-6 presents simplified schematic diagrams of the circuits, and their functions may be readily seen from the following:

Relay K7601, PLATE OVLD; Relay K7608, TUBE PROTECT; and Relay K7603, RETUNE: Excessive plate-to-filament-to-(B-) current in V7301 operates the plate overload relay and the tube protect relay. As a result, PLATE OVLD indicator I7601 goes on via closed contactors 4 and 5 of K7601; the series relay contactor circuit of the interlock circuit opens via open contactors 6 and 7 of K7601; contactors 6 and 7 of K7608 close; the overload winding of K7603 operates the relay contactors, thereby opening the series relay contactor circuit of the interlock circuit via open contactors 6 and 7 and causing RETUNE indicator I7603 to go on via closed contactors 4 and 5 of K7603. Upon correction of the trouble, operation of OVERLOAD RESET switch S7401 restores all relay settings to normal. The overload winding of K7603 also operates if the thermostat in the PA(40K)'s air stream operates. When this occurs, the series relay contactor circuit of the interlock circuit opens via open contactors 6 and 7, causing RETUNE indicator I7603 to go on via closed contactors 4 and 5 of K7603.

Relay K7605, BIAS; and Relay K7602, GRID OVLD: Insufficient bias on relay K7605 causes its contactors to open. As a result, BIAS indicator I7605 goes on via closed contactors 4 and 5 of K7605 and the series relay contactor circuit of the interlock circuit opens via open contactors 6 and 7 of K7605. Appreciable variation of bias operates the overload winding of relay K7602 and fires thyratron (crowbar) V8301 via voltage induced in T8105. Simultaneously GRID OVLD. indicator I7602 goes on via closed contactors 4 and 5 of K7602, and the series relay contactor circuit of the interlock circuit opens via open contactors 6 and 7 of K7602. Upon correction of the trouble, operation of OVERLOAD RESET switch S7401 restores the relay settings to normal.

Relay K7607, FINAL FILAMENT; and Relay K7609, CROWBAR: Loss of 230-volt or insufficient filament supply causes K7607's relay to operate, thereby opening the series relay contactor circuit of the interlock circuit via open contactors 3 and 4 of K7607, causing FINAL FILAMENT indicator I7607 to go on via closed contactors 7 and 8 of K7607, and operating TIME DELAY relay M7602 via open contactors 9 and 10 of K7607. A similar series of occurrences takes place if CROWBAR relay K7609 is operated. For example, loss of 230-volt or insufficient filament supply causes K7609's relay to operate. When contactors 6 and 7 of K7609 open, HIGH VOLTAGE circuit breaker CB7402 trips, thereby protecting the PA(40K) and CROWBAR tubes.

Relay K7604, SWF: An excessive standing wave ratio voltage on the antenna tuning unit actuates the overload winding of relay K7604, thereby causing SWR indicator I7604 to go on via closed contactors 4 and 5 of K7604 and opening the series relay contactor circuit of the interlock circuit via open contactors 3 and 4 of K7604. Upon correction of the trouble, operation of OVERLOAD RESET switch S7401 restores the relay settings to normal.

Relay K7606, DRIVER INTERLOCK: Normal procedure in initiating operation of the GPT-40K is as follows: DRIVER INTERLOCK switch S7601 is closed so that the series relay contactor circuit is closed at relay K7606 even though T800 in PA(10K)'s power supply at this time does not receive 230-volt power. If conditions are right in the PA(10K) section, this section can be placed in operating condition. Now the PA(40K) section may be powered provided conditions are proper. Transformer T800 now receives 230-volt power, and, consequently DRIVER INTERLOCKS switch S7601 may be opened without disturbing the continuity of the series relay contactor circuit. From this point on, the GPT-40K becomes inoperative under trouble conditions in either the PA(40K) or PA(10K) sections. Refer to Note on DRIVER INTERLOCK relay K7606 circuit on figure 4-4-6.

TIMER M8101 and Associated Shorting Relay: (See figure 4-4-3). Closure of main circuit breaker CB8101 inserts contactors K8101 and K8102 in the 230-volt power circuit to main power transformer T8101. Closure of HIGH VOLTAGE circuit breaker CB7402 energizes relay coils K8101 and K8102, thereby closing, first, contactors of relay K8102 and, later, contactors of relay K8101. This means that T8101 is supplied with approximately half voltage until TIMER relay M8101 functions (2 seconds) to short out 8 ohms (1900 watts) in each of K8101's 3-phase incoming legs. At this time, T8101 receives full voltage.

Relay M7602, TIME DELAY: (See figure 4-4-5). After an abnormal occurrence that "opens up" the series relay contactor circuit of the interlock circuit, this relay limits the time of closure of this circuit (X seconds, depending on setting) pending time to clear the trouble that actuated M7602.

BLOW DELAY Relay M7603:

WARNING

To avoid burns, allow ML-6697 tube to cool for at least 5 minutes before handling.

PA(40K) amplifier tube V7301, type ML-6697, requires in normal operation approximately 205 amps (filament) at 13 volts and 4 amps (plate) at 12 kv; this power is partly dissipated in the tube and partly in the antenna. The normal operating temperature of the tubes is, therefore, high (200°C) even though the tube is air cooled at approximately 1750 cubic feet per minute. When trouble occurs, this relay ensures air cooling of V7301 for 5 minutes via lockup of BLOWER relay K7101. After this time operating personnel may clear trouble involving this tube without danger of burns.

Relay L8105, DEADMAN: This relay affords electrical protection to operating personnel when abnormal conditions occur in the GPT-40K and when trouble-shooting by operating personnel is necessary. The primary function of this relay is to ground all high potential points under abnormal GPT-40K conditions. For this reason, the winding of this relay is included in the series relay contactor circuit of the interlock circuit.

4-4-5. BIAS SUPPLY DRAWER. (See figure 4-4-7.)

Figure 4-4-7 is a schematic diagram of the bias supply drawer, a unit of the GPT-40K. A 350-volt, full-wave rectifier, V7501 (6X4), provides unregulated 350 volts to two of the four plates of two amplifiers, V7508 RETUNE DC amplifier (12AT7) and V7509 SWR DC amplifier (12AT7).

The input grid 2 of V7508 is fed from network Z7302, connected in series with PLATE RF meter M7204. The output plate 6 of RETUNE DC amplifier V7508 is fed to contactor 6 of K7608 (figure 4-4-6). If TUBE PROTECT relay K7608 is operated, contactor 6 is closed upon contactor 7 and the overload winding of RETUNE K7603 is energized, thereby lighting indicator I7603 and opening the series relay contactor circuit. Additionally, the same end results are obtained if the thermostat in PA(40K)'s air flow operates due to poor PA(40K) tuning.

Input grid 7 of V7509 is fed from the SWR component in the GPT-40K's unbalanced antenna tuning circuit. Output plate 1 of SWR DC amplifier V7509 is fed to the overload winding of K7604 (figure 4-4-6). Operation of the SWR overload relay causes indicator I7604 to go on and the series relay contactor circuit to open.

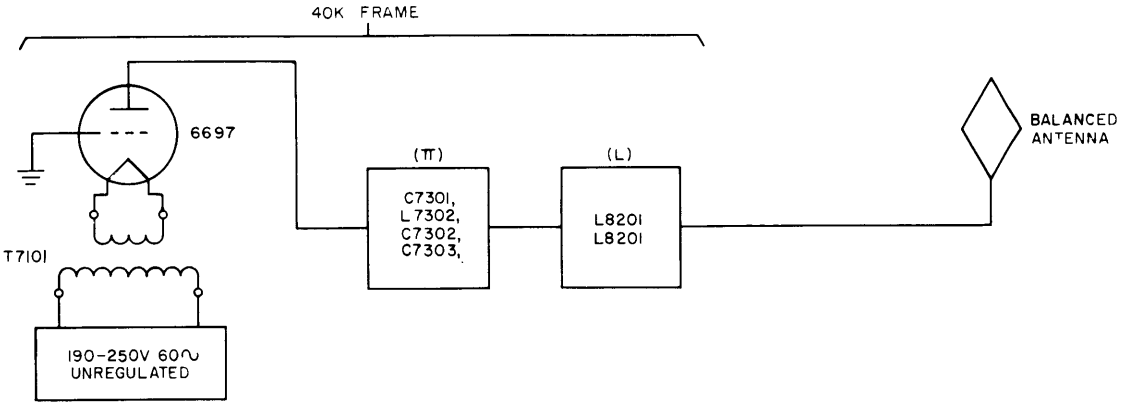
The bias supply drawer also contains a regulated 600-volt, full-wave rectifier. Terminal 9 of T7501 connects to the rectifier's B- voltage. This voltage reaches GPT-40K's (B-) voltage via terminals D of P7105, B of JP7602, and the winding of K7605 (figure 4-4-6). Excessive voltage differences between the rectifier's (B-) voltage and the GPT-40K's (B-) voltage operates BIAS relay K7605 which causes indicator I7605 to go on and the series relay contactor circuit to open.

4-4-6. CROWBAR CIRCUIT. (See figure 4-4-8.)

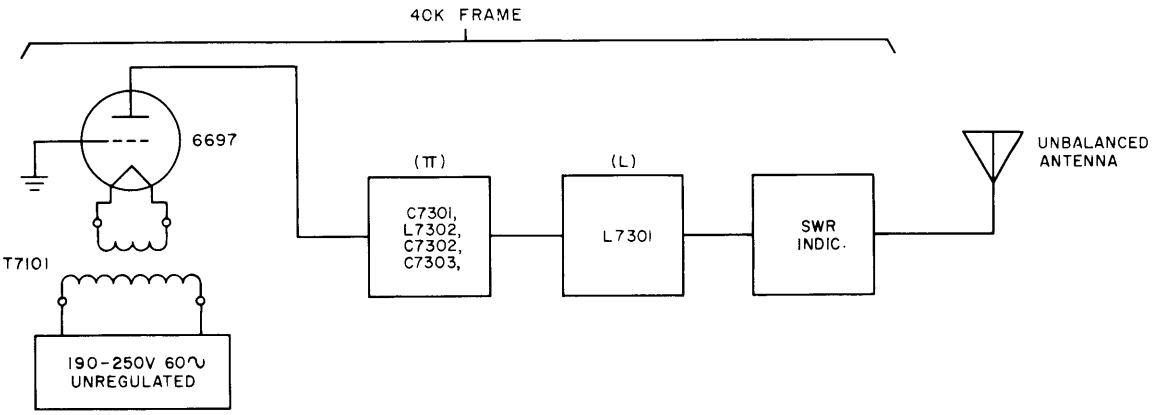
Figure 4-4-8 is a schematic diagram of the crowbar circuit. Chatham type tube CH-1095 is a powerful thyratron capable of shorting 800 (12 kv/15 ohms) amps from plate to cathode when triggered by sufficient voltage on its control grid. The plate of V8301 connects to B+ and the cathode to B-. Voltage variations between bias supply drawer terminal D and ground are reflected via transformer T8105 on to the grid of V8301. (See figure 4-4-6, GRID VOLT. relay K7602.)

4-4-7. ANTENNA TUNING UNIT AND METER NEL PANEL DRAWER. (See figure 4-4-9.)

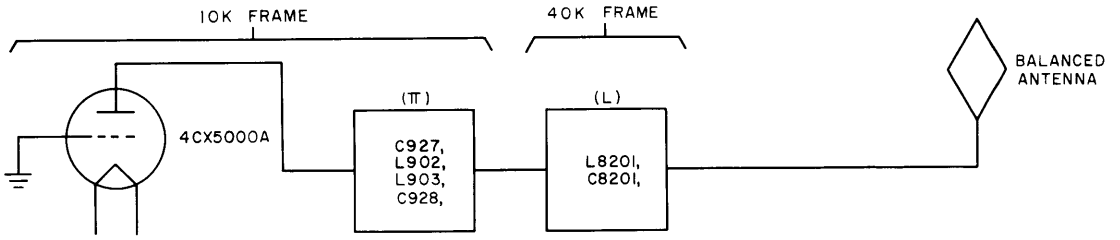
Figure 4-4-9 is a schematic diagram of the antenna tuning unit and meter panel drawer of GPT-40K. L8201 and C8201 form the L section for balanced antenna operation of the GPT-40K. (See figure 4-4-1.) The remainder of the unit consists of meters, lights, and contactors.



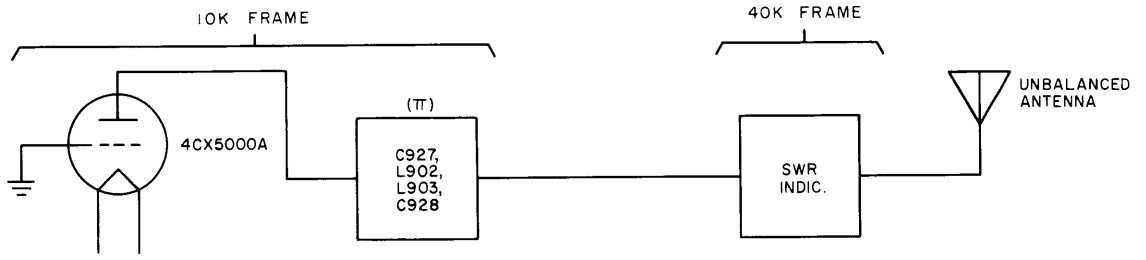
SKETCH 1. 40KW REGULAR FEED, BALANCED ANTENNA



SKETCH 2. 40KW REGULAR FEED, UNBALANCED ANTENNA



SKETCH 3. 10KW EMERGENCY FEED, BALANCED ANTENNA



SKETCH 4. 10KW EMERGENCY FEED, UNBALANCED ANTENNA

Figure 4-4-1. Block Diagram, Antenna Circuits for 10- and 40-kw Outputs, GPT-40K

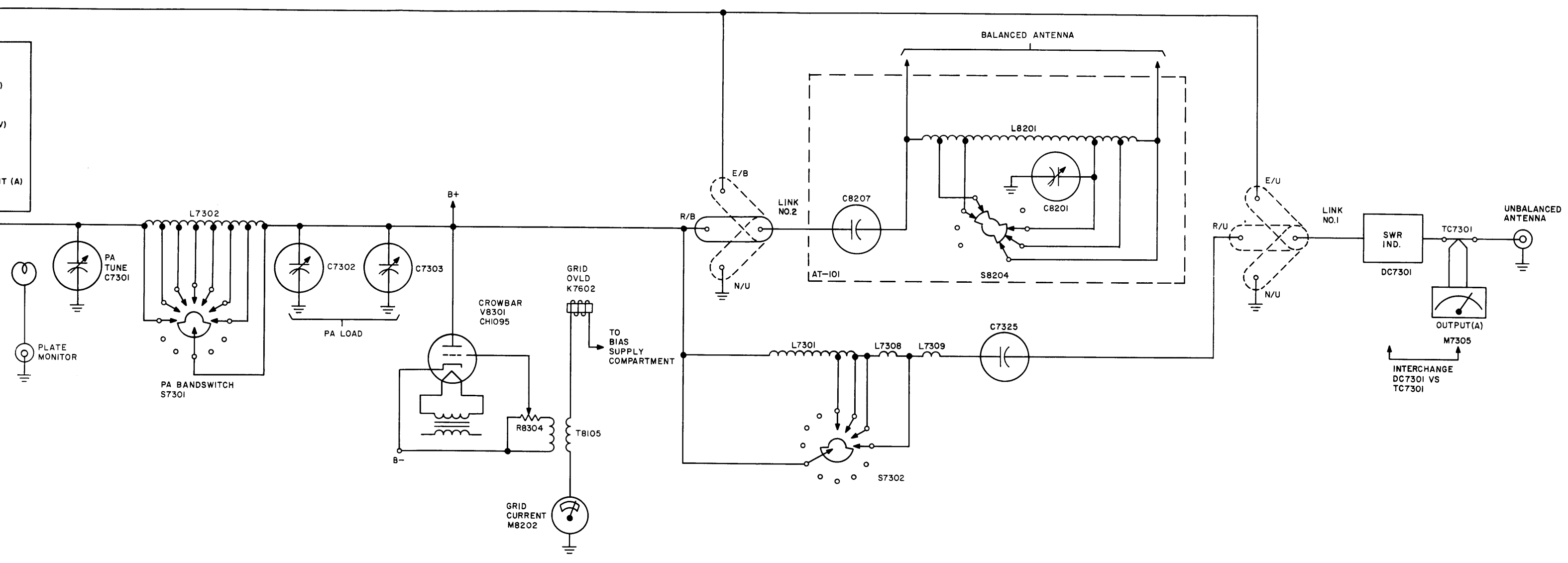
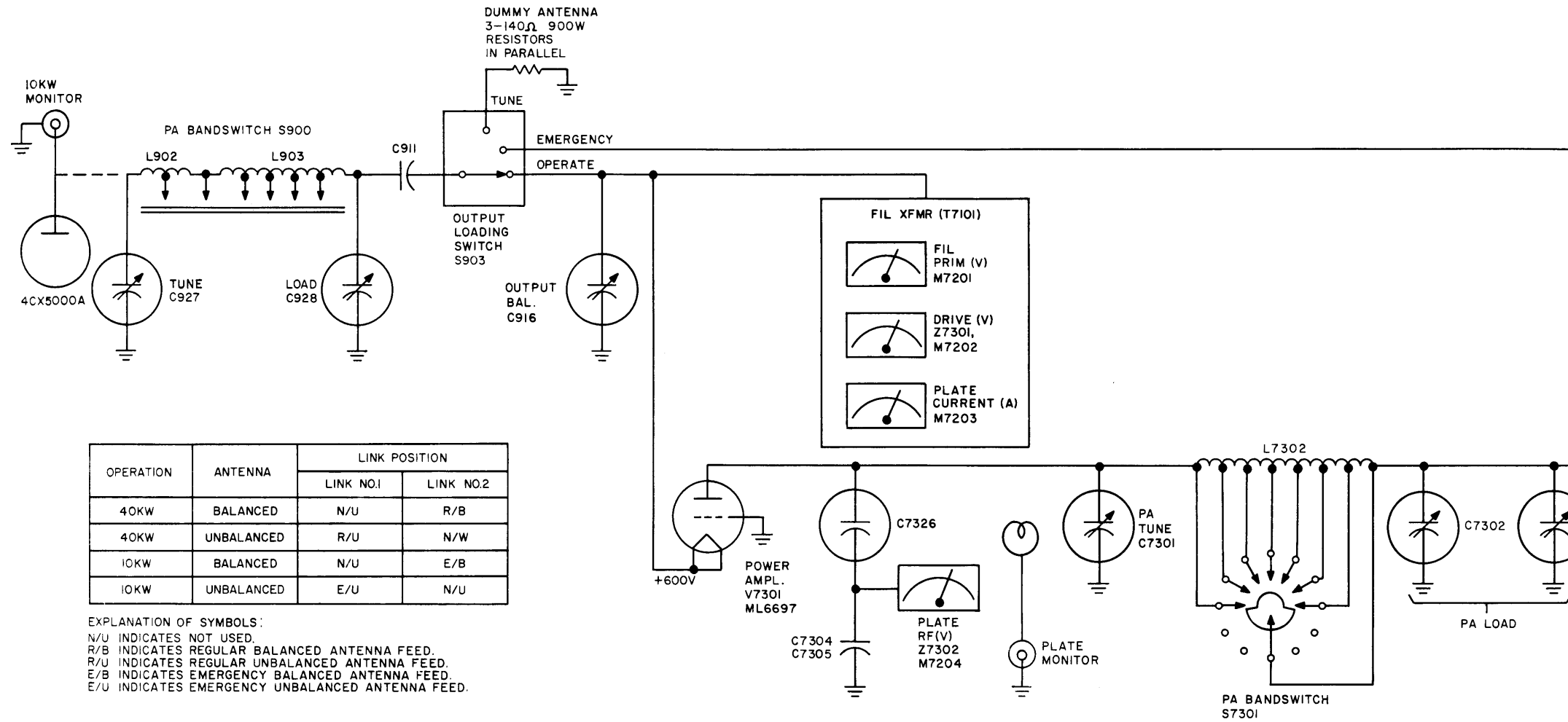


Figure 4-4-2. Simplified Schematic, Antenna Circuits for 10- and 40-kw Outputs, GPT-40K



OPERATION	ANTENNA	LINK POSITION	
		LINK NO.1	LINK NO.2
40KW	BALANCED	N/U	R/B
40KW	UNBALANCED	R/U	N/W
10KW	BALANCED	N/U	E/B
10KW	UNBALANCED	E/U	N/U

EXPLANATION OF SYMBOLS:
N/U INDICATES NOT USED.
R/B INDICATES REGULAR BALANCED ANTENNA FEED.
R/U INDICATES REGULAR UNBALANCED ANTENNA FEED.
E/B INDICATES EMERGENCY BALANCED ANTENNA FEED.
E/U INDICATES EMERGENCY UNBALANCED ANTENNA FEED.

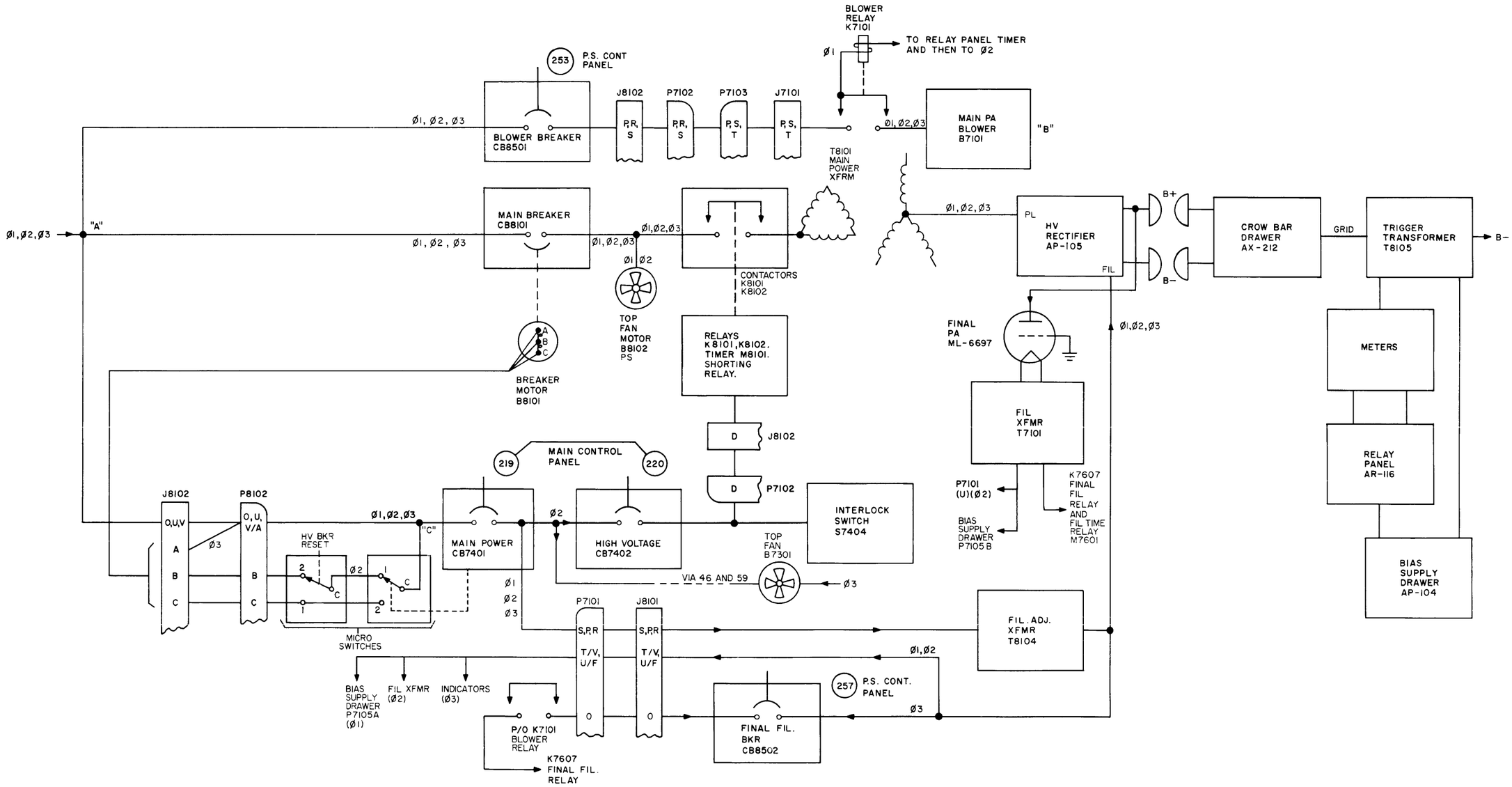


Figure 4-4-3. Functional Block Diagram, Power Supply Circuits, GPT-40K

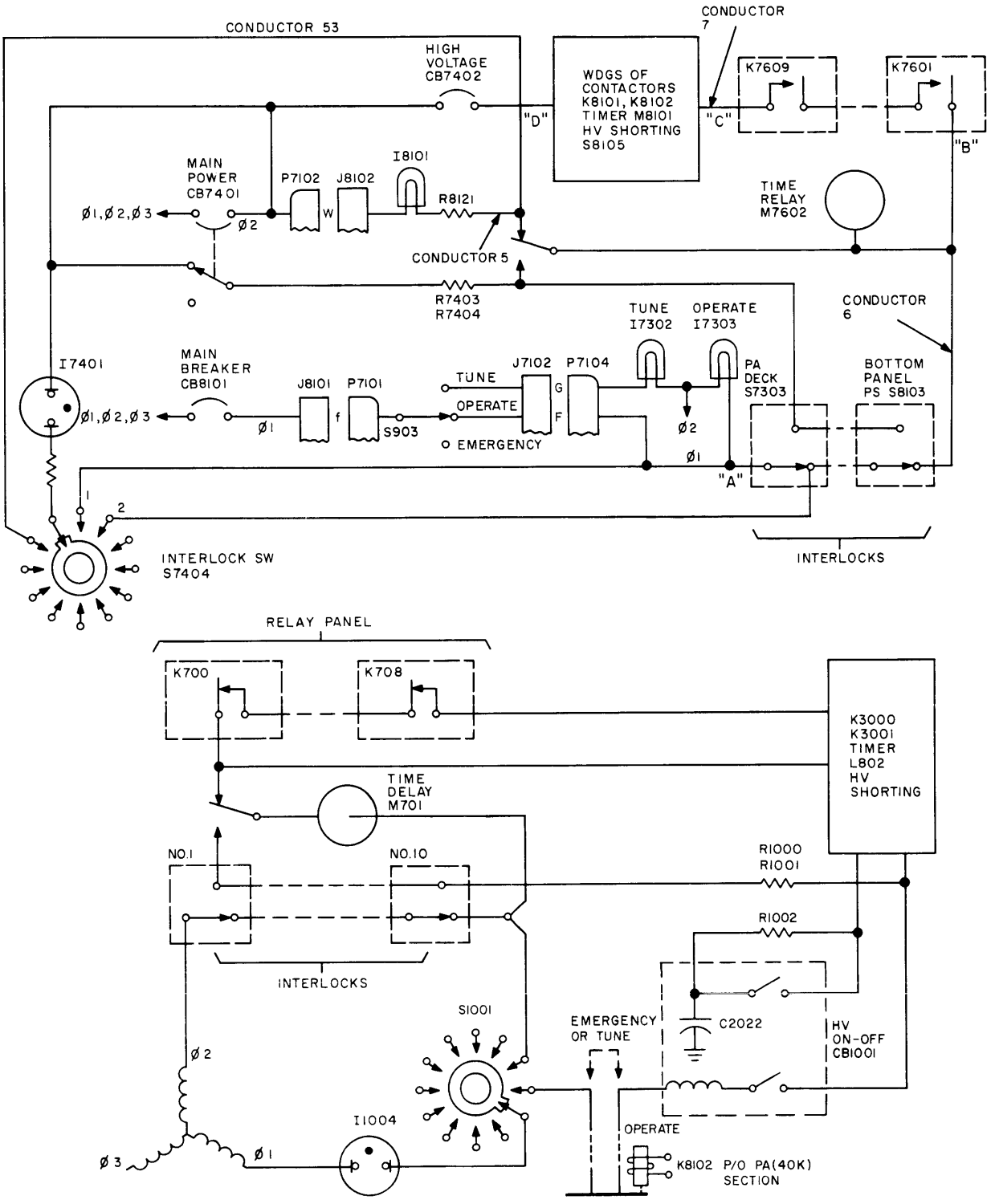


Figure 4-4-4. Functional Block Diagram, Interlock Protective Circuits for Modified GPT-10K and GPT-40K

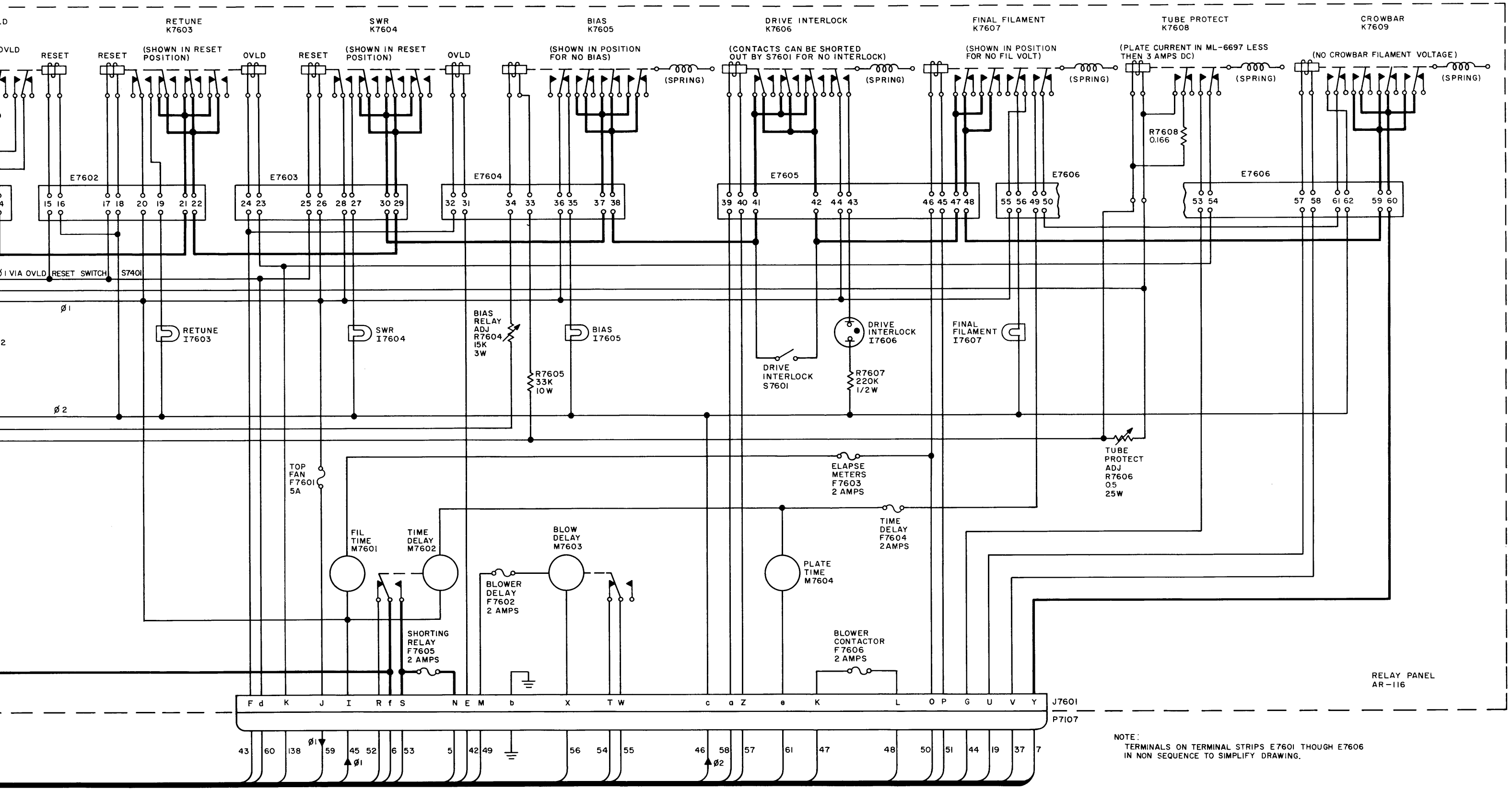


Figure 4-4-5. Schematic Diagram, Relay Panel Protective Circuit, GPT-40K

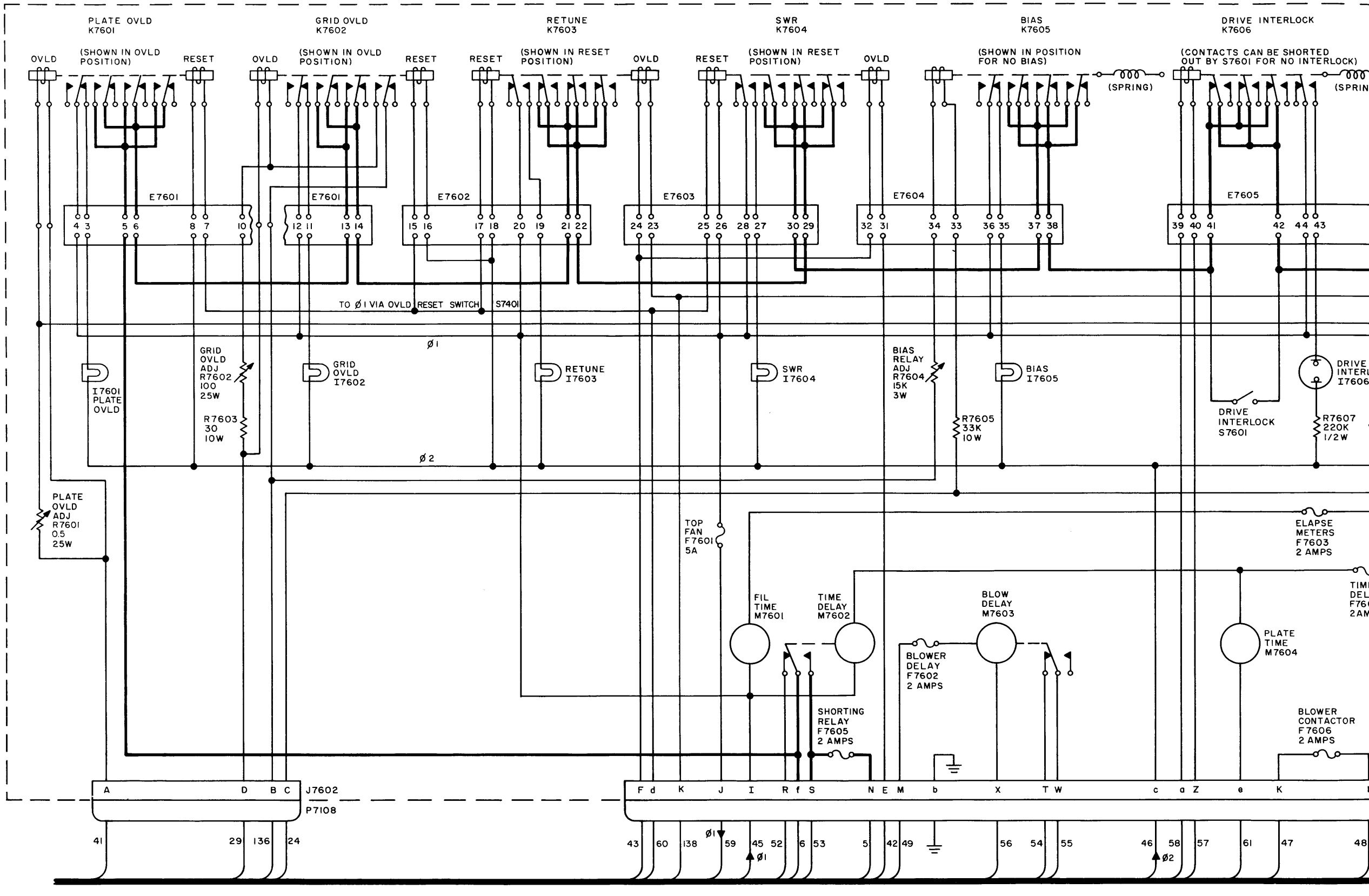


PLATE OVLD K7601
GRID OVLD K7602
RETUNE K7603
SWR K7604
BIAS K7605
DRIVE INTERLOCK K7606
OVLD
(SHOWN IN OVLD POSITION)
RESET
(SHOWN IN RESET POSITION)
(SHOWN IN POSITION FOR NO BIAS)
(SPRING)
(CONTACTS CAN BE SHORTED OUT BY S7601 FOR NO INTERLOCK)
E7601
E7602
E7603
E7604
E7605
TO Ø1 VIA OVLD RESET SWITCH S7401
Ø1
Ø2
I7601 PLATE OVLD
GRID OVLD ADJ R7602 100 25W
R7603 30 10W
GRID OVLD I7602
RETUNE I7603
SWR I7604
BIAS RELAY ADJ R7604 15K 3W
R7605 33K 10W
BIAS I7605
DRIVE INTERLOCK S7601
R7607 220K 1/2W
PLATE OVLD ADJ R7601 0.5 25W
TOP FAN F7601 5A
FIL TIME M7601
TIME DELAY M7602
BLOW DELAY M7603
ELAPSE METERS F7603 2 AMPS
PLATE TIME M7604
BLOWER DELAY F7602 2 AMPS
SHORTING RELAY F7605 2 AMPS
BLOWER CONTACTOR F7606 2 AMPS
J7602
P7108

Origi

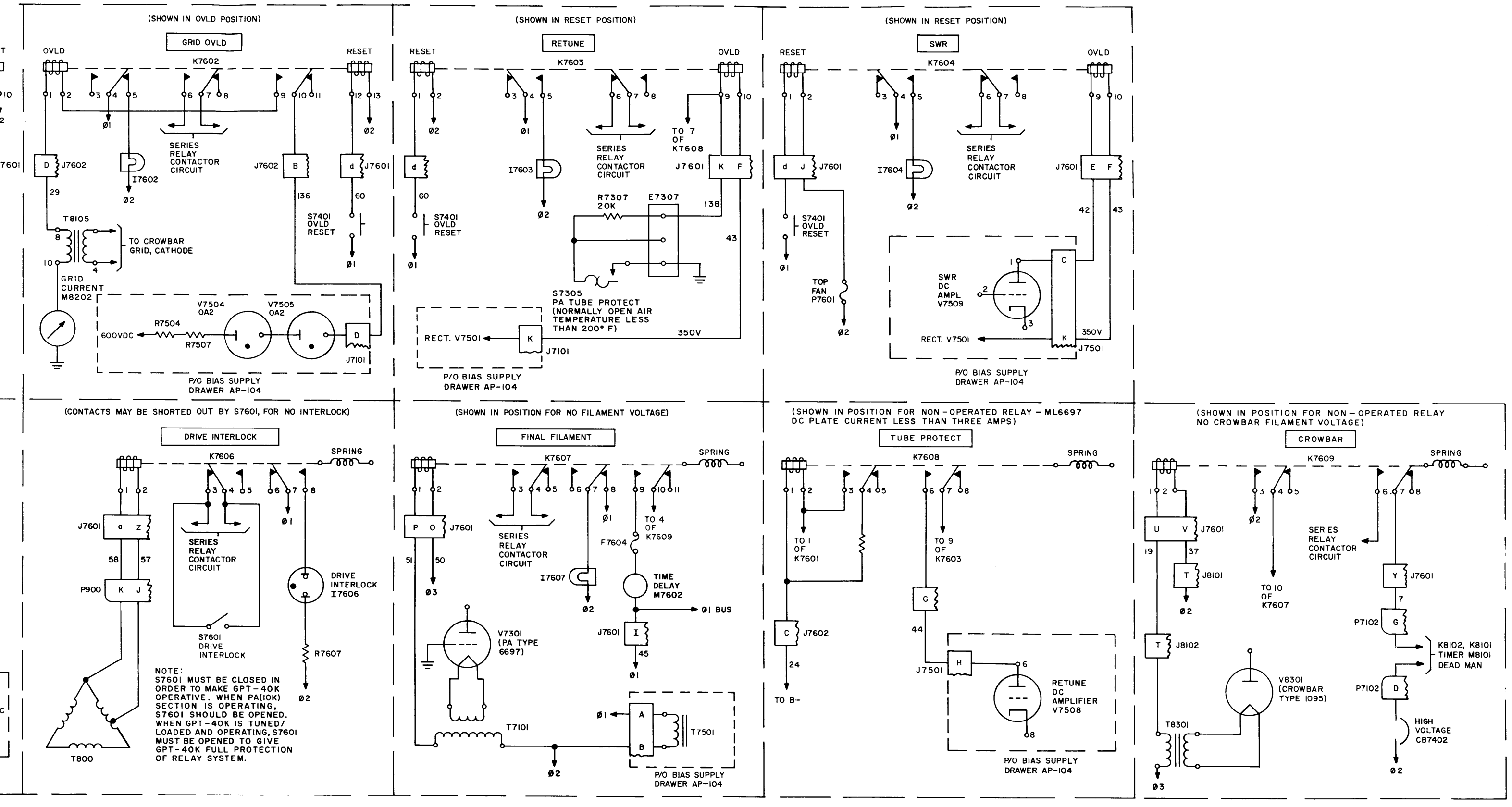
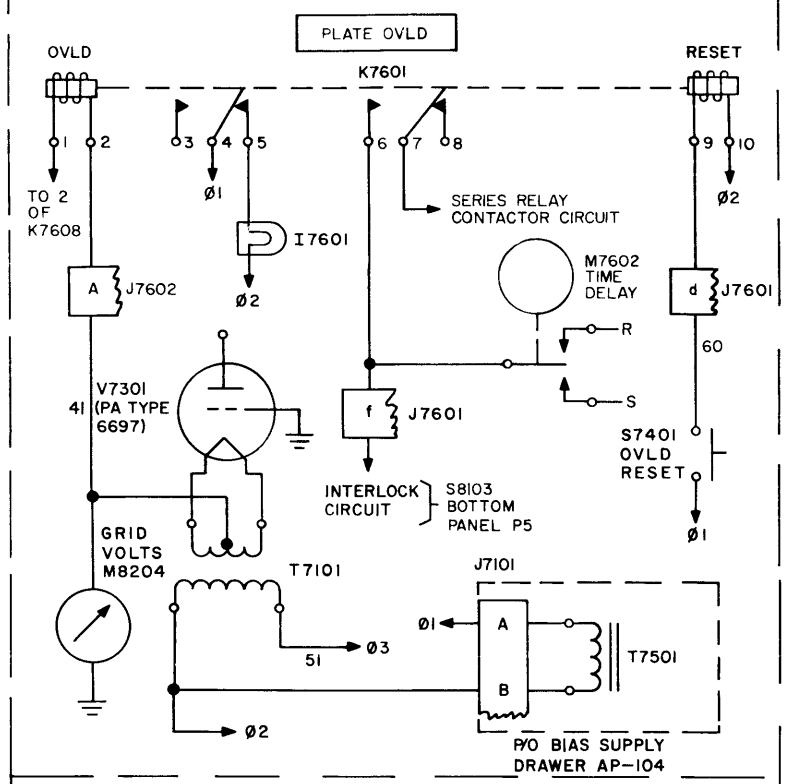


Figure 4-4-6. Simplified Schematic Diagrams, Relay Panel, GPT-40K

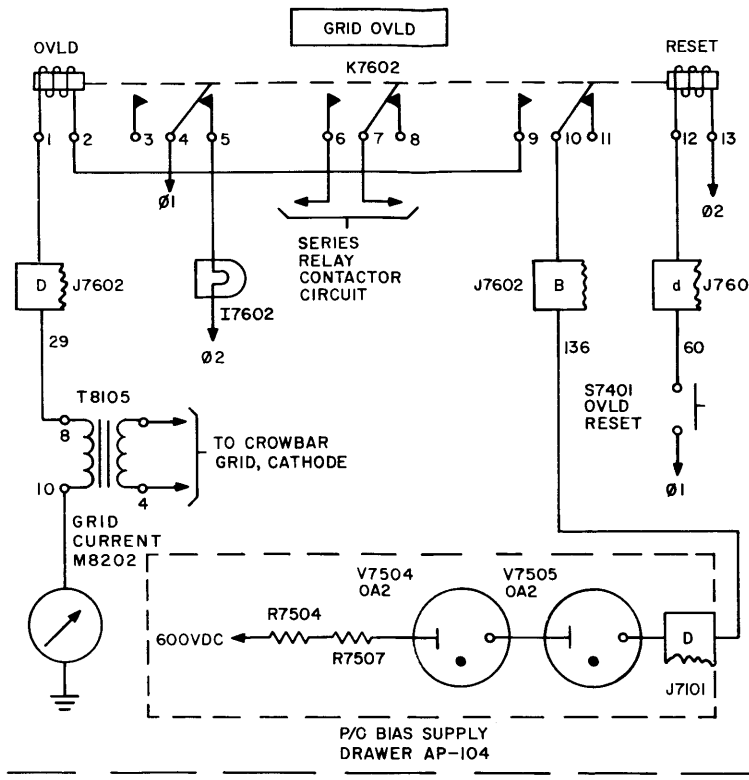
(SHOWN IN OVLD POSITION)

PLATE OVLD



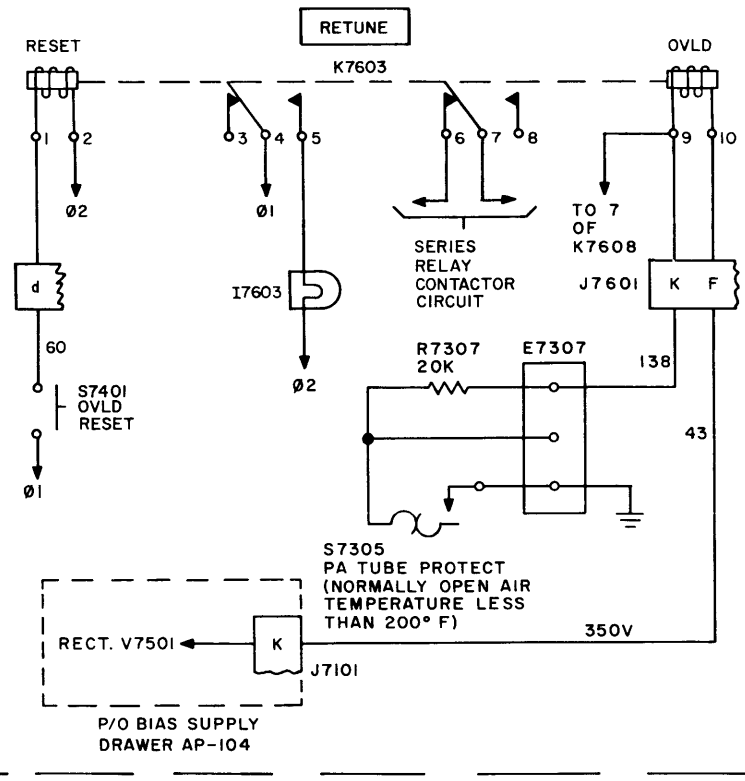
(SHOWN IN OVLD POSITION)

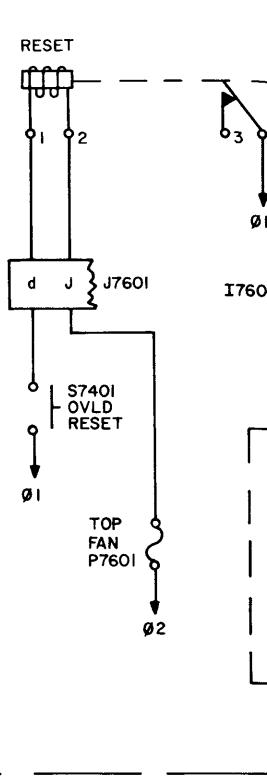
GRID OVLD



(SHOWN IN RESET POSITION)

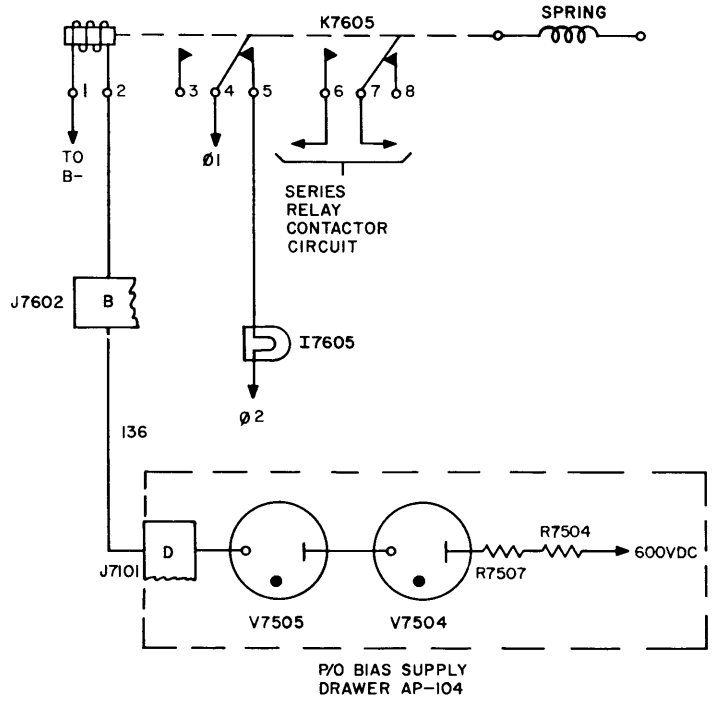
RETUNE





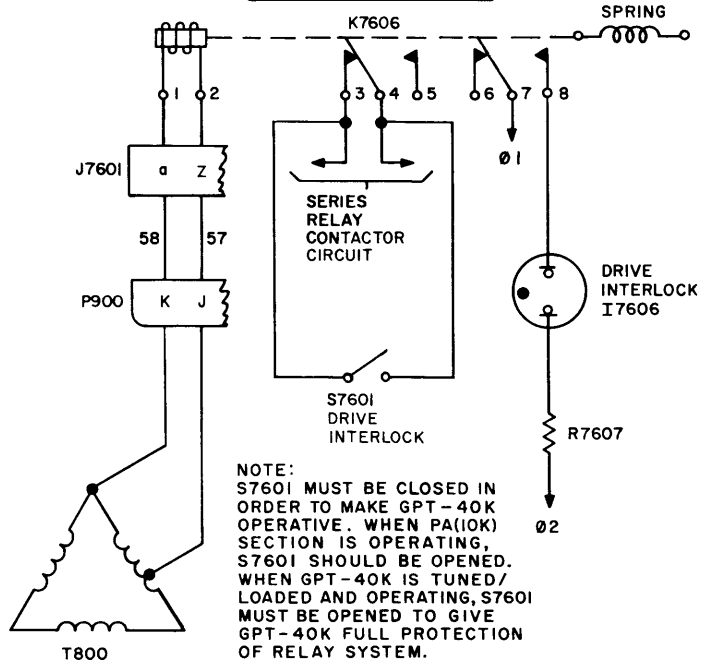
(SHOWN IN POSITION FOR NO BIAS)

BIAS



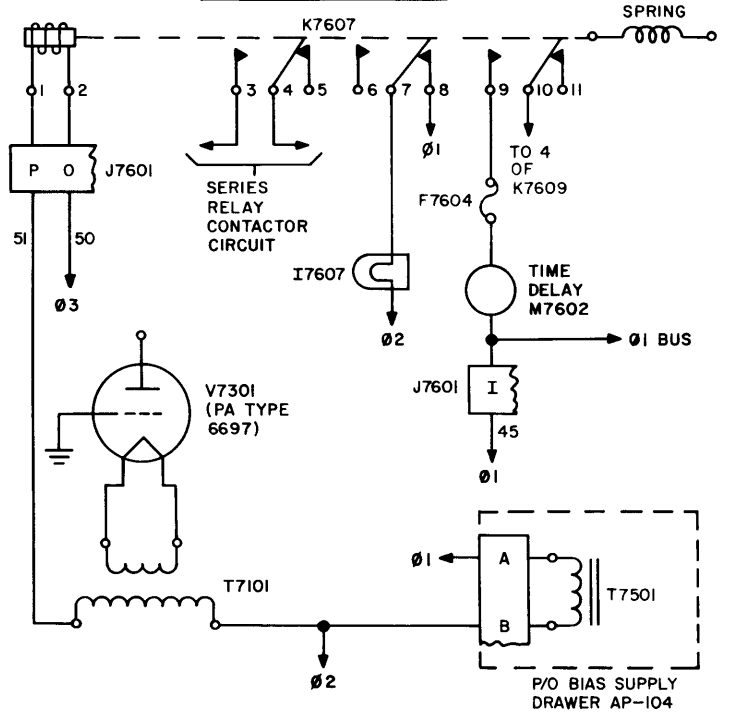
(CONTACTS MAY BE SHORTED OUT BY S7601, FOR NO INTERLOCK)

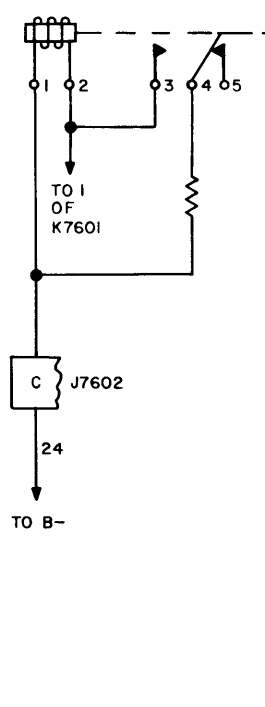
DRIVE INTERLOCK



(SHOWN IN POSITION FOR NO FILAMENT VOLTAGE)

FINAL FILAMENT





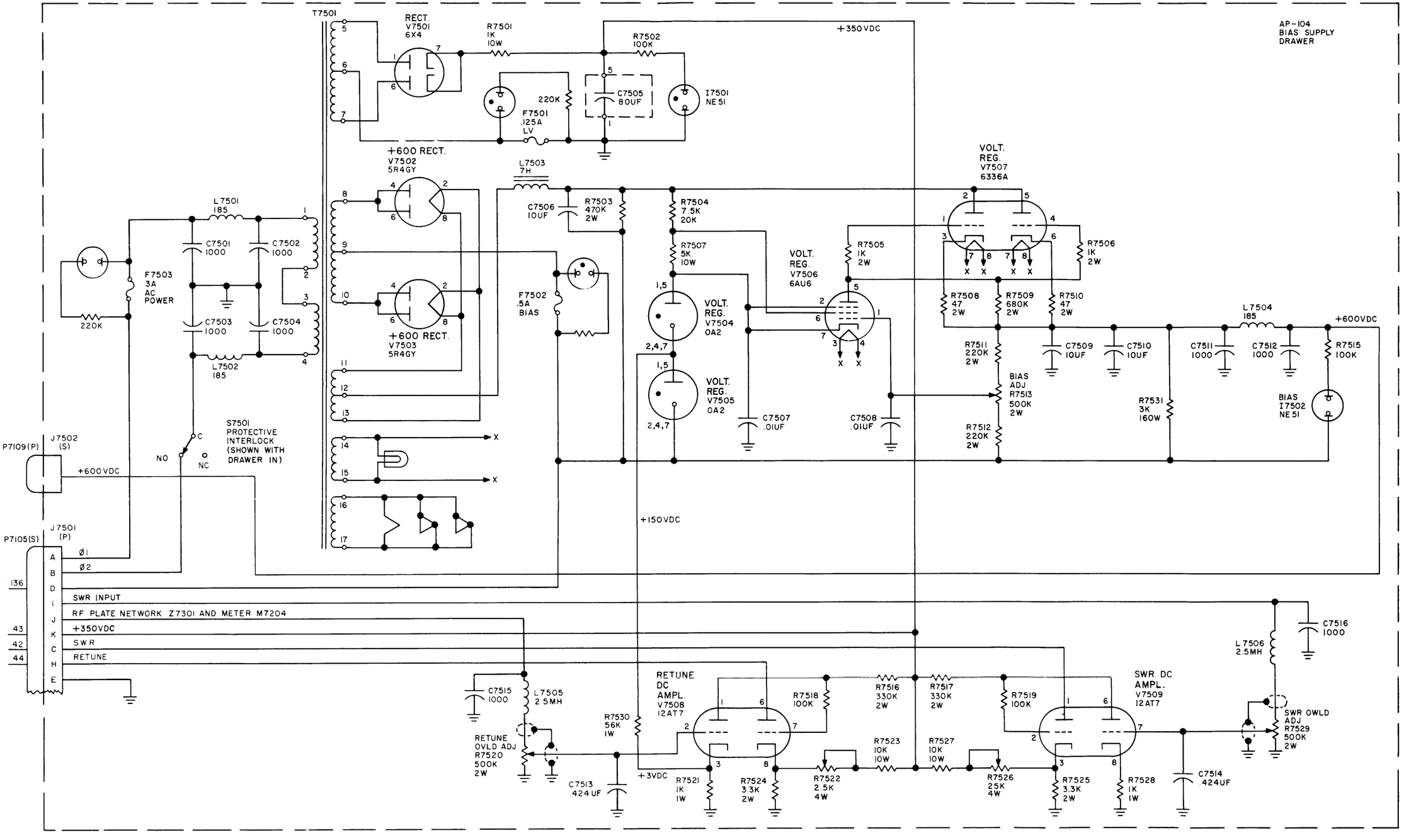


Figure 4-4-7. Schematic Diagram, Bias Supply Drawer, GPT-40K

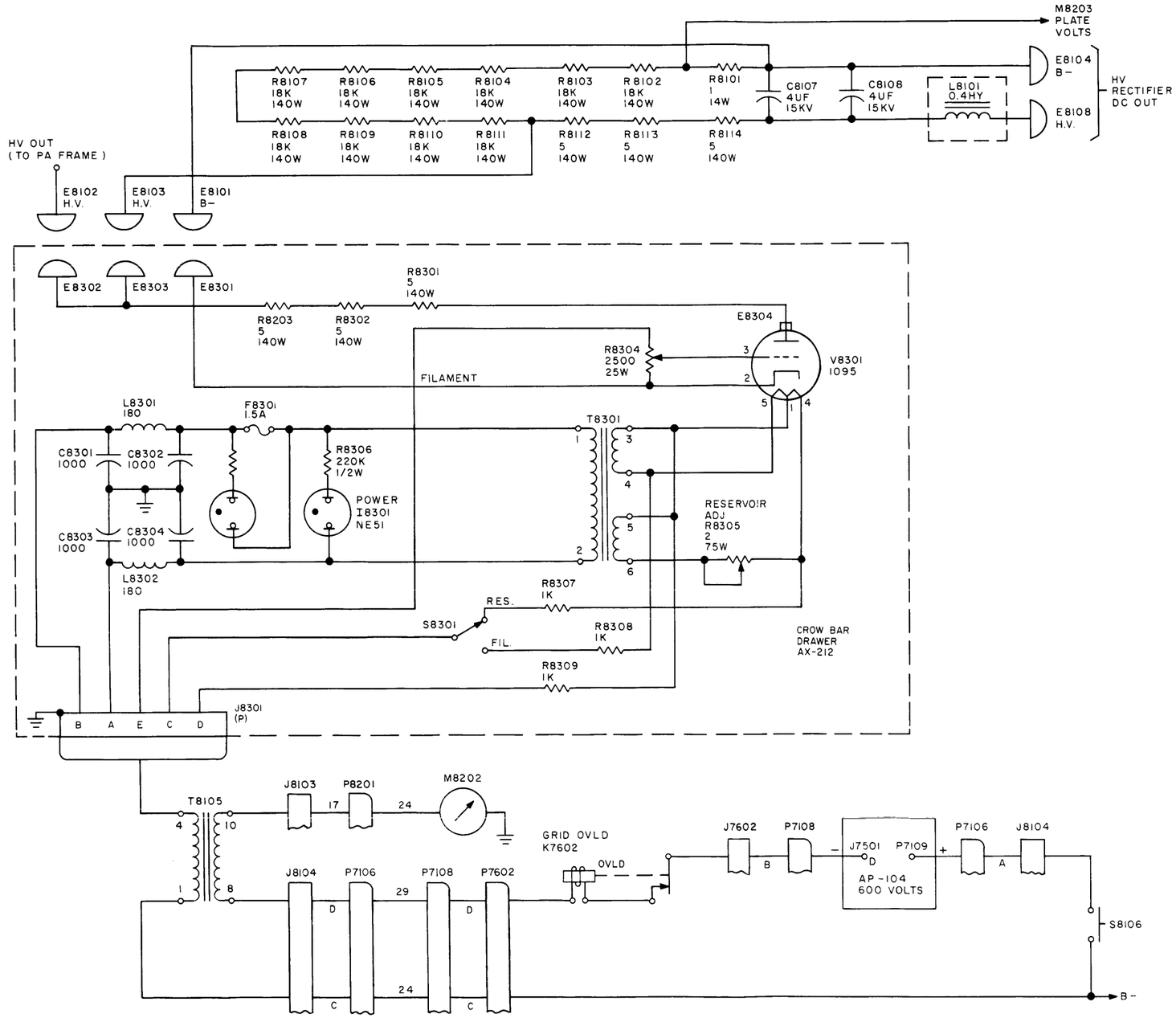


Figure 4-4-8. Simplified Schematic Diagram, Crowbar Drawer Circuit, GPT-40K

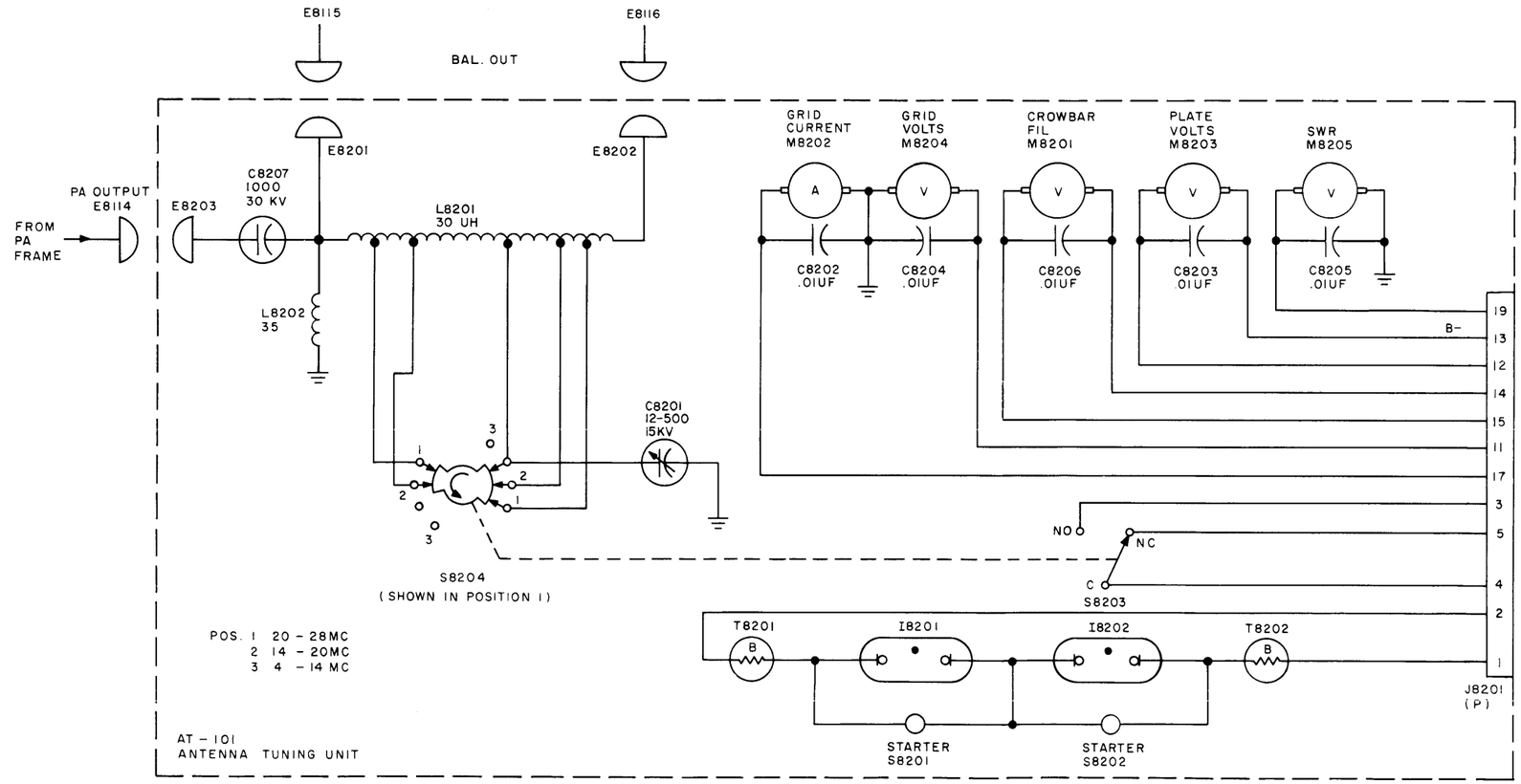


Figure 4-4-9. Schematic Diagram, Antenna Tuning Unit and Meter Panel Drawer Circuit, GPT-40K

SECTION 5
TROUBLE-SHOOTING

4-5-1. GENERAL.

Refer to paragraph 5-1, Part II, Volume I.

4-5-2. TROUBLE-SHOOTING TECHNIQUES.

Refer to paragraph 5-2, Part II, Volume I, except as follows:

a. Replace the second paragraph of paragraph 5-2b with the following:

Table 4-5-1 in this section is based on the operating chart in Section 3 in this part. As each of the chart's steps is taken in sequence, the tabulations in table 4-5-1 show normal indications and prescribe remedies when abnormal indications occur. This procedure is more practical than testing GPT-40K's units individually because of high voltages, high frequencies, built-in test equipments, and safety features used in operating the GPT-40K, and the close relationships of the GPT-40K's units.

b. Add the following to the end of paragraph 5-2d in Part II, Volume I:

At the present time many of TMC's specifications are based on bench tests using special jigs. Alternative specifications are needed for field use. Trouble-shooting in the field, in the meanwhile, should be performed by alternative and conventional, well-known means.

4-5-3. BIAS SUPPLY DRAWER.

a. RESISTANCE TO FRAME. - Tables 4-5-2 and 4-5-3 show values of resistance to frame at the bias supply drawer tube and connector pins. Table 4-5-5 shows values of voltages to frame.

b. LOCATION DATA. - See figure 4-1-8 in this part.

c. CABLING DIAGRAM. - See cable harness diagram of the PA frame, figure 4-7-2.

4-5-4. RELAY PANEL.

Since this panel is tested at the factory in a special jig, trouble-shooting in the field resolves itself to voltohmmeter tests plus the use of the relay panel's schematic.

4-5-5. ANTENNA TUNING UNIT AND METER PANEL DRAWER.

a. RESISTANCE TO FRAME. - Table 4-5-4 shows values of resistance to frame at antenna tuning unit and meter panel drawer connector pins.

b. LOCATION DATA. - Figure 4-5-1 shows top view, with callouts, of the antenna tuning unit and meter panel drawer.

c. CABLING DIAGRAM. - See cable harness diagram of the power supply frame, figure 4-7-3.

4-5-6. CROWBAR DRAWER.

a. RESISTANCE TO FRAME. - Tables 4-5-2 and 4-5-4 show values of resistance to frame at the crowbar drawer tube and connector pins.

b. LOCATION DATA. - Figure 4-5-2 shows top view, with callouts, of the crowbar drawer.

c. CABLING DIAGRAM. - See cable harness diagram of the power supply frame, figure 4-7-3.

4-5-7. HIGH VOLTAGE RECTIFIER DRAWER.

a. RESISTANCE TO FRAME. - Tables 4-5-2 and 4-5-4 show values of resistance to frame of the high voltage rectifier drawer tube and connector pins.

b. LOCATION DATA. - Figure 4-5-3 shows bottom view, with callouts, of the high voltage rectifier drawer. See figure 4-1-11 in this part for top view.

c. CABLING DIAGRAM. - See cable harness diagram of the power supply frame, figure 4-7-3.

4-5-8. PA FRAME.

a. RESISTANCE OF CONNECTOR PINS TO FRAME. - The values of resistance to ground, shown in table 4-5-3, are based on complete disconnection of all connectors in the PA section.

b. LOCATION DATA. - Figures 4-5-4 through 4-5-7 show views, with callouts, of the principal components mounted on the PA frame chassis.

c. CABLING DIAGRAM. - Figure 4-7-2 is the harness diagram of the PA frame's cabling.

4-5-9. POWER SUPPLY FRAME.

a. RESISTANCE OF CONNECTOR PINS TO FRAME. - The values of resistance to ground shown in table 4-5-4 are based on complete disconnection of all connectors in the power supply section.

b. LOCATION DATA. - Figures 4-5-8 through 4-5-10 show views, with callouts, of the principal components mounted on the power supply frame chassis.

c. CABLING DIAGRAM. - Figure 4-7-3 is the harness diagram of the power supply frame's cabling.

TABLE 4-5-1. TROUBLE-SHOOTING CHART FOR GPT-40K

STEP	CONTROLS OPERATED	NORMAL INDICATIONS	REMEDY
1	PA(10K)'s OUTPUT LOADING (19): TUNE PA(10K)'s MAIN POWER (32): ON PA(40K)'s MAIN POWER (219): ON Allow 20- to 30-minute warmup.	All meter lights go on. AC POWER indicator (6) goes on. AC POWER indicator (206) goes on.	Check AC power input.
2	Check that the straps in PA(40K)'s antenna circuit are arranged for proper mode of GPT-40K operation.	Visual check.	Arrange straps as required.
3	Tune and load the two RF, driver, and two IPA stages of GPT-40K as directed in Section 3, Part II, Volume I.	Refer to Section 3, Part II, Volume I.	If trouble, check table 5-1 in Part II Volume I.
4a	10-kw (PEP) output of PA(10K) fed to balanced 600-ohm antenna: Follow directives of paragraph 4-3-3a in this part.	Refer to Section 3, Part II, Volume I for normal indications.	If trouble, check table 5-1 in Part II Volume I.
4b	10-kw (PEP) output of PA(10K) fed to unbalanced 50-ohm antenna: Follow directives of paragraph 4-3-3b in this part.	Refer to Section 3, Part II, Volume I for normal indications.	If trouble, check table 5-1 in Part II Volume I.
4c	40-kw (PEP) output of PA(40K) fed to balanced 600-ohm antenna: Follow directives of paragraph 4-3-3c in this part.	Refer to Section 3 Part IV steps 1 through 8. Refer to Section 3, Part IV steps 9 and 10. On the GPT-10K section: High voltage light on top of transmitter goes on. PLATE ON indicator goes on. INTERLOCK indicator goes on. On the GPT-40K: OPERATE indicator goes on. } PA AC POWER indicator goes on. } TUNE PLATE ON indicator goes on. } PANEL Red lamp in PA compartment goes on. INTERLOCK indicator goes on. } MAIN HV BREAKER INDICATOR goes on. } CONTROL PANEL A.C. POWER indicator goes on. } BIAS BIAS indicator goes on. } SUPPLY L.V. indicator goes on. } DRAWER POWER indicator goes on (Crowbar Drawer)	Check that PA(40K)'s DRIVER INTERLOCKS switch is closed. Check PA(40K)'s interlocks. If the interlock system checks out, failure of any of the indicators (adjoining columns) to go on pinpoints troubled areas. Again, the lighting of fuse indicators (normally not on) pinpoints troubled areas.

TABLE 4–5–1. TROUBLE-SHOOTING CHART FOR GPT–40K (C nt.)

STEP	CONTROLS OPERATED	NORMAL INDICATIONS	REMEDY
	(No drive requirements.)	Refer to Section 3 Part IV steps 11, 12, and 13. On the GPT-10K: PA PLATE current, 0.5 amp IPA PLATE current, 200 mils PA SCREEN voltage, 1100-1200 FILAMENT voltage, 230 volts PA PLATE voltage, 7.5 kv On the GPT-40K: PA PLATE current, 1.5 amps PA PLATE voltage, 11 kv FILAMENT voltage, 230 volts	
	(Full drive requirements.)	Refer to Section 3 Part IV steps 14 and 15. PA(40K)'s meter indications should agree closely with values in paragraph 4-3-3c(14) in this part.	Failure of meters to "come up" properly to nominal values indicates poor tuning and/or loading. If GPT-40K goes off the air due to operation of an overload relay, reduce drive, depress OVERLOAD RESET pushbutton, and retune and reload.
4d	40-kw (PEP) output of PA(40K) fed to unbalanced 50-ohm antenna: Follow directives of paragraph 4-3-3d in this part.	Refer to step 4c in this table.	Refer to step 4c in this table.

TABLE 4–5–2. RESISTANCE TO FRAME ON VACUUM TUBE PINS

BIAS SUPPLY DRAWER

TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V7501 (6X4)	200	NC	Inf.	Inf.	NC	200	20K	-	-
V7502 (5R4)	NC	Inf.	NC	Inf.	NC	Inf.	NC	Inf.	-
V7503 (5R4)	NC	Inf.	NC	Inf.	NC	Inf.	NC	Inf.	-
V7504 (OA2)	Inf.	57K	NC	57K	Inf.	NC	57K	-	-
V7505 (OA2)	57K	Inf.	NC	Inf.	57K	NC	Inf.	-	-
V7506 (6AU6)	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	-
V7507 (6336A)	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	-
V7508 (12AT7)	350K	500K	1K	Inf.	Inf.	Inf.	450K	3.3K	Inf.
V7509 (12AT7)	Inf.	450K	3.3K	Inf.	Inf.	350K	500K	1K	Inf.

CROWBAR DRAWER

Vacuum tube V8301 (1095) measures infinity on all pins.

HIGH VOLTAGE RECTIFIER DRAWER

Vacuum tubes V8401 through V8406 (6895) measure infinity on all pins.

TABLE 4–5–3. RESISTANCE TO FRAME ON CONNECTOR PINS AT TERMINALS OF PA FRAME CABLES

CONNECTOR	0 OHMS	INFINITE OHMS	NOT USED
J7103(P), 14 Contacts	-	C, D, E, F, G, H, J, K, M	A, B, I, L, N
J7102(S), 14 Contacts	-	C, D, E, F, G, H, J, K, M	A, B, I, L, N
P7104(P), 14 Contacts	M	C, D, E, F, G, H, J, K	A, B, I, L, N
J7302(S), 4 Contacts	-	A, B, C, D	-
P7302(P), 4 Contacts	-	A, B, C, D	-
P7106(P), 4 Contacts	-	A, C, D	B
P7101(S), 35 Contacts	Z	A, B, E, F, H, O, P, R, S, T, U, V, Y, f	C, D, G, I, J, K, L, M, N, W, X, a, b, c, d, e, g, h, j, k
P7102(P), 35 Contacts	Z	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, Y	X, a, b, c, d, e, f, g, h, j, k
P7103(S), 35 Contacts	W	A, B, C, G, H, N, P, S, T, U, V	D, E, F, I, J, K, L, M, O, R, X, Y, Z, a, b, c, d, e, f, g, h, j, k
J7101(P), 35 Contacts	W	A, B, C, G, H, N, P, S, T, U, V	D, E, F, I, J, K, L, M, O, R, X, Y, Z, a, b, c, d, e, f, g, h, j, k
P7105(S), 14 Contacts	E	A, B, C, D, H, I, J*, K	F, G, L, M, N
J7501(P), 14 Contacts	E	A, B, C, D, H, I**, J**, K	F, G, L, M, N
P7109(P), 1 Contact	-	A	-
J7502(S), 1 Contact	-	A	-
J7602, 4 Contacts	-	A, B, C, D	-
P7108, 4 Contacts	-	A, B, C, D	-
J7601, 35 Contacts	b	E, F, G, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, a, c, d, e, f, k	A, B, C, D, H, g, h, j
P7107, 35 Contacts	b	E, F, G, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, a, c, d, e, f, k	A, B, C, D, H, g, h, j

NOTE

The values of resistance to ground are based on complete disconnection of all connectors in the PA Section. All switches are in nonoperating positions.

*J = 250 k
**I = J = 0 to 500 k

TABLE 4–5–4. RESISTANCE TO FRAME ON CONNECTOR PINS AT TERMINALS OF POWER SUPPLY FRAME CABLES

CONNECTOR	0 OHMS	INFINITE OHMS	NOT USED
J8104(S), 4 Contacts	-	A, C, D	B
J8101(P), 35 Contacts	Z	A, B, E, F, H, O, P, R, S, T, U, V, Y, f	C, D, G, I, J, K, L, M, N, W, X, a, b, c, d, e, g, h, j, k
J8102(S), 35 Contacts	Z	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, Y	X, a, b, c, d, e, f, g, h, j, k
P8101(S)	-	A, B, C, D, E	-
J8301(P)	-	A, B, C, D, E	-
J8103(S)	-	1, 2, 3, 4, 5, 11, 12, 13, 14, 15, 17, 19	6, 7, 8, 9, 10, 16, 18
J8201(P)	-	1, 2, 3, 4, 5, 11*, 12, 13, 14, 15, 17**, 19***	6, 7, 8, 9, 10, 16, 18

NOTE

The values of resistance to ground are based on complete disconnection of all connectors in the power supply section. All switches are in nonoperating positions.

* GRID VOLTS M8204 measures 60 ohms. Must be measured with Hewlett Packard VTVM on RX100 scale. This meter is very sensitive and burns out unless measured on a VTVM having a very high resistance.
** GRID CURRENT M8202 measures 1.3 ohms. Must be measured with Hewlett Packard VTVM on RX1 scale. This meter is very sensitive and burns out unless measured on a VTVM having a very high resistance.
*** SWR M8205 measures 1000 ohms. Must be measured with Hewlett Packard VTVM on RX1000 scale. This meter is very sensitive and burns out unless measured on a VTVM having a very high resistance.

TABLE 4–5–5. VOLTAGES TO FRAME ON VACUUM TUBE PINS

BIAS SUPPLY DRAWER

TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V7501 (6X4)	380 AC	NC	6.3 AC	6.3 AC	NC	380 AC	400 DC	-	-
V7502 (5R4)	NC	670 DC	NC	810 AC	NC	810 AC	NC	670 DC	-
V7503 (5R4)	NC	670 DC	NC	810 AC	NC	810 AC	NC	670 DC	-
V7504 (OA2)	290 DC	150 DC	NC	150 DC	290 DC	NC	150 DC	-	-
V7505 (OA2)	150 DC	0	NC	0	150 DC	NC	0	-	-
V7506 (6AU6)	285 DC	290 DC	6.3 AC	6.3 AC	600 DC	440 DC	290 DC	-	-
V7507 (6336A)	600 DC	660 DC	600 DC	600 DC	660 DC	600 DC	6.3 AC	6.3 AC	-
V7508 (12AT7)	50 DC	0	1 DC	6.3 AC	6.3 AC	0	40 DC	40 DC	6.3 AC
V7509 (12AT7)	0	44 DC	44 DC	6.3 AC	6.3 AC	53 DC	0 DC	1 DC	6.3 AC

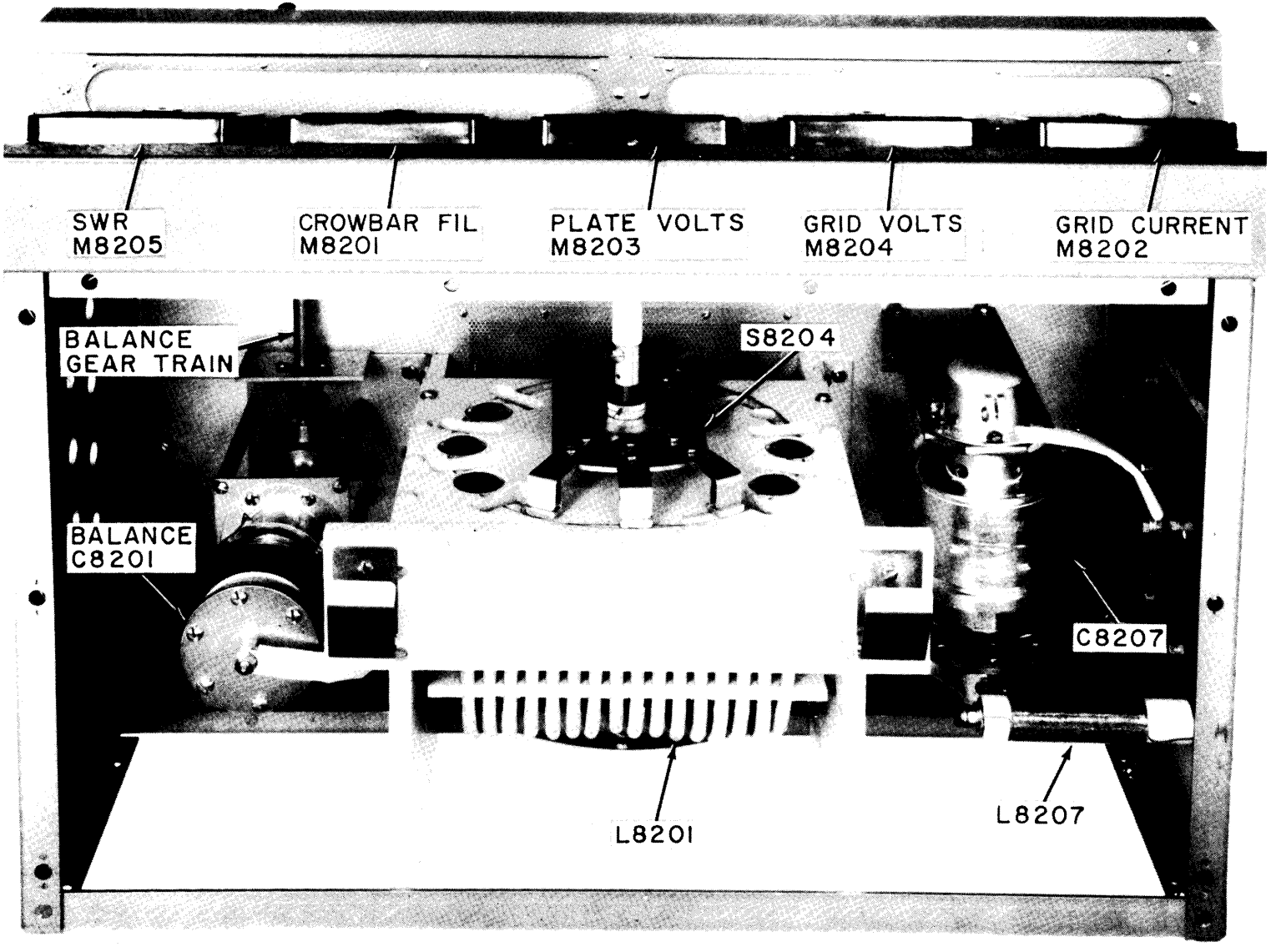


Figure 4-5-1. Top View with Callouts, Antenna Tuning Unit and Meter Panel Drawer, GPT-40K

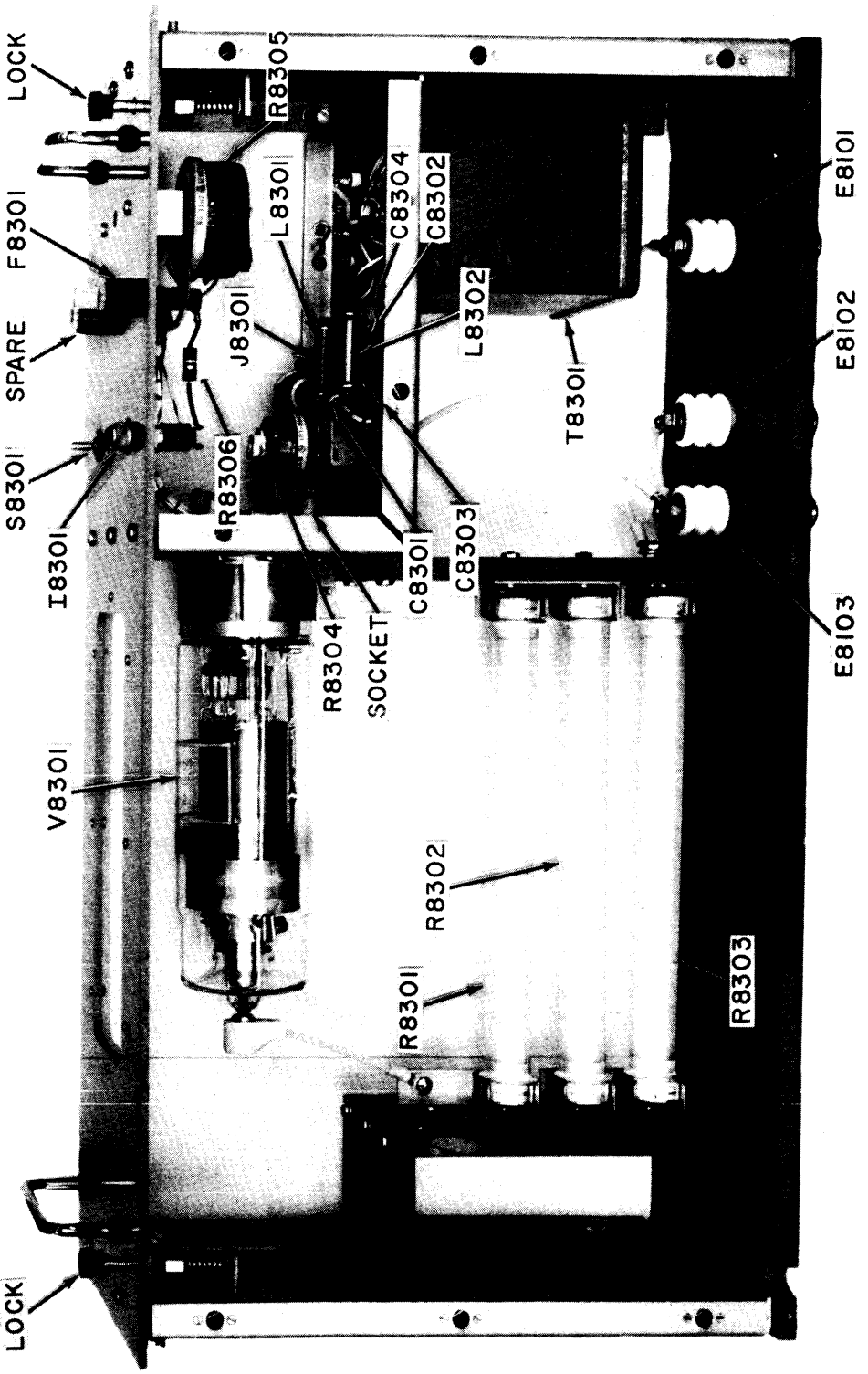


Figure 4-5-2. Top View with Callouts, Crowbar Drawer, GPT-40K

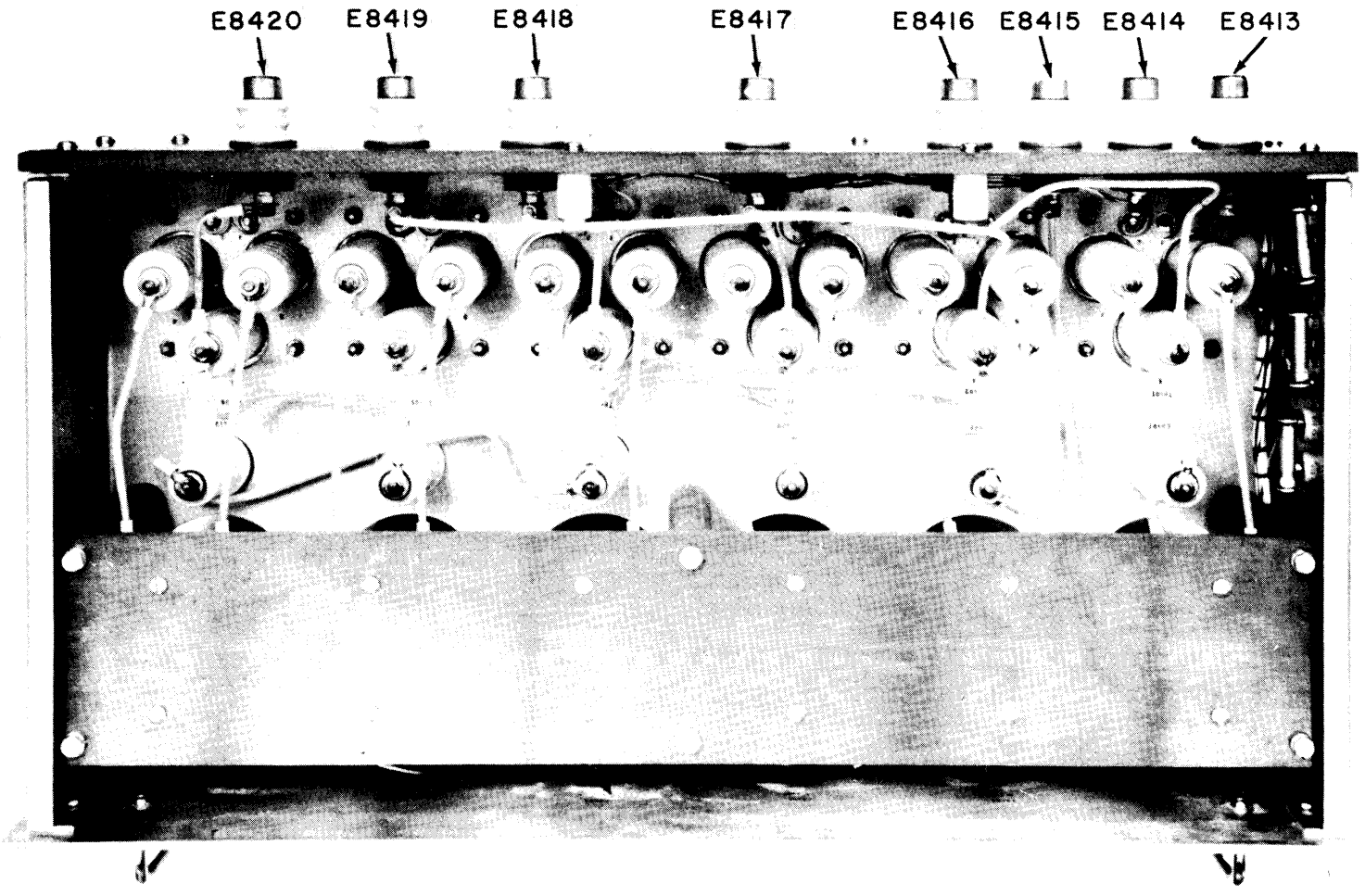


Figure 4-5-3. Bottom View with Callouts, High Voltage Rectifier Drawer, GPT-40K

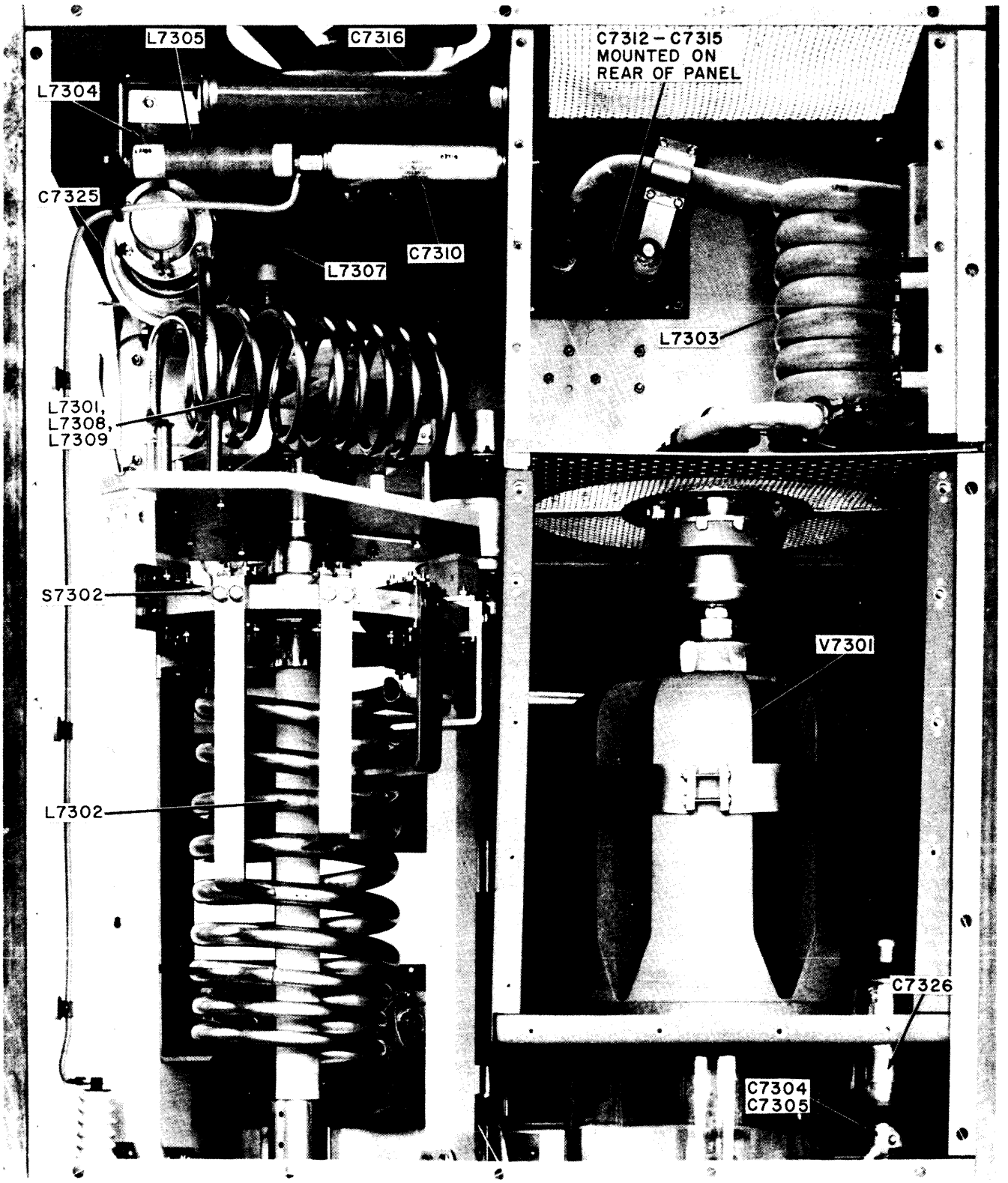


Figure 4-5-4. Rear View with Callouts, PA Capacitor/Coil/Gear Train Compartment, GPT-40K

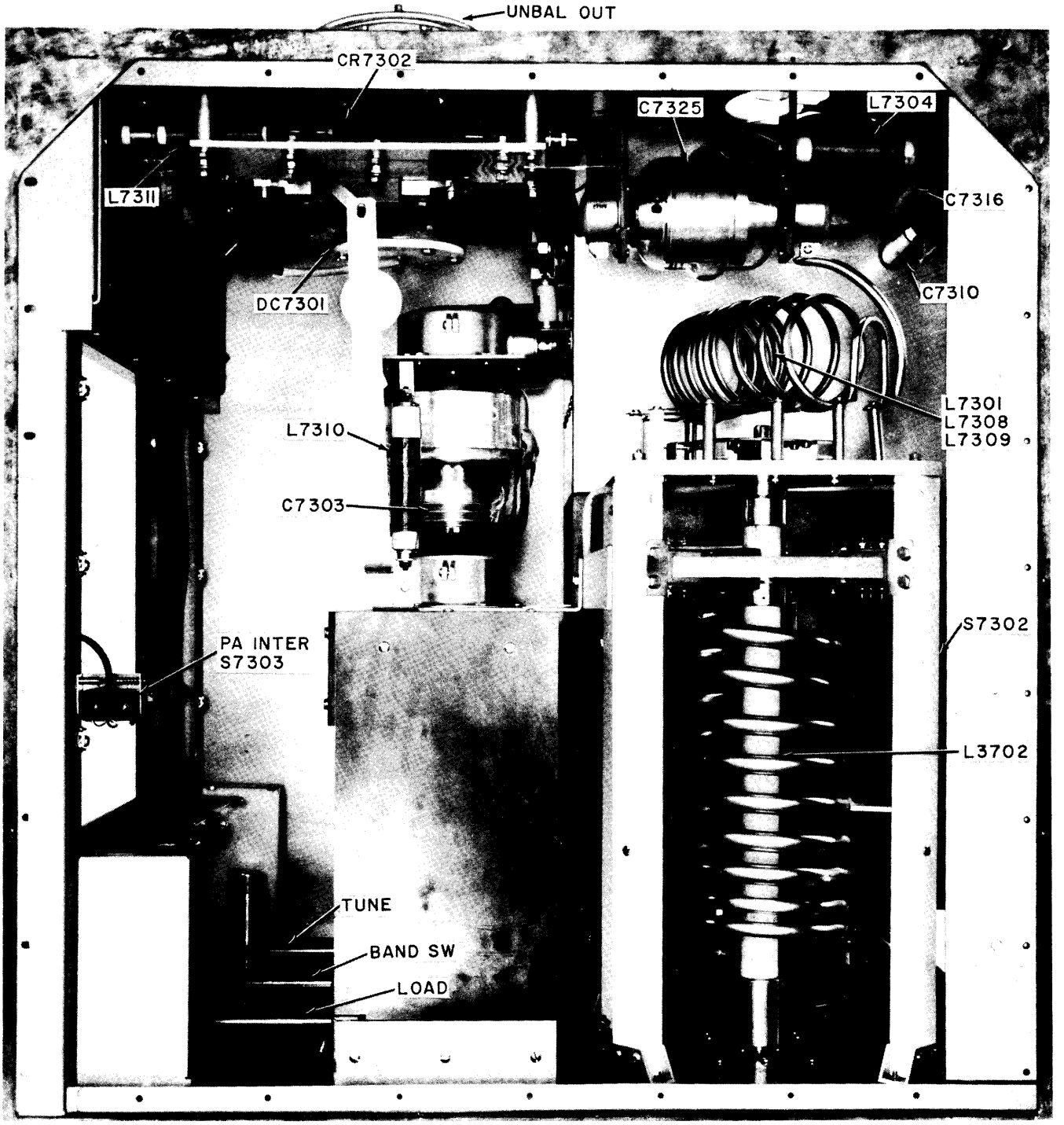


Figure 4-5-5. 135-Degree Angle Side View with Callouts, PA Capacitor/Coil/Gear Train Compartment, GPT-40K

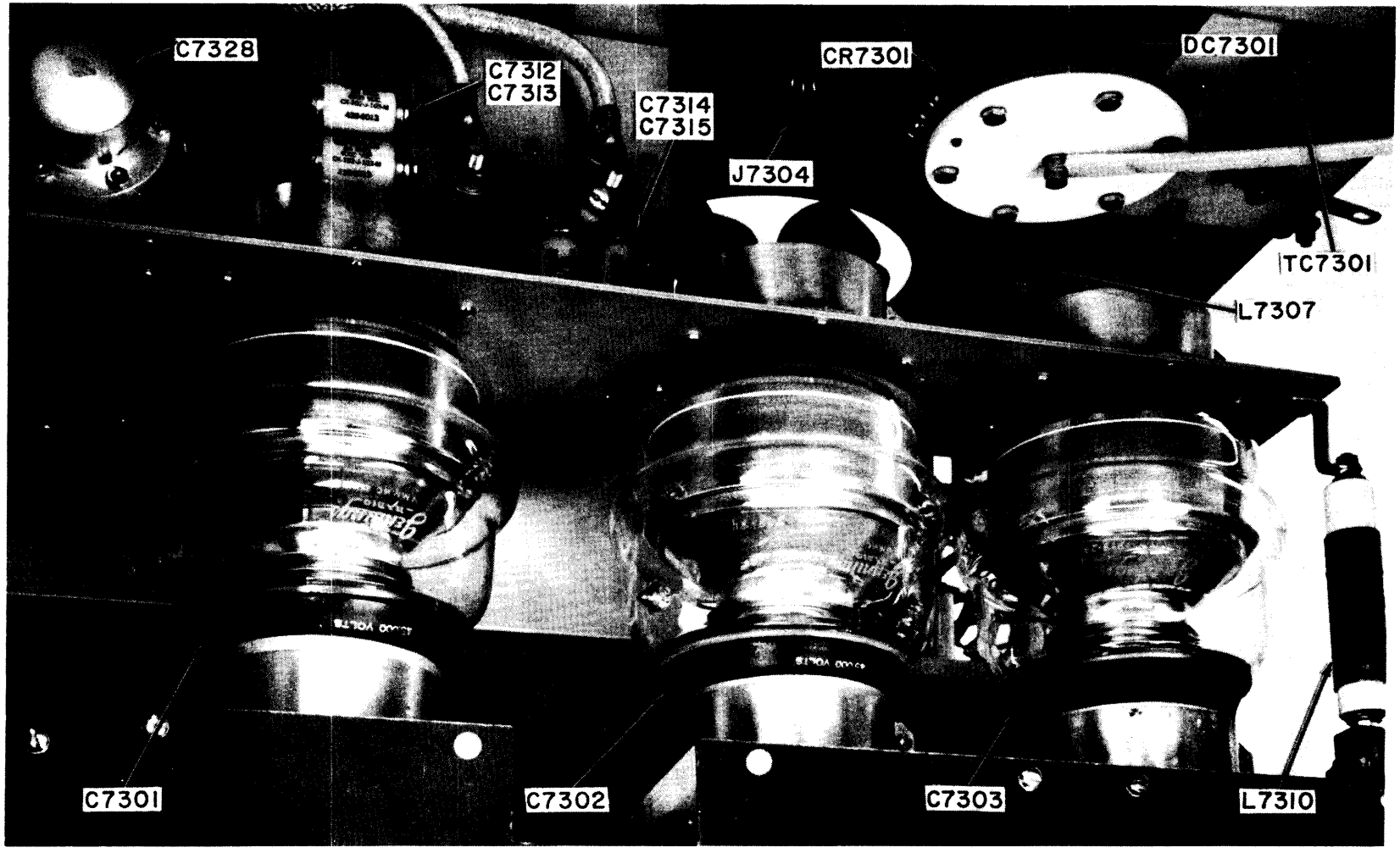


Figure 4-5-6. Front View with Callouts, PA Capacitor/Coil/Gear Train Compartment, GPT-40K

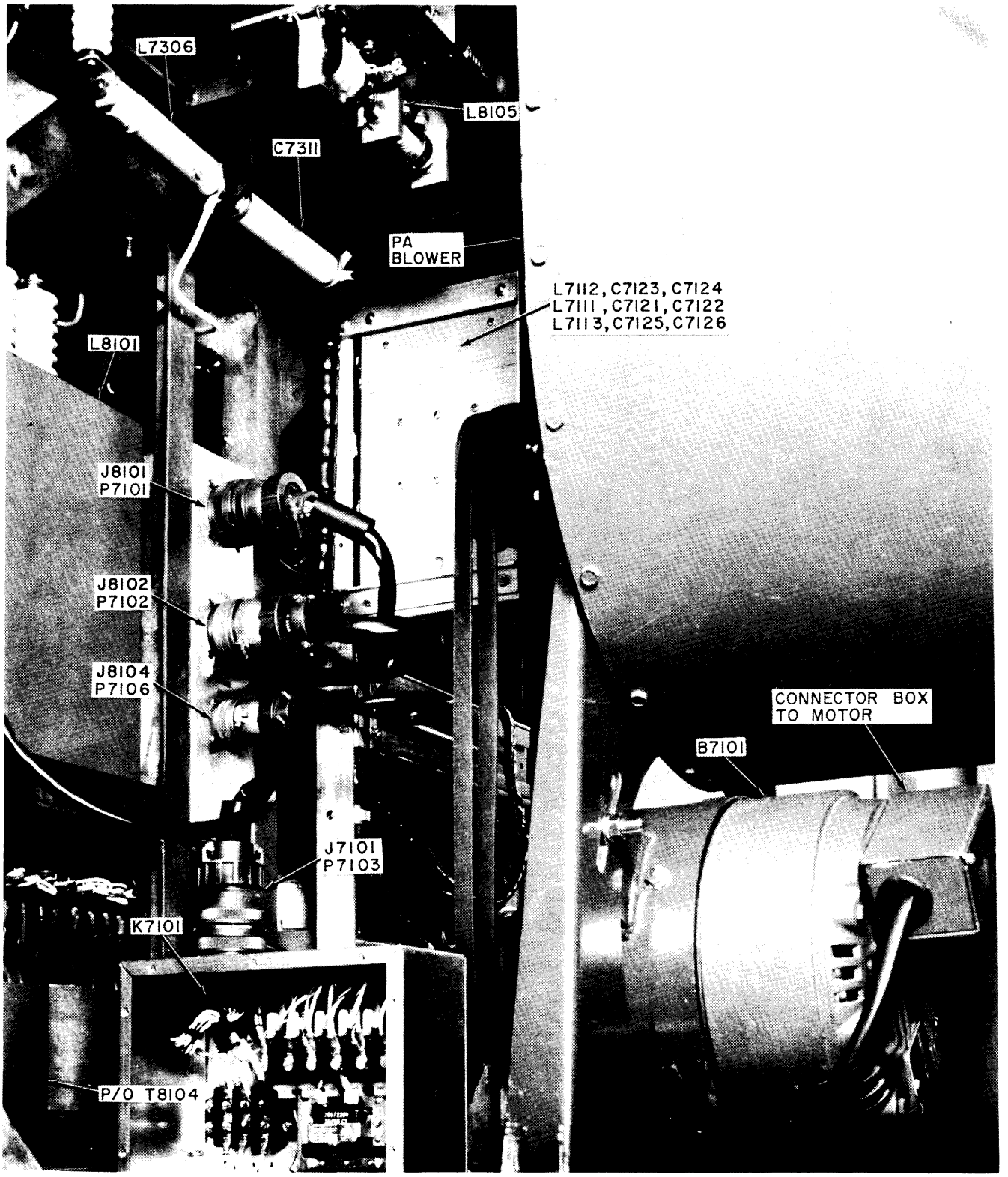


Figure 4-5-7. Rear View with Callouts, PA Blower Compartment, GPT-40K

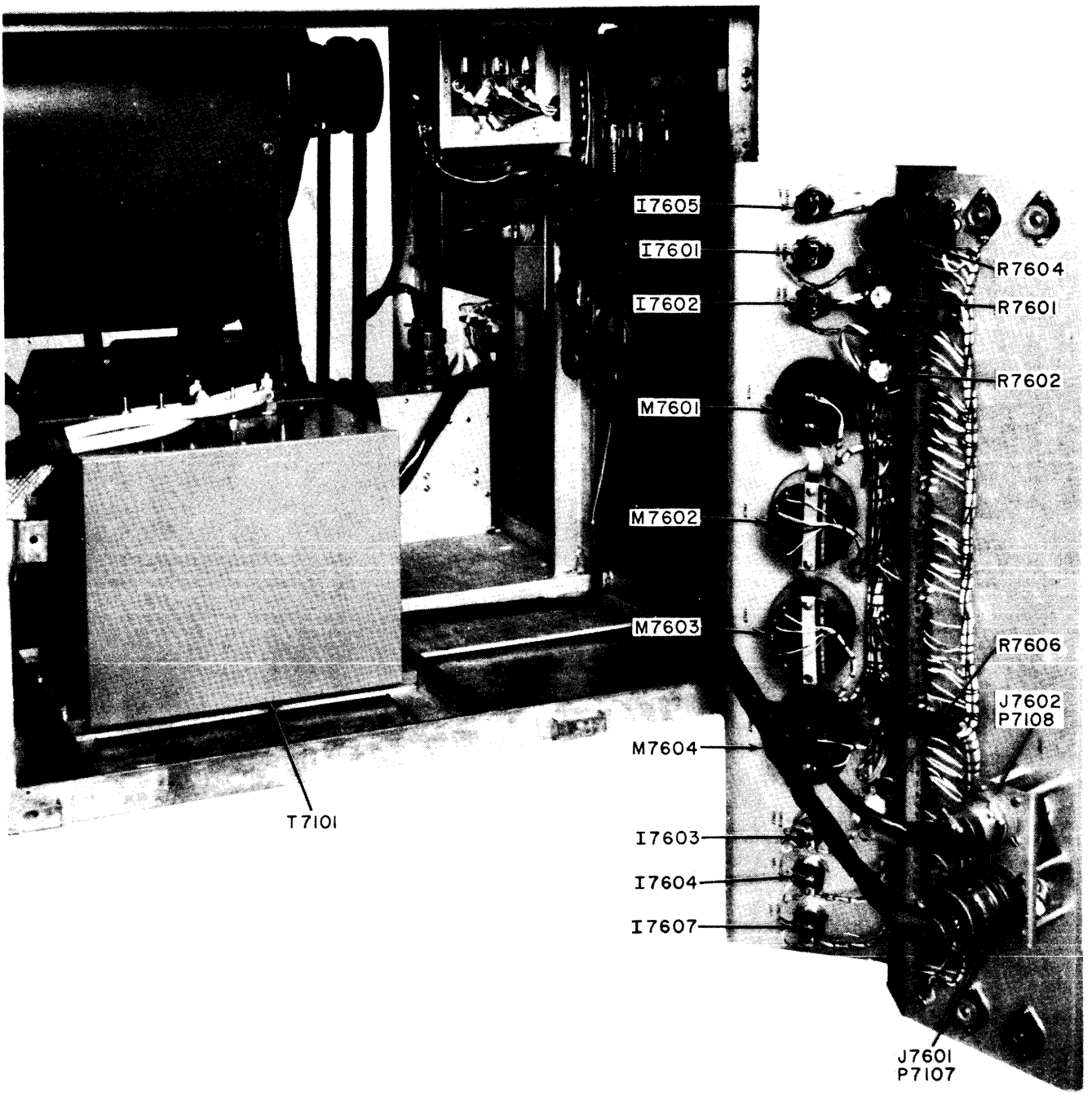


Figure 4-5-8. Rear View with Callouts, Indicator Control Panel, GPT-40K

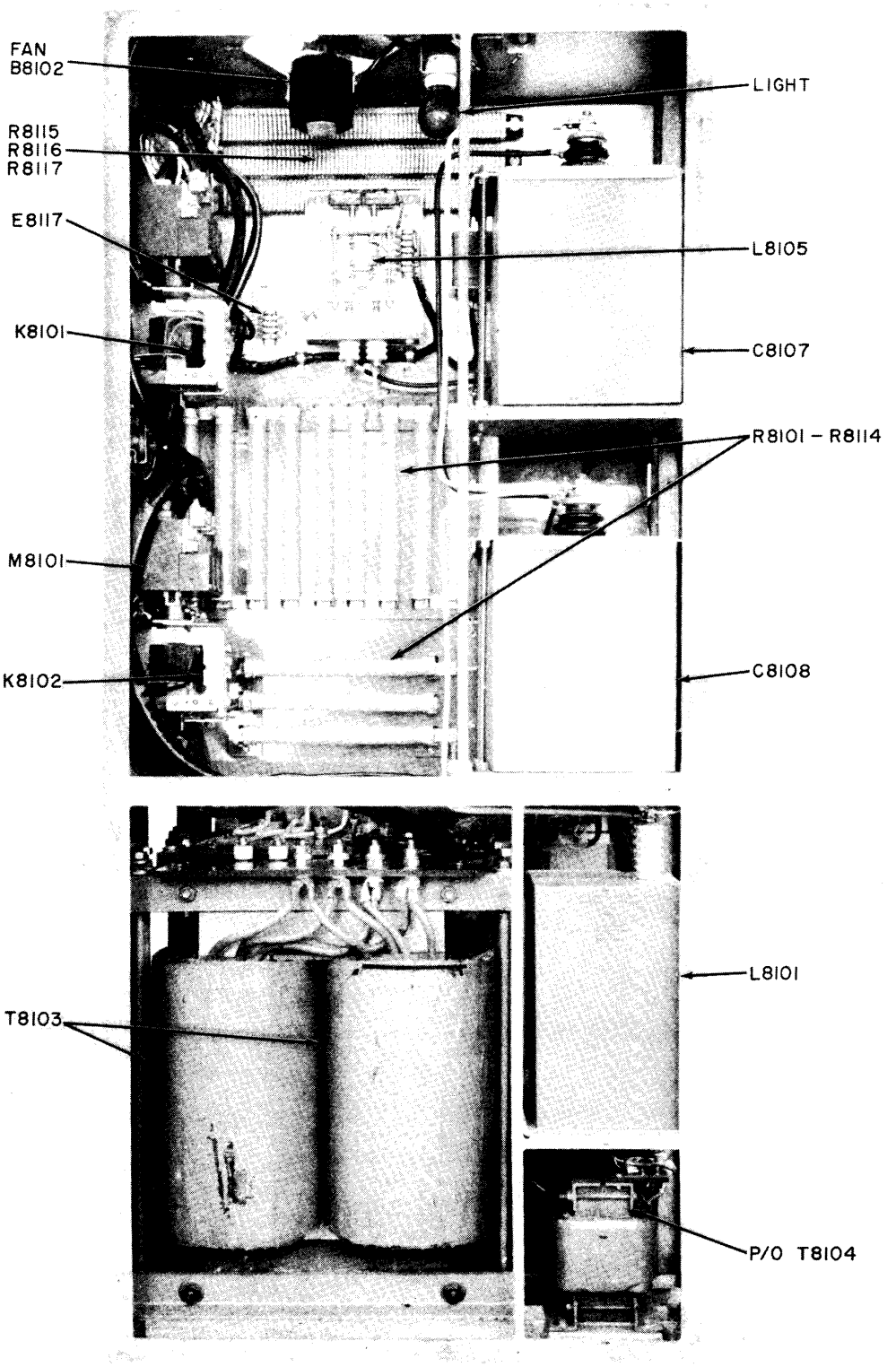


Figure 4-5-9. Rear View with Callouts, Fourth Frame, GPT-40K

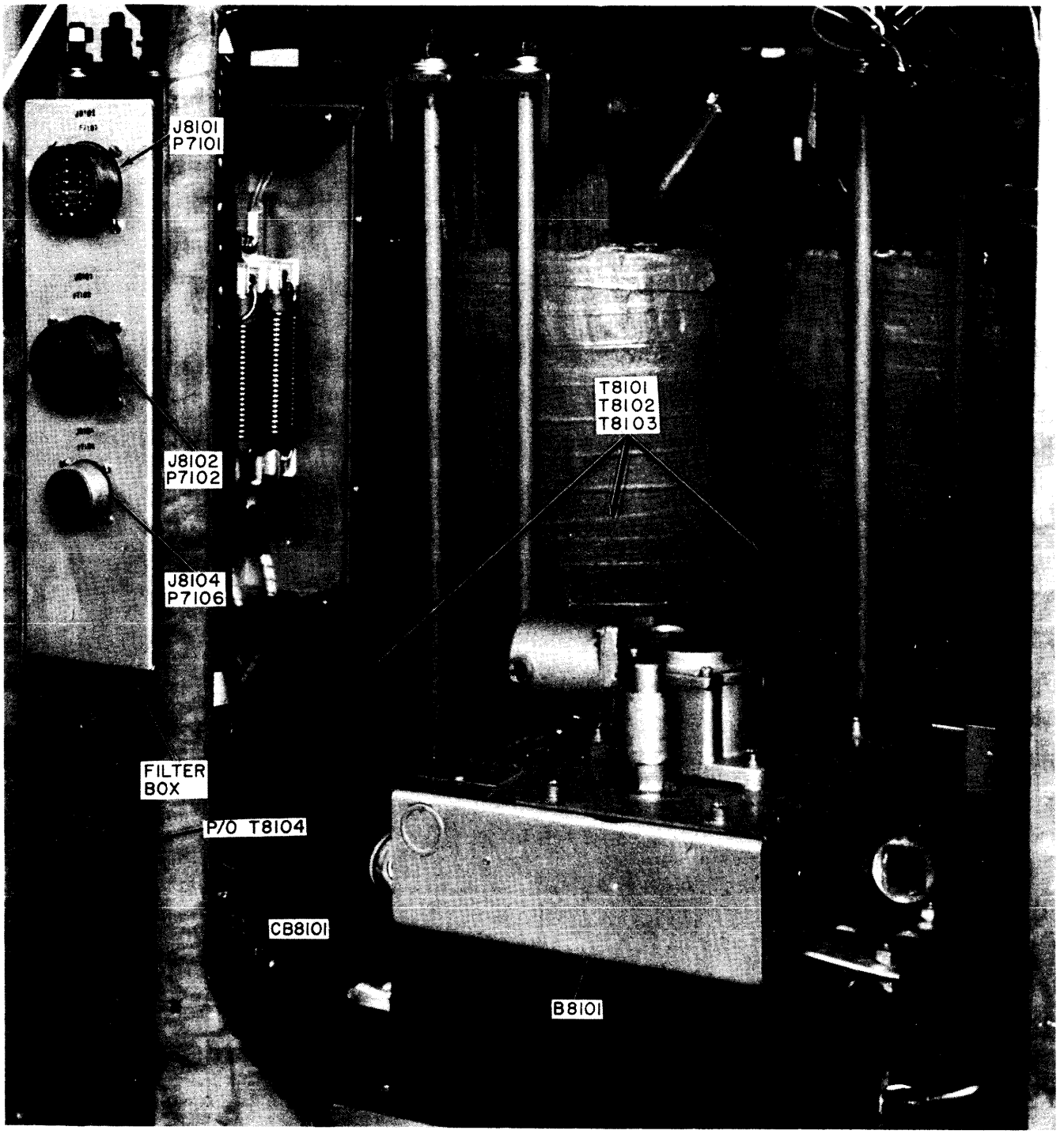


Figure 4-5-10. Side View with Callouts, Main Transformer and Motorized Circuit

SECTION 6

MAINTENANCE

4-6-1. GENERAL.

GPT-40K's maintenance consists of the maintenance of its IPA(10K)/PA(10K) and associated power supply sections and that of its PA(40K) and associated power supply sections. Maintenance of the first two frames of GPT-40K is given in Part II, Volume I, Section 6; maintenance of the last two frames of GPT-40K is given below.

The general maintenance principles stated in Part II, Volume I, Section 6 are not repeated here. Instead, maintenance is restricted to parts requiring special analysis.

4-6-2. OPERATOR'S MAINTENANCE.

For general principles, refer to Part II, Volume I, Section 6.

4-6-3. PREVENTIVE MAINTENANCE.

For general principles, refer to Part II, Volume I, Section 6.

4-6-4. CORRECTIVE MAINTENANCE.

a. GENERAL. As stated in Part II, Volume I, Section 6, corrective maintenance is an aftermath of trouble-shooting. With the exception of those cases when components suddenly fail for no apparent reason or under extenuating circumstances, an intelligent program of preventive maintenance should produce minimum GPT-40K outage.

After a defective part has been localized and isolated by the trouble-shooting technique presented in Part IV Section 5, replacement generally presents no major problem particularly in the case of failure of non-complex electrical and mechanical components. For this reason the following paragraphs are restricted to adjustments and factory test procedures in order to evaluate circuit parameters.

b. ADJUSTMENTS FOR RELAYS ON RELAY PANEL. - The following listing contains maintenance data for relays K7601 through K7609.

Relay	Nomenclature	Terminal	Resistance (in ohms)	Pileup	Contacts	60 cps or DC Adjustment	
						Operate	Nonoperate
K7601	PLATE OVLD	E7601 1-2 7-8	 1100 ±10% 0.93 ±10%	4PDT	Code 15, 1/4-inch Silver Cadmium. 25 amp 125 volts DC.	220 volts 60 cycles or less 1 amp DC	- 0.98 amp
K7602	GRID OVLD	E7602 15-16 No Desig.	 1100 ±10% 170 ±10%	4PDT	1/4-inch Silver. 20 amps noninductive at 125 volts.	220 volts 60 cycles or less 80 mils DC or less	- -
K7603	RETUNE	E7602 17-18 E7603 23-24	 1100 ±10% 10,000 ±10%	4PDT	1/4-inch Silver. 25 amps noninductive at 125 volts.	220 volts 60 cycles or less 11 mils DC or less	-
K7604	SWR	E7603 25-26 E7604 31-32	 1100 ±10% 10,000 ±10%	4PDT	1/4-inch Silver. 25 amps noninductive at 125 volts.	220 volts 60 cycles or less 11 mils DC or less	-

Relay	Nomenclature	Terminal	Resistance (in ohms)	Pileup	Contacts	60 cps or DC Adjustment	
						Operate	Nonoperate
K7605	BIAS	E7604 33-34	11,000 ±10%	4PDT	3/16-inch Silver Cadmium Oxide. 10 amps 125 volts AC resistive.	10 mils DC	9 mils DC
K7606	DRIVER INTERLOCK	E7605 39-40	1800 ±10%	4PDT	Code 15, 1/4-inch Silver Cadmium. 25 amps 125 volts DC.	220 volts 60 cycles AC	-
K7607	FINAL FILAMENT	E7605 45-46	0.01 ±10%	4PDT	Code 15, 1/4-inch Silver Cadmium. 25 amps 125 volts DC.	3 volts, 10 amps AC coil	-
K7608	TUBE PROTECT		0.93 ±10%	4PDT	Code 15, 1/4-inch Silver Cadmium. 25 amps 125 volts DC.	1 amp DC	-
K7609	CROWBAR	E7606 57-58	2.4 ±10%	4PDT	Code 15, 1/4-inch Silver Cadmium. 25 amp 125 volts DC.	10 volts, 0.5 amp AC coil	-

c. GPT-40K FACTORY CHECKOUT TESTS.

WARNING

Extreme caution should be taken when operating or repairing the GPT-40K since extremely high potentials are present.

(1) GENERAL. - The GPT-40K consists of a modified GPT-10K that drives a 40-kw (PEP) class AB, grounded-grid amplifier, hereinafter designated PA(40K). The PA(40K) is a Machlett tube ML-6697, capable of 35-kw plate dissipation. The filament of this tube is rated at 13 volts, 205 amps. There is a heat hazard when this tube has filament voltage applied for any length of time without adequate air cooling. The power supply is a 3-phase delta-wye transformer bank rated at 12 kv and 4-1/2 amps.

WARNING

Extreme caution should be practiced to avoid overheating.

The shorting stick supplied with the GPT-40K should be used as necessary throughout the testing procedure to avoid contact with high potentials.

(2) GPT-10K MODIFICATION. - Since the PA(10K) is only used as a 50-ohm unbalanced transmitter, there is no longer need for the antenna tuner. In its place a three-position switch and three 900-watt, 140-ohm resistors are used. The three-position switch has three modes of operation:

TUNE - For preliminary tuning of PA(10K) before applying power to the PA(40K).

OPERATE - For connecting the RF output of the PA(10K) to the input of the PA(40K).

EMERGENCY - In case of failure of PA(40K), the output of the PA(10K) can be switched into a balanced or unbalanced antenna.

(3) INTERLOCK SYSTEM. - The PA(10K) and the PA(40K) are designed to work as a single integrated transmitter except in case of emergency. This means that a failure in one causes power to be removed from both simultaneously. A wafer switch that tracks the main switch's three modes of operation is mounted on the mode switch shaft.

TUNE - Opens the PA(40K)'s interlock system to prevent high voltage from being applied to the PA(40K) during the process of tuning the PA(10K), and applies voltage to the TUNE indicator on the PA(40K)'s main front panel.

OPERATE - Closes PA(10K)'s interlock circuit through PA(10K)'s cabling, applies power to the OPERATE indicator, and permits PA(40K)'s high voltage to go on.

EMERGENCY - Completes the PA(10K)'s interlock system, and opens the PA(40K)'s interlock system.

(4) PA(10K), TEST PROCEDURE. - The PA(10K), with the modifications described above, can be checked as an independent transmitter when use is made of the dummy load. Connect the external plug to the PA(10K)'s external tester and proceed as follows:

(a) MECHANICAL AND ELECTRICAL INSPECTION.

WARNING

No power on PA(10K).

1. All three 230-volt input phases should be checked for possible shorts to ground, including the circuit up to main transformer T800.

2. Check 115-volt single phase circuits in auxiliary frame for possible shorts.

3. Check high voltage feed to plate and screen of power amplifier socket for possible shorts.

NOTE

High voltage shorting switch S801 must be open for this check.

Check the following requirements:

SCREEN: approximately 35,000 ohms
PLATE: approximately 100,000 ohms

4. Make a mechanical inspection of the entire transmitter before turning on the transmitter. Particular attention must be paid to the following: lead and cable dress, deadman assembly, all high voltage and RF connections must be secure, and cover must be on all units.

(b) AUXILIARY FRAME CHECKOUT.

1. Place auxiliary circuit breaker in ON position, turn power on all equipment in auxiliary frame, and allow a 10-minute warmup.

2. Observe the following: auxiliary frame fan should be operating; removing fuse F3000 at rear of auxiliary frame should make fan inoperative; check cycling of SBE, XFK, and VOX (outer) ovens and SBE and XFK ovens cycle after approximately 10 minutes.

(c) SETTINGS OF EQUIPMENT UNITS ON AUXILIARY FRAME AND FSA INHERENT DISTORTION.

1. FSA.

IF ATTEN - 20 DB

SWEEP WIDTH SELECTOR - 10KC

AMPLITUDE SCALE - LOG

GAIN - maximum

CAL OSC LEVEL - OFF

AFC - OFF

2. MCP.

ANALYZER MONITOR - TEST

VOX RF OUTPUT - FSA

3. TTG.

RF TONE SELECTOR - TWO TONE

4. VOX.

BAND-MCS - 2-4 mc

TUNING - 2.5 mc

Counter - 2.5 mc

METER - HFO

HFO - ON

ZERO BEAT - OFF

Output no higher than 0.3 volt.

5. FSA INDICATIONS. - After the above settings have been made, a two-tone trace should appear on the FSA oscilloscope.

NOTE

The VOX may have to be tuned slightly to either side of set frequency to bring in the trace.

Attenuate the input signal to the FSA with the INPUT ATTENUATOR switches as needed to fill the FSA graph. Turn IF ATTEN switch to 0 DB. FSA inherent distortion should be better than 55 db in order to serve as a satisfactory indicator of GPT-40K's distortion.

(d) SETTINGS OF EQUIPMENT UNITS ON AUXILIARY FRAME, AND SBE INHERENT DISTORTION.

1. SBE

MF XTAL SW - 4.25 mc

BAND MCS - 4.25 mc

USB - OFF

CARRIER INSERT - counterclockwise

EXCITER-ON; XMTR - ON

OUTPUT TUNING - 4-8 MC

LSB - CH 1

METER SW - LSB

2. MCP.

VOX RF OUTPUT - FSA
ANALYZER MONITOR - SBE
CHANNEL 1 - TONE INPUT

CHANNEL 2 - LINE 2 INPUT

MODE - SSB

SBE VMO INPUT - OFF

3. VOX.

BAND-MCS - 4-8 mc
TUNING - 2.250 mc
Counter - 2.250 mc

Output no higher than 0.3 volt

4. TTG.

AUDIO TONE SELECTOR - TWO TONE
AUDIO OUTPUT - half turn clockwise
RF TONE SELECTOR - OFF

5. DISTORTION TEST.

USB GAIN - 3 db (on SBE)
METER SW - MF (on SBE)
MF TUNING - 4.25 for peak indication on meter (on SBE)

METER SW - RF (on SBE)

OUTPUT - maximum (on SBE)

OUTPUT TUNING knob to set associated dial at 4 mc for peak indication on meter (on SBE)

OUTPUT - 10 db (on SBE)

FSA setting same as 6-4c(4)(c)1 above

Two-trace 2 kc apart (approximately) should appear on oscilloscope (on FSA)

Attenuate tones to fill FSA graph (on FSA)

IF ATTEN - 0 DB (on FSA)

Third order distortion must be 45 db or better (on FSA)

NOTE

Above test should be made also with SBE unit in LSB position.

(e) SLM CALIBRATION.

1. Adjust SBE audio level to -3 db.
2. Calibrate USB on SLM for -3 db.
3. Repeat above procedure for LSB.

(f) PA(10K) FRAME CHECKOUT.

1. OUTPUT LOADING mode switch S903 must be in the TUNE position.

2. Turn on MAIN POWER circuit breaker and observe the following:

3. AC POWER light and auxiliary meter panel lights should be on.

4. Rear fan and main blower should be operating.

5. Check PA(10K) blower for proper rotation (clockwise).

6. Removing fuse F703 (rear fan fuse) should make fan inoperative.

7. Removing fuses F700, F701, F702 should make PA(10K) blower inoperative.

8. Set FIL ADJ switch to 230 volts on FILAMENT PRIMARY meter.

9. After approximately 1 minute, PA BIAS (K700) and IPA BIAS (K708) relays should be energized; also their respective indicator lights should go off.

10. PA BIAS meter should read between 200 and 280 volts depending on setting of PA BIAS ADJ potentiometer.

11. IPA BIAS on meter M202 should indicate -70 to -90 volts depending on setting of IPA BIAS ADJ potentiometer R2009.

12. Check bias voltage at 4CX5000A tube socket (-200 to -280 volts).

(g) INTERLOCK SYSTEM.

1. Engage the following interlocks: S901, S1006, S1007, S1008, S1009, S1010, and S1011.

2. Set TIME DELAY relay to 5 minutes.

3. Turn on MAIN POWER circuit breaker; after 5 minutes high voltage shorting relay should be activated.

4. Set INTERLOCK switch to NORMAL position; interlock indicator should be on.

5. Set INTERLOCK switch to TIMER; interlock indicator should be on.

6. Remove TIME DELAY fuse; INTERLOCK indicator should go off and high voltage shorting relay should deactivate.

7. Check out the performance of the interlock systems by opening the following interlock switches successively:

NOTE

The PA(10K)'s TUNE OPERATE switch must be in the TUNE position for all of the following tests.

Relay deck (S1011)

High voltage deck (S1010)

Right side (S1008)

PA bandswitch (S901)

PA deck switch (S1007)

PA air switch (S800)

Rear door (S1006)

External

IPA air switch (S206)

IPA bandswitch (S205)

8. Turn OUTPUT LOADING mode switch S903 to OPERATE. The IPA's interlock system must be inoperative.

9. Set OUTPUT LOADING mode switch S903 to EMERGENCY, the PA(10K)'s interlock system should become operative.

(h) HIGH VOLTAGE TEST.

1. Allow PA(10K) to warm up for 30 minutes.

2. Turn OUTPUT LOADING mode switch S903 to TUNE.

3. Remove PA(10K) final tube (4CX5000A).

4. Turn HIGH VOLTAGE circuit breaker to on.

5. Set PA SCREEN ON/OFF switch to on.

6. Set TUNE OPERATE switch to OPERATE.

7. PA SCREEN voltmeter should indicate 1100 to 1250 volts.

8. PA PLATE voltmeter should indicate 6.5 to 7.5 kv.

9. MULTIMETER should indicate +400 volts on IPA E_S.

10. MULTIMETER should indicate 3 kv on IPA Eg.

11. Set TUNE OPERATE switch to TUNE.

12. PA SCREEN voltmeter should read 600 volts.

13. Turn off PA(10K)'s MAIN POWER and HIGH VOLTAGE circuit breakers.

14. Insert PA(10K)'s final tube (4CX5000A) into socket.

15. Close tube compartment.

(i) PARASITIC CHECK.

1. Set RFB's DRIVER BAND switch to 4-6 mc.

2. Set SBE's drive to minimum.

3. Set PA(10K)'s MAIN POWER circuit breaker to ON and allow a 5-minute warmup.

4. Set PA(10K)'s HIGH VOLTAGE circuit breaker to ON.

5. Rotate PA(10K)'s PA TUNE capacitor from minimum to maximum and check for any sudden rise in PA PLATE RF current which would indicate a parasitic oscillation.

6. The test procedure as explained above should be repeated on the following RFB's DRIVER BAND switch positions:

6-8 mc

8-11 mc

11-15 mc

15-19 mc

19-24 mc

24-28 mc

7. Turn off PA(10K)'s HIGH VOLTAGE circuit breaker.

(j) RF OUTPUT TUNING.

1. Turn OUTPUT LOADING mode switch S903 to TUNE; this terminates the PA(10K)'s output with 50 ohms, 3000 watts.

2. Set the following controls for 4 mc per PA(10K)'s standard unbalanced tuning chart:

IPA TUNING:
IPA LOADING:
PA TUNE:
PA LOAD:
BAND SW:
VOX:
IPA BAND:
DRIVER BAND:

Refer to table 3-3 in Part II Volume I.

3. Turn MCP's ANALYZER MONITOR to IPA.

4. Turn MCP's VOX RF OUTPUT switch to FSA.

5. Turn RFB's MULTIMETER switch to IPA, Eg (RF).

6. Advance SBE's OUTPUT control conservatively for 4-mc peak on SBE's multimeter.

7. Momentarily turn OUTPUT of SBE to 0.

8. Set PA SCREEN ON/OFF to ON and TUNE OPERATE to OPERATE.

9. Turn on HIGH VOLTAGE circuit breaker.

10. Adjust PA PLATE CURRENT for 0.5 amp with PA BIAS ADJ potentiometer if necessary.

11. Set TUNE OPERATE control to TUNE.

12. Advance SBE's OUTPUT control until IPA PLATE rises to approximately 300 ma; then dip and load the SBE conservatively.

13. Return SBE's OUTPUT to 0; set TUNE OPERATE control to OPERATE.

14. Advance SBE's OUTPUT control until PA PLATE CURRENT rises to approximately 1 amp; then dip and load until output meter indicates 5 amps.

15. Third order distortion should be down 40 db or more; fifth order distortion should be down more than third order distortion. Otherwise, retune and reload to obtain these objectives. Minor control adjustments should only be necessary.

16. PA(10K)'s tuning and loading should be accomplished well within the following limiting values; when exceeded, the PA(10K)'s protective relay system should be adjusted to shut down the PA(10K) without delay.

IPA screen, 30 ma

IPA plate, 600 ma

PA screen, 60 ma

PA plate, 2 amps

17. Upon completion of the above tests, the PA(10K) unit can be mated to the PA(40K) unit.

(5) PA(40K) TEST PROCEDURE.

(a) ELECTRICAL AND MECHANICAL INSPECTION.

WARNING

No power on PA(40K).

1. Check all three 230-volt input phases for grounds.

2. Check, with voltohmmeter from plate of ML-6697 to B- (high voltage shorting relay activated without power) for approximately 180K ohms.

3. Check that all connections in the PA(40K)'s power supply frame are tight because normal heavy currents can cause arcing if there are loose connections.

4. Check that all hardware in the PA(40K)'s deck are free of burrs in order to avoid arcing.

5. Check that all RF connections are tight to avoid arcing.

6. Check that all wiring is free from imperfections.

7. Check that there are no loose knobs, indicators, fuse holders, switches, or handles.

8. Check that with the PA TUNE and PA LOAD capacitors completely open their respective counters read 000.

9. Check that PA BAND SW counter corresponds to the PA proper bandswitch position.

10. Check that the counter for the BALANCE capacitor reads 000 when the capacitor is at minimum capacitance.

11. Check that the antenna tuning unit and meter panel drawer, BAND MCS switch counter corresponds to the proper position on the bandswitch.

(b) CONTROL CIRCUITS CHECK.

1. Set PA(40K)'s FINAL FILAMENT to ON.

2. Set PA(40K)'s BLOWER to ON.

3. Set PA(10K)'s MAIN POWER to ON.

4. Turn PA(10K)'s OUTPUT LOADING switch to OPERATE.

5. PA(10K)'s AC POWER light should go on.

6. PA(10K)'s meters go on in PA and power supply frame.

7. Set PA(10K)'s FIL. ADJ. to 230 volts.

8. Set PA(40K)'s RESERVOIR FILAMENT switch to FILAMENT; the CROWBAR FILAMENT meter should read 6.3 volts.

9. Set the PA(40K)'s RESERVOIR FILAMENT switch to RESERVOIR and adjust reservoir voltage to the right voltage.

NOTE

The reservoir voltage setting is stamped on the bottom of the thyratron.

10. Turn GPT-10K's OUTPUT LOADING switch to TUNE position; the TUNE light on the PA(40K) frame should go on and OPERATE light should go off.

11. Turn PA(10K)'s OUTPUT LOADING switch to OPERATE.

12. Check that PA(40K)'s BAND SWITCH RELEASE and associated detent operates when BAND SWITCH RELEASE is depressed. Check that band switch release turns only when BAND SWITCH RELEASE pushbutton is depressed.

13. Operate HV BREAKER RESET switch; note that motorized circuit breaker switch operates when reset pushbutton is depressed.

14. Trip the PLATE OVLD relay by hand and note return to normal when OVERLOAD RESET pushbutton is depressed.

15. Operate PA light switch and observe that the PA(40K)'s compartment goes on as required.

16. Check direction of PA(40K)'s blower; if incorrect, reverse two phases in blower contactor box; proper direction of blower rotation is counterclockwise (facing belt).

17. Remove BLOWER CONTACTOR fuse on relay panel; PA(40K)'s blower must cease to run.

18. Check PA(40K)'s top exhaust fan for direction of rotation (clockwise); remove top fan fuse F8101 on relay panel; the fan must stop.

19. Adjust BIAS ADJ potentiometer supply so that the GRID VOLTS meter indicates 600 volts.

20. With high voltage off, measure bias voltage and filament voltage of final tube with a volt-ohmmeter; bias, +600 volts DC; filament, 13 volts AC.

21. Successively open the following interlocks and observe that the high voltage shorting relay (deadman) operates (is deenergized):

TIMER - remove TIME DELAY fuse

Open rear door (power supply frame)

Pull out antenna tuning unit and meter panel drawer

Crowbar drawer

High voltage rectifier drawer

Bandswitch

Air switch

Rear door PA deck

External

NOTE

The external can be checked by turning the GPT-10K OUTPUT LOADING switch to TUNE or EMERGENCY; this should make the GPT-40K interlock system inoperative.

22. Turn off BLOWER switch. Observe that this removes FILAMENT PRIMARY voltage and the FINAL FILAMENT pilot light should go on.

23. Removing of LIGHTS fuse in control panel in power supply frame should make all lights in the power amplifier and power supply panel go off.

24. Removing of INTERLOCK fuse should make interlock system inoperative.

25. Remove BREAKER MOTOR fuse; this should make the motor breaker inoperative.

26. Check to see that all rectifiers are on (receiving filament voltage).

27. Make interlock circuit operative by closing all interlock switches and checking that the TIME DELAY fuse has been replaced. (Refer to above.)

CAUTION

Remove input phases to high voltage transformers.

28. Turn on HV BREAKER RESET switch. High voltage shorting relay should operate (be energized); also, as a result, the high voltage contactors. Now open every interlock one at a time; this should deenergize the high voltage contactors.

29. Reset all interlocks. Leave input phases to high voltage transformer disconnected.

30. Successively trip the following relays.

PLATE OVLD

GRID OVLD

RETUNE

SWR

BIAS

DRIVER INTERLOCK

FINAL FILAMENT

CROWBAR

This should operate (deenergize) the high voltage contactors.

31. After all relays are reset, turn HV BREAKER RESET switch off.

32. With a voltohmmeter, measure bias voltage from filament to ground; this must be +600 volts DC; if not, adjust BIAS ADJ potentiometer so GRID VOLTS meter indicates 600 volts DC.

33. Measure filament voltage; this should be 13 ±1.5 volts AC; FIL ADJ tap switch must correspond to input line voltage.

34. Secure all connections on final tube and close up the compartment.

(c) POWER SUPPLY CHECK.

1. Remove high voltage lead from power supply to PA(40K) section. This lead is the 12-kv lead from B+ to B- (L7306).

2. Reconnect input phases to high voltage transformers.

3. Connect resistive load capable of draining 1.5 amps from the B+ to the B- output terminals of power supply. At 12 kv this load must dissipate 18,000 watts; its resistance, therefore, must be 8000 ohms.

4. After a 20-minute warmup for rectifiers, turn on HIGH VOLTAGE circuit breaker and leave on for 10 minutes.

5. Turn off HIGH VOLTAGE circuit breaker and reconnect high voltage lead from power supply to PA(40K) section.

6. Turn on HIGH VOLTAGE circuit breaker.

7. Adjust BIAS ADJ for 1.5 amps of quiescent plate current.

8. Plate voltmeter should indicate 11 ±1.5 kv.

9. Raise quiescent current to 3 amps and adjust TUBE PROTECT relay to trip high voltage off.

CAUTION

Do not leave PA(40K) in the above condition for more than 10 seconds.

10. Adjust BIAS ADJ for 1.5 amps DC residual plate current.

11. Turn high voltage off.

(6) GPT-40K DISTORTION CHECK.

(a) Place GPT-10K to TUNE (OUTPUT LOADING switch in TUNE position).

(b) Tune transmitter to one of the test frequencies.

(c) Load transmitter to 5 amps. For details, see Section 3, Part II, Volume I, of GPT-40K instruction book.

(d) Set SBE's drive to zero.

(e) Set GPT-10K to OPERATE (OUTPUT LOADING mode switch in OPERATE position).

CAUTION

In the process of tuning the GPT-40K, care must be taken not to over dissipate the final tube with excessive plate current and no RF output. For details, see Part IV, Section 3.

(f) Set final amplifier controls to correspond to the tuning chart provided with the test procedure. (Refer to table 4-6-1 in this section.)

(g) Turn on HIGH VOLTAGE circuit breaker.

(h) Raise plate current to 2.3 amps.

(i) Tune to resonance and load to required output. For details, refer to Part IV, Section 3.

(j) Check third order distortion to TMC specifications. (Refer to table 1-3 in Part I.)

(k) Check all test frequencies on balanced and unbalanced outputs.

(7) PROTECTIVE CIRCUIT ADJUSTMENTS.

(a) PLATE OVLD ADJ: Adjust relay to trip at 5.0 amps.

(b) GRID OVLD ADJ: Adjust relay to trip at 200 ma.

(c) RETUNE OVLD ADJUST: This relay works in conjunction with the tube protect relay. Adjust the retune overload relay so that, when the transmitter is properly tuned and there's sufficient plate RF volts, the relay is deenergized. By removing the plate RF volts the transmitter should become inoperative.

To obtain this result, remove high voltage; remove BIAS fuse; connect milliammeter in series with retune relay overload coil; mechanically energize TUBE PROTECT relay; adjust R7522 in bias supply for 1-1/2 ma; replace BIAS fuse. Meter must read 11 ±1.5 ma.

(d) SWR OVLD ADJUST: Set SWR adjustment to midposition. This overload is safety factor that can only be checked by continuity. Connect milliammeter in series with SWR overload relay and adjust R7526 for 1-1/2 ma.

(8) INTERLOCK CONTROL CIRCUITS.

(a) Leave transmitter high voltage on.

(b) Turn off final amplifier high voltage.

(c) GPT-10K high voltage should go off.

(d) Place DRIVER INTERLOCKS switch to OFF position.

(e) Due to the final plate high heat dissipation, the final blower is automatically left on after main power is removed. The time left on is determined by the blower delay which can be set from 0 to 5 minutes. This should be set for 5 minutes to cool final tube after main power is removed. If the above conditions are met, check off test sheet and sign.

TABLE 4–6–1. TYPICAL GPT–40K TUNING AND LOADING PARAMETERS

			BALANCED OUTPUT						UNBALANCED OUTPUT		
					40 kw						
FMO	Ant. Band	Final Band	Tune	Load	Il	I2	% Unbal.	Balance Output	Tune	Load	Load Cur Amps
4	4-14	4-5	541	774	5.7*	5.7*	0	138	335	712	20**
5	4-14	4-5	298	422	5.7*	5.7*	0	122	236	812	20**
5	4-14	5-6	577	645	*	*	0	122	068	145	20**
6	4-15	5-6	311	497	*	*	0	117	012	052	20**
6	4-15	6-8	534	678	*	*	0	117	222	581	20**
8	4-15	6-8	167	363	*	*	0	165	332	672	20**
8	4-15	8-11	271	809	*	*	0	165	586	809	20**
11	4-15	8-11	030	385	*	*	0	117	137	268	20**
11	4-15	11-15	313	720	*	*	0	117	367	641	20**
15	15-20	11-15	137	322	*	*	0	170	166	294	20**
15	15-20	15-19	295	442	*	*	0	170	318	417	20**
19	15-20	15-19	171	242	*	*	0	132	185	242	20**
19	15-20	19-24	228	313	*	*	0	132	340	300	20**
24	20-28	19-24	239	195	*	*	0	134	214	184	20**
24	20-28	24-28	225	231	*	*	0	134	272	200	20**
28	20-28	24-28	196	162	*	*	0	124	194	151	20**

*For 40 kw PEP 5.7 amps of current through 600-ohm load.
**For 40 kw PEP 20 amps of current through 50-ohm load.

DC Residual plate current 2 amps

SECTION 7

SCHEMATIC AND CABLING DIAGRAMS

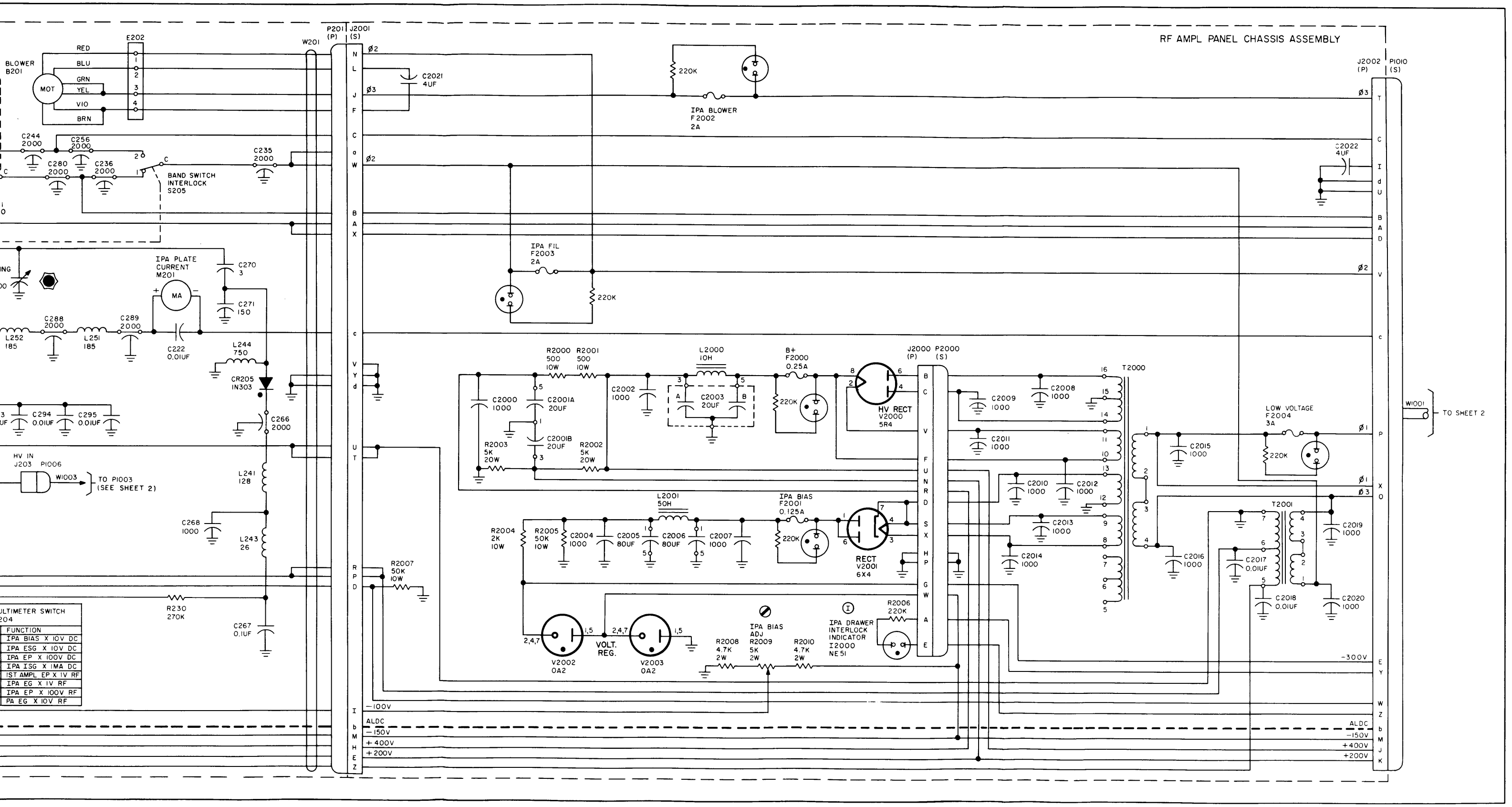
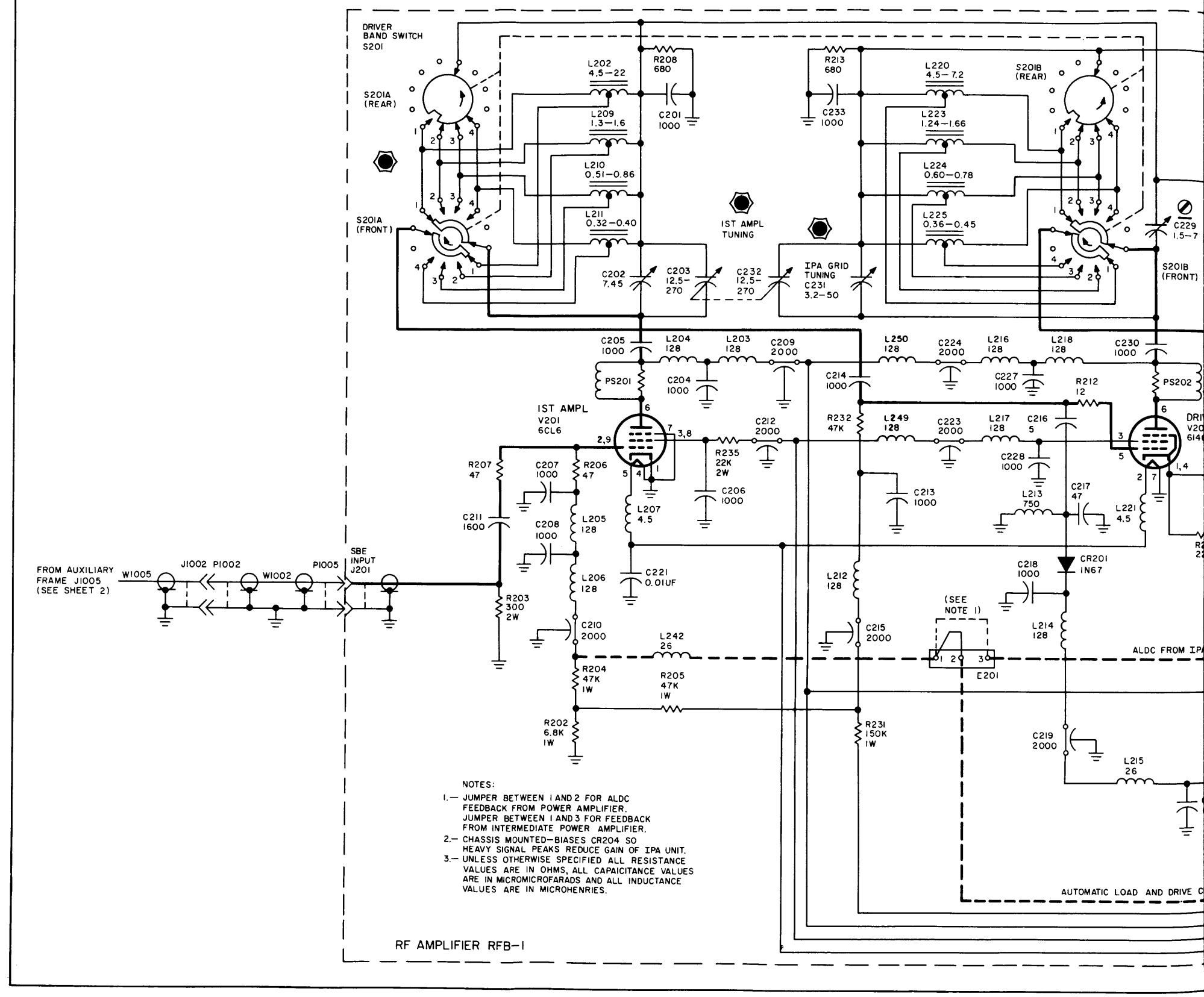


Figure 4-7-1. Schematic Diagram, GPT-40K (Sheet 1 of 5)

MULTIMETER SWITCH S204	
POS	FUNCTION
1	IPA BIAS X 10V DC
2	IPA ESG X 10V DC
3	IPA EP X 100V DC
4	IPA ISG X 1MA DC
5	1ST AMPL EP X 1V RF
6	IPA EG X 1V RF
7	IPA EP X 100V RF
8	PA EG X 10V RF

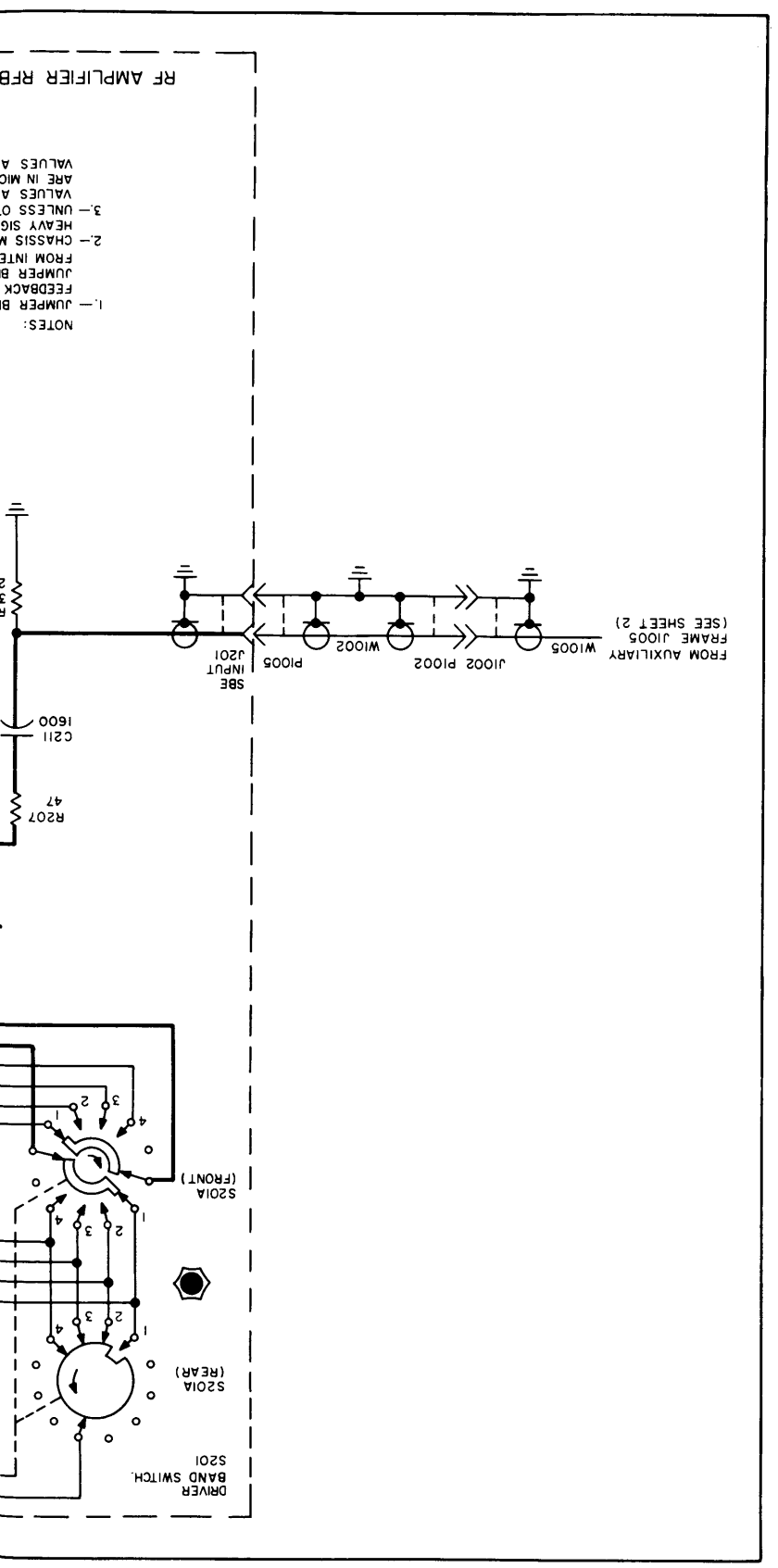
IPA BAND SWITCH S202	
POS	FUNCTION
1	4–6 MC
2	6–8 MC
3	8–12 MC
4	12–16 MC
5	16–20 MC
6	20–28 MC

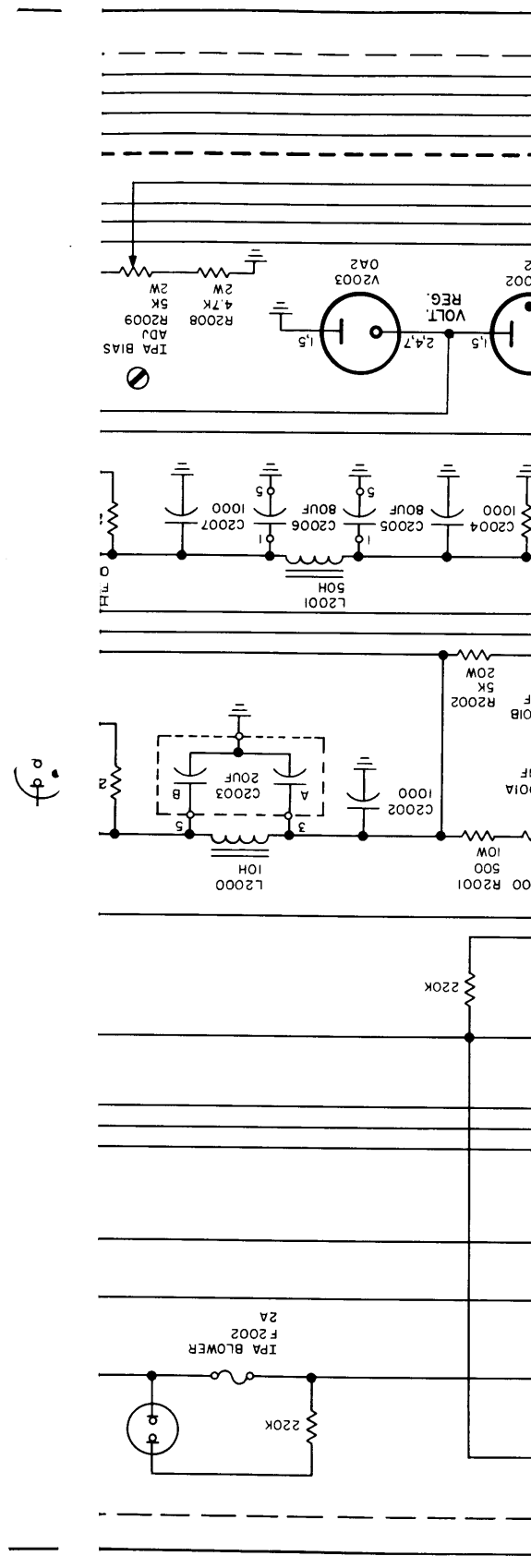
DRIVER BAND SWITCH S201	
POS	FUNCTION
1	4–8 MC
2	8–16 MC
3	16–20 MC
4	20–28 MC


DRIVER BAND SWITCH S201
S201A (REAR)
S201A (FRONT)
S201B (REAR)
S201B (FRONT)
L202 4.5–22
L209 1.3–1.6
L210 0.51–0.86
L211 0.32–0.40
R208 680
C201 1000
C202 7.45
C203 12.5–270
IST AMPL TUNING
C232 12.5–270
IPA GRID TUNING C231 3.2–50
R213 680
C233 1000
L220 4.5–7.2
L223 1.24–1.66
L224 0.60–0.78
L225 0.36–0.45
C229 1.5–7
C205 1000
L204 128
L203 128
C209 2000
PS201
C204 1000
IST AMPL V201 6CL6
R207 47
C207 1000
R206 47
C211 1600
C208 1000
L205 128
L207 4.5
C206 1000
R235 22K 2W
L206 128
C221 0.01UF
R203 300 2W
C210 2000
L242 25
R204 47K 1W
R205 47K 1W
R202 6.8K 1W
L250 128
C224 2000
L216 128
L218 128
C230 1000
C214 1000
C227 1000
R212 12
PS202
R232 47K
L249 128
C223 2000
L217 128
C216 5
C228 1000
L213 750
C217 47
L221 4.5
C213 1000
CR201 1N67
C218 1000
L212 128
C215 2000
(SEE NOTE 1)
L214 128
L201
R231 150K 1W
C219 2000
L215 26
ALDC FROM IPA
AUTOMATIC LOAD AND DRIVE C
FROM AUXILIARY FRAME J1005 (SEE SHEET 2)
W1005
J1002 P1002
W1002
P1005
SBE INPUT J201
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 CAPAICITANCE VALUES ARE IN MICROMICROFARADS AND ALL INDUCTANCE VALUES ARE IN MICROHENRIES.
RF AMPLIFIER RFB–1

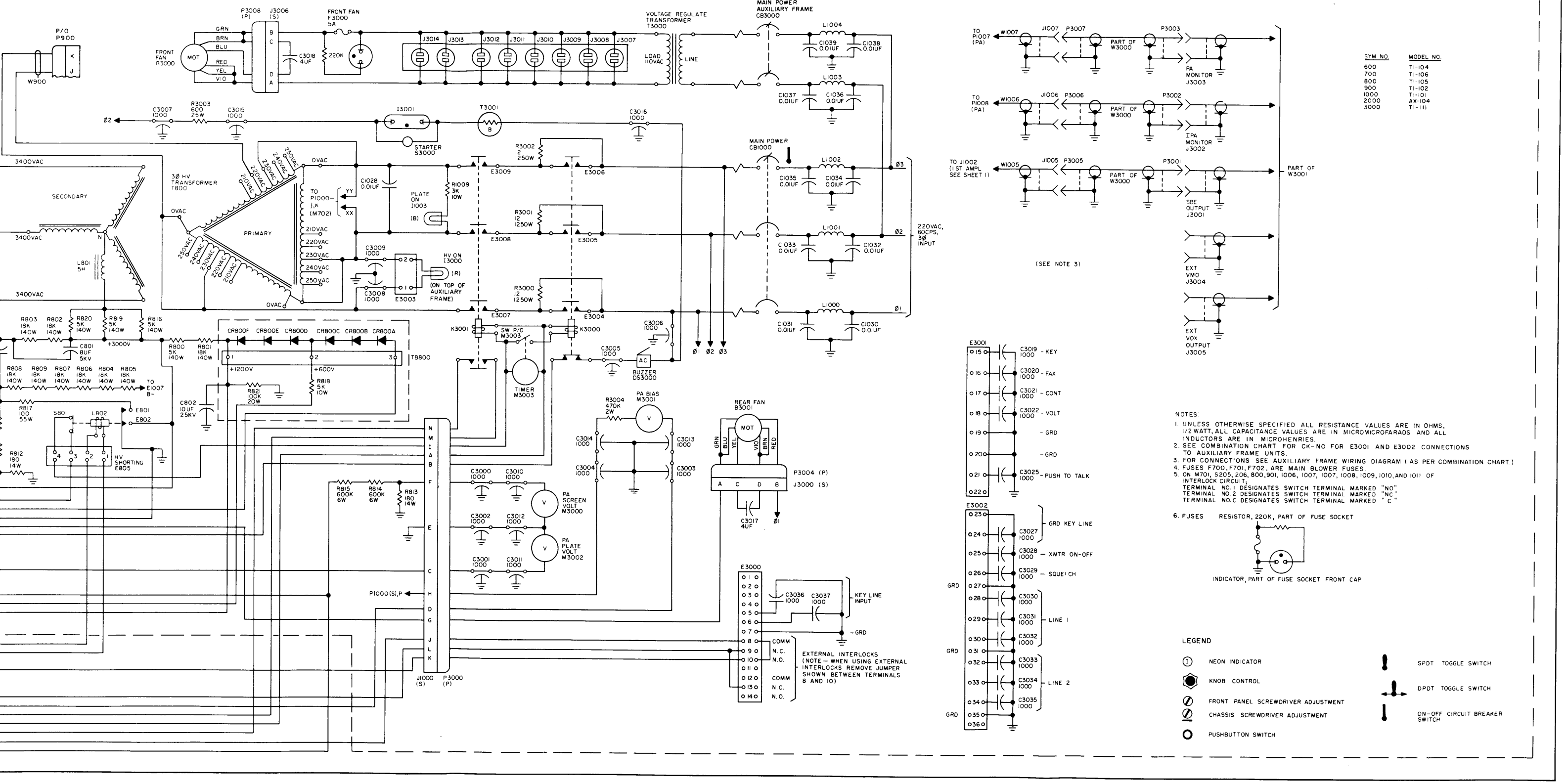
CK415

CK415


RF AMPLIFIER RFB
NOTES:
1— JUMPER B
FEEDBACK
JUMPER B
FROM INTE
2— CHASSIS M
HEAVY SIG
3— UNLESS OT
VALUES A
ARE IN MIC
VALUES A
FROM AUXILIARY
FRAME J1005
(SEE SHEET 2)
W1005
J1002 P1002
W1002
P1005
SBE
INPUT
J201
R207
47
C211
1600
S201A
(FRONT)
S201A
(REAR)
DRIVER
BAND SWITCH.
S201


IPA BIAS
ADJ
R2008
5K
2W
R2009
4.7K
2W
V2003
0A2
VOLT.
REG.
1,5
24,7
1,5
C2004
1000
C2005
80UF
C2006
C2007
1000
L2001
50H
R2002
5K
20W
C2002
1000
C2003
20UF
A
B
L2000
10H
R2001
500
10W
220K
IPA BLOWER
F2002
2A
220K

N POWER SUPPLY



SYM NO.	MODEL NO.
600	TI-104
700	TI-106
800	TI-105
900	TI-102
1000	TI-101
2000	AX-104
3000	TI-111

NOTES:

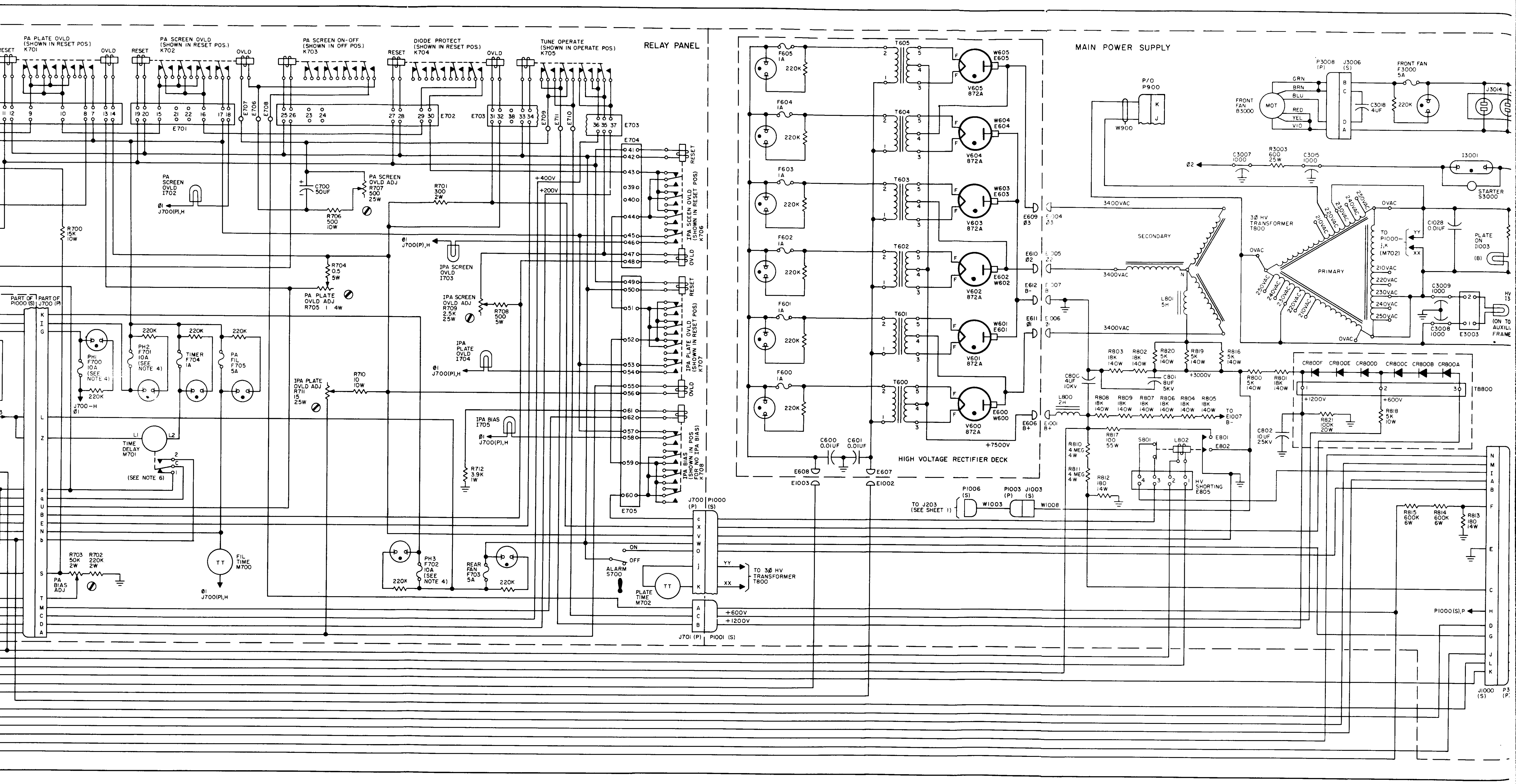
1. UNLESS OTHERWISE SPECIFIED ALL RESISTANCE VALUES ARE IN OHMS, 1/2 WATT, ALL CAPACITANCE VALUES ARE IN MICROMICROFARADS AND ALL INDUCTORS ARE IN MICROHENRIES.
2. SEE COMBINATION CHART FOR CK-NO FOR E3001 AND E3002 CONNECTIONS TO AUXILIARY FRAME UNITS.
3. FOR CONNECTIONS SEE AUXILIARY FRAME WIRING DIAGRAM (AS PER COMBINATION CHART)
4. FUSES F700, F701, F702, ARE MAIN BLOWER FUSES.
5. ON M701, S205, 206, 800, 901, 1006, 1007, 1007, 1008, 1009, 1010, AND 1011 OF INTERLOCK CIRCUIT;
   TERMINAL NO. 1 DESIGNATES SWITCH TERMINAL MARKED "NO"
   TERMINAL NO. 2 DESIGNATES SWITCH TERMINAL MARKED "NC"
   TERMINAL NO. C DESIGNATES SWITCH TERMINAL MARKED "C"
6. FUSES RESISTOR, 220K, PART OF FUSE SOCKET

INDICATOR, PART OF FUSE SOCKET FRONT CAP

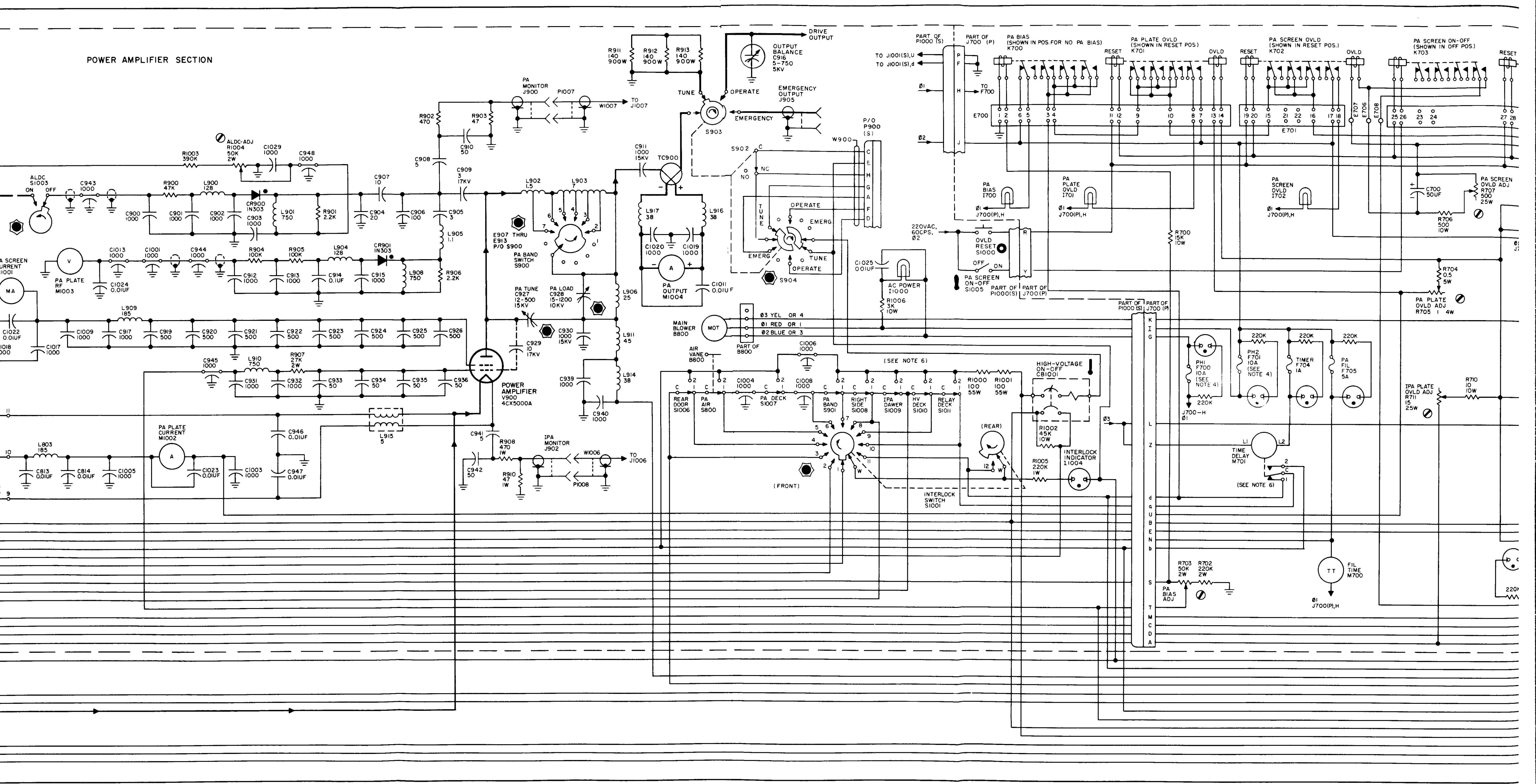
LEGEND

- NEON INDICATOR
- KNOB CONTROL
- FRONT PANEL SCREWDRIVER ADJUSTMENT
- CHASSIS SCREWDRIVER ADJUSTMENT
- PUSHBUTTON SWITCH
- SPDT TOGGLE SWITCH
- DPDT TOGGLE SWITCH
- ON-OFF CIRCUIT BREAKER SWITCH

Figure 4-7-1. Schematic Diagram, GPT-40K (Sheet 2 of 5)

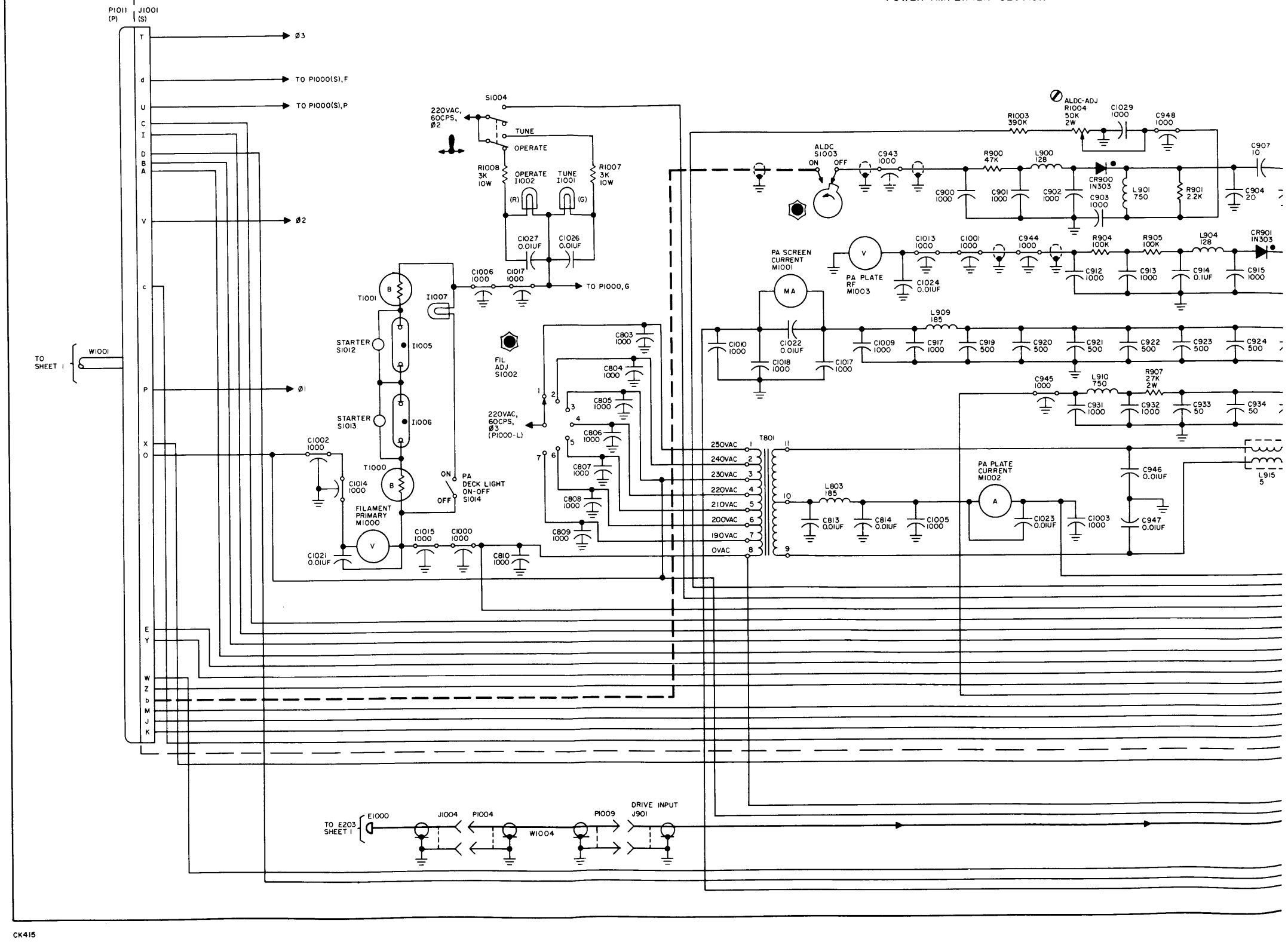


MAIN POWER SUPPLY
HIGH VOLTAGE RECTIFIER DECK
RELAY PANEL
J3014
I3001
STARTER S3000
PLATE ON I1003 (B)
HV I3 (ON TO AUXILI. FRAME)
E3003
C1028 0.01UF
C3009 1000
C3008 1000
FRONT FAN F3000 5A
220K
C3018 4UF
J3006 (S)
P3008 (P)
GRN BRN BLU RED YEL VIO
MOT
FRONT FAN B3000
C3015 1000
R3003 600 25W
C3007 1000
Ø2
TO P1000-J,K (M702)
YY XX
0VAC 210VAC 220VAC 230VAC 240VAC 250VAC
PRIMARY
3Ø HV TRANSFORMER T800
SECONDARY
L801 5H
3400VAC
P/O P900
W900
TB800
CR800A CR800B CR800C CR800D CR800E CR800F
+600V +1200V
R818 5K 10W
R821 100K 20W
R801 18K 140W
R800 5K 140W
C802 10UF 25KV
R816 5K 140W
R819 5K 140W
R820 5K 140W
+3000V
C801 8UF 5KV
R802 18K 140W
R803 18K 140W
R805 18K 140W
R804 18K 140W
R806 18K 140W
R807 18K 140W
R809 18K 140W
R808 18K 140W
C800 4UF 10KV
L800 2H
TO E1007 B-
E801 E802
L802
S801
HV SHORTING E805
R817 100 55W
R810 4 MEG 4W
R811 4 MEG 4W
R812 180 14W
E1004 Ø3
E1005 Ø2
E1007 B
E1006 Ø1
E1001 B+
J1000 (S)
P3 (P)
R813 180 14W
R814 600K 6W
R815 600K 6W
P1000(S),P
E609 Ø3
E610 Ø2
E612 B-
E611 Ø1
E606 B+
W605 E605 V605 872A
W604 E604 V604 872A
W603 E603 V603 872A
E602 W602 V602 872A
W601 E601 V601 872A
E600 W600 V600 872A
+7500V
T605 T604 T603 T602 T601 T600
F605 1A
F604 1A
F603 1A
F602 1A
F601 1A
F600 1A
C600 0.01UF
C601 0.01UF
E607 E1002
E608 E1003
W1008
P1003 (P) J1003 (S)
W1003
P1006 (S)
TO J203 (SEE SHEET 1)
TO 3Ø HV TRANSFORMER T800
J700 (P) P1000 (S)
J701 (P) P1001 (S)
RESET
IPA SCEEN OVLD (SHOWN IN RESET POS) K706
OVLD
IPA PLATE OVLD (SHOWN IN RESET POS) K707
IPA BIAS (SHOWN IN POS FOR NO IPA BIAS) K708
E703 E704 E705
ON OFF ALARM S700
PLATE TIME M702
TUNE OPERATE (SHOWN IN OPERATE POS) K705
E710 E711 E709
+400V +200V
DIODE PROTECT (SHOWN IN RESET POS) K704
E702
R701 300 2W
IPA SCREEN OVLD I703
IPA SCREEN OVLD ADJ R709 2.5K 25W
R708 500 5W
IPA PLATE OVLD I704
IPA BIAS I705
Ø1 J700(P),H
R712 3.9K 1W
REAR FAN F703 5A
PH3 F702 10A (SEE NOTE 4)
PA SCREEN ON-OFF (SHOWN IN OFF POS) K703
PA SCREEN OVLD ADJ R707 500 25W
R706 500 10W
C700 50UF
R704 0.5 5W
PA PLATE OVLD ADJ R705 1 4W
R710 10 10W
IPA PLATE OVLD ADJ R711 15 25W
E708 E706 E707
PA SCREEN OVLD (SHOWN IN RESET POS.) K702
E701
PA SCREEN OVLD I702
PA FIL F705 5A
TIMER F704 1A
PH2 F701 10A (SEE NOTE 4)
PH1 F700 10A (SEE NOTE 4)
J700-H Ø1
TIME DELAY M701
(SEE NOTE 6)
FIL TIME M700
PA PLATE OVLD (SHOWN IN RESET POS) K701
R700 15K 10W
PART OF P1000 (S)
PART OF J700 (P)
R702 220K 2W
R703 50K 2W
PA BIAS ADJ



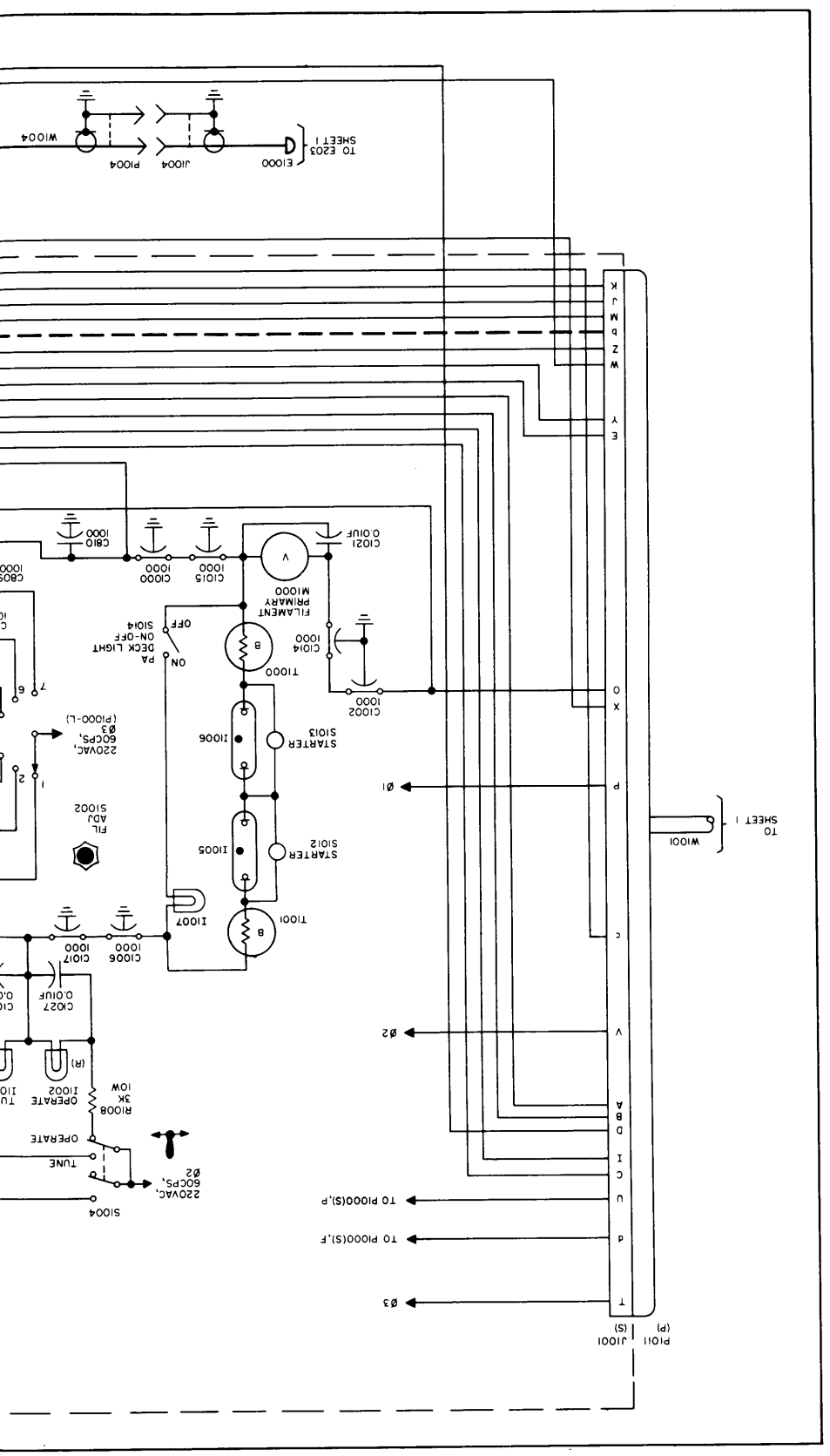
POWER AMPLIFIER SECTION
R911 140 900W
R912 140 900W
R913 140 900W
OUTPUT BALANCE C916 5-750 5KV
DRIVE OUTPUT
TUNE
OPERATE
EMERGENCY
EMERGENCY OUTPUT J905
S903
PA MONITOR J900
P1007
W1007
TO J1007
R902 470
R903 47
C910 50
C908 5
C909 3 17KV
C905 3
L905 1.1
R906 2.2K
C911 1000 15KV
TC900
L917 38
L916 38
C1020 1000
C1019 1000
PA OUTPUT M1004
C1011 0.01UF
S902
NC
NO
W900
P/O P900 (S)
OPERATE
EMERG
TUNE
S904
C1025 0.01UF
AC POWER I1000
R1006 3K 10W
220VAC, 60CPS, Ø2
OVLD RESET S1000
PA SCREEN ON-OFF S1005
PART OF P1000(S)
PART OF J700(P)
TO J1001(S),U
TO J1001(S),d
TO F700
E700
PA BIAS (SHOWN IN POS.FOR NO PA BIAS) K700
PA PLATE OVLD (SHOWN IN RESET POS) K701
PA SCREEN OVLD (SHOWN IN RESET POS.) K702
PA SCREEN ON-OFF (SHOWN IN OFF POS.) K703
RESET
OVLD
E701
E706
E707
E708
PA BIAS I700
PA PLATE OVLD I701
PA SCREEN OVLD I702
Ø1 J700(P),H
C700 50UF
R706 500 10W
PA SCREEN OVLD ADJ R707 500 25W
R700 15K 10W
R704 0.5 5W
PA PLATE OVLD ADJ R705 1 4W
ALDC S1003
ON
OFF
C943 1000
R1003 390K
ALDC-ADJ R1004 50K 2W
C1029 1000
C948 1000
R900 47K
L900 128
CR900 1N303
C903 1000
L901 750
R901 2.2K
C900 1000
C901 1000
C902 1000
C907 10
C904 20
C906 100
PA SCREEN CURRENT M1001
PA PLATE RF M1003
C1013 1000
C1001 1000
C944 1000
C1024 0.01UF
R904 100K
R905 100K
L904 128
CR901 1N303
C912 1000
C913 1000
C914 0.1UF
C915 1000
L908 750
L909 185
C1022 0.01UF
C1018 1000
C1017 1000
C1009 1000
C917 1000
C919 500
C920 500
C921 500
C922 500
C923 500
C924 500
C925 500
C926 500
C945 1000
L910 750
R907 27K 2W
C931 1000
C932 1000
C933 50
C934 50
C935 50
C936 50
L902 1.5
L903 7
E907 THRU E913 P/O S900
PA BAND SWITCH S900
PA TUNE C927 12-500 15KV
PA LOAD C928 15-1200 10KV
C930 1000 15KV
C929 10 17KV
L906 25
L911 45
L914 38
C939 1000
C940 1000
POWER AMPLIFIER V900 4CX5000A
L915 5
C946 0.01UF
C947 0.01UF
PA PLATE CURRENT M1002
C1023 0.01UF
C1003 1000
L803 185
C813 0.01UF
C814 0.01UF
C1005 1000
C941 5
C942 50
R908 470 1W
R910 47 1W
IPA MONITOR J902
W1006
P1008
TO J1006
MAIN BLOWER B800
MOT
PART OF B800
Ø3 YEL OR 4
Ø1 RED OR 1
Ø2 BLUE OR 3
AIR VANE B800
C1006 1000
(SEE NOTE 6)
REAR DOOR S1006
PA AIR S800
C1004 1000
PA DECK S1007
C1008 1000
PA BAND S901
RIGHT SIDE S1008
IPA DAWER S1009
HV DECK S1010
RELAY DECK S1011
R1000 100 55W
R1001 100 55W
HIGH-VOLTAGE ON-OFF CB1001
R1002 45K 10W
(REAR)
(FRONT)
INTERLOCK SWITCH S1001
R1005 220K 1W
INTERLOCK INDICATOR I1004
PART OF P1000 (S)
PART OF J700 (P)
PH1 F700 10A (SEE NOTE 4)
220K
J700-H Ø1
PH2 F701 10A (SEE NOTE 4)
TIMER F704 1A
PA FIL F705 5A
TIME DELAY M701
(SEE NOTE 6)
FIL TIME M700
Ø1 J700(P),H
R703 50K 2W
R702 220K 2W
PA BIAS ADJ
IPA PLATE OVLD ADJ R711 15 25W
R710 10 10W

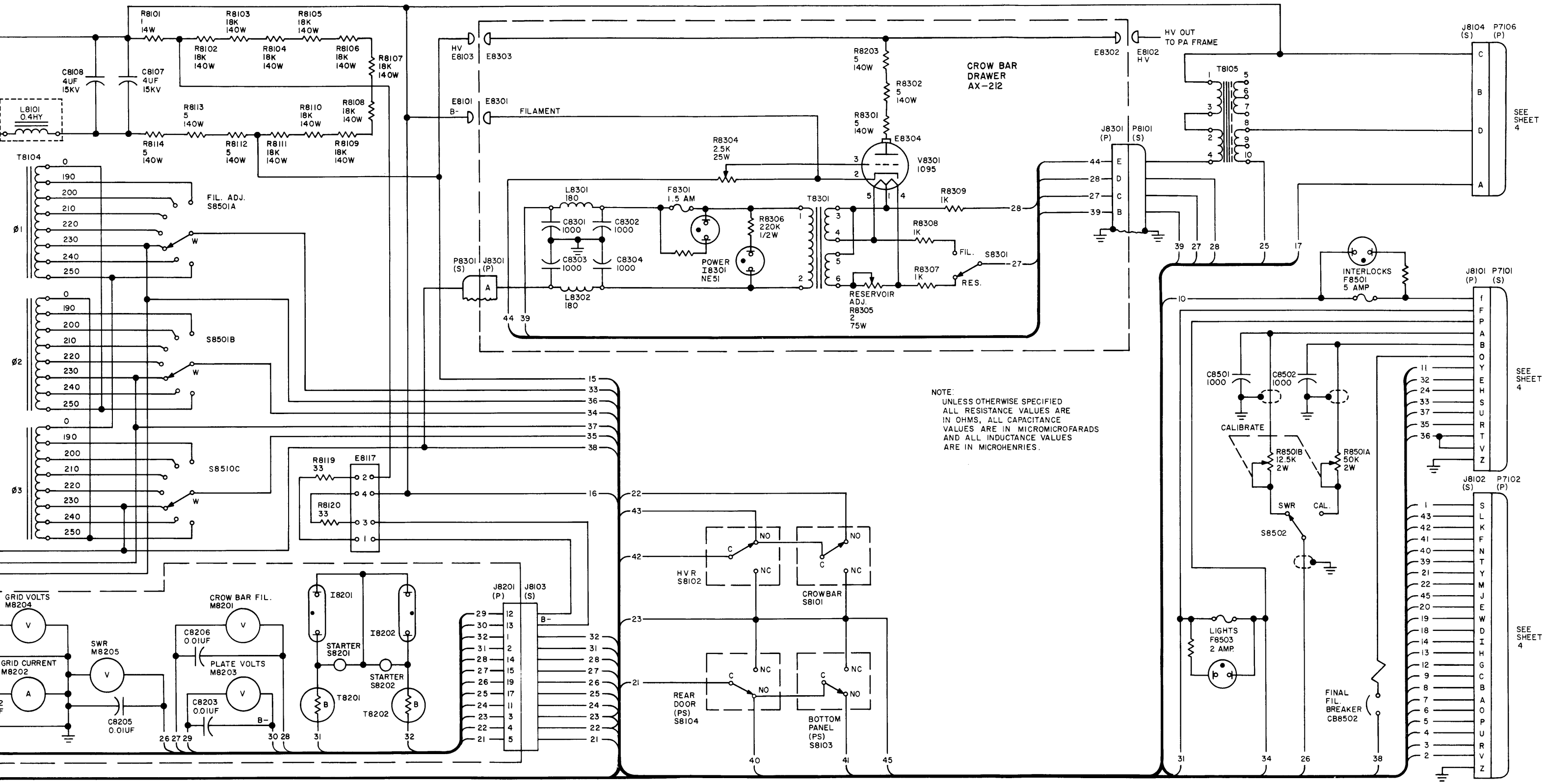
POWER AMPLIFIER SECTION



CK415

CK415


TO E203 SHEET 1
E1000
J1004
P1004
W1004
E
Y
W
Z
b
M
J
X
C1021 0.01UF
C810 1000
C1000 1000
C1015 1000
V
FILAMENT PRIMARY M1000
PA DECK LIGHT ON-OFF S1014
ON
OFF
B
T1000
C1014 1000
C1002 1000
O
X
P
C
V
D
B
A
I
C
U
d
T
TO P1000(S),P
TO P1000(S),F
Ø3
Ø2
Ø1
W1001
TO SHEET 1
P1011 (P)
J1001 (S)
S1004
220VAC, 60CPS, Ø2
TUNE
OPERATE
R1008 3K 10W
OPERATE T1002
C1027 0.01UF
C1017 1000
C1006 1000
T1001
I1007
FIL ADJ S1002
STARTER S1012
I1005
STARTER S1013
I1006
220VAC, 60CPS, Ø3 (P1000-L)
C810 1000
C1000 1000
C1015 1000
V
FILAMENT PRIMARY M1000
C1021 0.01UF



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

Figure 4-7-1. Schematic Diagram, GPT-40K (Sheet 3 of 5)

HV RECTIFIER AP-105

R8117 8 1900W

R8116 8 1900W

R8115 8 1900W

Ø3

Ø2

Ø1

T8101

T8103

T8102

0 190 208 230 250

E8111

E8110

E8109

HV AC E8420

HV AC E8419

HV AC E8418

E8411

E8410

E8409

E8408

E8407

V8406 6895

V8405 6895

V8404 6895

V8403 6895

V8402 6895

V8401 6895

E8406

E8405

E8404

E8403

E8402

E8401

T8406

T8405

T8404

T8403

T8402

T8401

F8406 1 AMP

F8405 1 AMP

F8404 1 AMP

F8403 1 AMP

F8402 1 AMP

F8401 1 AMP

E8413

E8417

E8416

E8415

E8414

L8401 180

L8402 180

L8403 180

C8401 1000

C8402 1000

C8403 1000

C8404 1000

C8405 1000

C8406 1000

E8104 B-

HV E8108

E8107 HVR FIL Ø3

E8106 HVR FIL Ø2

HVR. FIL. Ø1 E8105

L8101 0.4HY

C8108 4UF 15KV

C8107 4UF 15KV

R8101 1 14W

R8102 18K 140W

R8103 18K 140W

R8104 18K 140W

R8105 18K 140W

R8106 18K 140W

R8107 18K 140W

R8108 18K 140W

R8109 18K 140W

R8110 18K 140W

R8111 18K 140W

R8112 5 140W

R8113 5 140W

R8114 5 140W

T8104

0 190 200 210 220 230 240 250

Ø1 Ø2 Ø3

FIL. ADJ. S8501A

S8501B

S8510C

W

R8119 33

R8120 33

E8117

PS TOP FAN F8101 3 AMP

C8109 1UF

E8118 4 3 2 1

BR VI YE RD BL GRN

MOT

TOP FAN PS FRAME B8102

BREAKER MOTOR F8502 5 AMP

K8101

K8102

E8112 3 1 2

T

TIMER M8101

SHORTING RELAY

S8105

S8106

L8105

E8113

4 6 5 3 2 1

R8121 500 25W

HV WARNING I8101 RED

E8115 BAL. OUT E8116

PA OUTPUT E8114

FROM PA FRAME

E8203

E8201

E8202

L8201 30

C8207 1000 30KV

L8202 35

C8201 12-500 15KV

S8204 (SHOWN IN POS.1)

POS.	S8204
1	20-28 MC
2	14-20 MC
3	4-14 MC

ANTENNA TUNING UNIT AT-101

S8203 C NO NC

GRID VOLTS M8204

C8204 0.01UF

GRID CURRENT M8202

C8202 0.01UF

SWR M8205

C8205 0.01UF

CROW BAR FIL. M8201

C8206 0.01UF

PLATE VOLTS M8203

C8203 0.01UF

B-

I8201

STARTER S8201

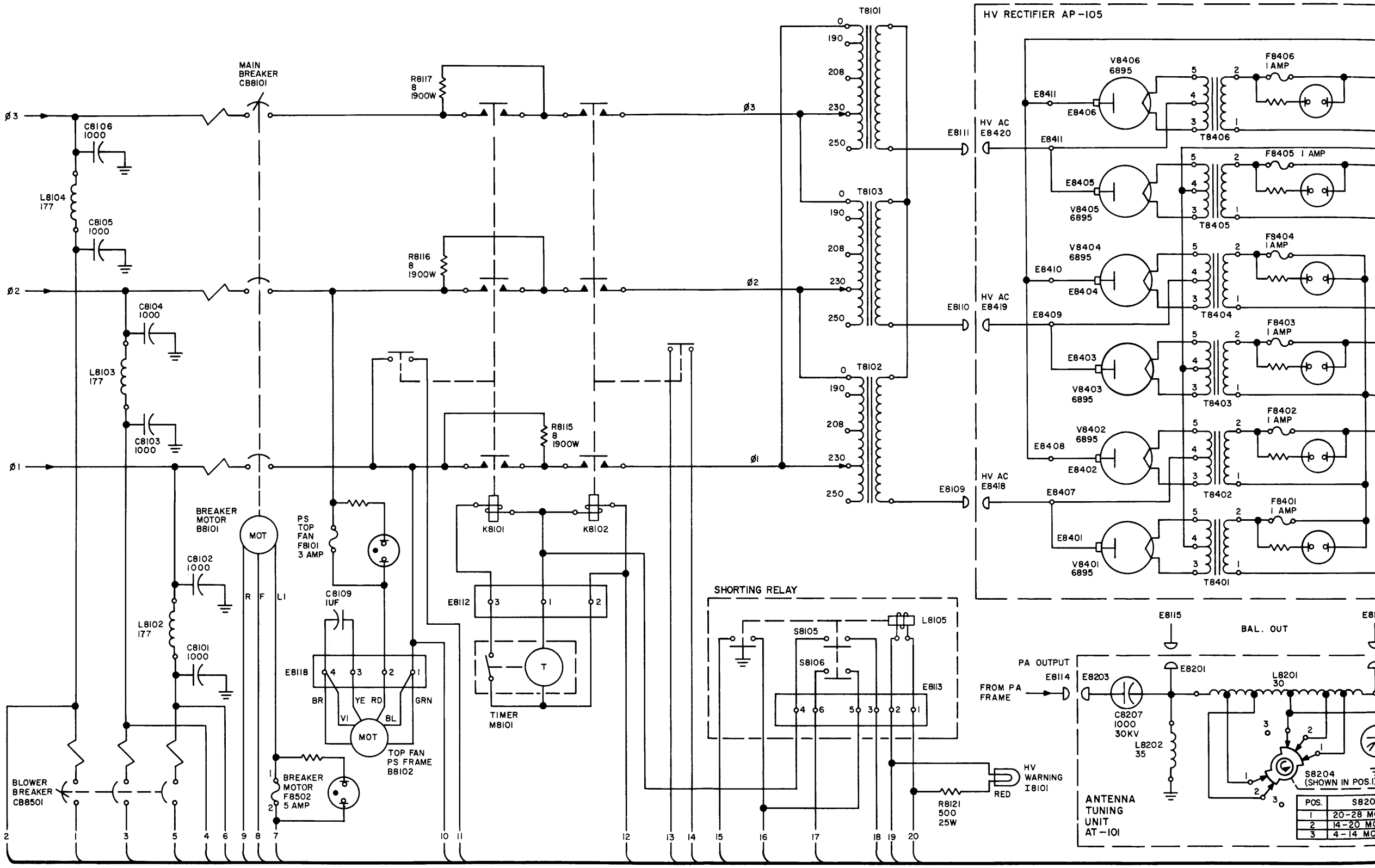
T8201

T8202

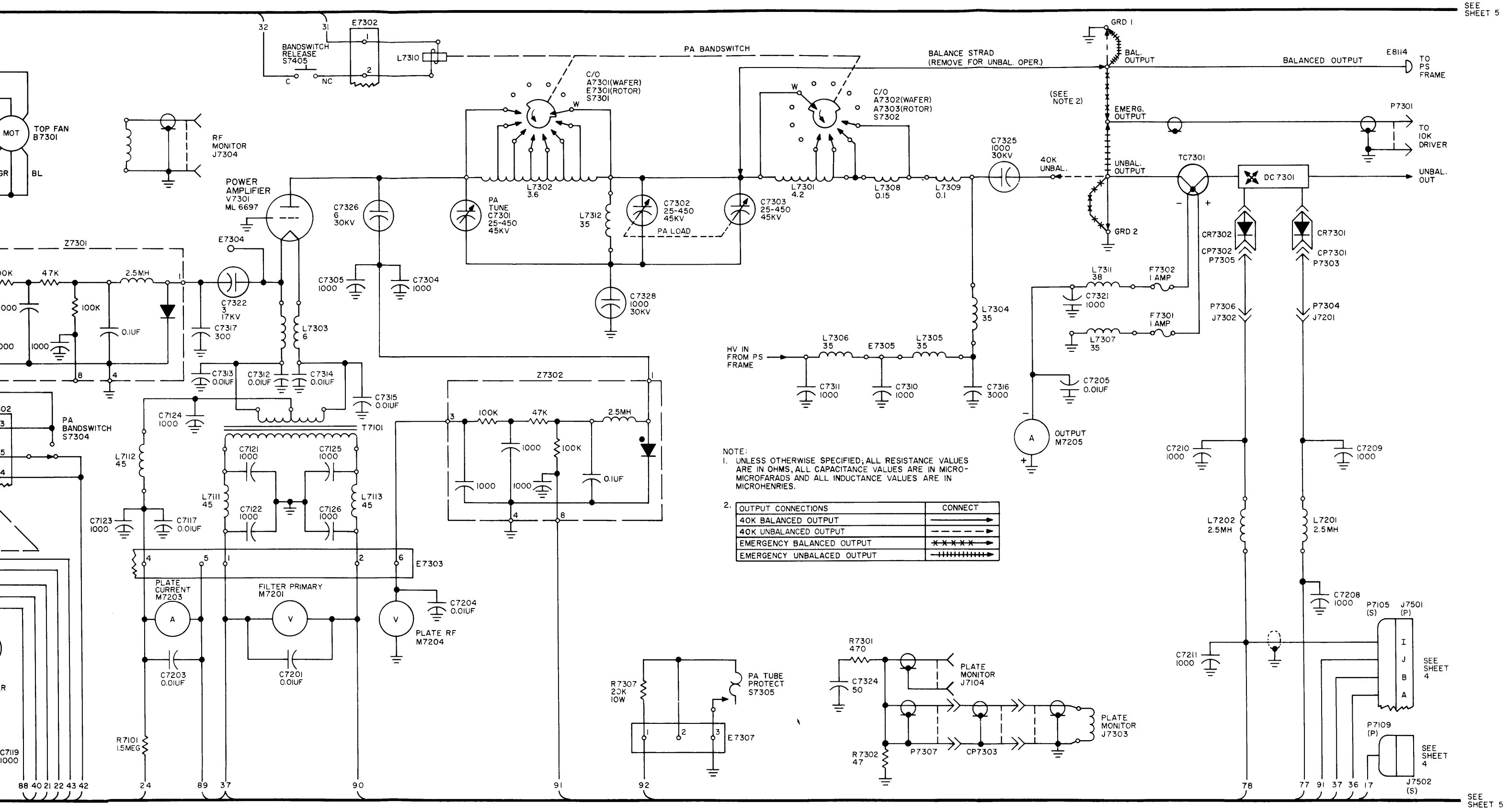
I8202

START S8202

10 11 12 13 14 15 16 17 18 19 20 21 23 24 25 22 26 27 29 30 28 31


HV RECTIFIER AP-105
MAIN BREAKER CB8101
Ø3
Ø2
Ø1
C8106 1000
L8104 177
C8105 1000
C8104 1000
L8103 177
C8103 1000
C8102 1000
L8102 177
C8101 1000
R8117 8 1900W
R8116 8 1900W
R8115 8 1900W
T8101
T8103
T8102
0
190
208
230
250
E8111
E8110
E8109
HV AC E8420
HV AC E8419
HV AC E8418
V8406 6895
V8405 6895
V8404 6895
V8403 6895
V8402 6895
V8401 6895
F8406 1 AMP
F8405 1 AMP
F8404 1 AMP
F8403 1 AMP
F8402 1 AMP
F8401 1 AMP
T8406
T8405
T8404
T8403
T8402
T8401
E8411
E8406
E8405
E8410
E8404
E8409
E8403
E8408
E8402
E8407
E8401
BREAKER MOTOR B8101
MOT
R F L1
PS TOP FAN F8101 3 AMP
C8109 1UF
E8118
BR YE RD GRN
VI BL
MOT
TOP FAN PS FRAME B8102
BREAKER MOTOR F8502 5 AMP
BLOWER BREAKER CB8501
K8101
K8102
E8112
T
TIMER M8101
SHORTING RELAY
S8105
S8106
L8105
E8113
R8121 500 25W
RED
HV WARNING I8101
E8115
BAL. OUT
PA OUTPUT E8114
FROM PA FRAME
E8203
E8201
C8207 1000 30KV
L8202 35
L8201 30
S8204 (SHOWN IN POS.1)
POS.
1 20-28 MC
2 14-20 MC
3 4-14 MC
ANTENNA TUNING UNIT AT-101
2 1 3 5 4 6 9 8 7 10 11 12 13 14 15 16 17 18 19 20

SEE SHEET 5

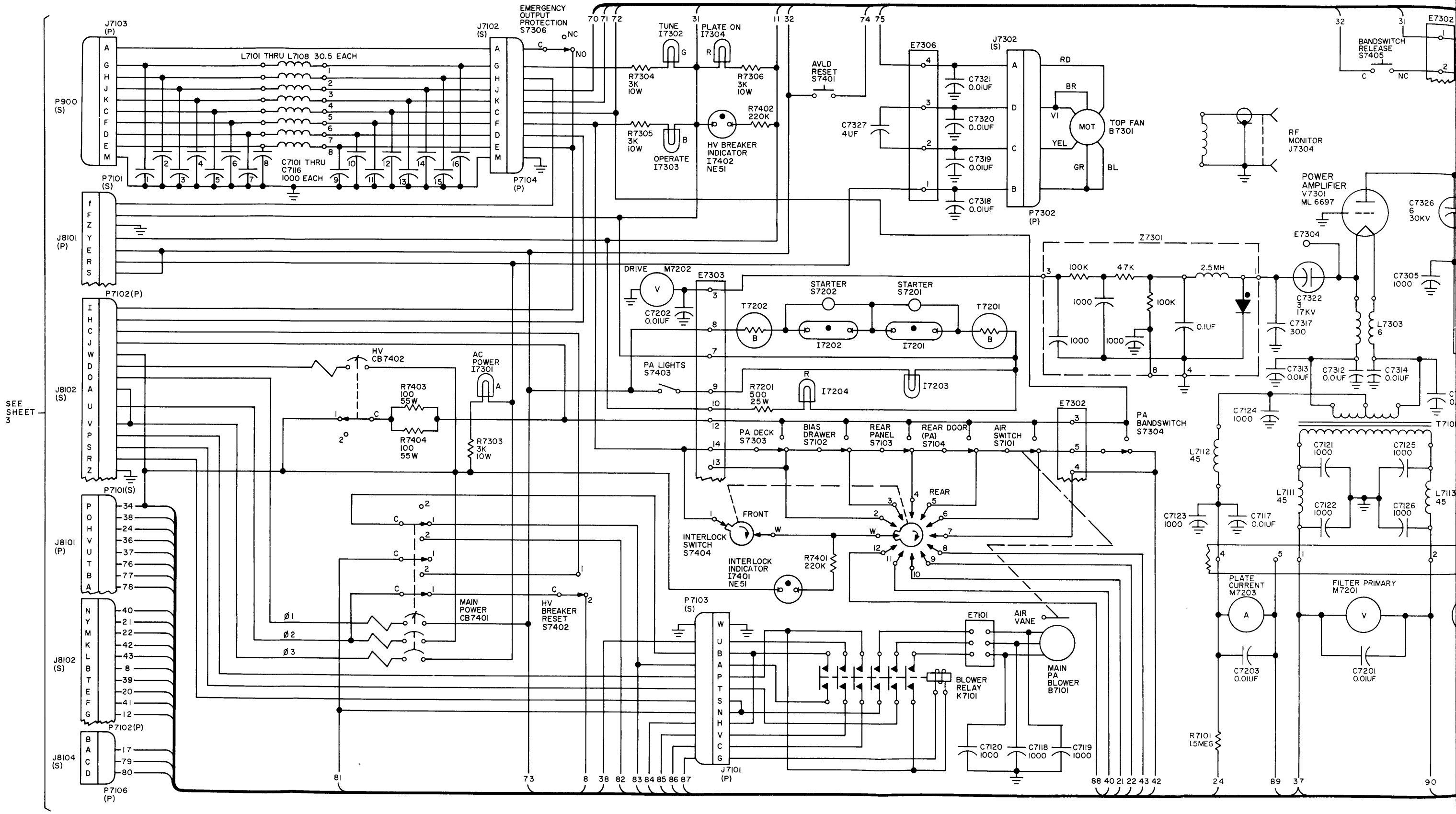


NOTE:
1. UNLESS OTHERWISE SPECIFIED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN MICROMICROFARADS AND ALL INDUCTANCE VALUES ARE IN MICROHENRIES.

2.

OUTPUT CONNECTIONS	CONNECT
40K BALANCED OUTPUT	——→
40K UNBALANCED OUTPUT	- - - - →
EMERGENCY BALANCED OUTPUT	×××××→
EMERGENCY UNBALACED OUTPUT	++++++→

Figure 4-7-1. Schematic Diagram, GPT-40K (Sheet 4 of 5)


J7103 (P)
J7102 (S)
EMERGENCY OUTPUT PROTECTION S7306
NC
NO
C
L7101 THRU L7108 30.5 EACH
P900 (S)
C7101 THRU C7116 1000 EACH
P7101 (S)
P7104 (P)
J8101 (P)
P7102(P)
J8102 (S)
P7101(S)
J8101 (P)
J8102 (S)
P7102(P)
J8104 (S)
P7106 (P)
SEE SHEET 3
TUNE I7302
PLATE ON I7304
R7304 3K 10W
R7306 3K 10W
R7305 3K 10W
R7402 220K
OPERATE I7303
HV BREAKER INDICATOR I7402 NE51
AVLD RESET S7401
E7306
C7321 0.01UF
C7320 0.01UF
C7319 0.01UF
C7318 0.01UF
C7327 4UF
J7302 (S)
P7302 (P)
RD
BR
VI
YEL
GR
BL
MOT
TOP FAN B7301
BANDSWITCH RELEASE S7405
E7302
RF MONITOR J7304
POWER AMPLIFIER V7301 ML 6697
C7326 6 30KV
E7304
Z7301
100K
47K
2.5MH
1000
100K
0.1UF
C7322 3 17KV
C7317 300
C7305 1000
L7303 6
C7313 0.01UF
C7312 0.01UF
C7314 0.01UF
C7124 1000
L7112 45
C7121 1000
C7125 1000
L7111 45
C7122 1000
C7126 1000
L7113 45
C7123 1000
C7117 0.01UF
PLATE CURRENT M7203
FILTER PRIMARY M7201
C7203 0.01UF
C7201 0.01UF
R7101 1.5MEG
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
PA DECK S7303
BIAS DRAWER S7102
REAR PANEL S7103
REAR DOOR (PA) S7104
AIR SWITCH S7101
E7302
PA BANDSWITCH S7304
REAR
FRONT
INTERLOCK SWITCH S7404
INTERLOCK INDICATOR I7401 NE51
R7401 220K
MAIN POWER CB7401
HV BREAKER RESET S7402
Ø1
Ø2
Ø3
P7103 (S)
J7101 (P)
E7101
AIR VANE
MAIN PA BLOWER B7101
BLOWER RELAY K7101
C7120 1000
C7118 1000
C7119 1000
70 71 72
31
11 32
74 75
32
31
81
73
8
38
82
83
84
85
86
87
88
40
21
22
43
42
24
89
37
90

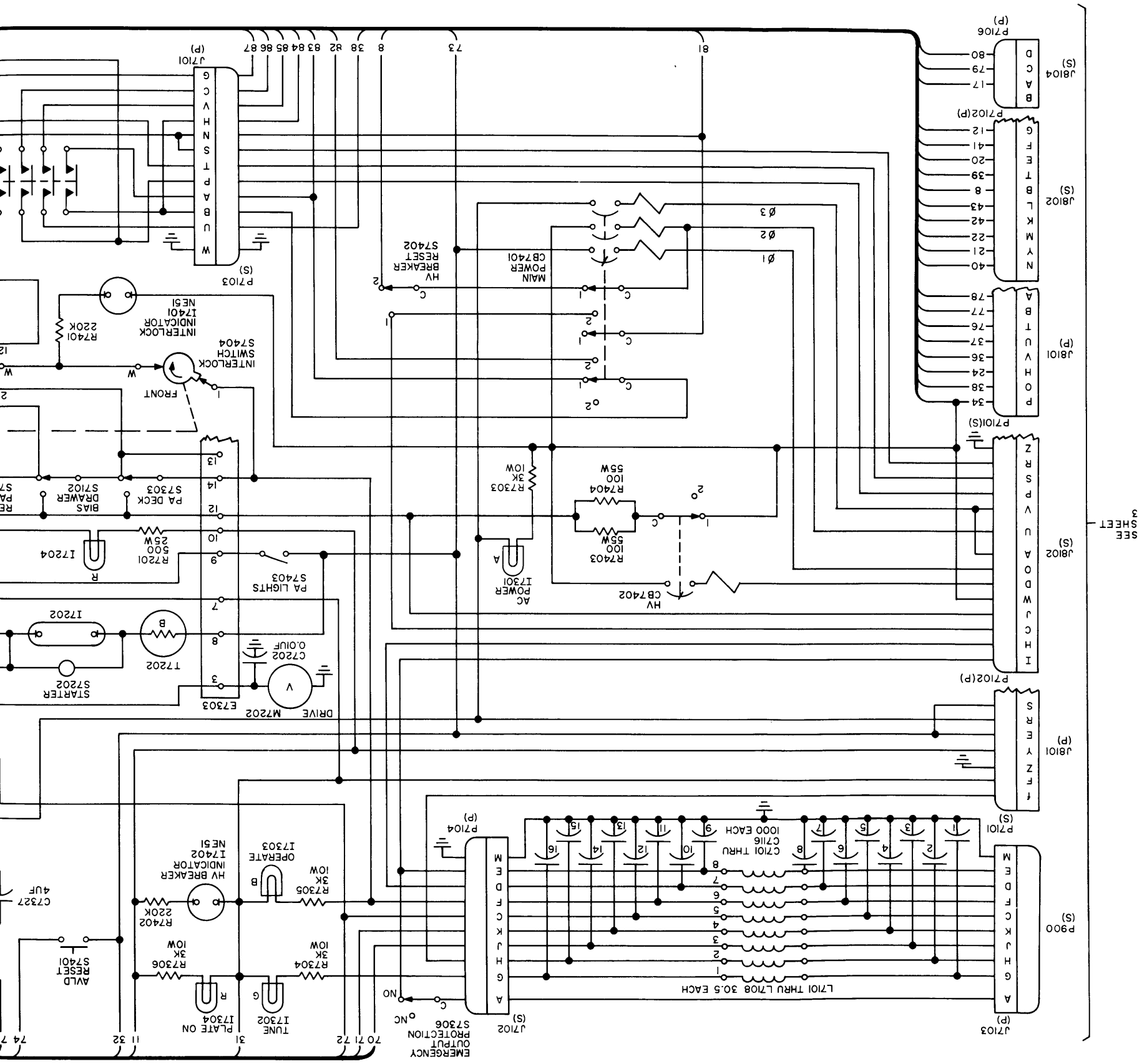

SEE SHEET 3
J8101 (P)
J8102 (S)
J8104 (S)
P7102(P)
P7106 (P)
P7101(S)
P7103 (P)
P900 (S)
J7101 (P)
P7103 (S)
P7102(P)
J8101 (P)
P7101 (S)
P7104 (P)
J7102 (S)
J7103 (P)
MAIN POWER CB7401
HV BREAKER RESET S7402
HV CB7402
AC POWER I7301
R7403 100 55W
R7404 100 55W
R7303 3K 10W
INTERLOCK SWITCH S7404
INTERLOCK INDICATOR I7401 NE51
R7401 220K
FRONT
REAR
PA DECK S7303
BIAS DRAWER S7102
PA LIGHTS S7403
R7201 500 25W
I7204
I7202
T7202
C7202 0.01UF
STARTER S7202
DRIVE M7202
E7303
TUNE I7302
PLATE ON I7304
R
G
R7304 3K 10W
R7306 3K 10W
AVLD RESET S7401
R7402 220K
HV BREAKER INDICATOR I7402 NE51
OPERATE I7303
R7305 3K 10W
C7327 4UF
C7101 THRU C7116 1000 EACH
L7101 THRU L7108 30.5 EACH
EMERGENCY OUTPUT PROTECTION S7306
NO
NC
C
W U B A P T S N H V C G
A B C D
N Y M K L B T E F G
P O H V U T B A
A G H J K C F D E M
I H C U W D O A U P S R Z
F F Z Y E R S
A G H J K C F D E M

PLATE OVLD K7601 (SHOWN IN OVLD POSITION)
GRID OVLD K7602 (SHOWN IN OVLD POSITION)
RETUNE K7603 (SHOWN IN RESET POSITION)
SWR K7604 (SHOWN IN RESET POSITION)
BIAS K7605 (SHOWN IN POSITION FOR NO BIAS)
DRIVE INTERLOCK K7606 (CONTACTS CAN BE SHORTED OUT BY S7601 FOR NO INTERLOCK)
FINAL FIL. K7607 (SHOWN IN POSITION FOR NO FIL VOLT)
TUBE PROTECT K7608 (PLATE CURRENT IN ML-6697 LESS THAN 3 AMPS DC)
CROWBAR K7609 (NO CROWBAR FIL. VOLTAGE)

OVLD RESET

E7601 E7602 E7603 E7604 E7605 E7606

R7608 0.16Ω

DRIVE INTERLOCK S7601

J7601 P7107

TOP FAN F7601 5 AMP

100 25W

R7603 30 10W

PLATE OVLD I7601

GRID OVLD I7602

RETUNE I7603

SWR I7604

15K 3W

BIAS I7605

R7605 33K 10W

DRIVE INTERLOCK I7606

R7607 220K 1/2W

FINAL FIL I7607

TIME DELAY F7604 2 AMP

TIME DELAY M7602

ELAPSE METERS F7603 2 AMP

SHORTING DELAY F7605 2AMP

FIL TIME M7601

PLATE TIME M7604

BLOWER CONTACTOR F7606 2AMP

BLOWER DELAY F7602 2 AMP

BLOW DELAY M7603

RELAY PANEL AR-116

Figure 4-7-1. Schematic Diagram, GPT-40K (Sheet 5 of 5)

BIAS
SUPPLY DRAWER
AP-104

RECTIFIER
V7501
6X4

R7501
1K
10W

220K

LV
F7501
0.125AMP

C7505
80UF

+350V

R7502
100K

LV
I7501
NE51

L7503
7HY

C7506
10UF

R7503
470K
2W

R7504
7.5K
20W

R7507
5K
10W

VOLTAGE
REGULATOR
V7504
0A2

VOLTAGE
REGULATOR
V7505
0A2

+150V

BIAS
F7502
0.5AMP

VOLTAGE
REGULATOR
V7506
6AU6

R7505
1K
2W

C7507
0.01UF

C7508
0.01UF

VOLTAGE
REGULATOR
V7507
6336A

R7506
1K
2W

R7509
680K
2W

R7508
47
2W

R7510
47
2W

L7504
185

C7509
10UF

C7510
10UF

C7511
1000

C7512
1000

R7511
220K
2W

BIAS
ADJ.
R7513
500K
2W

R7512
220K
2W

R7531
3K
160W

R7515
100K

BIAS
I7502
NE51

+600V

J7501 (P) P7105 (S)

J7502 (S) P7109 (P)

P7105 (S)

RETUNE

SWR

AC
POWER
I7503

V7506

V7507

+150V

R7530
56K
1W

+3V

RETUNE
DC
AMPLIFIER
V7508
12AT7

+350V

R7516
330K
2W

R7518
100K

R7521
1K
1W

R7524
3.3K
2W

C7513
0.424UF

R7523
10K
10W

R7522
25K
4W

R7527
10K
10W

R7526
25K
4W

R7517
330K
2W

SWR
DC
AMPLIFIER
V7509
12AT7

R7519
100K

R7525
3.3K
2W

R7528
1K
1W

C7514
0.424UF

L7506
2.5MH

SWR
OVLD ADJ.
R7529
500K
2W

C7516
1000

L7505
2.5MH

RETUNE
OVLD ADJ.
R7528
500K
2W

C7515
1000

J7501 (P)

P7608 J7602

PLATE OVLD
K7601
(SHOWN IN OVLD
POSITION)

GRID OVLD
K7602
(SHOWN IN OVLD
POSITION)

OVLD

RESET

E7601

E7602

PLATE
OVLD
ADJ.
R7601
0.5
25W

TUBE
PROTECT
ADJ.
R7606
0.5
2W

100
25W

R7603
30
10W

PLATE
OVLD
I7601

GRID
OVLD
I7602

Ø2

Ø1

BLOWER CONTACTOR
F7606
2AMP

P7107 J7601

BIAS
SUPPLY DRAWER
AP-104

RECTIFIER
V7501
6X4

T7501

R7501
1K
10W

220K

LV
F7501
0.125AMP

C7505
80UF

+350V

R7502
100K

LV
I7501
NE51

J7501 (P) P7105 (S)

+350V — K — 94

+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

+150V

VOLTAGE
REGULATOR
V7505
0A2

VOLTAGE
REGULATOR
V7506
6AU6

VOLTAGE
REGULATOR
V7507
6336A

R7505
1K
2W

R7506
1K
2W

R7509
680K
2W

R7508
47
2W

R7510
47
2W

L7504
185

+600V — J7502 (S) P7109 (P) — 17

R7511
220K
2W

C7509
10UF

C7510
10UF

C7511
1000

C7512
1000

R7515
100K

BIAS
ADJ.
R7513
500K
2W

R7512
220K
2W

R7531
3K
160W

BIAS
I7502
NE51

C7507
0.01UF

C7508
0.01UF

BIAS
F7502
0.5AMP

P7105 (S)

RETUNE — D — 93

SWR — H — 96

C — 97

I — 78

J — 91

AC
POWER
I7503

V7506

V7507

+150V

R7530
56K
1W

+350V

R7516
330K
2W

RETUNE
DC
AMPLIFIER
V7508
12AT7

R7518
100K

+350V

R7523
10K
10W

R7527
10K
10W

R7522
25K
4W

R7526
25K
4W

+350V

R7517
330K
2W

SWR
DC
AMPLIFIER
V7509
12AT7

R7519
100K

L7506
2.5MH

C7516
1000

SWR
OVLD ADJ.
R7529
500K
2W

C7514
0.424UF

+3V

R7521
1K
1W

R7524
3.3K
2W

R7525
3.3K
2W

R7528
1K
1W

L7505
2.5MH

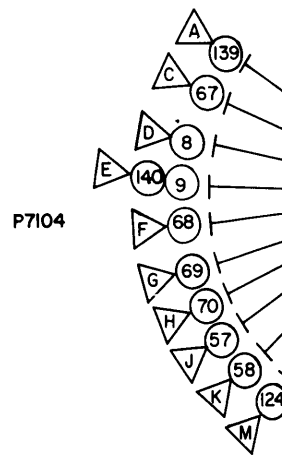
RETUNE
OVLD ADJ.
R7528
500K
2W

C7515
1000

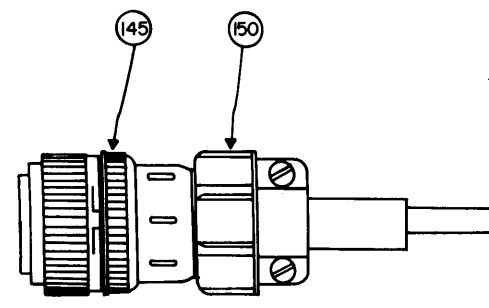
C7513
0.424UF

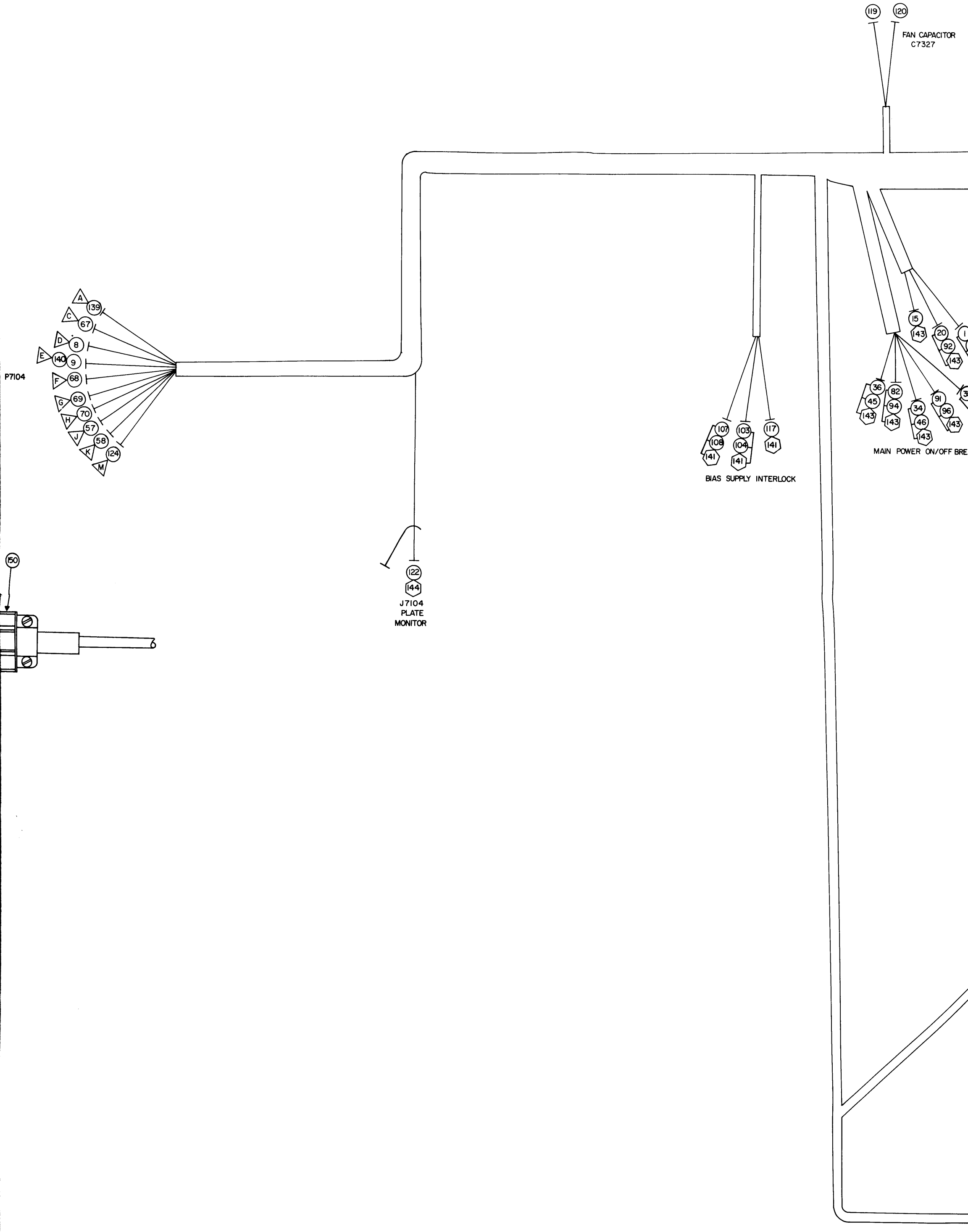
J7501 (P)

SE SPECIFIED; ALL RESISTANCE
OHMS, ALL CAPACITANCE VALUES
CROFARADS AND ALL INDUCTANCE
MICROHENRIES.



P7104




119
120
FAN CAPACITOR
C7327
A
139
C
67
D
8
E
140
9
F
68
G
69
H
70
J
57
K
58
124
M
P7104
150
122
144
J7104
PLATE
MONITOR
107
108
141
103
104
141
117
141
BIAS SUPPLY INTERLOCK
15
143
20
92
143
36
45
143
82
94
143
34
46
143
91
96
143
MAIN POWER ON/OFF BRE

119 120 FAN CAPACITOR C7327

131 69 90 131 141 AC POWER LIGHT/RESISTOR

132 69 31 86 141 132 141 TUNE LIGHT/RESISTOR

133 68 66 87 88 141 133 141 134 OPERATE LIGHT/RESISTOR

141 134 97 141 LIGHT/RESIST PLATE ON LK

15 143 20 92 143 1 21 143 36 82 45 94 143 143 34 46 143 91 96 143 35 90 121 143 MAIN POWER ON/OFF BREAKER

94 98 BAND SWITCH RELEASE

83 84 60 OVLD RESET

55 62 63 56 54 64 93 92 135 MAIN POWER BREAKER AUX SWITCH

INTERLOCK INDICATOR 96 95

23 14 53 66 118 116 107 109 111 113 115 12 13 INTERLOCK SWITCH

89 HV INDICATOR LIGHT 81

105 130 HV BREAKER (RESET SWITCH/RESISTOR)

93 141 2 141 3 135 141 HV BREAKER RESET SWITCH

85 30 84 PA LIGHT SWITCH

129 130 SHUNT RESISTORS IN HV INTERLOCK

106 105 AUX SWITCH FOR HV BREAKE

100 101 129 SHUNT RESISTORS IN HV INTERLC

27 28 128 METER CIRCUIT DC-100

GRN. BLU. RED YEL. VIOL. BRN. A B C D DO NOT WIRE JACK

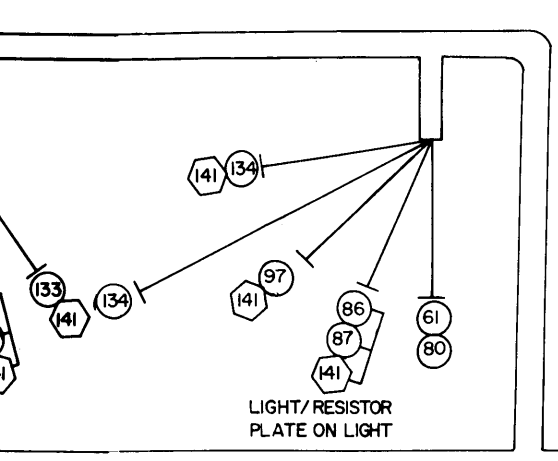
141 121 141 59 PA FAN 119 141 120 141

141 139 141 140 PA INTER

79 DETECTOR METER CIRCUIT (DRIVE INPUT)

141 141 141 141

138 141 THERMOMETER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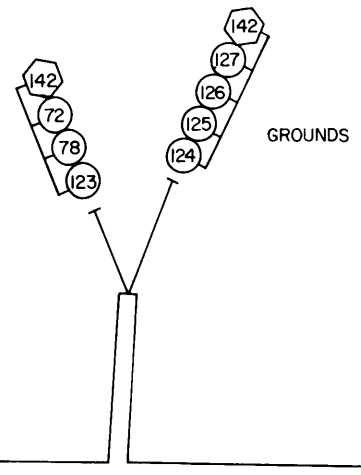
LIGHT/RESISTOR
PLATE ON LIGHT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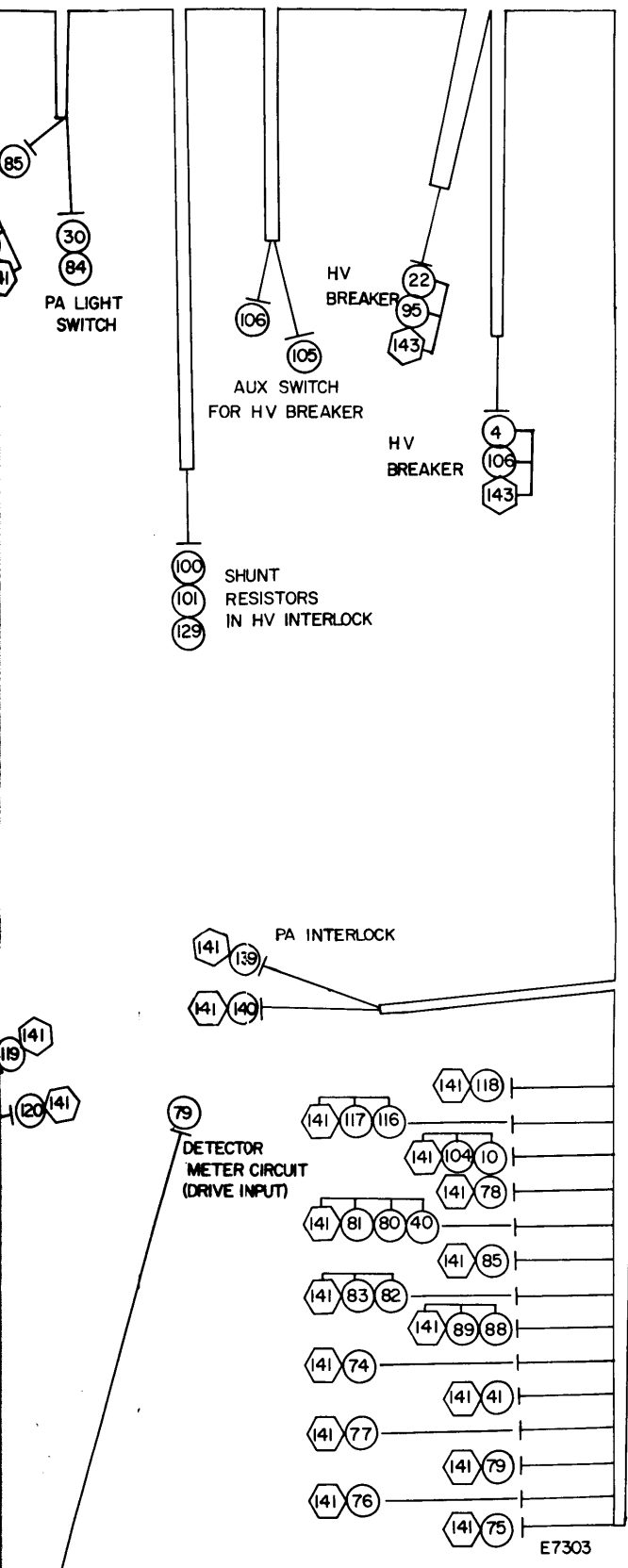
72
78
123
GROUNDS


85
30
84
PA LIGHT
SWITCH
106
105
AUX SWITCH
FOR HV BREAKER
HV
BREAKER
22
95
143
HV
BREAKER
4
106
143
100
101
129
SHUNT
RESISTORS
IN HV INTERLOCK
141
139
PA INTERLOCK
141
140
119
141
120
141
79
DETECTOR
METER CIRCUIT
(DRIVE INPUT)
141
118
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89
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141
74
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41
141
77
141
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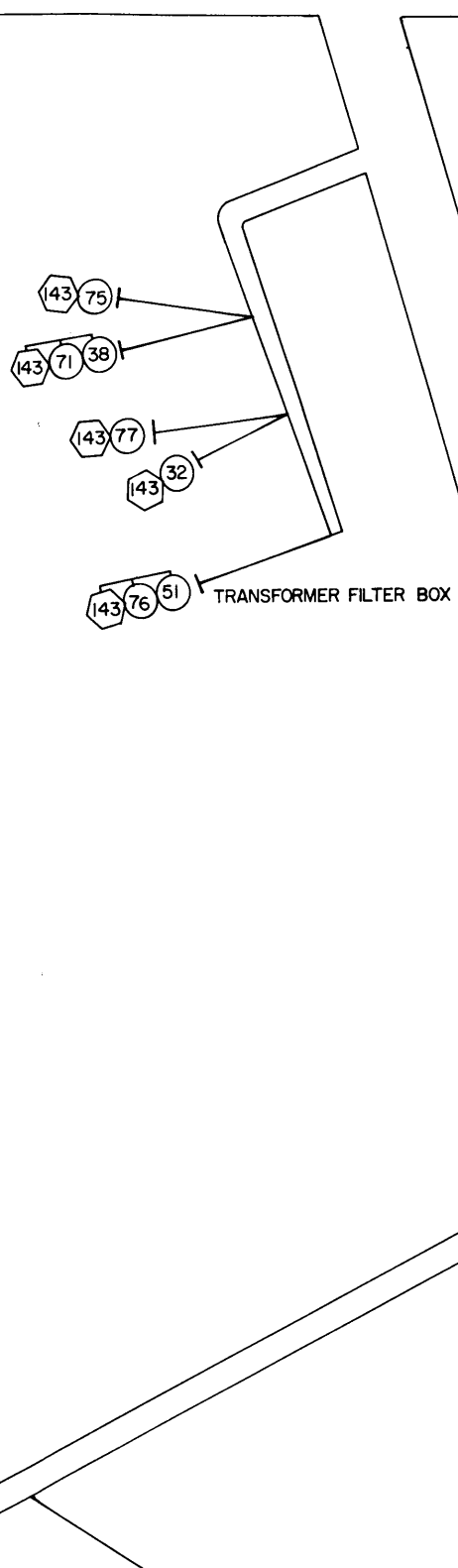
76
141
75
E7303
108
141
RELAY
PANEL
INTERLOCK
109
110
141
102
103
141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143
71
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143
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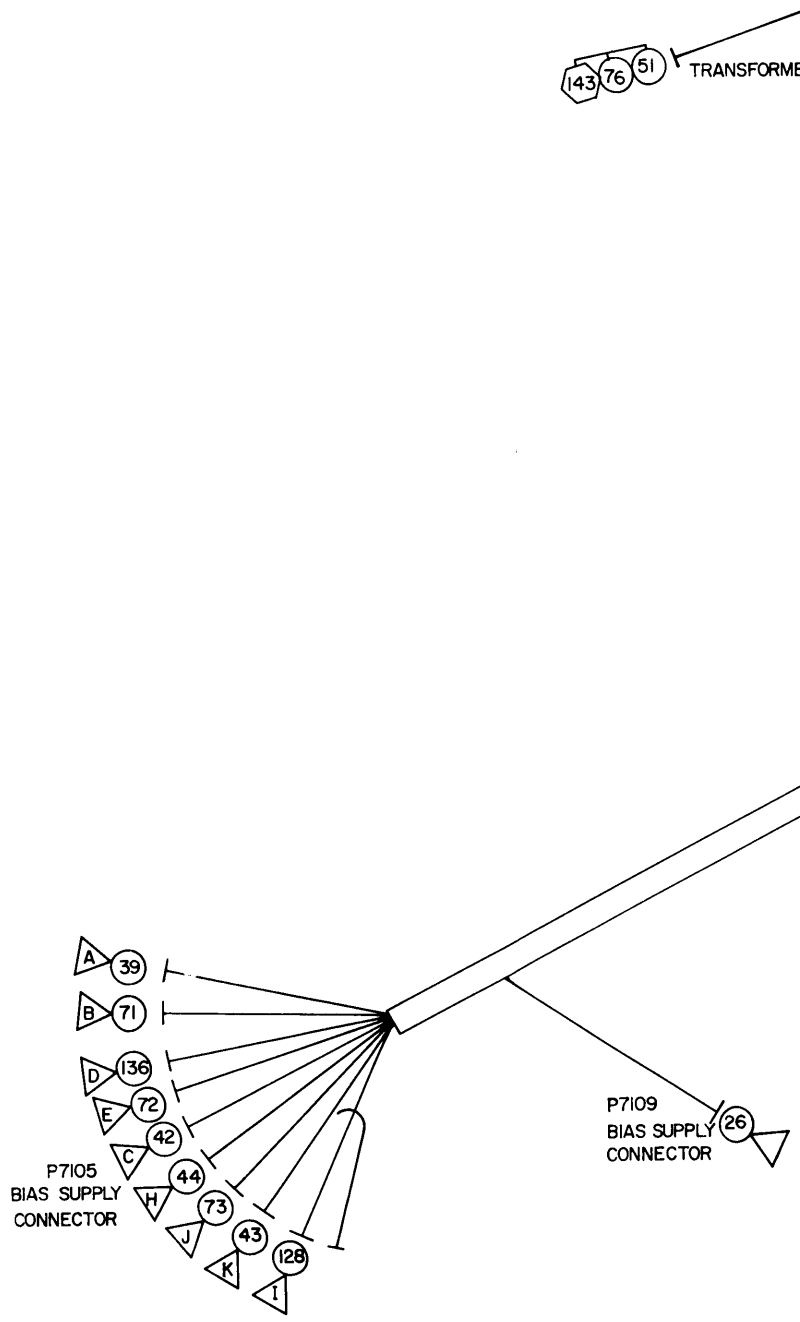
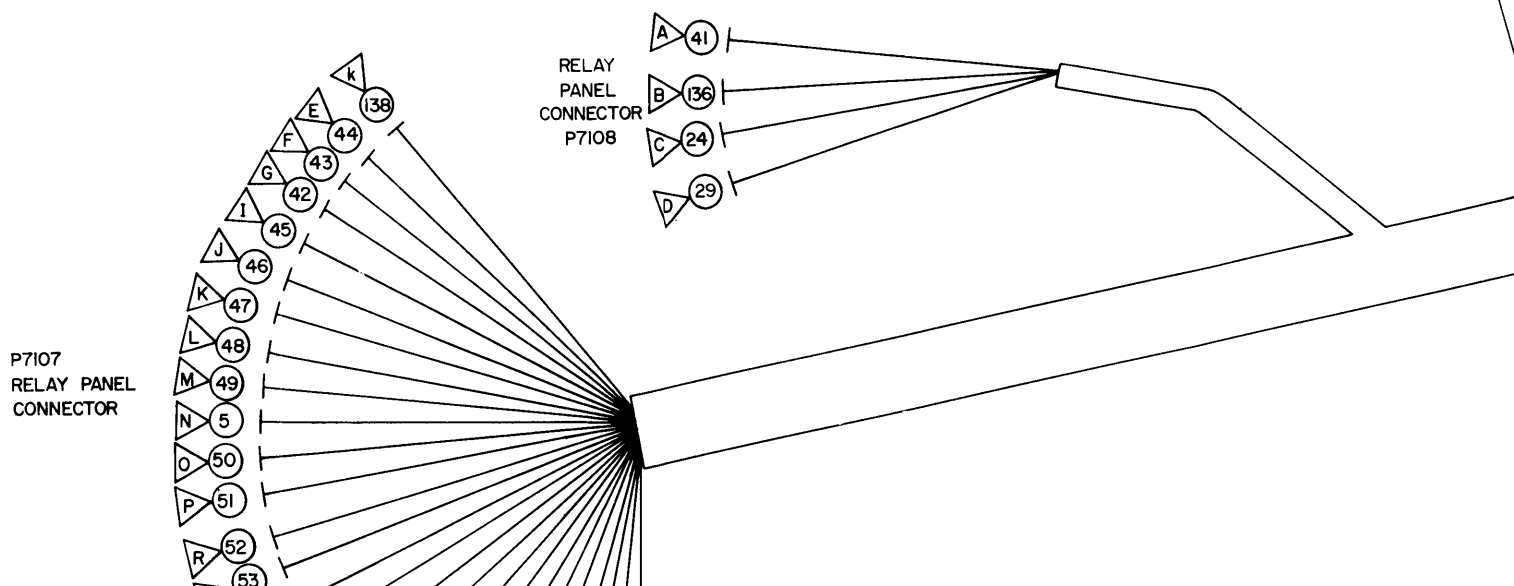
143
32
143
76
51
TRANSFORMER FILTER BOX


A
39
B
71
D
136
E
72
42
C
44
H
73
J
43
K
128
I
P7105
BIAS SUPPLY
CONNECTOR
P7109
BIAS SUPPLY
CONNECTOR
26


RELAY
PANEL
CONNECTOR
P7108
A
41
B
136
C
24
D
29
P7107
RELAY PANEL
CONNECTOR
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E
44
F
43
G
42
I
45
J
46
K
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M
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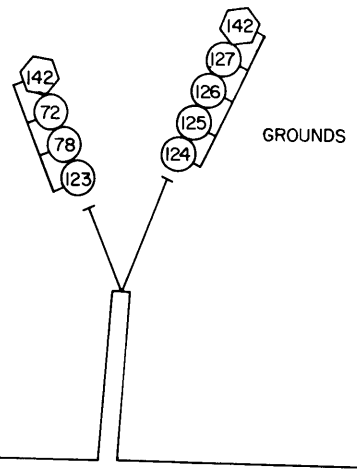
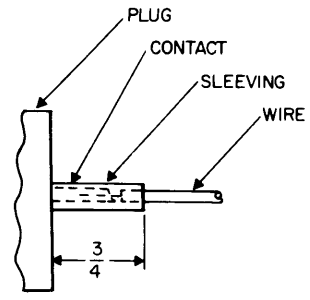


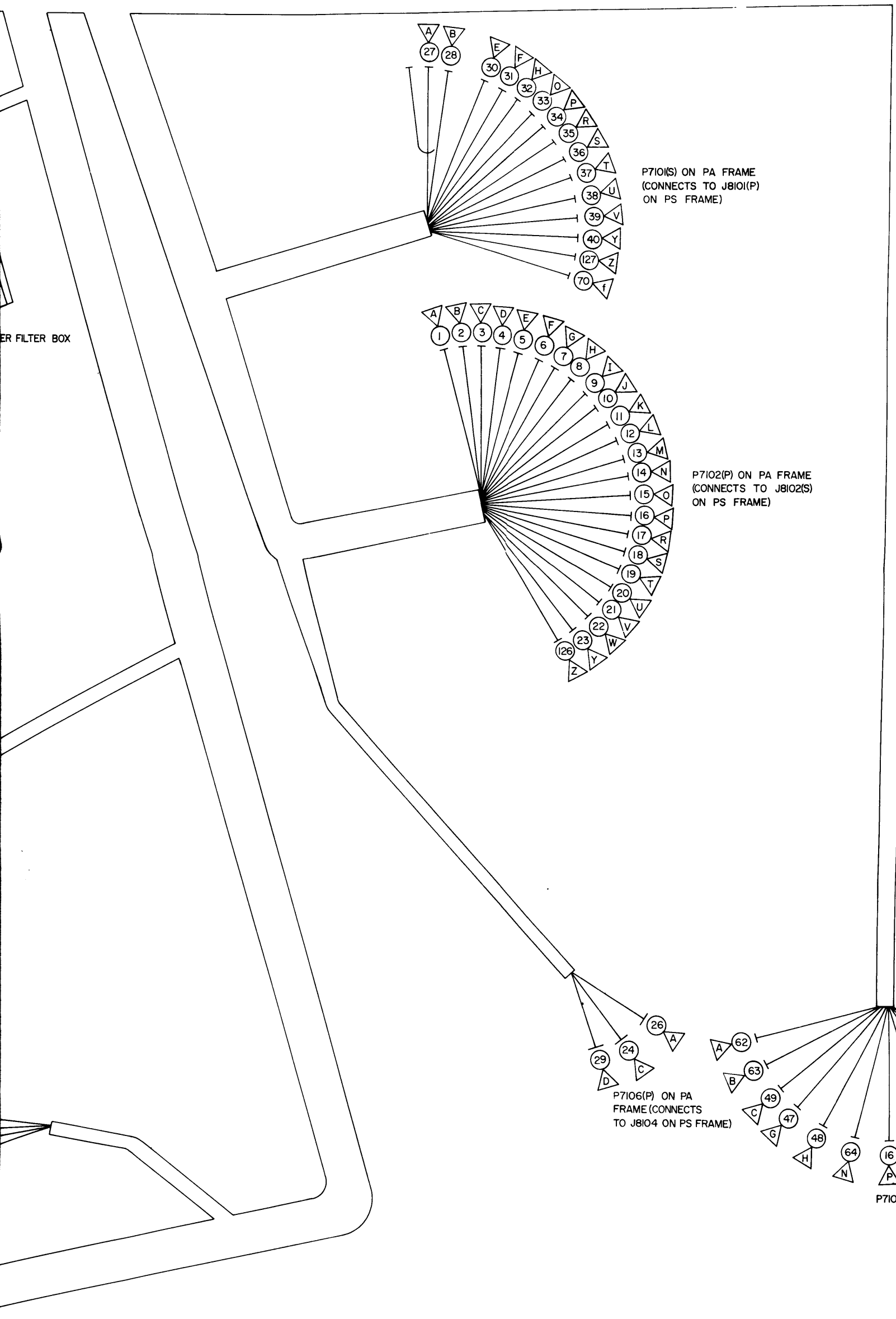


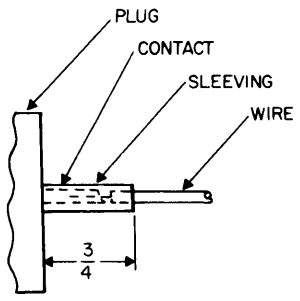
PLUG WIRING DETAILS
(FOR ITEMS 145, 146, 147, 148, 149, & 151)

ON ITMS 145 & 148 (MS3106B20-27) USE ITEM 159 SIZE 10, FOR CONNECTIO

ON ITEMS 146 & 147 (MS3106B32-7) USE ITEM 159 SIZE 10, FOR CONNECTIO
USE ITEM 158 SIZE 7 " "

ON ITEMS 149 & 151 (MS3106B22-10) USE ITEM 158 FOR ALL CONNECTIONS.





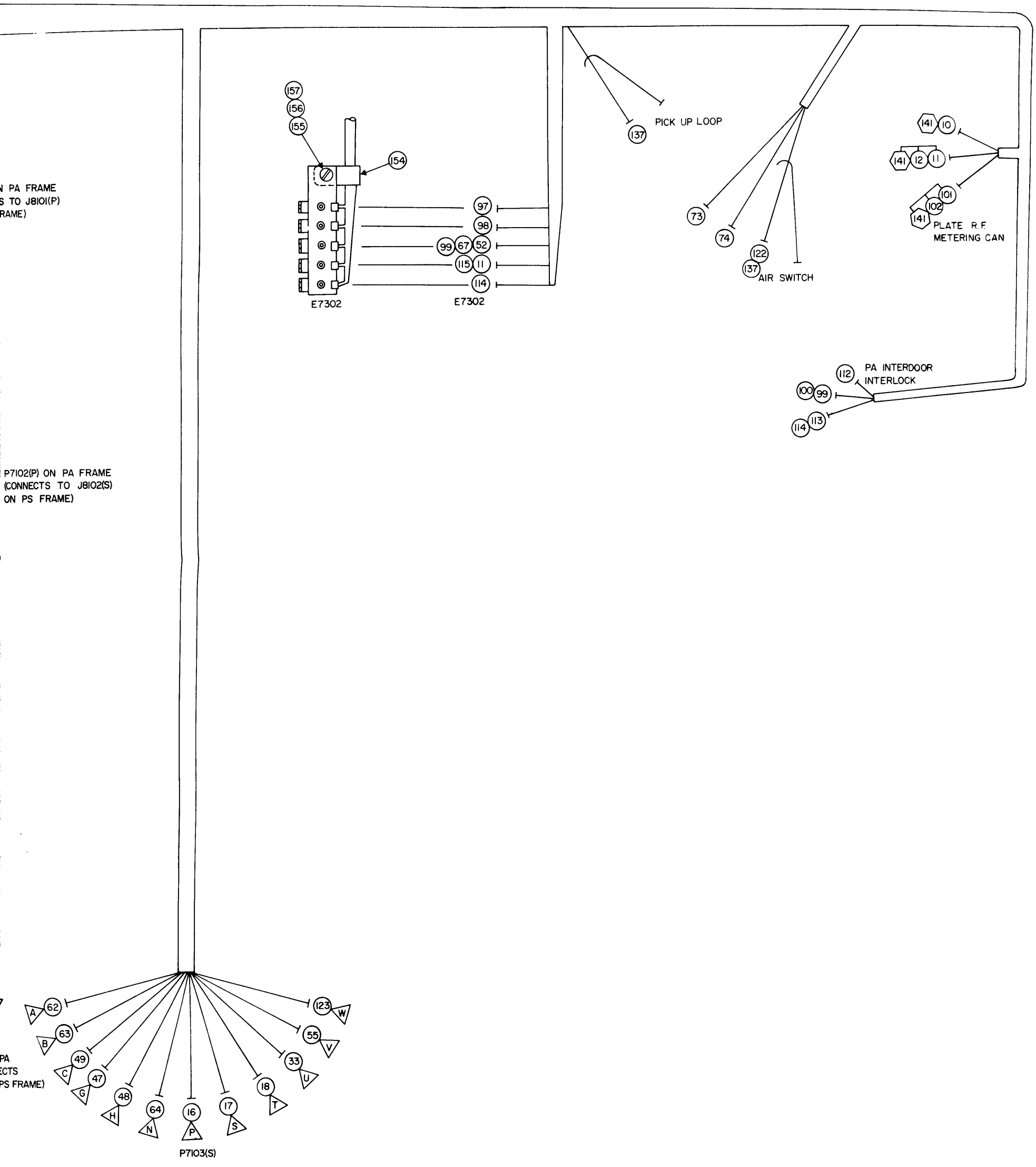
ON ITMS 145 & 148 (MS3106B20-27) USE ITEM 159 SIZE 10, FOR CONNECTIONS TO ALL PINS.

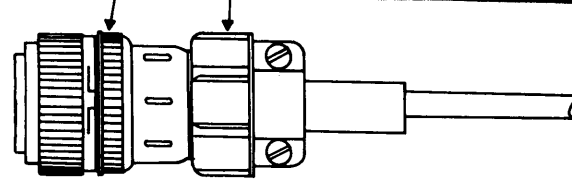
ON ITEMS 146 & 147 (MS3106B32-7) USE ITEM 159 SIZE 10, FOR CONNECTIONS TO PINS A THRU N, W THRU Z & a THRU k.
USE ITEM 158 SIZE 7 " " " " " " " " " " O,P,R,S,T,U,V.

ON ITEMS 149 & 151 (MS3106B22-10) USE ITEM 158 FOR ALL CONNECTIONS.

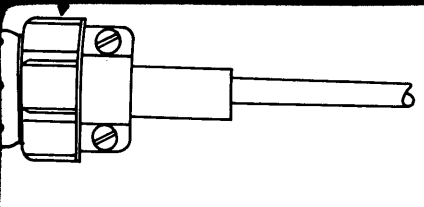
WIRING DETAILS

(145,146,147,148,149, & 151)





J7104
PLATE
MONITOR



DC-100

DO NOT WIRE JACK

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141 59 120 141

141 139

141 140

79 DETECTOR METER CIRCUIT (DRIVE INPUT)

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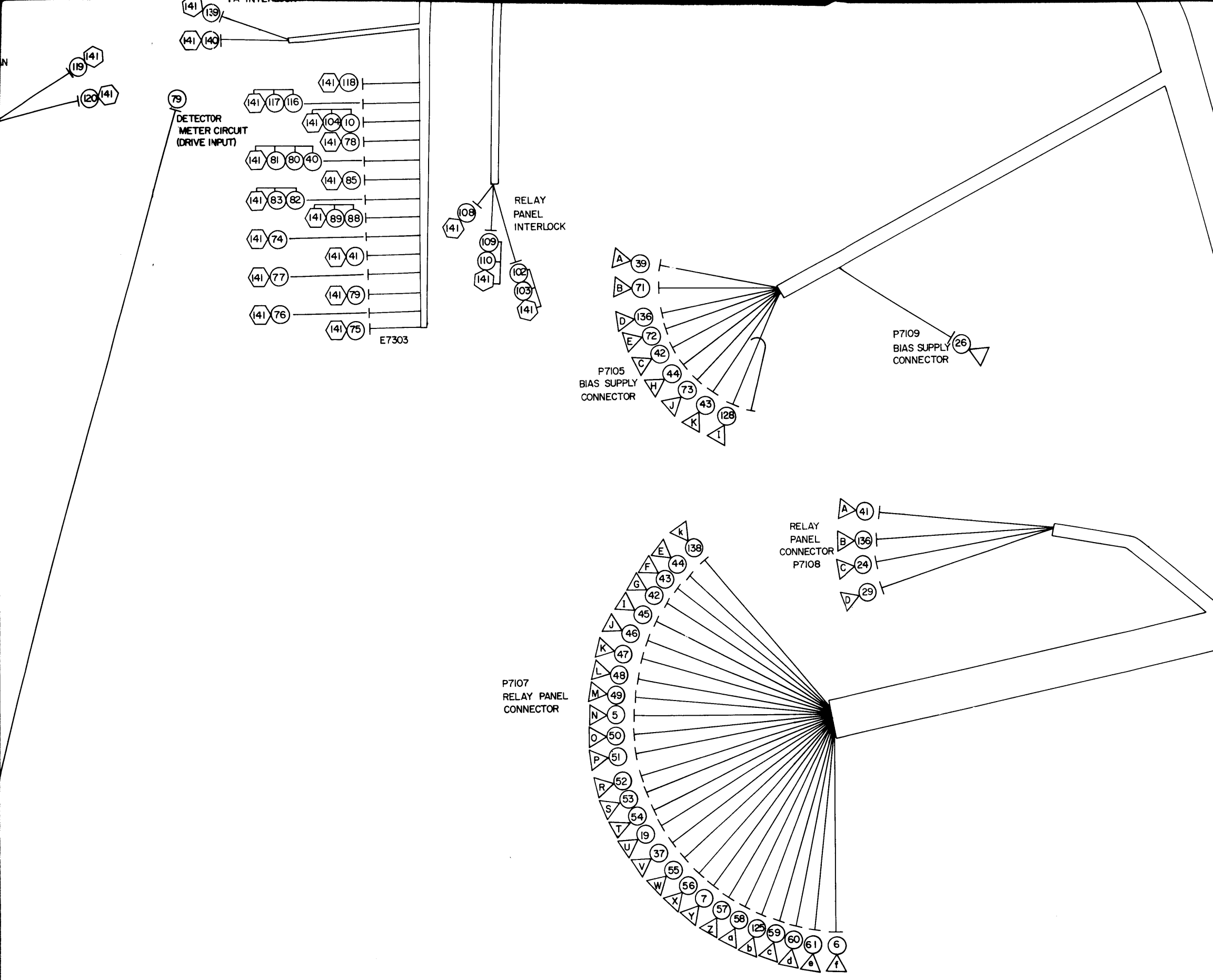
141 THERMOMETER


141 139
141 140
141 119
120 141
79
DETECTOR
METER CIRCUIT
(DRIVE INPUT)
141 118
141 117 116
141 104 10
141 78
141 81 80 40
141 85
141 83 82
141 89 88
141 74
141 41
141 77
141 79
141 76
141 75
E7303
108
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109
110
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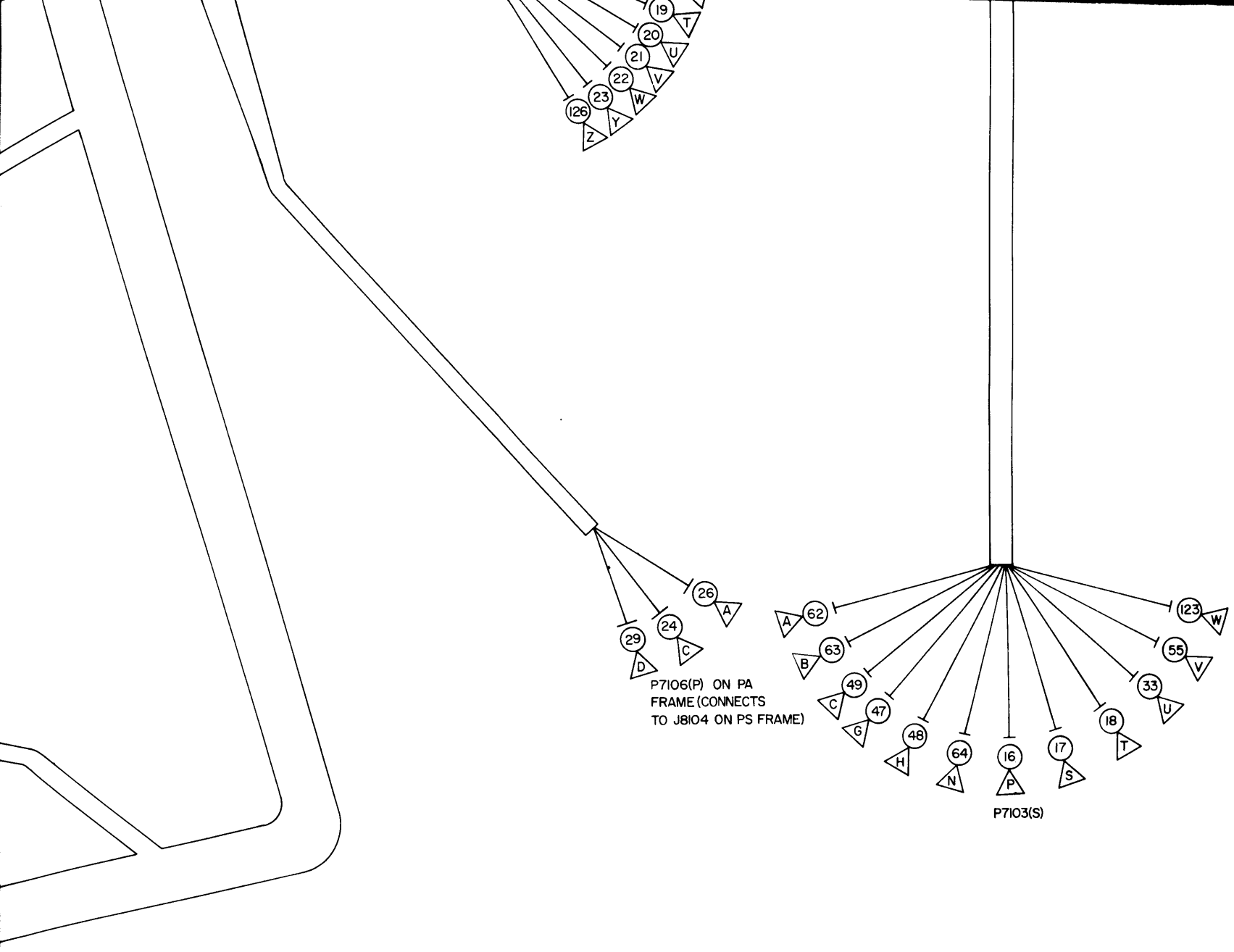
102
103
141
RELAY
PANEL
INTERLOCK
A 39
B 71
D 136
E 72
C 42
H 44
J 73
K 43
I 128
P7105
BIAS SUPPLY
CONNECTOR
P7109
BIAS SUPPLY
CONNECTOR
26
A 41
B 136
C 24
D 29
RELAY
PANEL
CONNECTOR
P7108
k 138
E 44
F 43
G 42
I 45
J 46
K 47
L 48
M 49
N 5
O 50
P 51
R 52
S 53
T 54
U 19
V 37
W 55
X 56
Y 7
Z 57
a 58
b 125
c 59
d 60
e 61
f 6
P7107
RELAY PANEL
CONNECTOR


19
T
20
U
21
V
22
W
23
Y
126
Z
26
A
24
C
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D
P7106(P) ON PA
FRAME (CONNECTS
TO J8104 ON PS FRAME)
A
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63
C
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P
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S
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V
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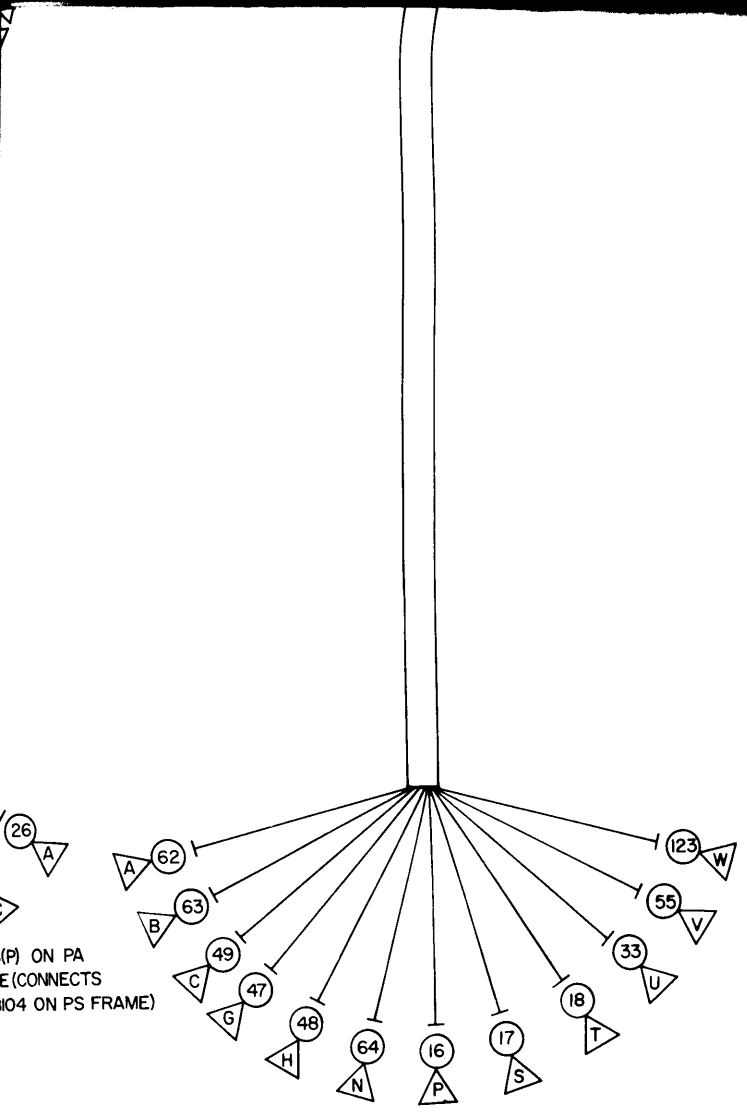
W
123
P7103(S)

Original



P7103(S)

Figure 4-7-2. Cabling Diagram,
Third Frame, GPT-40K (Sheet 1 of 2)

INATIONS	COND.	COLOR	TERMINATIONS
erlock Switch, Timer Position.	105	Red	Aux. SW.(HV Breaker)Resistor to HV Breaker Aux. Switch C.
Power Breaker; Aux. SW 2,Comm.	106	Yellow	HV Breaker Aux. Switch To HV Breaker.
Power Breaker; Aux. SW. 3 NO	107	Pink	Interlock Switch Bias Position to Bias Interlock Sw. NO
Power Breaker/ Aux. SW. 2 NC	108	Wh/Red	Bias Interlock Sw. NO To Relay Interlock Sw. Comm.
J, P7104.	109	Yellow	Interlock Sw. Relay Position To Relay Interlock Sw. NO.
K, P7104.	110	Yellow	Relay Interlock NO To Rear Door (PA) Comm.
A, J7302.	111	Blue	Rear Door(PA) NO to Interlock Sw. Rear Door Position.
. Reset SW.	112	Blue	Rear Door (PA) NO To Air Switch Comm.
e On Lite Res.	113	Orange	Interlock Switch Air Switch Position to Air Switch NO.
Power Breaker; Aux. Sw. 3 NO.	114	Orange	Airswitch NO To Bandswitch Comm.
Power Breaker/ Aux. SW. 3 Comm.	115	Wh/Red	Interlock Switch Bandswitch Position To Bandswitch NO
Power Breaker; Aux. Sw. 2 Comm.	116	Violet	Interlock Switch PA Deck Position To PA Deck Interlock NO
	117	Violet	PA Deck Interlock NO To Bias Interlock Comm.
lock Switch	118	Wh/Green	PA Deck Int. Comm To Interlock Switch External Position
switch Interlock NC.	119	Red	Fan Cap. To Pin C, J7302.
ate Light Resistor.	120	Wh/Red	Fan Cap. To Pin D,J7302
Light Res.	121		J7302, Pin B to Main Power Breaker Ø 3C.
f, P7101.	122	Coax./Blk.	Ext. Filter Box to Plate Meter Circuit Pin 5.
Filter box.	123	Black	P7103, Pin W to Ground.
nd.	124	Black	P7104, Pin M to Ground.
e Meter Circuit, Pin 8.	125	Black	P7107 ,Pin b to Ground.
Pin 3 to Meter Box Strip Term. 6.	126	Black	P7101, Pin Z to Ground Interconnect Box.
1(Fil Prl)to xfmr. Filter Box.	127	Black	P7102, Pin Z to Ground.
. 2(Fil Prl) to xfmr Filter Box.	128	White	SWR Circuit to P7105, Pin I
. 11(6nd) to Ground	129	Wh/Brown	HV Breaker Aux. Sw. Resistor W/100-101 to HV Breaker Aux. Sw. Resistor.
. 3 (Drive Meter +)to Circuit, Pin 3.			
tor To Meter Box Strip Term. 10 (Red-	130	Red	HV Breaker Aux Sw. Resistor to HV Breaker Aux. Sw. Resistor W/105.
. 10(Red Lite Res.)To HV Bkr. Ind.	131	White	AC Power Light to AC Power Light Resistor.
	132	White	Tune Light to Tune Light Resistor
to Meter Box Strip Term. 8(Meter Lites	133	White	Operate Light To operate Light Resistor.
	134	White	Plate On Light To plate on Light Resistor.
8 to Ovld. Reset Switch	135	Wh/Blue	Main Power Breaker Aux. Sw. 1 NC To HV Breaker Reset Sw. NO
o PA light Switch.	136	Red	P7105, Pin D to P7108, Pin B
9(Wh. Lite) To PA Light switch.	137	Black	Meter Circuit To Probe
On light.	138	Red	P7107, Pink to Therm. E7307.
erate Light	139	Yellow	P7104, Pin A to PA Int. C
er Box Strip Term. 7 (Fused Fluor.)	140	Wh/Yellow	P7104, Pin E to PA Int., NO.
. 7 To HV Brk. Indic. Light.	141		Lug Spade, #6
in Power Breaker Ø 3C.	142		Terminal, #10
2C to AC Power Light Resistor	143		Terminal, #1/4
2H to Main Power Breaker Aux. SW1	144		Connector, Receptacle, RF Coax, Interconn.
	145		Connector, Plug, Male, Interconnect.
x. SW. L NO to HV Breaker Reset Switch.	146		Connector, Plug, Female
1C to Bandswitch Rel. Sw.	147		Connector, Plug, Male, AC Filter
ock Indic.	148		Connector, Plug, Female, Bias
nterlock Indic.	149		Connector, Plug, Female, Relay
dswitch Release Solenoid	150		Clamp, Connector, (For 20-2722-P)
olenoid To Bandswitch Release SW. NC	151		Connector, Plug, Male
NC To Air Switch Interlock Sw.	152		Clamp, Connector (For 32-7)
r Int. NC	153		Fanning Strip, Angle, Right Hand
To Relay Panel Inter. NC	154		Clamp,""G" Type, 1/4" 1D.
to Bias Drawer Inter. NC	155		Screw, Machine
to PA Deck Interlock NC.	156		Lockwasher, 6-32
	157		Nut, Hex
	158		Insulation, Sleeving, Size 7
	159		Insulation, Sleeving, Size 10
	160		Connector, Plug, Male, Bias B
	161		Clamp, Cable (For 18).

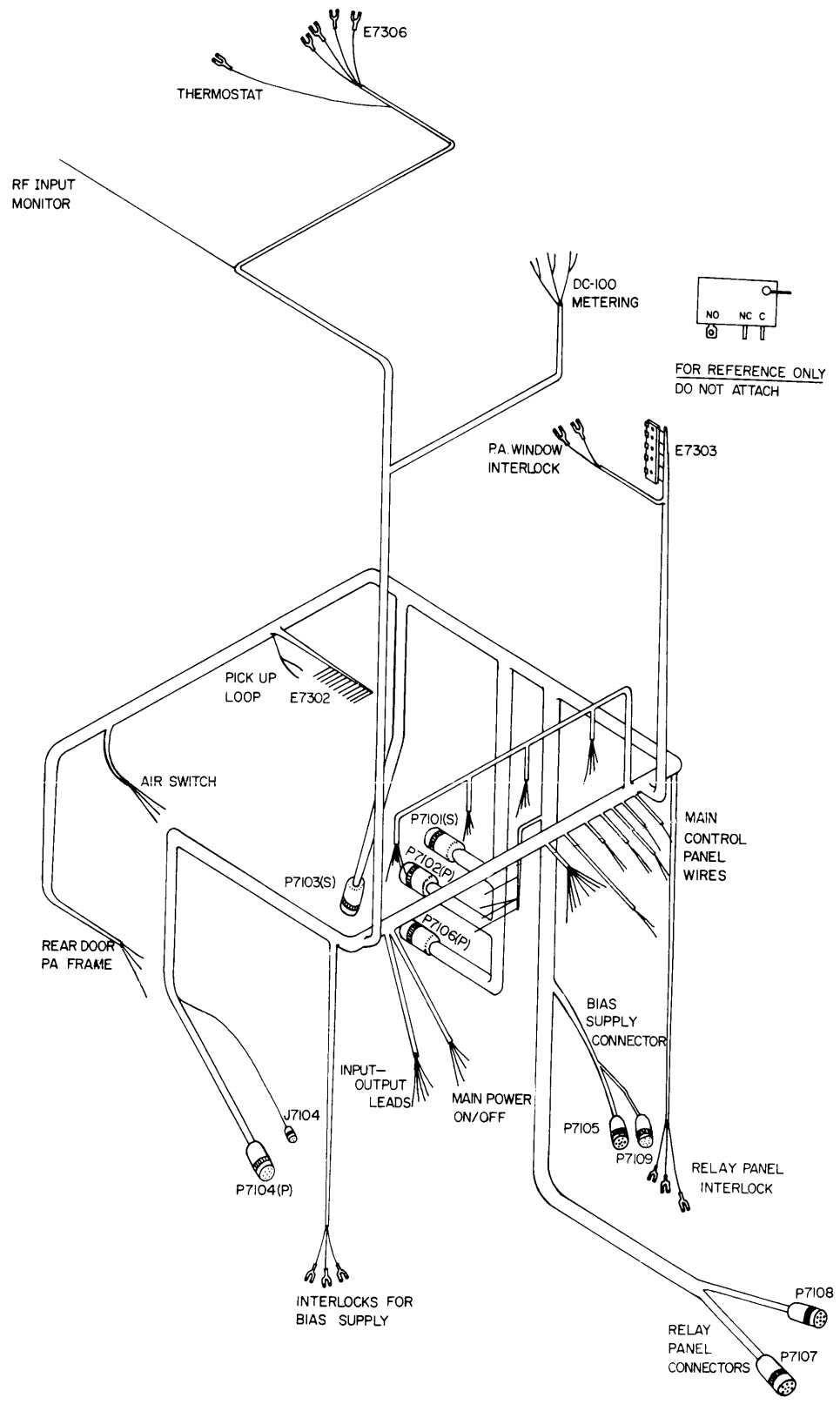


Figure 4-7-2. Cabling Diagram, Third Frame, GPT-40K (Sheet 2 of 2)

RUNNING SHEET FOR PA FRAME CABLE

COND.	COLOR	TERMINATIONS
1	Grey	P7102, Pin A to Main Power Breaker Ø 3H.
2	Wh/Violet	P7102, Pin B to HV Breaker Reset SW,NC.
3	Wh/Blue	P7102, Pin C to HV Breaker Reset SW,NO.
4	Yellow	P7102, Pin D to HV Breaker.
5	Wh/Blue	P7102, Pin E to N of Relay Plug P7107, J7601 Mate
6	Orange	P7102, Pin F. to f of relay Plug.
7	Green	P7102, Pin G to Y of Relay Plug. P7107 J7601 Mate
8	Wh/Green	P7102, Pin H to D of P7104.
9	Wh/Yellow	P7102, Pin I to E P7104.
10	Wh/Brown	P7102, Pin J to PA Deck Interlock NC
11	Wh/Red	P7102, Pin K to Bandswitch Int. No.
12	Wh/Yellow	P7102, Pin L to Inter. Switch, HVR Position
13	Wh/Orange	P7102, Pin M to Inter. Switch Crowbar Position.
14	Wh/Blue	P7102, Pin O to Inter. Switch Rear Door, PS Position.
15	White	P7102, Pin O to Main Power Breaker Ø 1H.
16	Wh/Black	P7102, Pin P to P of P7102.
17	Wh/Violet	P7102, Pin R to S of P7102.
18	Wh/Gray	P7102, Pin S to T of P7103.
19	Brown	P7102, Pin T to U of P7107.
20	Violet	P7102, Pin U to Main Power Breaker.
21	Grey	P7102, Pin V to Main Power Breaker.
22	Violet	P7102, Pin W to HV Breaker.
23	Red	P7102, Pin Y to Inter. Switch Ant. Tuner Position.
24	Tan	P7106, Pin C to C, P7108.
25		NOT USED
26	Wh/Red	P7106, Pin A to P7109.
27	Wh/Shielded	P7101, Pin A to SWR Circuit.
28	Red/Shielded	P7101, Pin A to SWR Circuit.
29	Green	P7106, Pin D to Pin D, P7108.
30	White	P7101, Pin E to PA Lite Switch.
31	Wh/Violet	P7101, Pin F to Tune Lite.
32	Wh/Orange	P7101, Pin H to xfmr. Filter Box Resistor.
33	Wh/Grey	P7101, Pin O to U, P7103,
34	Violet	P7101, Pin P to Main Power Breaker Ø 2G.
35	Grey	P7101, Pin R to Main Power Breaker Ø 3C.
36	White	P7101, Pin S to Main Power Breaker Ø 1C.
37	Wh/Black	P7101, Pin T to Pin V, Relay Plug.
38	Wh/Violet	P7101, Pin U to xfmr. Filter Box.
39	Wh/Black	P7101, Pin V to A Bias Supply.
40	Yellow	P7101, Pin Y to Term. 10, Meter Box Red Lite
41	Brown	P7107, Pin A to Term 5 Meter Box P1. Curr. Neg.
42	Wh/Red	P7107, Pin G to Pin C, P7105.
43	Pink	P7107, Pin F to Pin K, P7105.
44	Wh/Blue	P7107, Pin E to Pin H, P7105.
45	White	P7107, Pin I to Main Power Breaker Ø 1C.
46	Violet	P7107, Pin J to Main Power Breaker Ø 2C.
47	Yellow	P7107, Pin K to Pin G, P7103.
48	Red	P7107, Pin L to Pin H, P7103.
49	Orange	P7107, Pin M to Pin C, P7103.
50	Violet	P7107, Pin O to Pin V, P7103.
51	Violet	P7107, Pin P to xfmr. Filter Box
52	Wh/Brown	P7107, Pin R to Bandswitch Inter. NC.
53	Green	P7107, Pin S to Interlock Switch, Timer Position.
54	Wh/Yellow	P7107, Pin T to Main Power Breaker; Aux. SW 2,Comm.
55	Wh/Orange	P7107, Pin W to Main Power Breaker; Aux. SW. 3 NO
56	Wh/Red	P7107, Pin X to Main Power Breaker/ Aux. SW. 2 NC
57	Wh/Black	P7107, Pin Z to Pin J, P7104.
58	Blue	P7107, Pin A to Pin K, P7104.
59	Wh/Violet	P7107, Pin C to Pin A, J7302.
60	Wh/Black	P7107, Pin d to Ovld. Reset SW.
61	Yellow	P7107, Pin e to Plate On Lite Res.
62	Wh/Orange	P7103, Pin A to Main Power Breaker; Aux. Sw. 3 NO.
63	Wh/Green	P7103, Pin B to Main Power Breaker/ Aux. SW. 3 Comm.
64	Wh/Yellow	P7103, Pin N to Main Power Breaker; Aux. Sw. 2 Comm.
65		NOT USED
66	Wh/Green	Oper. Light To Interlock Switch
67	Wh/Brown	P7104, Pin C to Bandswitch Interlock NC.
68	Wh/Green Tag	P7104, Pin F to Operate Light Resistor.
69	Green	P7104, Pin G to Tune Light Res.
70	White	P7104, Pin H to Pin f, P7101.
71	Wh/Violet	P7105, Pin B to xfmr Filter box.
72	Black	P7105, Pin E to Ground.
73	Green	P7105, Pin J to Plate Meter Circuit, Pin 8.
74	Blue	Plate Meter Circuit Pin 3 to Meter Box Strip Term. 6.
75	Wh/Violet	Meter Box Strip Term 1(Fil Prl)to xfmr. Filter Box.
76	Violet	Meter Box Strip Term. 2(Fil Prl) to xfmr Filter Box.
78	Black	Meter Box Strip Term. 11(6nd) to Ground
79	Yellow	Meter Box Strip Term. 3 (Drive Meter +)to Circuit, Pin 3.
80	Yellow	Plate On Light Resistor To Meter Box Strip Term. 10 (Red-Lite Res.)
81	Yellow	Meter Box Strip Term. 10(Red Lite Res.)To HV Bkr. Ind. Light Res.
82	White	Main Power Bkr. Ø 1C to Meter Box Strip Term. 8(Meter Lites AC).
83	White	Meter Box Strip Term 8 to Ovld. Reset Switch
84	White	Ovld. Reset Switch to PA light Switch.
85	Wh/Black	Meter Box Strip Term 9(Wh. Lite) To PA Light switch.
86	Wh/Violet	Tune Light to Plate On light.
87	Wh/Violet	Plate On Light to Operate Light
88	Wh/Violet	Operate Light To Meter Box Strip Term. 7 (Fused Fluor.)
89	Wh/Violet	Meter Box Strip Term. 7 To HV Brk. Indic. Light.
90	Grey	AC Power Light To Main Power Breaker Ø 3C.
91	Violet	Main Power Breaker Ø 2C to AC Power Light Resistor
92	Violet	Main Power Breaker Ø 2H to Main Power Breaker Aux. SW1 Comm.
93	Red	Main Power Breaker Aux. SW. L NO to HV Breaker Reset Switch.
94	White	Main Power Breaker Ø 1C to Bandswitch Rel. Sw.
95	Violet	HV Breaker To Interlock Indic.
96	Violet	Main Power Ø 2C to Interlock Indic.
97	Wh/Violet	Plate on Lite To Bandswitch Release Solenoid
98	Red	Bandswitch Release Solenoid To Bandswitch Release SW. NC
99	Wh/Brown	Bandswitch Interlock NC To Air Switch Interlock Sw.
101	Wh/Brown	Resistor to Rear Door Int. NC
102	Wh/Brown	Rear Door Inter. NC To Relay Panel Inter. NC
103	Wh/Brown	Relay Panel Inter. NC to Bias Drawer Inter. NC
104	Wh/Brown	Bias Drawer Inter. NC to PA Deck Interlock NC.
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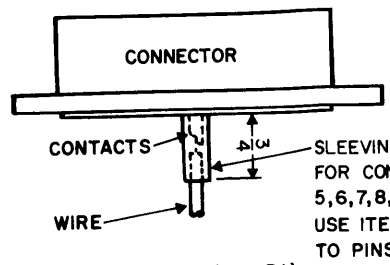
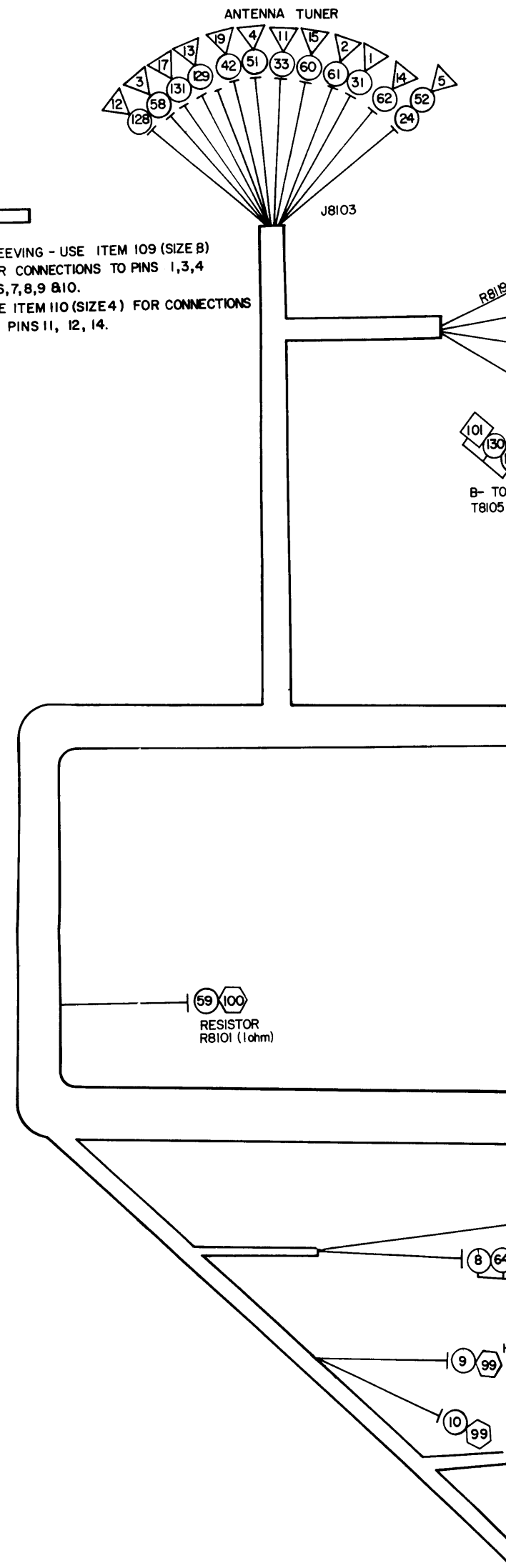
RUNNING SHEET FOR PA FRAME CABLE

COND.	COLOR	TERMINATIONS
1	Grey	P7102, Pin A to Main Power Breaker Ø 3H.
2	Wh/Violet	P7102, Pin B to HV Breaker Reset SW,NC.
3	Wh/Blue	P7102, Pin C to HV Breaker Reset SW,NO.
4	Yellow	P7102, Pin D to HV Breaker.
5	Wh/Blue	P7102, Pin E to N of Relay Plug P7107, J7601 Mate
6	Orange	P7102, Pin F. to f of relay Plug.
7	Green	P7102, Pin G to Y of Relay Plug. P7107 J7601 Mate
8	Wh/Green	P7102, Pin H to D of P7104.
9	Wh/Yellow	P7102, Pin I to E P7104.
10	Wh/Brown	P7102, Pin J to PA Deck Interlock NC
11	Wh/Red	P7102, Pin K to Bandswitch Int. No.
12	Wh/Yellow	P7102, Pin L to Inter. Switch, HVR Position
13	Wh/Orange	P7102, Pin M to Inter. Switch Crowbar Position.
14	Wh/Blue	P7102, Pin O to Inter. Switch Rear Door, PS Position.
15	White	P7102, Pin O to Main Power Breaker Ø 1H.
16	Wh/Black	P7102, Pin P to P of P7103.
17	Wh/Violet	P7102, Pin R to S of P7103.
18	Wh/Gray	P7102, Pin S to T of P7103.
19	Brown	P7102, Pin T to U of P7107.
20	Violet	P7102, Pin U to Main Power Breaker.
21	Grey	P7102, Pin V to Main Power Breaker.
22	Violet	P7102, Pin W to HV Breaker.
23	Red	P7102, Pin Y to Inter. Switch Ant. Tuner Position.
24	Tan	P7106, Pin C to C, P7108.
25		NOT USED
26	Wh/Red	P7106, Pin A to P7109.
27	Wh/Shielded	P7101, Pin A to SWR Circuit.
28	Red/Shielded	P7101, Pin A to SWR Circuit.
29	Green	P7106, Pin D to Pin D, P7108.
30	White	P7101, Pin E to PA Lite Switch.
31	Wh/Violet	P7101, Pin F to Tune Lite.
32	Wh/Orange	P7101, Pin H to xfmr. Filter Box Resistor.
33	Wh/Grey	P7101, Pin O to U, P7103,
34	Violet	P7101, Pin P to Main Power Breaker Ø 2G.
35	Grey	P7101, Pin R to Main Power Breaker Ø 3C.
36	White	P7101, Pin S to Main Power Breaker Ø 1C.
37	Wh/Black	P7101, Pin T to Pin V, Relay Plug.
38	Wh/Violet	P7101, Pin U to xfmr. Filter Box.
39	Wh/Black	P7101, Pin V to A Bias Supply.
40	Yellow	P7101, Pin Y to Term. 10, Meter Box Red Lite
41	Brown	P7107, Pin A to Term 5 Meter Box Pl. Curr. Neg.
42	Wh/Red	P7107, Pin G to Pin C, P7105.
43	Pink	P7107, Pin F to Pin K, P7105.
44	Wh/Blue	P7107, Pin E to Pin H, P7105.
45	White	P7107, Pin I to Main Power Breaker Ø 1C.
46	Violet	P7107, Pin J to Main Power Breaker Ø 2C.
47	Yellow	P7107, Pin K to Pin G, P7103.
48	Red	P7107, Pin L to Pin H, P7103.
49	Orange	P7107, Pin M to Pin C, P7103.
50	Violet	P7107, Pin O to Pin V, P7103.
51	Violet	P7107, Pin P to xfmr. Filter Box
52	Wh/Brown	P7107, Pin R to Bandswitch Inter. NC.

COND.	COLOR
53	Green
54	Wh/Yellow
55	Wh/Orang
56	Wh/Red
57	Wh/Black
58	Blue
59	Wh/Violet
60	Wh/Black
61	Yellow
62	Wh/Orange
63	Wh/Green
64	Wh/Yellow
65	
66	Wh/Green
67	Wh/Brown
68	Wh/Green
69	Green
70	White
71	Wh/Violet
72	Black
73	Green
74	Blue
75	Wh/Violet
76	Violet
78	Black
79	Yellow
80	Yellow
81	Yellow
82	White
83	White
84	White
85	Wh/Black
86	Wh/Violet
87	Wh/Violet
88	Wh/Violet
89	Wh/Violet
90	Grey
91	Violet
92	Violet
93	Red
94	White
95	Violet
96	Violet
97	Wh/Violet
98	Red
99	Wh/Brown
101	Wh/Brown
102	Wh/Brown
103	Wh/Brown
104	Wh/Brown



ITEM 97 (JJ-181)
WIRING



NTENNA TUNER

J8103

DEADMAN ASSEMBLY
E8113

E8117

R8119 / R8120

B- TO XFMR
T8105

TERMINAL 10

GRID CURRENT METER VIA
TERMINAL 8

TERMINAL 4

PULSE XMTR
T8105

TERMINAL 1

HIGH VOLTAGE RECTIFIER FIL

Ø3

Ø2

Ø1

ISTOR
01 (1ohm)

HV CONTACTOR COIL

HV CONTACTOR AUX
SWITCH

E8112

RESISTOR SHORTING CONTACTOR

AUX SWITCH
OF RESISTOR
SHORTING
CONTACTOR

AUX SWITCH
OF RESISTOR
SHORTING
CONTACTOR

FILAMENT
BOX Ø2

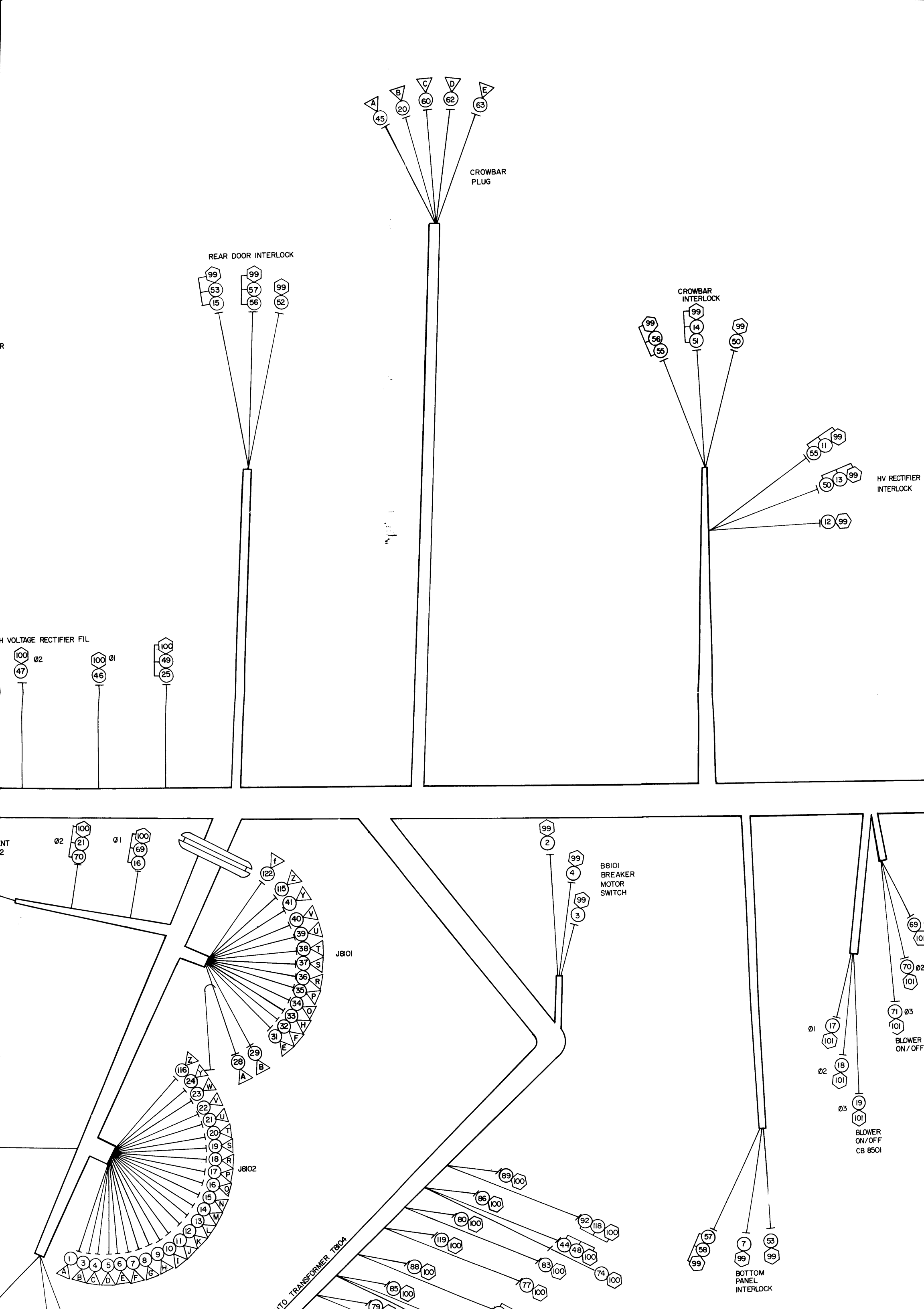
Ø2

Ø1

Ø3

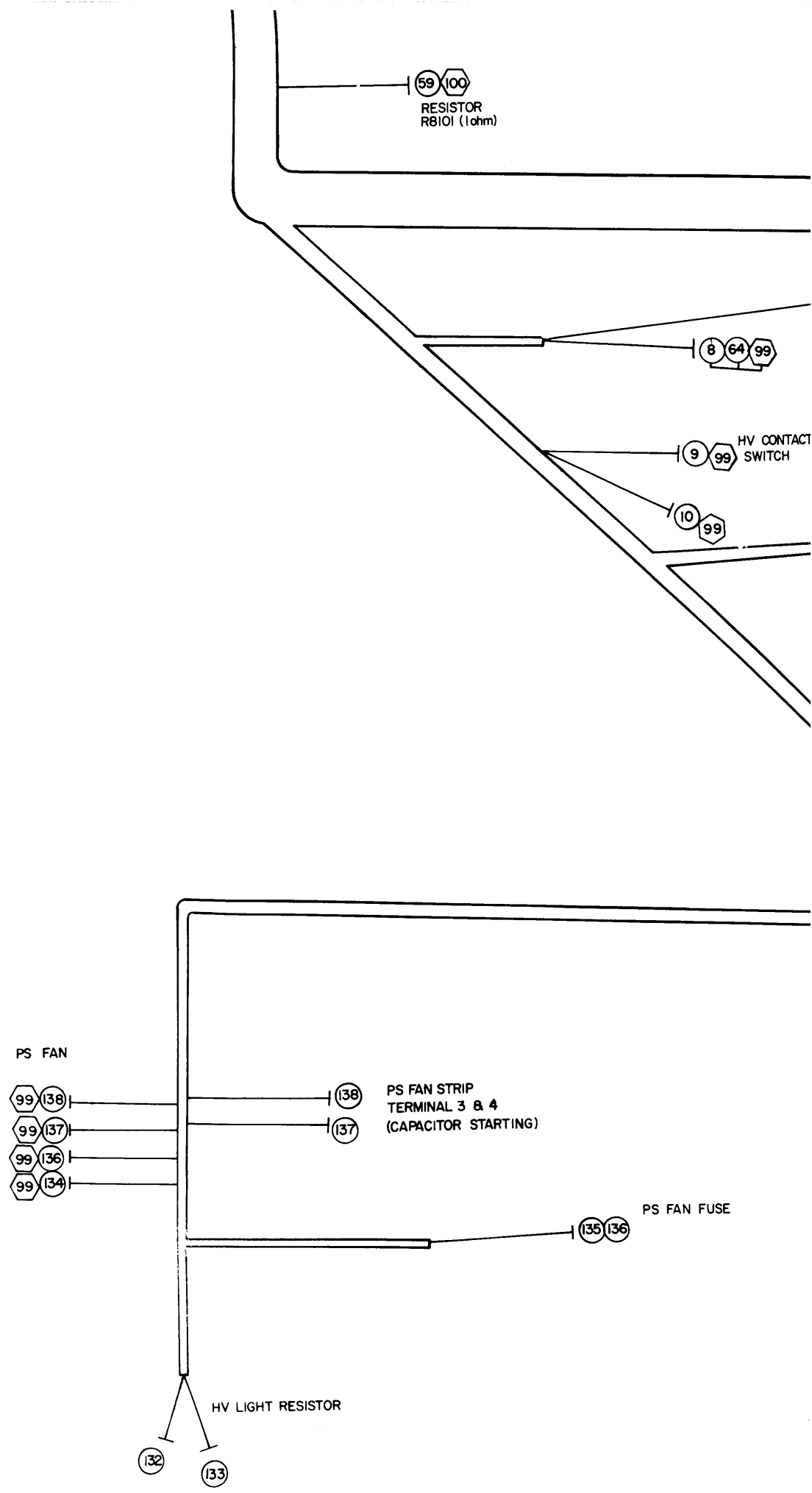
GROUNDS

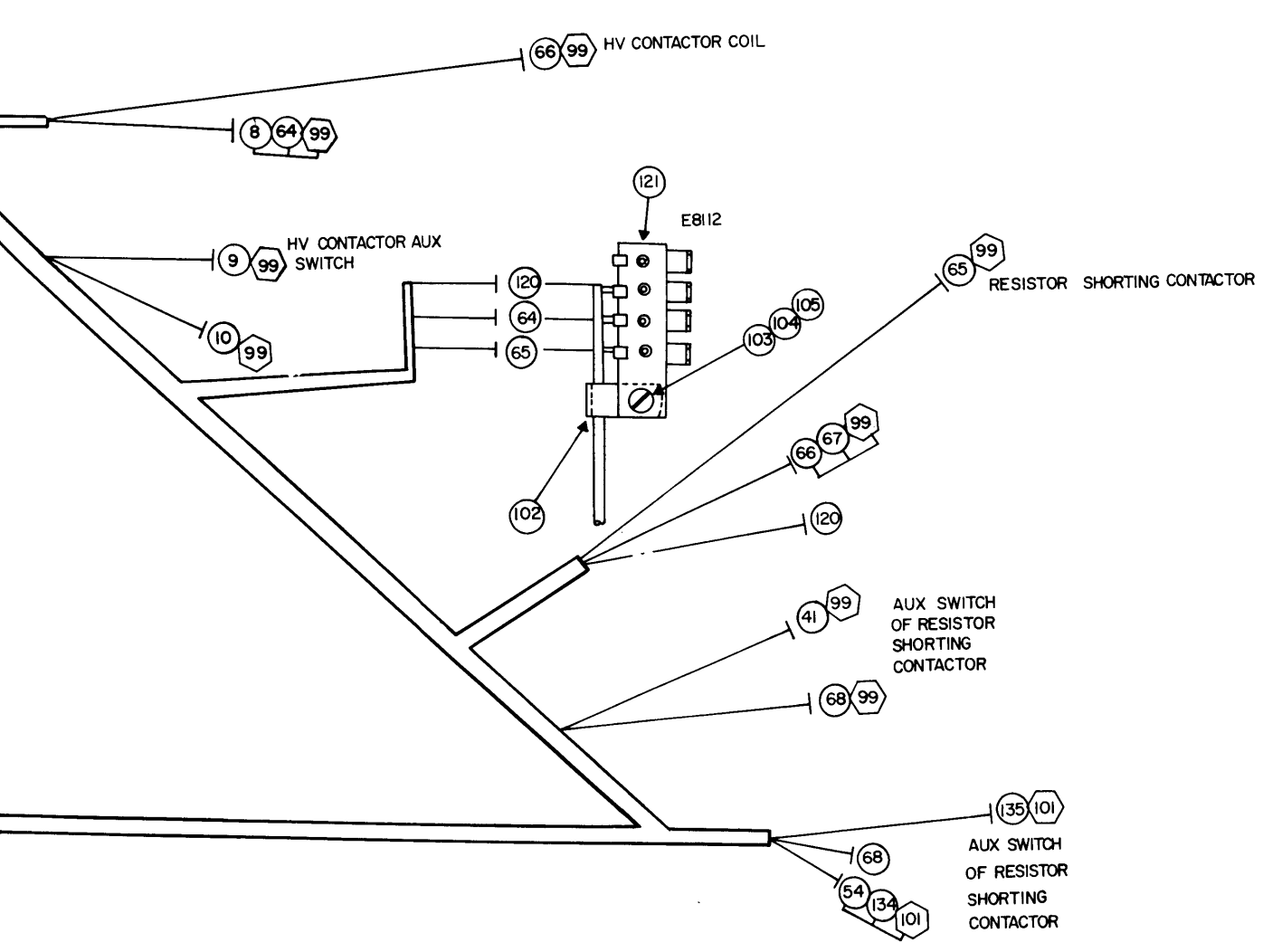
STRIP
AL 3 & 4
TOR STARTING)

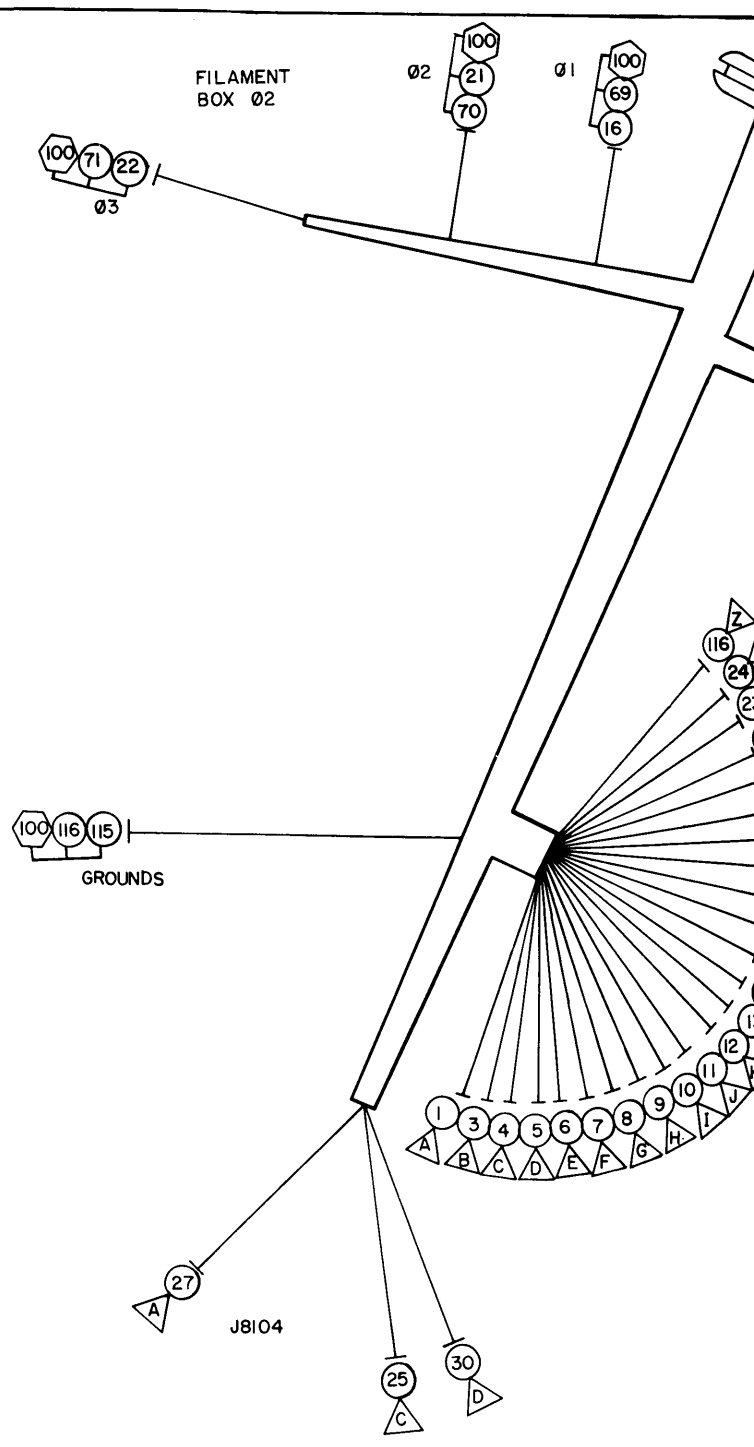

REAR DOOR INTERLOCK
99
53
15
99
57
56
99
52
A
45
B
20
C
60
D
62
E
63
CROWBAR
PLUG
CROWBAR
INTERLOCK
99
56
55
99
14
51
99
50
99
11
55
99
13
50
99
12
HV RECTIFIER
INTERLOCK
H VOLTAGE RECTIFIER FIL
100
47
Ø2
100
46
Ø1
100
49
25
100
21
70
Ø2
100
69
16
Ø1
J8101
J8102
B8101
BREAKER
MOTOR
SWITCH
99
2
99
4
99
3
99
17
101
Ø1
18
101
Ø2
19
101
Ø3
BLOWER
ON/OFF
CB 8501
71
101
Ø3
BLOWER
ON/OFF
57
58
99
7
99
53
99
BOTTOM
PANEL
INTERLOCK
TO TRANSFORMER T8104

VBAR
ERLOCK
9
4
SI
99
50
99
11
55
99
13
50
HV RECTIFIER
INTERLOCK
99
12
220V
TAP Ø1 84
210
TAP
SW Ø1 81
69 Ø1
101
70 Ø2
101
71 Ø3
101
BLOWER
ON/OFF
Ø1 17
101
Ø2 18
101
Ø3 19
101
BLOWER
ON/OFF
CB 8501
78
200V
TAP
Ø1
190V
TAP Ø1 15
85
TAP
200
Ø2
82
TAP
210
Ø2
79
TAP 200
Ø2
86
220
Ø3
76
TAP 190
Ø2
83
210
Ø3
80
200
Ø3
77
190
Ø3
36
WIPER
230
Ø3
74 230
Ø3
89 240
Ø3
92 250
Ø3
35 WIPER
43 230
Ø2
91 250
Ø2
230
73
Ø2
88
240 Ø2
37
Ø1
WIPER
230V
72 230V
TAP Ø1
87 240V
TAP Ø1
90 250
TAP Ø1
122
INTERLOCK
FUSE
54
1
BREAKER
MOTOR
FUSE
2
43
LIGHT FUSE
Ø2
32
61
LIGHT FUSE
Ø2
42
CAL SW
S8502
28
SWR
S8501
29
57
58
99
7
99
BOTTOM
PANEL
INTERLOCK
53
99

84
81
85
TAP
200
Ø2
82
TAP
210
Ø2
79
TAP 200
Ø2
86
220
Ø3
76
TAP 190
Ø2
83
210
Ø3
80
200
Ø3
77
190
Ø3
36
WIPER
230
Ø3
74
230
Ø3
89
240
Ø3
92
250
Ø3
35
WIPER
43
230
Ø2
91
250
Ø2
88
240 Ø2
37
Ø1
WIPER
230V
72
230V
TAP Ø1
87
240V
TAP Ø1
90
250
TAP Ø1
73
230
Ø2
15
Ø1
122
INTERLOCK
FUSE
54
1
BREAKER
MOTOR
FUSE
2
43
LIGHT FUSE
Ø2
32
61
LIGHT FUSE
Ø2
42
CAL SW
S8502
28
SWR
S8501
29
44
45
101
FINAL
FILAMENT
BREAKER
34
101
FINAL
FILAMENT
BREAKER


59
100
RESISTOR
R8101 (1ohm)
8
64
99
9
99
HV CONTACT
SWITCH
10
99
PS FAN
99
138
99
137
99
136
99
134
138
PS FAN STRIP
TERMINAL 3 & 4
(CAPACITOR STARTING)
137
PS FAN FUSE
135
136
HV LIGHT RESISTOR
132
133

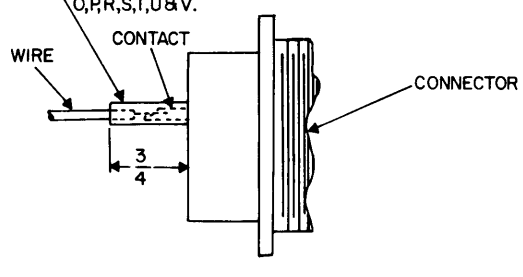




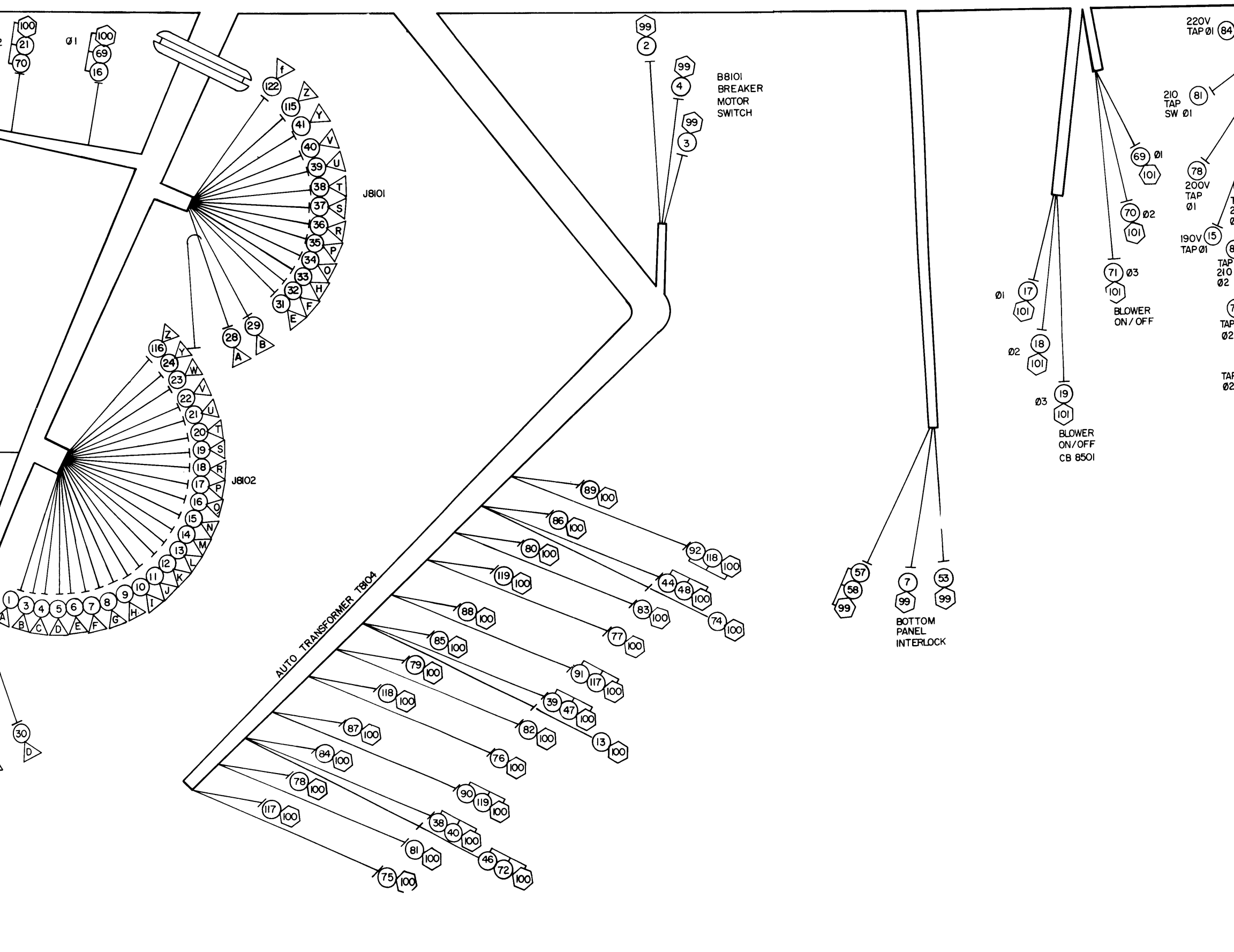
TING)

PS FAN FUSE
135 136

SLEEVING - USE ITEM 107 (SIZE 10) FOR CONNECTIONS TO PINS A, B, C, D, E, F, G, H, I, J, K, L, M, N, W, X, Y, Z, b, c & d
USE ITEM 108 (SIZE 7) FOR CONNECTIONS TO PINS O, P, R, S, T, U & V.



WIRING DETAIL FOR ITEMS 94 & 95


J8101
J8102
B8101
BREAKER
MOTOR
SWITCH
AUTO TRANSFORMER T8104
Ø1
Ø2
Ø3
BLOWER
ON/OFF
BLOWER
ON/OFF
CB 8501
BOTTOM
PANEL
INTERLOCK
220V
TAP Ø1
210
TAP
SW Ø1
200V
TAP
Ø1
190V
TAP Ø1

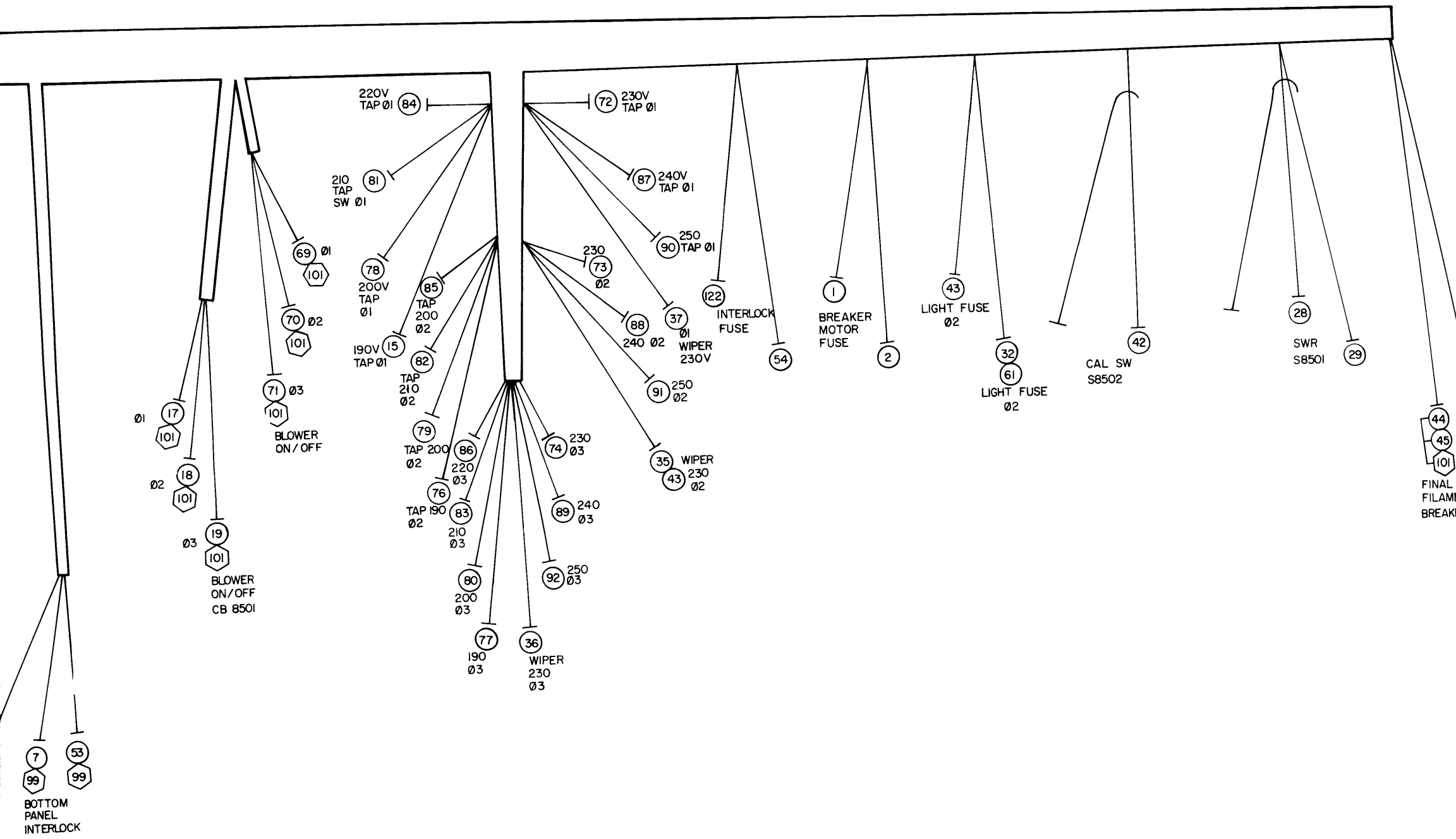


Figure 4-7-3. Cab
Fourth Frame, GPT-4

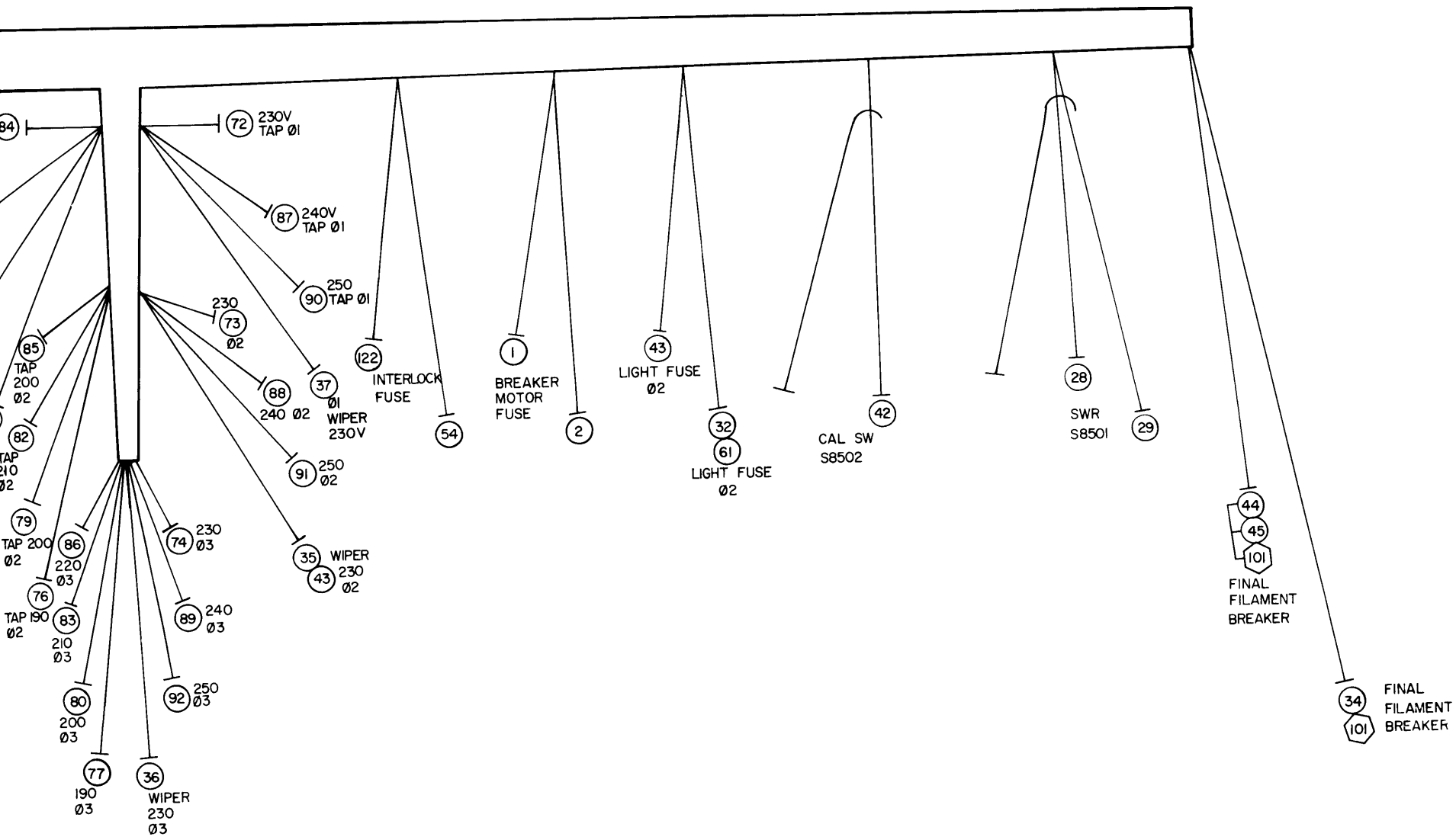


Figure 4-7-3. Cabling Diagram, Fourth Frame, GPT-40K (Sheet 1 of 2)

	COND.	COLOR	TERMINATIONS From	To
	134	White	Ø 1 Contactor	Fan Strip, Term. 1
Inter., C	135	Violet	Ø 2 Contactor	Fan Fuse
ner, Pin 4 C	136	Wh/Violet	Fan Strip Term 2	Fuse
or Inter., G	137	White	Fan Strip Term 3	Cap.
Panel Inter., C	138	White	Fan Strip, Term 4	Cap
ck Fuse				
Inter, NC				
or Inter. NC				
Panel Inter. NC				

	ITEM	DESCRIPTION	REMARKS
ner, Pin 3 NC	93	Cord, Lacing	
ner, Strip Plate Volt	94	Connector, Receptacle, Female	J8102
	95	Connector, Receptacle, Male	J8101
, Pin C Filament	96	Connector, Plug Female	P8101
ner, Pin 2	97	Connector, Receptacle, Female	J8103
er,Pin 14 AC Volts	98	Strip, Fanning, 6 Lug	
rm 4	99	Lug, Spade (#6)	
witch	100	Terminal, #10	
witch	101	Terminal, # 14	
. Coil	102	Clamp, "G" Type, 3/16 D	
elay Micro Sw.	103	Screw, Machine, 6-32 x ½ " Long	
rt Cont.Ø 1 Line Term.	104	Lockwasher, Ext.	
Box. Ø 1	105	Nut, Hex.	
Box, Ø 2	106	Grommet, Elastic, 1¼ 1D	
Box, Ø 3	107	Sleeving, Size 10 (.106 1D)	
MR, Ø 1 230 V	108	Sleeving, Size 7 (.148 1D)	
MR, Ø 2, 230 V	109	Sleeving, Size 8 (.133 1D)	
MR, Ø 3, 230 V	110	Sleeving, Size 4 (.208 1D)	
MR, Ø 1, 190 V	111	Deleted	
MR, Ø 2, 190V	112	Deleted	
MR, Ø 3, 190 V	113	Deleted	
MR, Ø 1, 200 V	114	Deleted	
MR, Ø 2, 200 V	121	Fanning Strip	
MR, Ø 3, 200 V	123	Connector, Receptacle, Female	J8104
MR, Ø 1, 210 V	124	Connector Plate	J8104
MR, Ø 2, 210 V	125	For P8101	
MR, Ø/3, 210 V	126	NOT USED	
MR, Ø 1, 220 V			
MR, Ø 2, 220 V			
MR, Ø 3, 220 V			
MR, Ø 1, 240 V			
MR, Ø 2, 240 V			
MR, Ø 3, 240 V			
MR, Ø 1, 250 V			
MR, Ø 2, 250 V			
MR, Ø 3, 250 V			

(Auto XFMR)
(Auto XFMR)
(Auto XFMR)
oil
101

trip 1
trip 3
rm. 1
nit Pin 17
Resistor

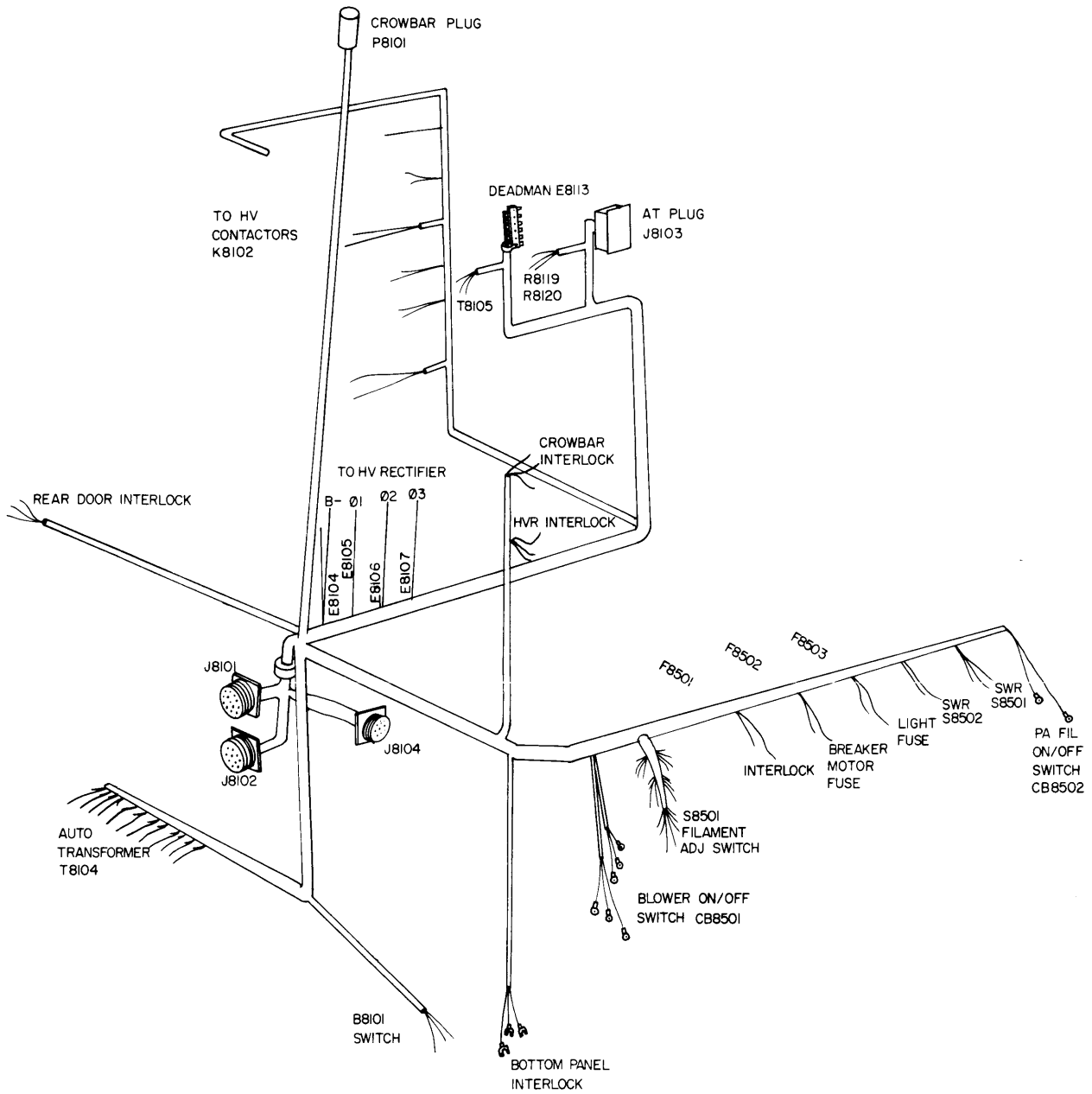


Figure 4-7-3. Cabling Diagram, Fourth Frame, GPT-40K (Sheet 2 of 2)

RUNNING SHEET FOR PS FRAME CABLE

COND.	COLOR	TERMINATIONS From	To
1	Grey	Pin A	Breaker Motor Fuse
2	Grey	Breaker Motor Fuse	L1 of Breaker Motor
3	Wh/Violet	J8102 Pin B	Forward, Breaker Motor
4	Wh/Blue	J8102, Pin C	Reverse, Breaker Motor
5	Yellow	J8102, Pin D	Micro Sw., Shorting Relay
6	Wh/Blue	J8102, Pin E	Shorting Relay Coil
7	Orange	J8102, Pin F	Bottom Panel Int. NO
8	Green	J8102, Pin G	HV Contactor Coil
9	Wh/Green	J8102, Pin H	HV Cont. Aux. Sw.
10	Wh/Yellow	J8102, Pin I	HV Cont. Aux. Sw.
11	Wh/Brown	J8102, Pin J	HVR Interlock, NC(HV Prot.)
12	Wh/Red	J8102, Pin K	HVR Interlock, C(Inter Start)
13	Wh/Yellow	J8102, Pin L	HVR Interlock, NO(Indic)
14	Wh/Orange	J8102, Pin M	Crowbar Inter. NO
15	Wh/Blue	J8102, Pin N	Rear Door Inter. NO
16	White	J8102, Pin O	Filter Box, Ø 1 (AC Ln)
17	Wh/Black	J8102, Pin P	Blower On-Off, Ø 1
18	Wh/Violet	J8102, Pin R	Blower On-Off, Ø 2
19	Wh/Grey	J8102, Pin S	Blower On-Off, Ø 3
20	Brown	J8102, Pin T	Crowbar, Pin B
21	Violet	J8102, Pin U	Filter Box, Ø 2(AC Ln)
22	Grey	J8102, Pin V	Filter Box, Ø 3(AC Ln)
23	Orange	J8102, Pin W	Shorting Relay Coil
24	Red	J8102, Pin Y	Ant. Tuner, Pin 5 Micro Sw, NO(Indic)
25	Tan	J8104, Pin C	B-of HVR & C.B.
26		NOT USED	
27	Wh/Red	J8104, Pin A	Short Relay Micro Sw. + 600 V
28	Wh/Shielded	J8101, Pin A	SWR Pot
29	Red/Shielded	J8101, Pin B	SWR Pot
30	Green	J8104. Pin D	Ant. Tuner, Pin 17 Grid Current Meter
31	White	J8101, Pin E	Ant. Tuner,Pin 1 Ø 1 to Meter Lights
32	Wh/Violet	J8101, Pin F	Light Fuse, Ø 2
33	Orange	J8101, Pin H	Ant. Tuner, Pin 11 Grid Volt Meter
34	Wh/Grey	J8101, Pin O	Final Fil. Breaker
35	Violet	J8101, Pin P	Fil. Adj. Sw. - Ø 2 Wiper 230 V
36	Grey	J8101, Pin R	Fil. Adj. Sw. - Ø 3 Wiper 230 V
37	White	J8101, Pin S	Fil.Adj.Sw.-Ø 1 Wiper 230 V
38	Wh/Black	J8101, Pin T	Auto XFMR,Ø 1 230 V
39	Wh/Violet	J8101, Pin U	Auto XFMR, Ø 2 230 V
40	Wh/Black	J8101, Pin V	Auto XFMR, Ø 1 230 V
41	Yellow	J8101, Pin Y	Resistor,Contactor Aux.Switch
42	Green	SWR, Cal. Switch	Ant. Tuner Pin 19
43	Violet	Light Fuse, Ø 2	Fil.Adj.Sw.-Ø 2 Wiper 230 V
44	Grey	Final Fil. Breaker	Auto XFMR-Ø 3 230 V
45	Grey	Final Fil. Breaker	Crowbar, Pin A
46	Wh/Black	HVR, Ø 1 Fil.	Auto XFMR, - Ø 1 230 V
47	Wh/Violet	HVR, Ø 2 Fil.	Auto XFMR, - Ø 2 230 V
48	Wh/Grey	HVR, Ø 3 Fil.	Auto XFMR, - Ø 3 230 V
49	Tan	HVR & Crowbar B Return	Ant. Tuner Term. Strip
50	Wh/Yellow	HVR Inter. NO	Crowbar Inter., C
51	Wh/Orange	Crowbar Inter., NO	Ant. Tuner, Pin 4 C
52	R d	Ant. Tuner, Pin 5 NO	Rear Door Inter., G
53	Wh/Blue	Rear Door Inter, NO	Bottom Panel Inter., C
54	White	Fil.Adj.Sw. Ø 1 Wiper	Interlock Fuse
55	Wh/Brown	HVR Inter., NC	Crowbar Inter, NC
56	Wh/Brown	Crowbar Inter., NC	Rear Door Inter. NC
57	Wh/Brown	Rear Door Inter., NC	Bottom Panel Inter. NC
58	Wh/Brown	Bottom Panel Inter, NC	Ant. Tuner, Pin 3 NC
59	Wh/Red	1 Ohm 14W Resistor Board	Ant. Tuner, Strip Plate Volt Meter.
60	Blue	Ant. Tuner,Pin 15 AV Volts	Crowbar, Pin C Filament
61	Wh/Violet	Light Fuse	Ant. Tuner, Pin 2
62	Pink	Crowbar,Pin D Filament	Ant.Tuner,Pin 14 AC Volts
63	Wh/Brown	Crowbar, Pin E to	XFMR Term 4
64	Green	HV Cont. Coil	Timer Switch
65	Orange	Res. Short Cont. Coil	Timer Switch
66	Blue	Res. Short Cont. Coil	HV Cont. Coil
67	Blue	Res. Short Cont. Coil	Short Relay Micro Sw.
68	White	Res.Short.Cont.Aux Switch	Res.Short Cont.Ø 1 Line Term.
69	White	Blower on-off Ø 1	Filter Box. Ø 1
70	Violet	Blower On-Off Ø 2	Filter Box, Ø 2
71	Grey	Blower On-Off Ø 3	Filter Box, Ø 3
72	White	Tap Sw. Ø 1, 230 V	Auto XFMR, Ø 1 230 V
73	Violet	Tap Sw. Ø 2, 230 V	Auto XFMR, Ø 2, 230 V
74	Grey	Tap Sw, Ø 3, 230 V	Auto XFMR, Ø 3, 230 V
75	Red	Tap Sw. Ø 1, 190 V	Auto XFMR, Ø 1, 190 V
76	Red	Tap Sw. Ø 2, 190 V	Auto XFMR, Ø 2, 190V
77	Red	Tap Sw. Ø 3, 190 V	Auto XFMR, Ø 3, 190 V
78	Blue	Tap Sw. Ø 1, 200 V	Auto XFMR, Ø 1, 200 V
79	Blue	Tap Sw, Ø 2, 200 V	Auto XFMR, Ø 2, 200 V
80	Blue	Tap SW, Ø 3, 200 V	Auto XFMR, Ø 3, 200 V
81	Yellow	Tap Sw, Ø 1, 210 V	Auto XFMR, Ø 1, 210 V
82	Yellow	Tap Sw, Ø 2, 210 V	Auto XFMR, Ø 2, 210 V
83	Yellow	Tap Sw, Ø 3, 210 V	Auto XFMR, Ø/3, 210 V
84	Orange	Tap Sw, Ø 1, 220 V	Auto XFMR, Ø 1, 220 V
85	Orange	Tap Sw, Ø 2, 220 V	Auto XFMR, Ø 2, 220 V
86	Orange	Tap Sw, Ø 3, 220 V	Auto XFMR, Ø 3, 220 V
87	Green	Tap Sw, Ø 1, 240 V	Auto XFMR, Ø 1, 240 V
88	Green	Tap Sw, Ø 2, 240 V	Auto XFMR, Ø 2, 240 V
89	Green	Tap Sw, Ø 3, 240 V	Auto XFMR, Ø 3, 240 V
90	Brown	Tap Sw, Ø 1, 250 V	Auto XFMR, Ø 1, 250 V
91	Brown	Tap Sw, Ø 2, 250 V	Auto XFMR, Ø 2, 250 V
92	Brown	Tap Sw, Ø 3, 250 V	Auto XFMR, Ø 3, 250 V
115	Black	J8101, Pin Z	Ground
116	Black	J8102, Pin Z	Ground
117	Brown	Ø 1 0 to	Ø 2 250 (Auto XFMR)
118	Brown	Ø 2 0	Ø 3 250 (Auto XFMR)
119	Brown	Ø 3 0	Ø 1 250 (Auto XFMR)
120	Blue	Timer	Cont. Coil
122	Wh/Black	Int. Fuse	F of J8101
127	Tan	Shorting Relay Pin 5	B-
128		Ant. Tuner,Pin 12	Term. Strip 1
129		Ant. Tuner,Pin 13	Term. Strip 3
130	Tan	Sh.Rel. B	XFMR Term. 1
131	Wh/Brown	XFMR. Term 10	Tuner Unit Pin 17
132	Wh/Blue	Sh.Relay, Term 1	HV Lite Resistor
133	Orange	Sh. Relay, Term 2	HV Lite
134	White		
135	Violet		
136	Wh/Violet		
137	White		
138	White		

ITEM
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RUNNING SHEET FOR PS FRAME CABLE

COND.	COLOR	TERMINATIONS From	To
1	Grey	Pin A	Breaker Motor Fuse
2	Grey	Breaker Motor Fuse	L1 of Breaker Motor
3	Wh/Violet	J8102 Pin B	Forward, Breaker Motor
4	Wh/Blue	J8102, Pin C	Reverse, Breaker Motor
5	Yellow	J8102, Pin D	Micro Sw., Shorting Relay
6	Wh/Blue	J8102, Pin E	Shorting Relay Coil
7	Orange	J8102, Pin F	Bottom Panel Int. NO
8	Green	J8102, Pin G	HV Contactor Coil
9	Wh/Green	J8102, Pin H	HV Cont. Aux. Sw.
10	Wh/Yellow	J8102, Pin I	HV Cont. Aux. Sw.
11	Wh/Brown	J8102, Pin J	HVR Interlock, NC(HV Prot.)
12	Wh/Red	J8102, Pin K	HVR Interlock, C(Inter Start)
13	Wh/Yellow	J8102, Pin L	HVR Interlock, NO(Indic)
14	Wh/Orange	J8102, Pin M	Crowbar Inter. NO
15	Wh/Blue	J8102, Pin N	Rear Door Inter. NO
16	White	J8102, Pin O	Filter Box, Ø 1 (AC Ln)
17	Wh/Black	J8102, Pin P	Blower On-Off, Ø 1
18	Wh/Violet	J8102, Pin R	Blower On-Off, Ø 2
19	Wh/Grey	J8102, Pin S	Blower On-Off, Ø 3
20	Brown	J8102, Pin T	Crowbar, Pin B
21	Violet	J8102, Pin U	Filter Box, Ø 2(AC Ln)
22	Grey	J8102, Pin V	Filter Box, Ø 3(AC Ln)
23	Orange	J8102, Pin W	Shorting Relay Coil
24	Red	J8102, Pin Y	Ant. Tuner, Pin 5 Micro Sw, NO(Indic)
25	Tan	J8104, Pin C	B-of HVR & C.B.
26		NOT USED	
27	Wh/Red	J8104, Pin A	Short Relay Micro Sw. + 600 V
28	Wh/Shielded	J8101, Pin A	SWR Pot
29	Red/Shielded	J8101, Pin B	SWR Pot
30	Green	J8104, Pin D	Ant. Tuner, Pin 17 Grid Current Meter
31	White	J8101, Pin E	Ant. Tuner,Pin 1 Ø 1 to Meter Lights
32	Wh/Violet	J8101, Pin F	Light Fuse, Ø 2
33	Orange	J8101, Pin H	Ant. Tuner, Pin 11 Grid Volt Meter
34	Wh/Grey	J8101, Pin O	Final Fil. Breaker
35	Violet	J8101, Pin P	Fil. Adj. Sw. - Ø 2 Wiper 230 V
36	Grey	J8101, Pin R	Fil. Adj. Sw. - Ø 3 Wiper 230 V
37	White	J8101, Pin S	Fil.Adj.Sw.-Ø 1 Wiper 230 V
38	Wh/Black	J8101, Pin T	Auto XFMR,Ø 1 230 V
39	Wh/Violet	J8101, Pin U	Auto XFMR, Ø 2 - 230 V
40	Wh/Black	J8101, Pin V	Auto XFMR, Ø 1 230 V
41	Yellow	J8101, Pin Y	Resistor,Contactor Aux.Switch
42	Green	SWR, Cal. Switch	Ant. Tuner Pin 19
43	Violet	Light Fuse, Ø 2	Fil.Adj.Sw.-Ø 2 Wiper 230 V
44	Grey	Final Fil. Breaker	Auto XFMR-Ø 3 230 V
45	Grey	Final Fil. Breaker	Crowbar, Pin A
46	Wh/Black	HVR, Ø 1 Fil.	Auto XFMR, - Ø 1 230 V
47	Wh/Violet	HVR, Ø 2 Fil.	Auto XFMR, - Ø 2 230 V
48	Wh/Grey	HVR, Ø 3 Fil.	Auto XFMR, - Ø 3 230 V
49	Tan	HVR & Crowbar B Return	Ant. Tuner Term. Strip
50	Wh/Yellow	HVR Inter. NO	
51	Wh/Orange	Crowbar Inter.	
52	Red	Ant. Tuner, Pi	
53	Wh/Blue	Rear Door Inte	
54	White	Fil.Adj.Sw. Ø	
55	Wh/Brown	HVR Inter., NC	
56	Wh/Brown	Crowbar Inter.	
57	Wh/Brown	Rear Door Inte	
58	Wh/Brown	Bottom Panel I	
59	Wh/Red	1 Ohm 14W Resi	
60	Blue	Ant. Tuner,Pin	
61	Wh/Violet	Light Fuse	
62	Pink	Crowbar,Pin D	
63	Wh/Brown	Crowbar, Pin E	
64	Green	HV Cont. Coil	
65	Orange	Res. Short Con	
66	Blue	Res. Short Con	
67	Blue	Res. Short Con	
68	White	Res.Short.Cont	
69	White	Blower on-off	
70	Violet	Blower On-Off	
71	Grey	Blower On-Off	
72	White	Tap Sw. Ø 1, 2	
73	Violet	Tap Sw. Ø 2, 2	
74	Grey	Tap Sw, Ø 3, 2	
75	Red	Tap Sw. Ø 1, 1	
76	Red	Tap Sw. Ø 2, 1	
77	Red	Tap Sw. Ø 3, 1	
78	Blue	Tap Sw. Ø 1, 2	
79	Blue	Tap Sw, Ø 2, 2	
80	Blue	Tap SW, Ø 3, 2	
81	Yellow	Tap Sw, Ø 1, 2	
82	Yellow	Tap Sw, Ø 2, 2	
83	Yellow	Tap Sw, Ø 3, 2	
84	Orange	Tap Sw, Ø 1, 2	
85	Orange	Tap Sw, Ø 2, 2	
86	Orange	Tap Sw, Ø 3, 2	
87	Green	Tap Sw, Ø 1, 2	
88	Green	Tap Sw, Ø 2, 2	
89	Green	Tap Sw, Ø 3, 2	
90	Brown	Tap Sw, Ø 1, 2	
91	Brown	Tap Sw, Ø 2, 2	
92	Brown	Tap Sw, Ø 3, 2	
115	Black	J8101, Pin Z	
116	Black	J8102, Pin Z	
117	Brown	Ø 1 0 to	
118	Brown	Ø 2 0	
119	Brown	Ø 3 0	
120	Blue	Timer	
122	Wh/Black	Int. Fuse	
127	Tan	Shorting Relay	
128		Ant. Tuner,Pin	
129		Ant. Tuner,Pin	
130	Tan	Sh.Rel. B	
131	Wh/Brown	XFMR. Term 10	
132	Wh/Blue	Sh.Relay, Term	
133	Orange	Sh. Relay, Ter	

PART V

PARTS LIST

INTRODUCTION

Reference designations have been assigned to identify all maintenance parts of the equipment. They are used for marking the equipment (adjacent to the part they identify) and are included on drawings, diagrams, and the parts list. The letters of a reference designation indicate the kind of part (generic group), such as resistor, amplifier, electron tubes, etc. The number differentiates between parts of the same generic group. Parts of the same first major unit are numbered from 1 to 199; parts of the second 201 to 299, etc. Two consecutive series of numbers have been assigned to major units in which there are more than 100 parts of the same generic group. Sockets associated with a particular plug-in device, such as an electron tube or fuse, are identified by a reference designation which includes the reference designation of the plug-in device. For example, the socket for fuse F7 is designated XF7. The parts for each major unit are grouped together. Column 1 lists the reference series of each major unit, followed by the reference designations of the various parts in alphabetical and numerical order. Column 2 gives the name and describes the various parts. Major part assemblies are listed in their entirety; subparts of a major assembly are listed in alphabetical and numerical order with reference to its major assembly. Column 3 indicates how the part is used within a major component. Column 4 lists each Technical Materiel Corporation part number.

CONTENTS

PA(10K) FRAME

PA(40K) FRAME

POWER SUPPLY FRAME

PA(10K) SECTION (SYMBOL SERIES 900)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
A901	NOT USED.		
A902	NOT USED.		
A903	FINAL COIL/SWITCH ASSEMBLY.	PA Tuning	AS-102
C900	CAPACITOR, fixed: mica; button; 1000 mmf, ±5%, 300 wvdc.	ALDC Bypass	CB21PD102J
C901	Same as C900.	ALDC Bypass	
C902	Same as C900.	ALDC Bypass	
C903	Same as C900.	ALDC Bypass	
C904	CAPACITOR, fixed: mica; 20 mmf, ±5%, 500 wvdc.	ALDC Filter	CM15C200J
C905	CAPACITOR, fixed: ceramic; 3 mmf, ±.25 mmf, 500 wvdc.	PA Plate RF Meter Coupling	CC21SL030C
C906	CAPACITOR, fixed: mica; 100 mmf, ±5%, 500 wvdc, char. C.	ALDC Filter	CM20C101J
C907	CAPACITOR, fixed: ceramic; 10 mmf, ±.5 mmf, 500 wvdc.	ALDC Coupling	CC21SL100D
C908	CAPACITOR, fixed: mica; 5 mmf, ±20%, 500 wvdc.	PA Monitor Coupling	CM20C050M
C909	CONDENSOR, fixed: vacuum; 3 mmfd, 17,000 volts peak; 7 amp current rating; 1-1/16 in. dia. x 3-1/4 in. lg.	PA Monitor Coupling	C0-102-3
C910	CAPACITOR, fixed: mica; 51 uuf, ±5%, 500 wvdc.	Voltage Divider	CM15C510J
C911	CAPACITOR, fixed: vacuum; 1000 mmf, 15,000 wvdc.	PA Plate DC Blocking	C0-101-1000-15C
C912	Same as C900.	M1003 Bypass	
C913	Same as C900.	M1003 Bypass	
C914	CAPACITOR, fixed: mylar; .1 mf, ±5%, 700 wvdc.	M1003 Bypass	CN108C1003J
C915	Same as C900.	M1003 Bypass	
C916	CAPACITOR ASSY., variable: vacuum; 5-750 mmf, 5000 volts peak; clockwise rotation decreases capacity; 3-1/4 in. dia. x 7-3/4 in. lg. o/a, with bevel gear.	Output Balance	AM-103

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C917	CAPACITOR, fixed: ceramic; 1000 mmf, ±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; 500 uuf, ±20%, 5000 wvdc, 6-32 tapped studs each end; 13/16" dia. x 7/8" lg. o/a, p/o XV900.	PA Screen Bypass	CC-109-36
C920	Same as C919, part of XV900.	PA Screen Bypass	
C921	Same as C919, part of XV900.	PA Screen Bypass	
C922	Same as C919, part of SV900.	PA Screen Bypass	
C923	Same as C919, part of SV900.	PA Screen Bypass	
C924	Same as C919, part of XV900.	PA Screen Bypass	
C925	Same as C919, part of XV900.	PA Screen Bypass	
C926	Same as C919, part of XV900.	PA Screen Bypass	
C927	CAPACITOR ASSY., variable: vacuum; 5-250 mmf, 15,000 volts peak; clockwise rotation decreases capacity; 3-9/16 in. dia. x 7-3/4 in. lg. o/a., with bevel gear.	PA Tuning	AM-104
C928	CAPACITOR ASSY., variable: vacuum; 15-1200 mmf, 10,000 volts peak; clockwise rotation decreases capacity; 4-5/16 in. dia. x 10 in. lg. o/a., with bevel gear.	PA Load	AM-102
C929	CONDENSER, fixed: vacuum; 10 mmf, 17,000 volts peak; 1-1/16 in. dia. x 3-1/8 in. lg. o/a.	PA Inverse Feedback	CO-104-2
C930	Same as C911.		
C931	CAPACITOR, fixed: mica; 1000 mmf, ±10%, 500 wvdc.	Grid Bypass	CM20C102K
C932	Same as C931.	Grid Bypass	
C933	CAPACITOR, fixed: ceramic; 50 mmf, ±10%, 7500 wvdc, 6-32 tapped studs each end, 13/16" dia. x 7/8" lg. o/a.	Grid Bypass	CC-109-19
C934	Same as C933, part of XV900.	Grid Bypass	
C935	Same as C933, part of XV900.	Grid Bypass	

PA(10K) SECTION (SYMBOL SERIES 900)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C936	Same as C933, part of XV900.	Grid Bypass	
C937	NOT USED.		
C938	NOT USED.		
C939	CAPACITOR, fixed: trylar; 1000 uufd, ±10%, 14,000 wvdc.	PA Plate Bypass	CX102K102T
C940	Same as C939.	PA Plate Bypass	
C941	CAPACITOR, fixed: mica; 5 uuf, ±20%, 500 wvdc.	IPA Monitor Volt. Divider	CM15C050M
C942	CAPACITOR, fixed: mica; 510 mmf, ±5%, 500 wvdc.	IPA Monitor Volt. Divider	CM20B510J
C943	CAPACITOR, feed-thru: 1000 mmf, ±20%, 500 wvdc.	Feed-thru Bypass ALDC Circuit	CK70A102M
C944	Same as C943.	RF Bypass M1003	
C945	Same as C943.	PA Grid Bias Bypass	
C946	CAPACITOR, fixed: trylar; 10,000 uufd; ±10%, 4000 wvdc.	PA Filament Bypass	CX102J103M
C947	Same as C946.	PA Filament Bypass	
C948	Same as C943.	ALDC Bypass	
CR900	DIODE, germanium.	ALDC Rectifier	1N303
CR901	Same as CR900.	PA Plate, RF Rectifier	
E900 TO E906	NOT USED.		
E907	CONTACT ASSEMBLY, short.	p/o RF Bandswitch	AX-129
E908	Same as E907.	p/o RF Bandswitch	
E909	Same as E907.	p/o RF Bandswitch	
E910	Same as E907.	p/o RF Bandswitch	
E911	Same as E907.	p/o RF Bandswitch	
E912	CONTACT ASSEMBLY, long.	p/o RF Bandswitch	AX-128
J900	CONNECTOR, receptacle: electrical; 1 female contact; 52 ohms, BNC type.	IPA Monitor	UG-625/U
J901	CONNECTOR, receptacle: female; teflon insulated; mtg. dim. four 1/8 inch holes on 29/32 in. mtg. centers.	Driver Input	UG-560/U

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
J902	Same as J900.	Monitor	
J903	NOT USED.		
J904	CONNECTOR, probe assembly.	RF Monitor	AJ-100
J905	CONNECTOR, receptacle: RF; coaxial; QDL.	Emerg. Output	JJ-137
J906	CONNECTOR, receptacle: RF; coaxial.	PA Monitor	JJ-172
L900	CHOKE, R.F.: 128 microhenries, ±10%, Q=100.	ALDC Choke	CL-177
L901	COIL, R.F.: 750 microhenries, ±20%, 100 ma max. current, approx. 17 ohms dc resistance.	ALDC Choke	CL-100-5
L902	COIL, High frequency; L - 1.5 uh; Q - 200 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, R.F.: 1.1 microhenry; Q less than 70 at 7.9 mc; 3/16 in. dia. x 5/8 in. lg. body.	M1003 Choke	CL-139
L906	CHOKE, plate: L - 25 uhy; Q - greater than 180 F-2.5 mc.	PA Plate Choke	CL-167
L907	NOT USED.		
L908	Same as L901.	M1003 Choke	
L909	COIL, R.F.: fixed; 180 microhenries, ±10% microhenries, Q = 50.	PA Screen Choke	CL-178
L910	Same as L901.	PA Grid Choke	
L911	COIL, R.F.: fixed; plate decoupling: L - 45 microhenries, Q - 130 or greater; F - 2.5 Mc test frequency.	PA Plate Choke	CL-154
L912	NOT USED.		
L913	NOT USED.		
L914	CHOKE, R.F.: fixed; 38 microhenries, ±5%, Q = 160.	PA Plate Choke	CL-179
L915	COIL, PA, filament: 5 microhenry each coil; inside coil completely insulated from outside coil; 3-1/4 in. O.D. x 6-1/2 in. lg.	PA Fil. Choke	CL-160
L916	Same as L914	Thermocouple Isolation	

PA(10K) SECTION (SYMBOL SERIES 900)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
L917	Same as L914.	Thermocouple Isolation	
MP900	COUNTER, rotating: 3 wheel, 0 to 9 each wheel.	Tune Indicator	CY-105
MP901	Same as MP900.		
MP902	Same as MP900.		
MP903	COUNTER, rotating: 3 wheel, tune, operate, emergency.	Output Loading Indicator	AC-108
MP904	COUNTER, rotating: 3 wheel, 4 to 28 Mc.	Bandswitch Indicator	AC-107
P900	CONNECTOR, plug: female; AN pin type.	IPA To PA Interconnect	MS3106B20-27S
P901	CONNECTOR, plug: RF; Dielectric-Teflon used W/RG-174/u coaxial wire	PA Monitor	PL-169
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	RC20GF222K
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
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	RC30GF471K
R909	NOT USED.		
R910	RESISTOR, fixed: composition; 47 ohms, ±10%, 1 watt.	IPA Monitor Volt. Divider	RC30GF470K
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, micro, push; 10 amps at 125/250 VAC; 1/2 amp at 125 VDC.	PA Bandswitch Interlock	SW-189

PA(10K) SECTION (SYMBOL SERIES 900)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
S902	SWITCH, push button: momentary contact; normally closed; SPST, 15 amp, at 125/250 or 460 VAC, 1/2 amp at VDC, 1/4 amp at 250 VDC.	PA Output Interlock	SW-169
S903	SWITCH ASSEMBLY: rotary, 3 position single pole; ceramic insulation.	10KRF Output Switch	AS-117
S904	SWITCH WAFER: rotary.	10K Output Indicator Switch	WS-109
TC900	THERMOCOUPLE: used with 0-20 meter movement; 2-1/8 in. lg. x 1 in. wide x 1 in. high o/a.	Ant. Current Thermocouple	TH-100-20
V900	TUBE, power amplifier: ceramic tetrode.	Power Amplifier	4CX5000A
XV900	SOCKET, tube: consists of socket and capacitors C919 thru C926 and C933 thru C936.	Socket for V900	AX-130

PA(40K) FRAME (SYMBOL SERIES 7100)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
B7101	BLOWER, centrifugal: CCW rotation up blast; 3 hp, 3400 rpm; 208 V, 60 cps, 3 phase.	Main PA Blower	BL-107
C7101	CAPACITOR, fixed: ceramic; 1000 mmfd, ±20%, 5000 wvdc.	Bypass, External Filter	CC-109-38
C7102	Same as C7101.	Bypass, External Filter	
C7103	Same as C7101.	Bypass, External Filter	
C7104	Same as C7101.	Bypass, External Filter	
C7105	Same as C7101.	Bypass, External Filter	
C7106	Same as C7101.	Bypass, External Filter	
C7107	Same as C7101.	Bypass, External Filter	
C7108	Same as C7101.	Bypass, External Filter	
C7109	Same as C7101.	Bypass, External Filter	
C7110	Same as C7101.	Bypass, External Filter	
C7111	Same as C7101.	Bypass, External Filter	

PA(40K) FRAME (SYMBOL SERIES 7100)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C7112	Same as C7101.	Bypass, External Filter	
C7113	Same as C7101.	Bypass, External Filter	
C7114	Same as C7101.	Bypass, External Filter	
C7115	Same as C7101.	Bypass, External Filter	
C7116	Same as C7101.	Bypass, External Filter	
C7117	CAPACITOR, fixed: mylar; .01 ufd, ±5%, 4000 wvdc.	Bypass, PA Fil. Filter	CX102J103M
C7118	Same as C7101.	Bypass, Main Blower	
C7119	Same as C7101.	Bypass, Main Blower	
C7120	Same as C7101.	Bypass, Main Blower	
C7121	Same as C7101.	Bypass, PA Fil. Filter	
C7122	Same as C7101.	Bypass, PA Fil. Filter	
C7123	Same as C7101.	Bypass, PA Fil. Filter	
C7124	Same as C7101.	Bypass, PA Fil. Filter	
C7125	Same as C7101.	Bypass, PA Fil. Filter	
C7126	Same as C7101.	Bypass, PA Fil. Filter	
C7127	Same as C7101.	Bypass, Main Blower	
C7128	Same as C7101.	Bypass, Main Blower	
C7129	Same as C7101.	Bypass, Main Blower	
E7101	TERMINAL STRIP, barrier type: 3 terminals.	Main Blower Strip	TM-118-3
J7101	CONNECTOR, receptacle: male; AN pin type, 35 contacts.	Blower Contactor Receptacle	MS3102A-32-7P
J7102	CONNECTOR, receptacle: female; AN pin type, 14 contacts.	External Filter Receptacle	MS3102A-20-27S
J7103	CONNECTOR, receptacle: male; AN pin type, 14 contacts.	External Filter Receptacle	MS3102A-20-27P
J7104	CONNECTOR, receptacle: RF; coaxial.	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
L7101	COIL, R.F.: fixed; 30.5 uhy; Q = 35, resistance .025 ohms; frequency 2.5 mc.	External Filter Coil	CL-222

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
L7102	Same as L7101.	External Filter Coil	
L7103	Same as L7101.	External Filter Coil	
L7104	Same as L7101.	External Filter Coil	
L7105	Same as L7101.	External Filter Coil	
L7106	Same as L7101.	External Filter Coil	
L7107	Same as L7101.	External Filter Coil	
L7108	Same as L7101.	External Filter Coil	
L7109	NOT USED.		
L7110	NOT USED.		
L7111	COIL, R.F.: fixed; 45 uhy, Q = 15 or greater, 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: female; socket type, 35 contacts.	PA to PS Interconnect	MS3106B-32-7S
P7102	CONNECTOR, plug: male; pin type, 35 contacts.	PA to PS Interconnect	MS3106B-32-7P
P7103	Same as P7101.	Blower Contactor Plug	
P7104	CONNECTOR, plug: male; pin type, 14 contacts.	External Filter Plug	MS3106B-20-27P
P7105	CONNECTOR, plug: female; socket type, 14 contacts.	Bias Supply Plug	MS3106B-20-27S
P7106	CONNECTOR, plug: male; 4 contacts.	PA to PS Interconnect.	MS3106B-22-10P
P7107	Same as P7101.	Relay Panel Plug	
P7108	CONNECTOR, plug: female; 4 contacts.	Relay Panel Plug	MS3106B-22-10S
P7109	CONNECTOR, plug: male; 1 contact.	Bias Supply B- Plug	MS3106B-18-16P
R7101	RESISTOR, fixed: composition; 1 megohms, ±5%, 1/2 watt.	Grid Voltmeter Dropping	RC20GF105J
S7101	SWITCH, airflow.	Main Blower Air Switch	SW-243
S7102	SWITCH, interlock: SPDT; 15 amps at 120, 250 VAC.	Bias Drawer Interlock	SW-230

PA(40K) FRAME (SYMBOL SERIES 7100)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
S7103	Same as S7102.	Relay Panel Interlock	
S7104	Same as S7102.	Rear Door (PA) Interlock	
T7101	TRANSFORMER, power: step-down; primary winding 230 V, 50/60 cycle; secondary winding 13 VAC at 225 amps CT; test voltage 2000 V. In accordance with MIL-T-27 and Amend., Type TF3RX01YY.	PA Filament	TF-215

METER PANEL (SYMBOL SERIES 7200)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C7201	CAPACITOR, fixed: mica; .01 mfd, ±10%, 500 wvdc.	Fil. 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	Same as C7208.	SWR Bypass	
C7210	Same as C7208.	SWR Bypass	
C7211	Same as C7208.	SWR Bypass	
I7201	LAMP, fluorescent: standard cool, 1/2" dia. x 11-1/4" long.	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 Lite	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

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
L7202	Same as L7201.	SWR Filter	
M7201	METER, filament primary: AC voltmeter, 0-300 volts, red marker at 230 V; 4-1/2" sq. case.	Filament Primary	MR-118
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 in. sq. case.	Plate; R. F.	MR-120
M7205	METER, amperes: R. F.; 0-35 amps; 4-1/2" rectangular case. (Must purchase with matching Thermocouple, TH-101, Symbol Number TC7301.)	Output	MR-137
R7201	RESISTOR, fixed: wire wound; 500 ohms, 25 watts.	HV ON Lite Volt. Dropping Res.	RW-111-17
S7201	STARTER, fluorescent lamp; 8 watts; 13/16" dia. x 1-1/2" long.	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	
XI7201 A	SOCKET, fluorescent lamp: 75 watts, 250 volts.	Lamp Socket	TS-141
XI7201 B	Same as XI7201A.	Lamp Socket	
XI7202 A	Same as XI7201A.	Lamp Socket	
XI7202 B	Same as XI7201A.	Lamp Socket	
XI7203	SOCKET, bulb head mounting: ceramic; for standard base incandescent lamp; rated for 660 watts, 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	

PA(40K) SECTION (SYMBOL SERIES 7300)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
A7301	WAFER AND CONTACT ASSEMBLY: super mica insulation; contacts rhodium plated brass; 7 short and 1 long contact. Replaceable part of S7301.	S7301 Wafer and Contacts	AX-217
A7302	WAFER, CONTACT AND COIL ASSEMBLY: super mica insulated; 8 contacts rhodium plated brass. Consist of L7301, L7308, L7309. Replaceable part of S7302.	S7302 Wafer, Contacts and Coils	AX-218
A7303	ROTOR ASSEMBLY: fan type; 5 contact, rhodium plated brass. Replaceable part of S7302.	S7302 Rotor	AR-126
B7301	FAN, axial: 3400 rpm, CW; 115-230 VAC.	Top Fan	BL-108
C7301	CAPACITOR, variable: vacuum; 25-450 mmfd, 45 Kv, 125 amps RMS.	PA Tune	CB-149
C7302	Same as C7301.	PA Load	
C7303	Same as C7301.	PA Load	
C7304	CAPACITOR, fixed: ceramic; 1000 uufd, ±20%, 5000 wvdc.	Bypass, Plate Meter Circuit	CC-109-38
C7305	Same as C7304.	Bypass, Plate Meter Circuit	
C7306	NOT USED.		
C7307	NOT USED.		
C7308	NOT USED.		
C7309	NOT USED.		
C7310	CAPACITOR, fixed: trylar; 1000 uufd, ±10%, 18,000 wvdc.	Bypass, PA Plate	CX102K102S
C7311	Same as C7310.	Bypass, PA Plate	
C7312	CAPACITOR, fixed: trylar; .01 ufd, ±5%, 4000 wvdc.	Bypass, PA Filament	CX102J103M
C7313	Same as C7312.	Bypass, PA Filament	
C7314	Same as C7312.	Bypass, PA Filament	
C7315	Same as C7312.	Bypass, PA Filament	
C7316	CAPACITOR, fixed: plastic; 3000 mmfd, 25,000 wvdc.	Bypass, PA Plate	CX-103
C7317	CAPACITOR, fixed: mica; 300 mmfd, ±10%; char. B, 500 wvdc.	Bypass, Drive Meter Circuit	CM20B301K

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C7318	CAPACITOR, fixed: mica; .01 mfd, ±10%, char. B, 300 wvdc.	Top Fan Bypass	CM35B103K
C7319	Same as C7318.	Top Fan Bypass	
C7320	Same as C7318.	Top Fan Bypass	
C7321	Same as C7304.	Bypass, Output Meter	
C7322	CAPACITOR, fixed: vacuum; 3 mmfd, 17000 volts peak; 7 amp current rating; 1-1/16" dia. x 3-1/4" lg.	Coupling, Drive Meter Circuit	CO-102-3
C7323	Same as C7318.	Top Fan Bypass	
C7324	CAPACITOR, fixed: mica; 50 mmfd, ±10%, char. B, 500 wvdc.	Plate Monitor	CM15B500K
C7325	CAPACITOR, fixed: vacuum; 1000 mmfd, 30 Kv, 125 amps RMS.	DC Blocking	C0-106-1000-30C
C7326	CAPACITOR, fixed: vacuum; 6 mmfd, 30 Kv, 60 amps RMS.	Coupling, Plate Meter Circuit	C0-107-6-30C
C7327	CAPACITOR, fixed: paper; 4 mfd, ±10%; char. F; 600 wvdc; oil filled and impregnated, hermetically sealed cylindrical metal case.	Top Fan Capacitor	CP41B1FF405K
C7328	Same as C7325.	Bypass	
CP7301	ADAPTER, connector.	P7303 to XCR7301 Adapter	UG-273/U
CP7302	Same as CP7301.	P7302 to XCR7302 Adapter	
CP7303	Same as CP7301.	J7303 to P7307 Adapter	
CR7301	DIODE, germanium.	SWR Forward	1N21B
CR7302	Same as CR7301.	SWR Reverse	
DC7301	COUPLER, directional.	SWR System	DC-100
E7301	ROTOR, switch: fan type; rhodium plated. Replaceable part of S7301.	S7301 Rotor	RO-101
E7302	TERMINAL STRIP, barrier type: 5 terminal.	Bandswitch Release Strip	TM-102-5
E7303	TERMINAL STRIP, barrier type: 14 terminal.	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

PA(40K) SECTION (SYMBOL SERIES 7300)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
E7306	TERMINAL STRIP, barrier type: 4 terminals.	Top Fan Strip	TM-102-4
E7307	TERMINAL STRIP, barrier type: plastic; 3 terminals.	PA Tube Thermostat Strip	TM-102-3
F7301	FUSE, cartridge: 1 amp.	Output Mtr Protect	FU-100-1
F7302	Same as F7301.	Output Mtr Protect	
I7301	LAMP, incandescent: 230 V, 10 watts, screw base.	AC Power	BI-105-1
I7302	Same as I7301.	Tune	
I7303	Same as I7301.	Operate	
I7304	Same as I7301.	Plate On	
J7301	NOT USED.		
J7302	CONNECTOR, receptacle: female; 4 contacts.	Top Fan Recep.	MS3102A-14S-2S
J7303	CONNECTOR, probe, R.F.	Plate Monitor	AJ-101
J7304	CONNECTOR, probe, R.F.	R.F. Monitor	AJ-100
L7301	COIL, R.F.: fixed; 4.2 uhy; tapped at 3.2, 1.5, 1.1, .9, .6 uhy; 250 amps max; gold plated copper. Not a replaceable item, part of A7302.	"L" Section Coil	CL-218
L7302	COIL, R.F.: fixed; 3.6 uhy; tapped at 3.2, 1.5, 1.1, .9, .6 uhy; 30 amps max; gold plated copper.	"PI" Section Coil	CL-219
L7303	COIL, R.F.: fixed; 6 uhy; 225 amps max; teflon insulated.	PA Filament Coil	CL-220
L7304	COIL, R.F.: fixed; 35 uhy, Q = 180 at 2.5 mc.	Decoupling Coil	CL-166
L7305	Same as L7304.	Decoupling Coil	
L7306	Same as L7304.	Decoupling Coil	
L7307	Same as L7304.	Thermocouple Coil	
L7308	COIL, R.F.: fixed; .15 uhy. Not a replaceable item, part of A7302.	19-24 MC Coil "L" Section	CL-223
L7309	COIL, R.F.: fixed; .1 uhy. Not a replaceable item, part of A7302.	24-28 MC Coil "L" Section	CL-224

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
L7310	SOLENOID, relay: with plunger; 230 V, 60 cps, 0.2 amps; continuous duty cycle.	Bandswitch Release System	SZ-100
L7311	COIL, R.F.: fixed; 38 microhenries, ±5%, Q = 160, Freq = 2.5 MC (test).	Thermocouple Coil	CL-179
L7312	Same as L7304.	Decoupling	
P7301	CONNECTOR, plug: QDL; male; single connector; for RG-18/U, RG-35/U or GR-164/U cable.	Emergency Output Connector	PL-136
P7302	CONNECTOR, plug: male, 4 contacts.	Top Fan Plug	MS-3106B-14S-2P
P7303	CONNECTOR, plug: R.F., coaxial.	SWR Forward Connector	PL-169
P7304	Same as P7303.	SWR Forward Connector	
P7305	Same as P7303.	SWR Reverse Connector	
P7306	Same as P7303.	SWR Reverse Connector	
P7307	Same as P7303.	Plate Monitor	
R7301	RESISTOR, fixed: composition; 470 ohms, ±10%; 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: wire wound; 3000 ohms, ±10%; 10 watts.	AC Power Light Dropping Resistor	RW-109-30
R7304	Same as R7303.	Tube Light Dropping Resistor	
R7305	Same as R7303.	Operate Light Dropping Resistor	
R7306	Same as R7303.	Plate On Light Dropping Resistor	
R7307	RESISTOR, fixed: wire wound; 20,000 ohms, ±5%, 10 watts.	Thermostat Dropping	RW-109-37
R7308	NOT USED.		
R7309	NOT USED.		
S7301	SWITCH ASSEMBLY: rotary; consisting of the following replaceable items: Symbol # A7301 (AX-217) Wafer and Contact Assembly. Symbol # E7301 (RO-101) Rotor	PA Bandswitch "PI" Section	Use A7301 and E7301

PA(40K) SECTION (SYMBOL SERIES 7300)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
S7302	SWITCH ASSEMBLY: rotary; consisting of the following replaceable items: Symbol # A7302 (AX-218) Wafer and Coil Assembly Symbol # A7303 (AR-126) Rotor Assembly	PA Bandswitch; "L" Section	Use A7302 and A7303
S7303	SWITCH, INTERLOCK: SPDT; 15A at 125, 250 VAC; 2 amps resistive at 250 VDC.	PA Deck Interlock	SW-230
S7304	SWITCH, MICRO, push: SPDT; 10A at 125, 250 VAC; 1/2 amp at 125 VDC.	PA Bandswitch	SW-189
S7305	SWITCH, thermostatic: SPST; closes at 200° ±6°F; opens at 185° ±6°F.	PA Tube Protect	SS-104
TC7301	THERMOCOUPLE, meter: external; 50 amps R.F. (Can only be purchased as matched set with Meter MR-137, Symbol Number M7205.)	RF Output Metering	TH-101
V7301	TUBE, electron: triode.	Power Amplifier	ML-6697
XCR7301	HOLDER, crystal: connector type.	CR7301 Holder	TS-146
XCR7302	Same as XCR7301.	CR7302 Holder	
XF7301	HOLDER, fuse: clip type; single pole, for 1/4 x 1-1/4" AGC fuse.	F7301 Holder	FH-105
XF7302	Same as XF7301.	F7302 Holder	
XI7301	SOCKET, lamp: with frosted amber lens; screw type socket.	AC Power	TS-136-3FS
XI7302	SOCKET, lamp: with frosted green lens; screw type socket.	Tune	TS-136-2FS
XI7303	SOCKET, lamp: with frosted blue lens; screw type socket.	Operate	TS-136-4FS
XI7304	SOCKET, lamp: with frosted red lens; screw type socket.	Plate On Drive	TS-136-1FS
XZ7301	SOCKET, electron tube: octal.	Drive Network Socket	TS-101-P01
XZ7302	Same as XZ7301.	Plate Monitor Network Socket	
Z7301	NETWORK, detector: R.F.; range 4 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: 110 volts, 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, ±10%, 1/2 watt.	Interlock Indic. Dropping Resistor	RC20GF224K
R7402	Same as R7401.	HV Breaker Indicator Dropping Resistor	
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 125 V, 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, 12 amps at 125.	HV Bkr. Reset	SW-272-R
S7403	SWITCH, toggle: SPST; 6 amps; 125 VAC; 28° angle of throw solder lug terminals.	PA Lights ON-OFF	ST-12A
S7404	SWITCH, rotary: 1 section; 12 positions, 30° 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
XI7401	LIGHT, indicator: with clear white lens; for miniature bayonet base, T-3-1/4 bulb.	I7401 Socket	TS-106-2
XI7402	Same as XI7401.	I7402 Socket	

BIAS SUPPLY DRAWER (SYMBOL SERIES 7500)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C7501	CAPACITOR, fixed: ceramic; 1000 uufd, ±20%; 5000 wvdc.	AC Input Filter	CC-109-38
C7502	Same as C7501.	AC Input Filter	
C7503	Same as C7501.	AC Input Filter	
C7504	Same as C7501.	AC Input Filter	
C7505	CAPACITOR, fixed: dry electrolytic; polarized, 80 mfd, 450 wvdc.	Filter Cap., 350 V	CE51F800R
C7506	CAPACITOR, fixed: paper dielectric; 10 uf; ±10%, 600 volts, char. E.	Filter Cap., 600 V	CP70B1EG 106K
C7507	CAPACITOR, fixed: mica; .01 mfd, ±10%, char. B; 300 wvdc.	RF Bypass, V7504	CM35B103K
C7508	Same as C7507.	RF Bypass, V7506	
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: mylar; .424 uf, 200 wvdc.	Grid Bypass, V7508	CN108C4243K
C7514	Same as C7513.	Grid Bypass, V7509	
C7515	CAPACITOR, fixed: mica; 1000 uufd, ±10%; char. B; 500 wvdc.	Retune Bypass	CM20B102K
C7516	Same as C7515.	SWR Ovld. 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, neon: miniature; 110 volts, 1/25 watt; T-3-1/4 clear bulb; bayonet base.	Low Voltage	BI-100-51
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: male contacts, 14 contacts.	Voltage Input & Output	MS3102A-20-27P

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
J7502	CONNECTOR, receptacle: female, 1 contact.	B- Connector	MS3102A-18-16S
L7501	COIL, R.F.: fixed; 185 microhenries, ±15 microhenries; 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, R.F. fixed: 2.5 millihenries.	Retune Filter	CL-140-1
L7506	Same as L7505.	SWR Filter	
R7501	RESISTOR, fixed: wire wound; 1,000 ohms, ±5%, 10 watts.	Voltage Dropping V7501	RW-109-24
R7502	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1/2 watt.	I7501 Voltage Dropping	RC20GF104K
R7503	RESISTOR, fixed: composition; 470,000 ohms, ±10%, 2 watts.	Voltage Dropping	RC42GF474K
R7504	RESISTOR, fixed: wire wound; 7500 ohms, ±10%, 20 watts.	Voltage 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: wire wound; 5000 ohms, 10 watts, 1-3/4 length.	Voltage Divider	RW-109-32
R7508	RESISTOR, fixed: composition; 47 ohms, ±10%, 2 watts.	Voltage Divider	RC42GF470K
R7509	RESISTOR, fixed: composition; 680,000 ohms, ±10%, 2 watts.	Voltage Divider	RC42GF684K
R7510	Same as R7508.	Voltage Divider	
R7511	RESISTOR, fixed: composition; 220,000 ohms, ±10%, 2 watts.	Voltage Divider	RC42GF224K
R7512	Same as R7511.	Voltage Divider	
R7513	RESISTOR, variable: composition; 500,000 ohms, ±20%, 2 watts, with locking bushing.	Bias Adj.	RV4ATXA504B

BIAS SUPPLY DRAWER (SYMBOL SERIES 7500)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
R7514	NOT USED.		
R7515	Same as R7502.	Bias Indicator Voltage Dropping	
R7516	RESISTOR, fixed: composition; 330,000 ohms, ±10%, 2 watts.	V7508 Plate Dropping	RC42GF334K
R7517	Same as R7516.	V7509 Plate Dropping	
R7518	Same as R7502.	V7508 Grid Dropping	
R7519	Same as R7502.	V7509 Grid Dropping	
R7520	Same as R7513.	Retune Ovld. Adj. V7508	
R7521	RESISTOR, fixed: composition; 1000 ohms, ±10%, 1 watt.	Cathode Res., V7508	RC32GF102K
R7522	RESISTOR, variable: wire wound; 25,000 ohms, ±10%, 4 watts, linear taper.	Cathode Volt. Adj., V7508	RA106ASXA 253A
R7523	RESISTOR, fixed: wire wound; 10,000 ohms, ±10%, 10 watts.	Cath. Volt. Dropping, V7508	RW-109-34
R7524	RESISTOR, fixed: composition; 3300 ohms, ±10%, 2 watts.	Cath. Volt. Dropping, V7508	RC42GF332K
R7525	Same as R7524.	Cath. Volt. Dropping, V7509	
R7526	Same as R7522.	Cath. Volt. Adj., V7509	
R7527	Same as R7523.	Cath. Volt. Dropping, V7509	
R7528	Same as R7521.	Cath. Res., V7509	
R7529	Same as R7513.	SWR Ovld. Adj., V7509	
R7530	RESISTOR, fixed: composition; 56,000 ohms, ±5%, 1 watt.	Cath. Bias Res., V7508	RC32GF563J
R7531	RESISTOR, fixed: wire wound; 3000 ohms, ±5%, 160 watts, 230 ma.	Volt. Bleeder	RW-117-21
S7501	SWITCH, interlock: push to operate; total travel approx. 0.312 in.; 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

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
V7501	TUBE, electron: full wave rectifier, 7 pin miniature.	Rectifier, +350V	6X4
V7502	TUBE, electron: full wave rectifier, octal base.	Rectifier, +600V	5R4GY
V7503	Same as V7502.	Rectifier, +600V	
V7504	TUBE, electron: voltage regulator; 7 pin miniature.	Voltage Regulator	0A2
V7505	Same as V7504.	Voltage Regulator	
V7506	TUBE, electron: sharp cutoff RF pentode; 7 pin miniature.	Voltage Regulator, +600V	6AU6
V7507	TUBE, electron: twin power triode.	Voltage Regulator, +600V	6336A
V7508	TUBE, electron: duo triode; 9 pin miniature.	Retune DC Ampl.	12AT7
V7509	Same as V7508.	SWR DC Ampl.	
XC7501 thru XC7504	NOT USED.		
XC7505	SOCKET, electron: octal.	Capacitor Socket C7505	TS101P01
XF7501	SOCKET, 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: with 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: with 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	
XV7508	SOCKET, electron tube: 9 pin miniature.	Tube Socket V7508	TS103P01
XV7509	Same as XV7508.	Tube Socket V7509	

RELAY PANEL (SYMBOL SERIES 7600)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
E7601	BOARD, terminal: barrier type; fourteen 6-32 x 1/4" binding head machine screws.	Relay Terminal Strip	TM-100-14
E7602	BOARD, terminal: barrier type; eight 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; ten 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 candelabra; 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	
J7601	CONNECTOR, receptacle: male; 35 contacts.	Power In & Out	MS3102A-32-7P
J7602	CONNECTOR, receptacle: male; 4 contacts.	Power In & Out	MS3102A-22-10P

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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; operate latch - 200 y, 60 cps 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	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.	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; rated at 25 amps; coil .01 ohms, ±10%; operate at 3 VAC at 10 amps.	Final Filament	AR-125

RELAY PANEL (SYMBOL SERIES 7600)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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 in. dia. panel, mounting bakelite case; contacts rated at 10 amps; time cycle 5 min.; dial division - 15 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 Overload Adj.	RA75ASA0R5 AK25
R7602	RESISTOR, variable: wire wound; 100 ohms, ±10%; 25 watts.	Grid Overload Adj.	RA75ASA101 AK25
R7603	RESISTOR, fixed: wire wound, 30 ohms, ±5%, 10 watts.	Grid Overload Voltage 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 Voltage 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. Voltage Dropping	RC20GF224K
R7608	RESISTOR, fixed: wire wound; .166 ohms, ±5% (R7608 is P/O K7608)	Tube Protect Relay Coil Shunt	AR-128
R7609	Same as R7608.		
S7601	SWITCH, toggle:SPST;6 amps; 125 VAC; 28° angle of throw; solder lug terminals.	Drive Interlock Switch	ST-12A

RELAY PANEL (SYMBOL SERIES 7600)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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	

POWER SUPPLY FRAME (SYMBOL SERIES 8100)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
B8101	GEARCASE-MOTOR: 240 VAC at 5 amps. For use with, but note 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; 1000 uufd, ±20%, 5000 wvdc.	AC Filter	CC-109-38
C8102	Same as C8101.	AC Filter	
C8103	Same as C8101.	AC Filter	
C8104	Same as C8101.	AC Filter	
C8105	Same as C8101.	AC Filter	
C8106	Same as C8101.	AC Filter	
C8107	CAPACITOR, fixed: oil filled, 4 ufd, 15,000 wvdc.	AC Filter	CP-107
C8108	Same as C8107.	AC Filter	
C8109	CAPACITOR, fixed: paper, bathtub case; 1 ufd; ±10%, 600 wvdc, char. F.	Fan Capacitor	CP53B1FF105K

POWER SUPPLY FRAME (SYMBOL SERIES 8100)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
CB8101	CIRCUIT BREAKER: magnetic trip; 3 pole; 600 VAC, 225 amps; 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	Same as E8101.	HVR Filament	
E8106	Same as E8101.	HVR Filament	
E8107	Same as E8101.	HVR Filament	
E3108	Same as E8101.	HVR High Voltage	
E8109	Same as E8101.	HVR HV AC	
E8110	Same as E8101.	HVR HV AC	
E8111	Same as E8101.	HVR HV AC	
E8112	TERMINAL STRIP, barrier type, 3 terminals.	Timer Term. Strip	TM-102-3
E8113	TERMINAL STRIP, barrier type, 6 terminals.	Shorting Relay Term. Strip	TM-102-6
E8114	CONTACT, spring: 1-1/2 x 1-1/2 x 2-1/2", beryllium copper, rhodium 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	TERMINAL STRIP, barrier type, 4 terminals.	Resistor Mtg. Term. Strip	TM-102-4
E8118	Same as E8117.	Top Fan Term. Strip	
F8101	FUSE, cartridge: time-lag; 3 amp.	Top Fan Fuse	FU-102-3
I8101	LAMP, incandescent: red; 110/115 V, 25 watts; standard screw base; 4" x 1-7/8" o/a.	HV Warning	BI-106-3

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
J8101	CONNECTOR, receptacle: male; 35 contacts.	Interconnect Receptacle PA Frame	MS3102A-32-7P
J8102	CONNECTOR, receptacle: female; 35 contacts.	Interconnect Receptacle PA Frame	MS3102A-32-7S
J8103	CONNECTOR, receptacle: female; rectangular; 17 contacts.	Interconnect Receptacle Tuner Unit	JJ-181
J8104	CONNECTOR, receptacle: female; 4 contacts.	Interconnect Receptacle PA Frame	MS3102A-22-10S
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 TF1R04YY.	AC Filter Choke	TF-5016
L8102	COIL, 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; 230V, 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: female; AN pin type, 5 contacts.	Crowbar Plug	MS3106B-22-12S
R8101	RESISTOR, fixed: wire wound; 1.0 ohms, 14 watts.	Bleeder/Divider Resistor	RW119G1R0
R8102	RESISTOR, fixed: 18,000 ohms, 140 watts, char. F, wire wound.	Bleeder/Divider Resistor	RW118F183
R8103	Same as R8102.	Bleeder/Divider Resistor	
R8104	Same as R8102.	Bleeder/Divider Resistor	
R8105	Same as R8102.	Bleeder/Divider Resistor	
R8106	Same as R8102.	Bleeder/Divider Resistor	
R8107	Same as R8102.	Bleeder/Divider Resistor	

POWER SUPPLY FRAME (SYMBOL SERIES 8100)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
R8108	Same as R8102.	Bleeder/Divider Resistor	
R8109	Same as R8102.	Bleeder/Divider Resistor	
R8110	Same as R8102.	Bleeder/Divider Resistor	
R8111	Same as R8102.	Bleeder/Divider Resistor	
R8112	RESISTOR, fixed: wire wound; 140 watts, 5.0 ohms, char. F.	Bleeder/Divider Resistor	RW118F5R0
R8113	Same as R8112.	Bleeder/Divider Resistor	
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: wire wound; 500 ohms, 25 watts.	HV Warning Lamp Volt. Dropping	RW-111-17
S8101	SWITCH, interlock: push to operate; total travel app. 0.312 in.; 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 button: 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	

POWER SUPPLY FRAME (SYMBOL SERIES 8100)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
T8103	Same as T8101	Main Power Transformer	
T8104	TRANSFORMER, power, fixed autotransformer: 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	TRANSFORMER, power: pri. 11/220 V, 50/60 cps, single phase; sec. #1: 250-0-250 V RMS, 35 ma DC; sec. #2: 6.3 V, CT, 30.	Crowbar Triggering	TF-126
XF8101	FUSE HOLDER, 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
XI8101	SOCKET, bulkhead mounting; ceramic; for standard base incandescent lamp; rated for 660 watts, 250 volts.	I8101 Socket	TS-143

ANTENNA TUNING UNIT AND METER PANEL DRAWER (SYMBOL SERIES 8200)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
A8201	ROTOR ASSEMBLY: switch, 5 contacts; gold plated.	S8201 Rotor	AR-127
A8202	COIL, WAFER AND CONTACT ASSEMBLY: 15-0-15 uhy; tapped at 6 and 12 uhy of each section giving 15, 12, 6, 0, 6, 12, 15, uhy; 30 amps maximum; gold plated; glass silicone and supramica insulation.	Bandswitch Coil & Contacts	AC-112
C8201	CAPACITOR, variable: vacuum; 12 to 50 ufd, 15,000 volts 45 amps RMS.	Balance Adjust	AM-112
C8202	CAPACITOR, fixed: mica; .01 ufd, ±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	

ANTENNA TUNING UNIT AND METER PANEL DRAWER (SYMBOL SERIES 8200)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C8207	CAPACITOR, fixed: vacuum; 1000 mmfd, 30 Kv, 125 amps RMS.	Coupling Cap.	CO-106-1000-30C
E8201	CONTACT, spring: 1-1/2 x 1-1/2 x 2-1/2, beryllium copper nickel plated. Part of Symbol # A8202.	Balanced Output Contact	AX-221
E8202	Same as E8201.	Balanced Output Contact	
E8203	CONTACT, button: brass, rhodium plated; with hardware brass, nickel plated.	PA Output Contact	AX-222
I8201	LAMP, fluorescent: standard cool; 1/2 in. dia x 11-1/4 in. lg.	Meter Illuminating Light	BI-107
I8202	Same as I8201.	Meter Illuminating Light	
J8201	CONNECTOR, receptacle: male; rectangular; 17 pin contacts.	Power Input Connector	JJ-180
L8201	COIL, RF, fixed: 30 uhy total. Not a replaceable item. Part of symbol # A8202.	Coil Section Of A8202	p/o A8202
L8202	COIL, R.F., fixed: 35 uhy, Q = 180 at 2.5 Mc.	Static Choke	CL-166
M8201	METER, volts, AC: rectifier type; 0-10 volts AC, approximately 1000 ohms resistance; rectangular case 4.2 x 4.66.	Crowbar Filament Meter	MR-131
M8202	METER, milliamps: 300-0-300; approximately 1 ohm resistance; rectangular case, 4.2 x 4.66.	Grid Current Meter	MR-130
M8203	METER, volts, DC: 0-20 kilovolts; approximate resistance 46 ohms, rectangular case 4.2 x 4.66.	Plate Volts Meter	MR-133
M8204	METER, volts, DC: negative 0-1000 volts, approximate resistance 46 ohms; rectangular case 4.2 x 4.66.	Grid Volts Meter	MR-134
M8205	METER, volts, R.F.: 0-4 standing wave indicator; approximate resistance 1000 ohms; rectangular case 4.2 x 4.66.	SWR Meter	MR-136
R8201	NOT USED.		

ANTENNA TUNING UNIT AND METER PANEL DRAWER (SYMBOL SERIES 8200)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
S8201	STARTER, fluorescent lamp; 8 watts; 13/16 in. dia. x 1-1/2 in. long	Lamp Starter	PO-170
S8202	Same as S8201.	Lamp Starter	
S8203	SWITCH, micro: pugh; 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 # A8201 Wafer - p/o Symbol # 8202	Bandswitch	p/o A8201 and A8202
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 watt, 250 volts.	Starter Socket	TS-140
XS8202	Same as XS8201.	Starter Socket	

CROWBAR DRAWER (SYMBOL SERIES 8300)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C8301	CAPACITOR, fixed: ceramic; 1000 uufd, ±20%, 5000 wvdc.	Filter Bypass	CC-109-38
C8302	Same as C8301.	Filter Bypass	
C8303	Same as C8301.	Filter Bypass	
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

CROWBAR DRAWER (SYMBOL SERIES 8300)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
I8301	LAMP, neon: miniature; 110 volts, 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	MS3102A-22-12P
L8301	COIL, R.F.: fixed; 180 microhenries, ±10 microhenries, Q = 50.	AC Filter Coil	CL-178
L8302	Same as L8301.	AC Filter Coil	
R8301	RESISTOR, fixed: wire wound; 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: wire wound; 2500 ohms, ±10%, 25 watts.	Grid Leak Resistor	RA75AXA252 AK25
R8305	RHEOSTAT, sliding contact type: 2 ohms, 75 watts, 6.120 maximum amps; 28 steps.	Reservoir Adj.	RP-101-3
R8306	RESISTOR, fixed: carbon; 220 K ohms, ±10%, .5 watts.	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	ST22N
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 Transf.	TF-214
V8301	TUBE, electron: crow bar; hydrogen thyratron.	HV Discharge Tube	7568
XF8301	FUSE HOLDER, 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	Same as C8401.	Bypass	
C8403	Same as C8401.	Bypass	
C8404	Same as C8401.	Bypass	
C8405	Same as C8401.	Bypass	
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-THRU: high voltage; ceramic insulated, nickel plated brass.	B-Contact	AX-220
E8414	Same as E8413.	Filament Contact	
E8415	Same as E8413.	Filament Contact	
E8416	Same as E8413.	Filament Contact	
E8417	Same as E8413.	HV Contact	
E8418	Same as E8413.	HV AC Contact	
E8419	Same as E8413.	HV AC Contact	
E8420	Same as E8413.	HV AC Contact	
F8401	FUSE, cartridge: time lag; 1 amp.	HV Filament Fuse, V8401	FU-102-1
F8402	Same as F8401.	HV Filament Fuse, V8402	

HIGH VOLTAGE RECTIFIER DRAWER (SYMBOL SERIES 8400)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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 microhenries, ±10 microhenries; 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 2.5V; 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	Same as V8401.	HV Rectifier	
V8403	Same as V8401.	HV Rectifier	
V8404	Same as V8401.	HV Rectifier	
V8405	Same as V8401.	HV Rectifier	
V8406	Same as V8401.	HV Rectifier	
XF8401	FUSE HOLDER, bayonet base: 100/250 volts, neon lamp, clear knob, black plastic body, 13/16 x 2-13/16 in. 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	

HIGH VOLTAGE RECTIFIER DRAWER (SYMBOL SERIES 8400)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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	

POWER SUPPLY CONTROL PANEL (SYMBOL SERIES 8500)

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: SPST; 6 amps.	SWR - Cal Switch	ST-12D
XF8501	FUSE HOLDER, bayonet base: 100/250 volts, neon lamp, clear knob, black plastic body, 13/16 x 2-13/16 in. o/a.	Socket, F8501	FH-104-3
XF8502	Same as XF8501.	Socket F8502	
XF8503	Same as XF8501.	Socket F8503.	